FORM 9 (Rule 7)

Section 9 of Care of Cathedrals Measure 2011
Publice Notice on application to the Cathedrals Fabric Commission

PUBLIC NOTICE

TAKE NOTICE that the Chapter of the Cathedral Church of:

The Cathedral and Metropolitical Church of St Peter in York

has on this date: 26th October 2026

applied to the Cathedrals Fabric Commission for approval of the following proposal:
complete as on Form 8

Conservation of the glazing and masonry to the Rose Window S16 on the South Transept, including the installation of environmental protective glazing to the Rose Window. Conservation and repair to South Transept elevation masonry.

Summary of the nature of work and its extent (and materials) [or in the case of an object, a short description of it and details of the proposal]

Conservation of the glazing and masonry to the Rose Window S16 on the South Transept, including the installation of environmental protective glazing to the Rose Window, with masonry repairs to the façade below.

Forming this project are the following components:

- A light conservation of the existing, fractured and plated glazing in the Rose window
- Design and installation of Protective Glazing with IR / UV glass,
- Design and installation of a supporting armature required to hold the existing glazing in position
- Conservation of the stonework within and surrounding the Rose Window, and to the façade of the South Transept, in line with Stone Practice
- Establishing a baseline for the monitoring and maintenance of the Rose Window and surrounding stonework
- Reinstate and upgrade existing bird protection against guano and nesting.
- Conditional approval of provision of some limited uplighting from the Rose window gallery to the south transept vault, as part of an overhaul of the existing south transept lighting scheme.

Plans, drawings, specifications or other documents

Copies of the plans, drawings, specification and other documents accompanying this application may be examined at the office of the Chapter of the Cathedral Church
Insert address and contact details

8-10 Minster Yard, York, YO1 7HH, c/o 01904 557226, works@yorkminster.org
or via the York Minster website at: https://yorkminster.org/about-us/statutory-applications/

Between the hours of:	08.00 – 16.00
From this day:	26th October 2026
and until:	23rd November 2026

REPRESENTATIONS

If you wish to make representations about the whole or any part of the proposal described in this Notice you should write to

The Secretary of the Cathedrals Fabric Commission:
c/o Cathedrals and Major Churches Officer
Church Buildings Division
Church House
Great Smith St
London
SW1P 3AZ
adrian.daffern@churchofengland.org, 020 7898 1678

So that it reaches the Secretary not later than: *insert a date ending 28 days after the time of the commencement of the period for representations.*

23rd November 2026

DIRECTIONS TO CHAPTER

1. This public notice (or a copy of it) must be displayed for a continuous period of 28 days in a prominent position inside and outside your cathedral where it is readily visible to the public.

2. A copy of this notice must be sent as follows:

(a) to the Fabric Advisory Committee of your Cathedral Church
(b) to Historic England (formerly English Heritage)
(c) to the national amenity societies as applicable (see list on Form 8)

and

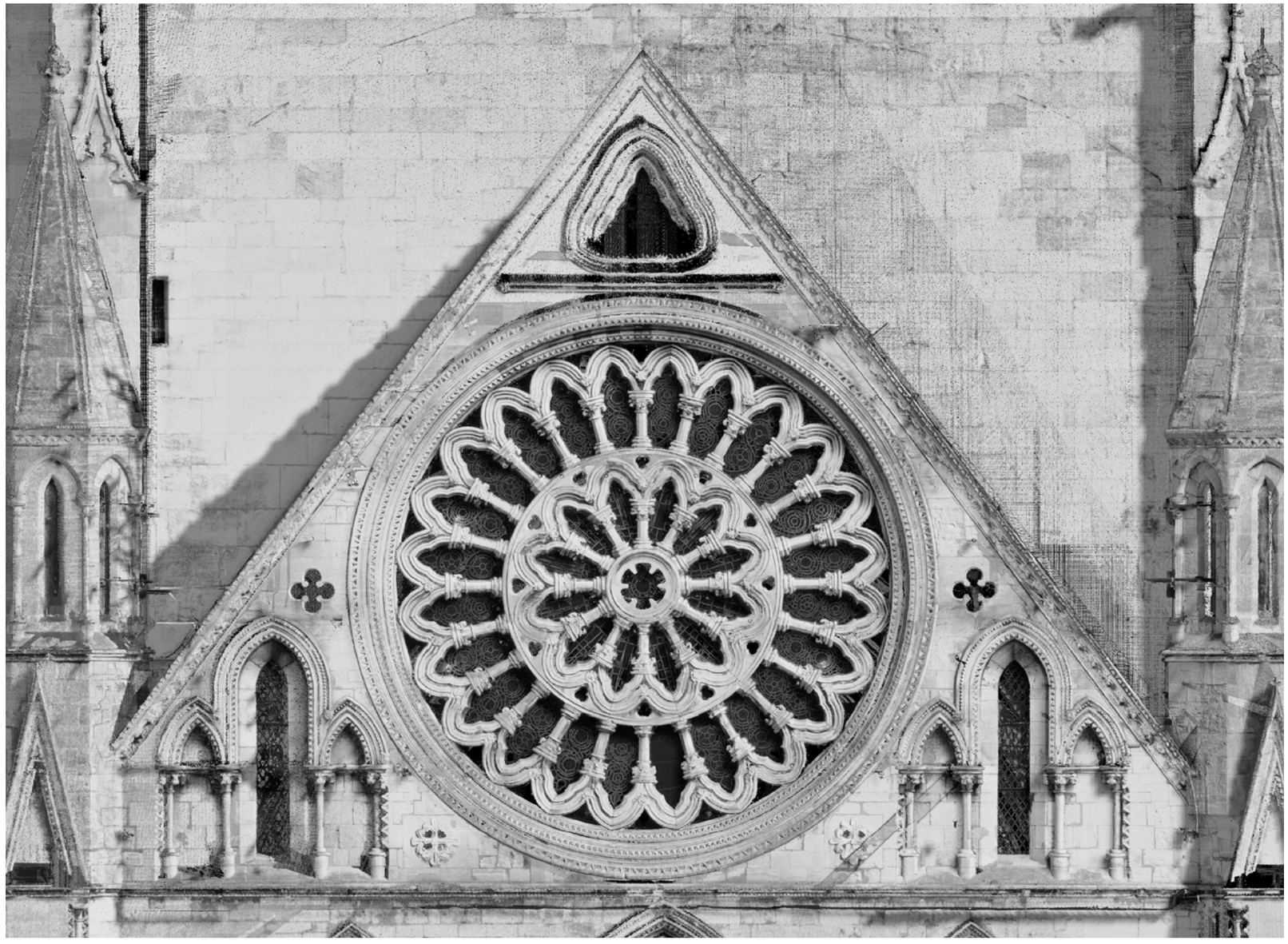
(*only if the proposal is for works as described in section 2(1)(a) of the Measure*)
(d) to the local planning authority.

Rev.: 01
Date: October 2026

York Minster

Conservation of the Rose Window (S16)

Paper for CCM Approval to CFCE



Contents

Introduction & Purpose of this proposal 2

Pre-Application Discussions & Adjacent Works 3

History of the South Transept & Rose Window 4

The Rose Window in Context 7

Statement of Significance 8

Statement of Significance Methodology 8
Statement of Significance of York Minster 8
Statement of Significance of the Rose Window 9

Summary of Initial Investigation 10

Survey of Glazing 10
Survey of Stone 11
Assessment of Condition 14
Assessment of Historic Repairs 15
Statement of Approach 16

Technical Proposals 17

Conservation of Glass Panels 17
Structural Considerations 18
Design Principles of the Armatures 19
Installation of Protective Glazing 20
Conservation of Stonework 22
Conservation of the South Transept, South Elevation 26
Maintenance and Monitoring 27
Research Opportunities 28

Heritage Impact Assessment 31

Suggested Conditions with an approval 32

Conclusion 32

Appendices 33

Introduction & Purpose of this proposal

This application relates to the conservation of the Rose Window (S16), which crowns the South Transept elevation of York Minster.

Chapter are seeking consent under the Care of Cathedrals Measure (CCM) from CFCE for the works of conservation and repair, as proposed in this paper and supporting documents. The following report sections set out the historic context of the Rose Window and South Transept, detail findings from investigations into the condition of both the glass and stone, and set out technical design for the proposals.

The information provided in this application - for regulators nad consultees - offers a summary of the analysis to date and demonstrates the care and consideration taken in developing a response to this unique heritage asset. Supporting papers - especially the research by the York Glazier's Trust (YGT) - articulates the compelling case for the interventions that are the basis for the conservation programme proposed.

Statement of Need

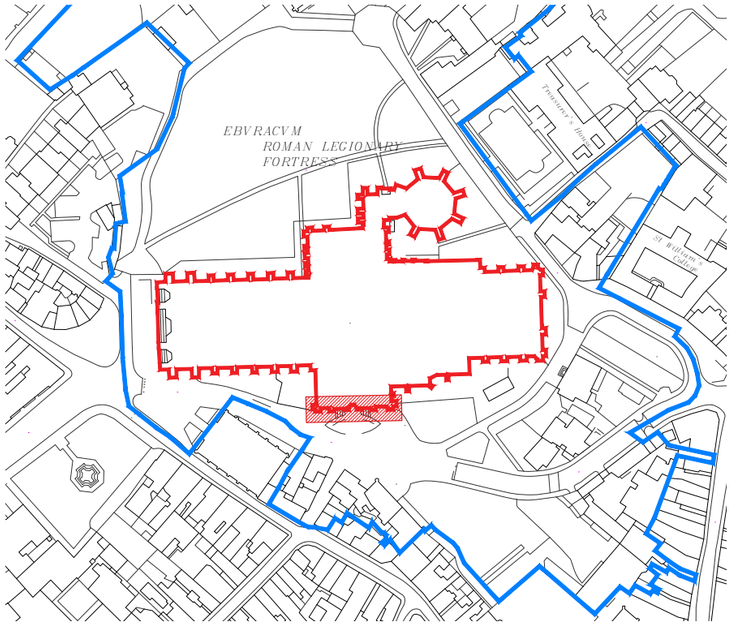
The need for this project of repair and conservation is founded in the principles of stewardship that are articulated in both the Minster's Conservation Management Plan and the 20 year Programme for Glass. More broadly, the policy context of the adopted Neighbourhood Plan articulates the aspirations of a 'sustainable heritage' for the Minster and its precinct - fusing skills, land use and financial strategy for stewardship.

More specifically, the need and driver for this project has been a long standing recognition that the emergency conservation of the Rose Window glass was (or had the potential to be) short-lived and unstable, by dint of the processes and materials used. The case for starting an investigation into the condition of the Rose glass was first made in YGT's quinquennial inspection of glass. Once safe access was made possible in 2024, the FAC approved a CCM for investigations, which have more than vindicated the concerns and risks raised. The process and general method of safeguarding historic glass with environmental protective glazing (EPG) has long been proven; this application articulates the case and the methods for an essential programme of repair and conservation.

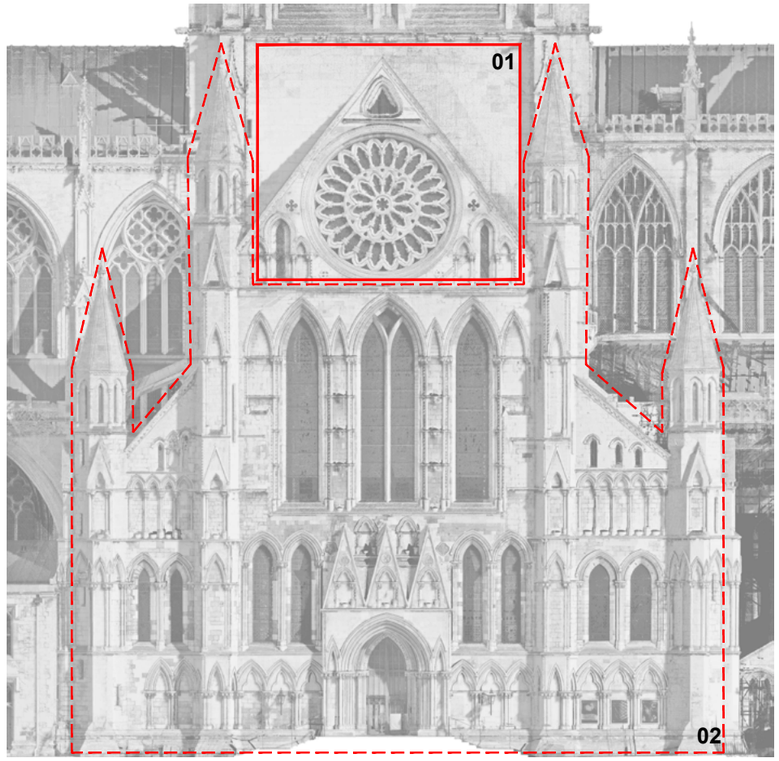
Why now?
This project is being brought forward to facilitate the continued work of conservation to the historic glazing of the South Transept windows.

In late 2026, erection of scaffolding during works to the lower windows afforded close, physical access to the Rose Window for the first time in 40 years, and for the first time since its reinstatement post fire. This access has allowed the Minster's project team and specialist conservators to inspect the condition of the glass and understand how the emergency repairs, which were implemented following the 1984 fire, are faring.

Inspection and assessment of glass and the masonry tracery, with particular focus on the effects of the fire in 1984, has informed this application. As the masonry was not a major component of the rescue and repair works following the fire, this project allows for a renewed understand of condition, with specific weight placed on identifying any latent defects following the fire. The proposals for conservation seek to mitigate future risks of failure and falling masonry over the public entrance and public open space.



1. Location Plan, with the location of works highlighted. Refer to 122-12-04 (EX) 001 for scale drawing



2. South Elevation of the South Transept

What will this include?
This project and CCM application covers the following works:

- Conservation and stabilisation of the existing, fractured and plated glazing in the Rose window
- Design and installation of Protective Glazing with IR / UV glass
- Design and installation of a supporting armature required to hold the re-situated historic glazing in position in a protected environment
- Conservation of the stonework within and surrounding the Rose Window, in line with the adopted Stone Practice Policy
- Establishing a baseline and methodology for the monitoring and future maintenance of the Rose Window and surrounding stonework
- Reinstating external bird protection against guano and nesting.
- We also seek a conditional approval for provision of some limited low-energy uplighting from the Rose Window gallery to the south transept vault, as part of an overhaul of the existing south transept lighting scheme.

How will this be undertaken; finalising details?
Following a CCM approval, the historic glass panels will be removed to the conservator's studio in January 2027. YGT, the Minster's specialist conservator-masons and the Surveyor will then review the entire condition of the window and stonework holistically. Final scheduling of repairs and conservation will then be completed, confirming the approaches and methods which are defined in this CCM application. The approaches to conservation of the glazing and masonry surrounds, will be progressed to the specifications in line with Stone Practice Policy and YGT glass conservation practice. If there are conservation principles or details that diverge from the anticipated approach we have written in these proposals, they will be brought to the Standing Committee for Glass, for determination of approach or detail.

Whilst undertaking the condition survey of the masonry across the South Transept, we will develop a methodology for future inspection of both the glasswork and masonry and establish a baseline from which to monitor in upcoming inspections.

Final RIBA 4 technical details of the support and ventilation details, will be concluded and, we propose, brought to the Minster's FAC for sign off prior to manufacture.

Pre-Application Discussions & Adjacent Works

To develop of this application the Project Team have undertaken pre-application discussions and submitted papers to both the CFCE and FAC during 2026.

With the consent of these bodies, YGT were able to remove eight glass panels for detailed assessment. The outcome of these preliminary assessment is summarised below and appended in full.

Similarly, with access now provided, the Project Team were able to complete initial condition surveys of the stone, the findings from which can be read in report section: *Survey of Stone.*

In October 2026, a further pre-application consultation and workshop on the specialist protective glass, to be manufactured by Lamberts glass, was attended by CFCE members and officers. The response to the formal CFCE pre-app advice is informed by this supplementary meeting.



3. Inner ring of the internal tracery

Summary of Pre-Application Advice:

Reverend Canon Adrian Daffern FSA – Summary of Advice from the CFCE following visit in August 2026

We have been in dialogue with the CFCE as part of pre-application consultation. The project team met members of the Commission on site in late July 2026 to discuss the project and a recent trial undertaken by YGT. A further workshop with Lamberts was also held in October 2026. The formal pre-application response from CFCE forms an appendix to this application.

In summary, the Commission supported the proposed intentions of the project and commended the investigative work YGT has undertaken to ascertain the condition of the window. CFCE recognised the complexity of the context and the opportunity the project offers to assess and document conservation work to date.

To support the acceptance and approval of the proposals, the Commission have requested for research, technical evidence and testing of UV/IR glass to be provided, demonstrating that the specification can meet the requirements of the location (south facing, exposed, and able to mitigate increasing temperatures). The supplementary meeting with Lamberts has further informed the available evidence base and supporting case for use of these protective glazing materials. All data and evidence on the proposed UV/IR glass is appended to this CCM application.

It was noted at the Lamberts workshop that full reassurance and answers to all the questions CFCE were seeking on the protective glass is not achievable. Proving the longevity of any new material is not an immediate science. Hence some of these questions are answered in this application based on rational evaluation - for example we consider what could happen if the benefits of the UV/IR were not as enduring as expected. For this reason, the project includes monitoring and inspection as a key mitigation against materials performance uncertainties - not just in relation to the protective glass, but also in relation to the known uncertainties about the long term behaviour of the materials used in the 1984 emergency conservation. These are matters to be properly addressed by the monitoring approach which forms part of this application.

CFCE encourage consultation with partners in the field, such as those working at Canterbury, Lincoln and Notre-Dame, to share learnings and approaches both to work on their respective rose windows and how conservation post-fire has been undertaken.

The Commission have requested that the application demonstrates how the protective glazing will be formed, and how this will manage heat, humidity, condensation and water movement. Where conservation and repair of the stonework is required, the commission encourage the application and use of *Stone Practice*. As part of the application the project team should include a monitoring and action plan for the continued monitoring of the Rose Window.

The CFCE advice has been taken on board and aligned with the current project proposal.

Adjacent & Supporting Works:

Previous approvals, and the works they included, have informed this paper and the proposal. These approvals include:

South Transept Glazing Project
During Q3 2026, works commenced on site for the conservation of windows s16 to s24, including the installation of protective glazing and a supporting armature to support the reinstated glass panels. These approved works are due to complete early 2027.

Erection of Scaffolding to the South Transept
To facilitate the glazing project, scaffolding was erected to both the interior and exterior of the south elevation of the South Transept. This was gained CCM approval in 2025.

Installation of the South Transept Cross:
The South Transept Cross is programmed to be installed in October 2027 and was granted CCM approval in Q3 2026. This will overlap with works to the Rose Window and will be facilitated by the existing scaffold and lifting plan.

In parallel to these works, the project intends to utilise access to complete the following maintenance and repair works:

Conservation of the stonework across the south elevation of the South Transept
A broader campaign of conservation to the masonry of the South Transept is required. This has been postponed to coincide with the conservation of the Rose Window due to its proximity and shared approaches to the conservation of the masonry.

Undertaking aspects covered in the QI where access allows
More broadly the intention is to incorporate *easy wins* that were raised in the Quinquennial Inspection while access is provided. This would include works such as cleaning, repair and repointing where budgets allow.

Underpinning the proposed masonry works is the adopted *Stone Practice Policy*, the Minster's policy for conservation of all stonework. This policy was first established in 2004 and was updated, and approved via CCM, in 2024. The policy informs the surveying and assessment of existing stonework, and sets out the requirements for proposed conservation. Stone Practice will guide the masonry work proposed in this application. For further detail see *Conservation of Stonework.*

History of the South Transept & Rose Window

Sources for the History of the Rose Window

This section considers the separate histories of the tracery and glazing of the Rose Window. First, the history of the construction and development of the window is described, followed by a statement of significance which will underpin proposals to conserve the window. The effect of the proposals on the significance of the window is assessed in the heritage impact assessment below.

There is no published material which makes the Rose Window of York Minster a specific focus. There has, however, been some interest in the glazing of the Rose in surveys of stained and painted glass within the Minster. The first such work was by Eric Milner-White (Dean of York 1941 to 1963), who suggested an early sixteenth century date for the Rose Window. This was later refined by David O'Connor and Jeremy Haselock to around the second decade of the sixteenth century.[1] More recently, Sarah Brown has considered the Rose Window in her specific publication on stained glass within the Minster, and Louise Ann Hampson has studied in detail the fabric rolls and other material relating to the Rose within the York Minster Library.[2] In 2025, the York Glaziers Trust considered and reported on the modern history of repairs to the window – particularly in the wake of the 1984 fire – incorporating an analysis of window conservation materials samples (this work is ongoing).[3] York Minster's Rose Window was also included in a Europe-wide survey of rose windows by Painton Cowen.[4]

The Construction of the Rose Window

The Rose Window (CVMA Ref S16), set within the south elevation of the South Transept, was erected as part of a wider scheme of rebuilding both transepts, commissioned by Walter de Gray, Archbishop of York from 1215. Building work commenced with the construction of the South Transept, probably around 1225.[5] The new transepts were placed on the footings of the previous transepts (erected in c.1080 by Thomas of Bayeux), but were considerably wider, with the footings of the outer wall of the earlier structure partly providing the foundations for the arcades of the new.[6]

The Rose Window seems to have been a late introduction into the initial design of the South Transept. Stone ribs forming the springing of a vault are visible today within the South Transept at triforium level. They suggest a stone vault was initially proposed, which would have passed below the Rose Window. Whilst it may be possible that the Rose Window was intended to light the space above the vault (as at Beverley Minster), the stone detailing to the interior tracery of the window suggests its internal face was intended for display. Therefore, the Rose Window was probably added to the design of the elevation after the vault proposal was abandoned. Both transepts were complete by the time of Walter de Gray's death in 1255 (he is buried within the South Transept). This suggests a 30-year span for the construction of the transepts, with the Rose Window probably incorporated in the latter two decades of this period.

One possible explanation for the change in the design of the South Transept was the canonisation of St William in 1226. The main south entrance to the Minster became a major point of entry for pilgrims to St William's shrine. The Rose Window may have been a means to aggrandise this point of entry for the pilgrims and was probably conceived as part of a single composition with the monumental five tall lancets of the Five Sisters Window (as it is now known) to the north elevation of the North Transept.

The provenance of the original glass within the Rose Window remains a subject of speculation. Cowen places the Minster's rose within a wider context of the Cistercian architectural tradition, where rose windows are typically placed above lancets (such as at Fountains Abbey, Kirkstall Abbey and Byland Abbey).[7] She suggests that these Cistercian windows were originally glazed with grisaille glass (white glass painted with mostly monochromatic decorative elements), in part due to St Bernard's intolerance of excessive decoration — St Bernard was the founder of Clairvaux abbey and a pivotal figure in the expansion of the Cistercian Order. This is corroborated by surviving thirteenth-century glass within the South Transept, located at high level within the south elevation of the west aisle, and the c.1250-1260 glass of the Five Sisters Window (see figure 4).



4. Nineteenth-century sketch of the Five Sisters' grisaille glass by John Brown (reproduced in Sarah Brown , 1999)

1 Eric Milner-White, *Sixteenth Century Glass in York Minster and in the Church of St. Michael-Le-Belfrey* (York: St. Anthony's Press, 1960) ; David E. O'Connor and Jeremy Haselock, 'The Stained and Painted Glass' in *A History of York Minster* Edited by G.E. Aylmer and Reginald Cant. (Oxford; Clarendon Press, 1977);

2 Sarah Brown, *Stained Glass at York Minster* (London: Scala, 1999) ; Louise Ann Hampson, 'Casting a Dim Religious Light: The Stained and Painted Glass of York Minster' (unpublished PhD thesis, 2016).

3 York Glaziers Trust, Report on the Rose Window (October-December 2025).

4 Painton Cowen, *The Rose Window* (London: Thames and Hudson, 2005).

5 Sarah Brown, *York Minster: Architectural History* (Swindon: English Heritage, 2003), p. 13.

6 Brown (2003), p. 16.

7 Cowen (2005), p. 63.

History of the South Transept & Rose Window

The Development of the Rose Window

The original glass within the South Transept probably survived until the early sixteenth century, when it was replaced in a wider scheme of re-glazing within the Minster.[8] Glass of this date survives within the Rose Window and within the lancets below. The Rose Window was re-glazed to include radial lights bearing paired flowers, possibly alternating red and white (though this colouration may have been added later). The window was possibly created to represent the union of the houses of York and Lancaster after the marriage of Henry VII and Elizabeth of York in 1486, or may have been a symbol of the Virgin Mary (sometimes referred to as the Rosa Mystica).[9] The scheme for the centre of the window at this time is unknown (the current glazing of the central lights is later). The lancets below (from east to west) depict St William, St Peter, St Paul and St Wilfred. The placement of apostles in this location below a rose is a well-established idiom. Rose windows are particularly associated with light (this is particularly apparent at York from the high-set southern vantage) and the Apostles, through disseminating the word of God, enlighten the church.[10] The current glazing of the Rose Window, therefore, should be considered as part of a wider scheme of symbolism within the early sixteenth-century glazing of the South Transept.

A fragment of the arms of Archbishop Thomas Savage (1501-7) survives in the westernmost lancet below the Rose Window (that depicting St Wilfred). This suggests the windows were possibly completed after his death, as a memorial. However, as noted by O'Connor and Haselock, the style of these windows, decorated in an Anglo-Dutch idiom (with curtains draped behind the figures, a distinctive canopy design and round-headed quarry windows behind the heads of the saints), might draw closer comparisons with the 1530s windows within St Michael-le-Belfrey, suggesting a slightly later date for the re-glazing works to the South Transept (possibly the 1520s), and therefore the Rose Window.[11]

Until the eighteenth century, window S23 – today depicting Moses (part of the lower level of South Transept windows to the central aisle) – once included an image of the Virgin and Child and a memorial panel to glazier and Lord Mayor John Petty (Fig. 4.). John Petty was from a prominent family of glaziers at York. His family's involvement in the re-glazing of the lantern in the 1470s is well documented, and it therefore seems highly possible that they were also involved with the creation of the Rose Window just a few decades later – if not John Petty himself.[12]

Further works are recorded to the Rose Window later in the century. A widespread campaign of window repairs, undertaken by Robert Thompson, is recorded in the York Minster Archive, including eighteen and a half days work 'on the greate O under the new bell' in 1582/3.[13]

The next major recorded scheme of works to the Rose is not until the end of the eighteenth century. On 25th June 1793, the prolific York-based glass painter William Peckitt was paid £3 8s for works 'to the circular window in the Minster.'[14] The works were personally commissioned by Dean Fountayne. Peckitt re-glazed the central panels of the window to the present design: a yellow flower, set within a blue background surrounded by yellow rays. This has sometimes been described as a sunflower, but Hampson has suggested it is more likely to be an English marigold.[15] There may have also been some tracery repairs in magnesian limestone at this time by the then surveyor of the fabric John Carr.

There appears to be a long-standing association with the Rose Window and marigold flowers. Daniel Defoe, in his travel diary published in 1748, referred to the window as the 'marigold' window, which he notes was based on the colouration of its glass, and James Torre, writing between 1675 and c.1691, states that it was called 'the Marygold window' because it contained several little marigolds.[16] This places the supposedly early sixteenth century red and white colouration of the roses in some doubt. It is certainly true that 'the Rose Window' is a fairly recent name (first appearing in mid-twentieth century accounts of the window).[17]



5. A sketch of the John Petty memorial panel, formerly within window s23 (Louise Ann Hampson)

8 Hampson (2018), p. 45.

9 Sarah Brown *'Our Magnificent Fabrick': York Minster: An Architectural History C1220-1500 / Sarah Brown.* (Swindon: English Heritage, 2003) ; York Glaziers Trust (October-December 2025).

10 Helen J. Dow, 'The Rose-Window', *Journal of the Warburg and Courtauld Institutes* (1957), vol. 20, p. 267.

11 O'Connor and Haselock (1977), p. 332-334.

12 Hampson (2018), p. 45.

13 York Minster fabric roll 1582/3 quoted in Hampson (2018), p. 70.

14 William Peckitt's commission book quoted in Hampson (2018), p. 54.

15 Hampson (2018), p. 172.

16 Daniel Defoe, *A Tour Thro' the Whole Island of Great Britain* (London: printed for S. Birt, T. Osborne, D. Browne, J. Hodges, J. Osborn, A. Millar, and J. Robinson, 1748), 174 ; James Torre, 'The Fabric of York Minster' quoted in Hampson (2018).

17 Hampson (2018), p. 206.

History of the South Transept & Rose Window

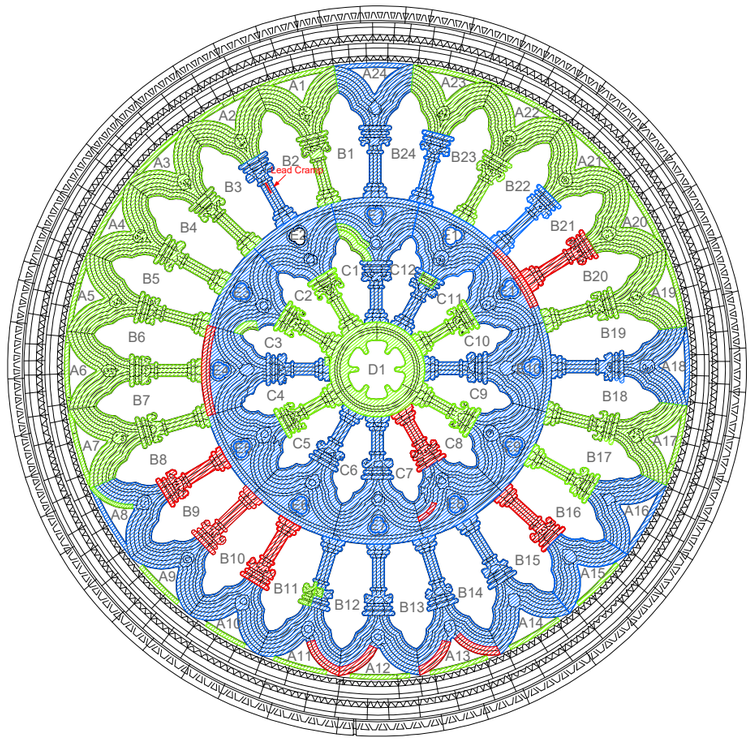
G. E. Street oversaw a major scheme of work to the exterior and interior of the South Transept in the 1870s and 80s. He probably replaced most of the upper half of the external Rose Window's tracery and the central sexafoil, using new magnesian limestone (see Fig. 6) — though some of this work may have been carried out the previous century by John Carr. These works are differentiated from the original fabric by a distinctive foliate boss design.

The full extent of Street's works to the South Transept are summarised in a letter by Street to Dean Duncombe (who part funded the works), held within the Explore York Archive.[18] In it, amongst other things, he describes exterior works 'far in excess of what I had hoped would be necessary', including 'taking down and reconstructing the whole of the Clerestory.' Furthermore, he replaced a large amount of external stonework, 'cutting out all rotten and decayed stones, and replacing them with new, copied from the old work.' He suggests the need for this was due to 'a great deal of damage [...] done by a general repair and reworking of the stonework in [...] the last century.'

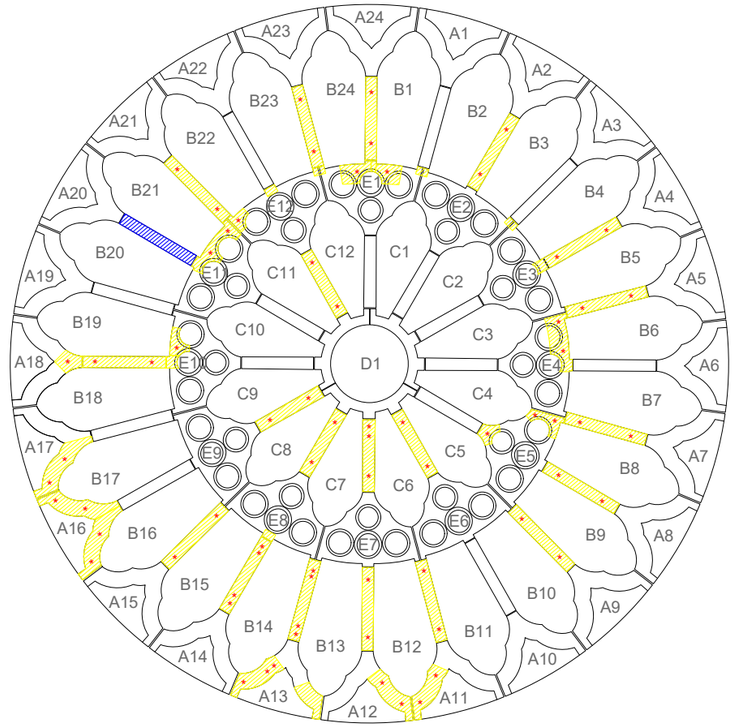
A further restoration of the Rose Window was carried out in 1969-70. Stonework was again replaced, this time with Portland Limestone, including to some of the capitals and shafts to the lower half of the window (see Fig. 5). This campaign involved the removal of some of the Peckitt glass.[19] Glazing was entirely re-leaded and small triangular-shaped glazed panels were added to the outer edges of the window, each depicting a sun. The glazing was also replaced to the outer round windows of the central ring. After the works, the window was re-dedicated as a memorial to Lawrence Roger Lumley (Earl of Scarborough and first High Steward of York Minster), who died in 1969.



6. An example of an original boss to the Rose Window (left) and an example of a 1870s G. E. Street boss (right).



7. External elevation of the Rose Window showing the original and replaced internal tracery (Peter Arts, York Minster Stoneyard) Refer to Section: Conservation of Stonework for scale drawings.



8. Internal elevation of the Rose Window showing the original and replaced external tracery (Peter Arts, York Minster Stoneyard). Refer to Section: Conservation of Stonework for scale drawings.

In 1984, a lightning strike caused a major fire which destroyed most of the interior timber work within the South Transept, including its vault. Remarkably, the Rose Window survived, but with significant cracking in the glass as a result of the intense temperature changes caused by the heat from the fire and cooling from the water used to douse the flames.[20] The window was taken down and repaired the following year.[21] The methodology of the conservators was, broadly speaking, to 'dismantle the panels, clean the glass, edge-bond the broken pieces where possible, and replace the glass pieces with an equivalent glass where it was not.'[22] The most heavily cracked glass was sandwiched between two plates of glass, in other cases only a single plate was used on the external face. On the exterior of some of the panels, a shaped lead sheet was soldered to the leads of the glazing. For further details on the post-fire works, the YGT report and addendums should be consulted.

18 Explore York Archive, George Edmund Street letter to Dean Augustus Duncombe (October 16th, 1876).

19 Hampson (2018).

20 York Glaziers Trust (October-December 2025) ; See the appended York Glaziers Trust report for a full timeline of the disaster.

21 The subsequent repairs are recorded in some detail by Gibson in his 1987 publication for the Architects' Journal.

22 York Glaziers Trust (October-December 2025) p. 10.

The Rose Window in Context

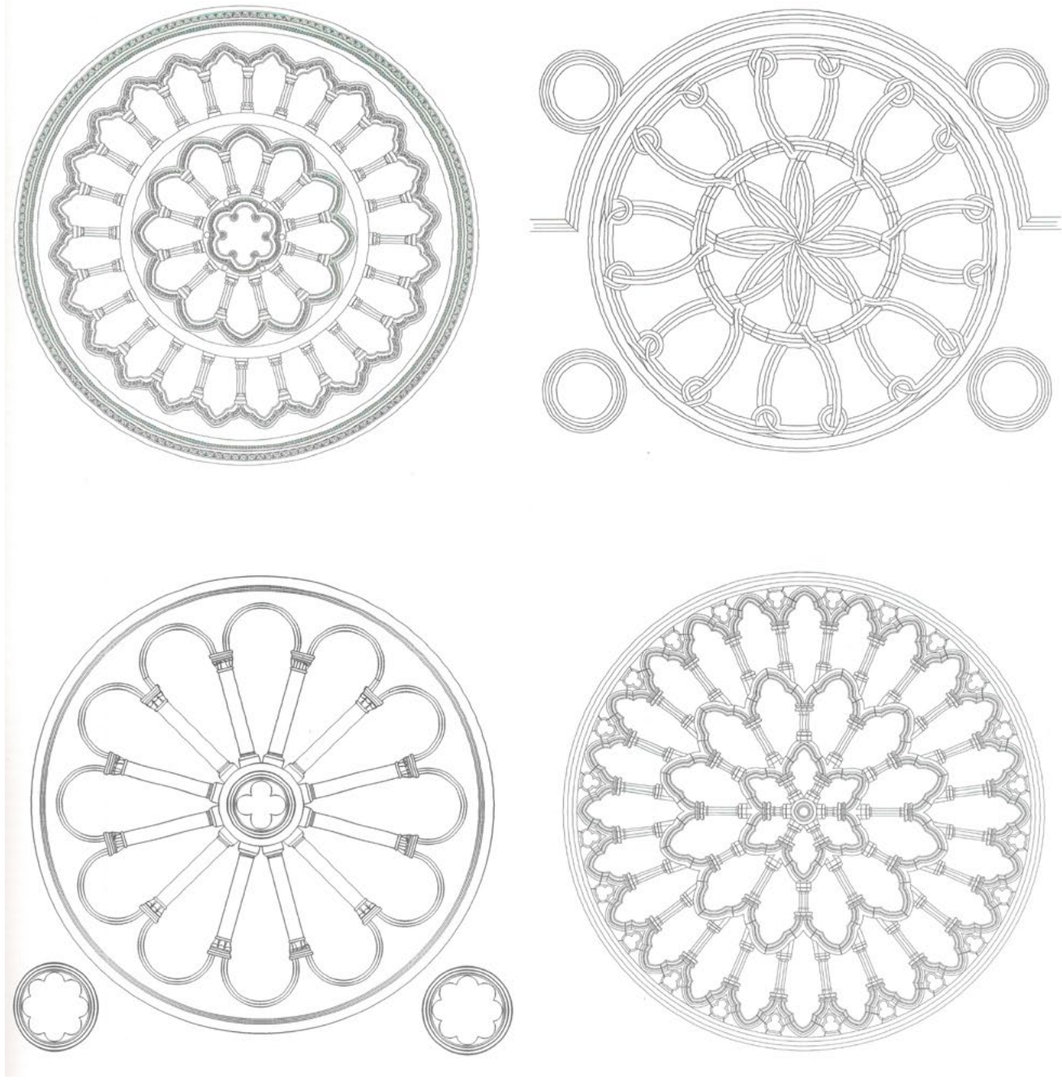
In general, the development of rose windows has been described as a progression from the oculus windows of the Romanesque Christian churches (and earlier), through to the delicate tracery, verticality, weightlessness and scale of the Rayonnnant and Flamboyant styles (the latter named for its flame-like properties).[23] Interestingly, the rose window remained a central feature of European architecture in later derivations of the Gothic style, whereas in England it seems to have been gradually abandoned in favour of the axial lines of Perpendicular tracery.[24]

There can be little doubt that the prevalence of the rose window form in Europe was partly due to its symbolic meaning. Beauty was interpreted as an act of God and, in the Gothic church, the manipulation of light, sound and geometry was a means to represent this divine beauty on earth. The 'marriage of light and number' of the rose window was therefore a fitting device.[25] In addition to this, one might consider the specific symbolism of the circle to the Christian church, such as Ezekeil's Wheel, the Wheel of Fortune, the Eye of God, the heavenly cosmos and the Eucharistic wafer.[26] Rose windows are also sometimes employed as a symbol for the soul of the deceased (particularly relevant in the context of the South Transept, something of a 'clerical mausoleum').[27]

The Abbey of St Denis, just outside Paris (dating to around 1140-50) is generally regarded as the birthplace of the Gothic rose window (though its twelfth-century rose window does not survive).[28] The earliest surviving rose window tracery is at St Etienne in Beuvais, erected ten years later. The apogee of the style is generally situated in France and includes the transept roses of Notre Dame in the Rayonnant style and the west façade of Lyon Cathedral in the Flamboyant style. However, there were also fine rose windows in England, including at Westminster Abbey and Old St Paul's Cathedral (neither of which survive).

According to Cowen, the earliest surviving glazed rose window in Europe is located in the north transept of Canterbury Cathedral, dating to around 1180.[29] This was introduced by Archbishop Baldwin, who had previously been a Cistercian monk. The Cistercian order were particularly influential in spreading the rose window form in England. The earliest examples are found in a number of now-ruined Yorkshire Abbeys, including within the Chapel of the Nine Altars at Fountains Abbey (c.1155-60), the east front of Kirkstall Abbey (founded in 1152) and in the west front of Byland Abbey (completed in the early 1190s). The latter is commonly described as the inspiration for the Rose Window of York Minster. Reconstructed from surviving fragments by Stuart Harrison, the Byland rose comprised of a sexafoil encircled by two layers of 12 lights and 24 lights, the same arrangement as the Minster's Rose.[30] Other commonalities at Byland include the placement of the rose window above lancets, and its size (both rose windows span their façade).

Therefore, the Rose Window at York Minster seems part of a wider architectural European idiom, originating in France and spread by the Cistercian order initially through foundations established in the North of England.[31]



9. Rose windows at (clockwise from top left) Byland Abbey, c. 1240; Kirkstall Abbey, c. 1155; Elgin Abbey, c. 1220-40; west rose, Fountains Abbey, c.1150 (drawings by Stuart Harrison, assembled by Painton Cowen).

23 Cowen (2005), p. 23.

24 Cowen (2005), p. 22 ; though there are some good examples of rose windows in the Decorated Gothic style, most notably the curvilinear 'Bishops Eye' window within Lincoln Cathedral.

25 Cowen (2005), p. 23.

26 For further details see Elizabeth Carson Pastan 'Regarding the Early Rose Window in Investigations' in *Medieval Stained Glass* Ed. by Elizabeth Carson Pastan, Brigitte Kurma (Boston; Brill, 2019), p.272.

27 Brown (2003), p. 22.

28 Cowen (2005), p. 20-21.

29 Cowen (2005), p. 43.

30 Stuart Harrison & Paul Barker, 'Byland Abbey, North Yorkshire: The West Front and Rose Window reconstructed' *Journal of the British Archaeological Association*, 140:1, pp. 134-151.

31 The style also appears to have spread to the houses of other orders and was also incorporated into the design of the Augustinian priories of Guisborough and Kirkham and, in Scotland, the Catholic Elgin Cathedral.

Statement of Significance

Statement of Significance Methodology

The following section provides an overview statement of significance of the specific area of change and for the Scheduled Monument as a whole, using Historic England's *Conservation Principles* (2008) and the following significance scale:

EXCEPTIONAL is used to define areas or aspects considered to be of international importance or value.

HIGH is used to define areas or aspects considered to be of national importance or value.

SOME is used to define areas or aspects considered to be of local importance or value or to have an element considered to be of potentially national interest.

NEUTRAL is used to define areas or aspects considered to be of neutral value (neither contributing to nor detracting from the heritage values).

DETRACTING is used to define areas or aspects considered to have a negative value or which are intrusive to the significance as a whole.

Statement of Significance of York Minster

The following statement of significance is taken from a draft version of the York Minster Conservation Management Plan (March 2026). It highlights the importance of the Minster as a place to experience God's love, for its associations with early Christianity, its depth of archaeology, its enormous scale and the quality of its craftsmanship.

The essence of what makes the Minster significant is that it is a place to encounter God's love. This is embodied in its fabric which bears witness to the power of God's love through the ages and connects those who visit or work in the Minster in the present day to generations of the faithful who have built, cared for, worshipped in and beautified the church. The ongoing stewardship of the building is itself an expression of faith.

The Minster is the Metropolitical church of the Northern Province of the Church of England, the principal place of Christian worship in York and Yorkshire and a long-established centre of church administration. The apparent presence of a Bishop of York at the Council of Arles in 314AD and the re–foundation of the Minster in the 7th century are testament to the Minster's long history and status and a continuous Christian tradition spanning more than 1,300 years. Its profound spiritual and cultural value is therefore unquestionable. The present Minster, constructed after 1225, is also a deeply–rooted source of identity for its city and county, not least because it is a defining and unmistakable feature on the skyline of York and its environs. It is a spiritual focus for individuals and groups alike, providing a place to encounter God's love for its regular congregations, other congregations and Christian groups in the diocese, local people, visitors from further afield and organisations of all kinds including the armed forces. The Minster's clergy, staff, volunteers, musicians and friends enjoy a strong sense of community, and the warmth of their hospitality is often commended by visitors. There is a very strong musical tradition, which brings great pleasure to visitors and adds significantly to the atmosphere of the building and the experience of worship.

The Minster stands as a witness to the history of York: its monuments, outstanding archaeology and extensive Collections provide unique evidence of the city's past and development. The Collections include objects and documents which testify to local and national history: some, such as the Horn of Ulf and the York Gospels, are of particular antiquity and significance. The building itself has exceptional evidential and design value. Its sheer scale and the quality of its craftsmanship reflect the prosperity of the medieval city and the ambition of its patrons and archbishops, and position the Minster in the first rank of European great churches. More than that, its particular interest rests in the way it contributed to the distinctive evolution of the Gothic tradition in the north of England, and the way it illustrates how architectural concepts were transmitted across medieval Europe. The Chapter House and especially the Vestibule channel French ideas that were being introduced at court; these ideas were then developed in the nave and Quire in an increasingly idiosyncratic fashion.

The Minster's celebrated medieval stained glass is an integral part of its architectural design and essential to creating the special atmosphere of the building. By virtue of the remarkable extent of survival and its artistic and technical quality, it is unquestionably of international importance. The Minster and its glass and fittings were the creation of many designers and craftsmen of regional and national importance. Today the design and craft tradition is kept alive through the work of the Minster's stonemasons and conservators, and their skill and knowledge is one of the cathedral's greatest heritage values. Above all others, it is the architectural and artistic values of the Minster, and the achievements and skill of both past and present designers and craftsmen, which is most admired by visitors.

The Precinct's archaeology and architecture – not least the City Walls, the remains of the Archbishop's Palace and St William's College - are outstandingly important and contain unique evidence of the history and development of one of the country's most historically important urban centres since its creation by the Romans.

Since the Reformation, the nature of the Precinct has changed considerably, and it now has two distinct characters: north of the Minster, it is largely gardens and green space, enclosed by the Walls and some significant historic houses. Dean's Park is the largest publicly-accessible green space in the walled city, and highly valued as a tranquil sanctuary. South of the cathedral, the once strong sense of separateness and tight enclosure have been eroded by Georgian 'improvement' and Victorian highways. For the majority of visitors, there is no longer a perceptible architectural or urban boundary between the Minster and the city, which comes up to the cathedral's doorstep.

Statement of Significance of the Rose Window

Evidential Value
The surviving fabric of the Rose Window evidences its rich history of its construction and development. Its tracery is an important survival from the mid-twelfth century and was constructed as part of the South Transept, the earliest above-ground fabric of York Minster. Some of the original stonework within the window survives, adorned with delicate foliate bosses and capitals. In addition, the history of alteration to the window is made visible by stylistic differences within the tracery of the stonework. The work of the nineteenth (and possibly eighteenth) century and the 1970s work use different stone types, Magnesian Limestone and Portland Limestone respectively, and employ different mouldings – for instance with different boss designs.

Some documentary sources survive which relate to the Rose Window. Royal grants of timber evidences the mobilisation of funds and resources for the commencement of the South Transept construction, but there are no archival survivals which illuminate a more detailed construction history – such as the reasons for abandoning the South Transept vault.[32] There is some documentary evidence for the later history of alteration and repair by Thompson and Peckitt but, between them, there are nearly 200 years of history for which the archive is notably silent. Observations by diarists including John Torre (from the late seventeenth century) and Daniel Defoe (from the mid-eighteenth century), are also significant.

Therefore, overall, the Rose Window is of *Exceptional* evidential value.

Historical Significance
The Rose Window is associated with a number of major figures of local and national significance. Most importantly, the tracery of the window was part of the works commissioned by Archbishop Walter de Gray, a close ally of King John, named among the bishops in the pre-amble to the Magna Carter.[33] This association is apparent from the tomb of Walter de Gray which remains within the east aisle of the South Transept.

The glazing of the Rose Window is significant for its association with the Petty family, an influential York-based family of glaziers, whose work can be seen within the heraldic windows of the lantern tower, as well as elsewhere in York, for instance within the south front of St Michael-le-Belfrey. The central panels also have associative value for their association with Peckitt, an especially prolific glazier, with many windows attributed to him within York Minster, emblematic of a distinct richly-coloured style. This is well-represented in his blue and yellow central panels to the centre of the Rose Window.

The glazing of the outer panels, in their current form, illustrates the union of the houses of York and Lancaster at the end of the Wars of the Roses, displaying the white rose of York next to the red rose of Lancaster.

The tracery of the Rose Window is illustrative of a wider architectural form imported from Europe. They are uncommon in England, but many examples survive in France. The York Minster Rose has particular similarities with the high-set transept roses at Laon Cathedral, also arranged at high level atop three lancets. Similarly, the York Minster Rose has significance for its association with the Cistercian Order, who imported the tracery style from to England in their foundations including Fountains Abbey, Kirkham Abbey and Byland Abbey. The latter is particularly associated with York Minster for the similarities in its tracery.

Therefore, overall, the Rose Window is of *Exceptional* historical value.

Aesthetic Value
The Rose Window plays a major role in views to both the interior and exterior of the Minster. Its exterior tracery is a memorable aesthetic experience, terminating the vertical lines of the lancets below and filling the central gable. It is particularly remarkable in terms of scale when it gradually comes into view from the narrow streets of the city.

Internally, the southern aspect of the window affords a quality of light and colour which is remarkable, even within the Minster. The blues, reds and yellows are vibrant and clear, and the imagery perfectly legible from ground level. It functions with the Five Sisters window to aggrandise the former entry point for pilgrims attending the shrine of St William, and the survival of both together is evocative of the aesthetic experience within the building in the thirteenth century. However, one wonders what the aesthetic effect of the Rose Window would have been when viewed beside the original medieval vault (the present vault is a post fire construction). Brown suggests a timber barrel vault may have been the original arrangement based on the precedent set in the south transept of Byland Abbey.[34]

The Rose Window tracery appears broadly as it did in the thirteenth century. The nineteenth century repairs are generally sensitive and, whilst they do not replicate the original motifs, they use the same magnesian limestone. However, the 1970s repairs use neither the same materials as the original, nor do they emulate the original palette of motifs. Similarly, the fire damage and post-fire repairs have altered the appearance of some of the panels, for example through plating the most fire-damaged panels and the addition of lead sheets to the external face of the glass where it meets the stonework mouldings.

However, there are some poor-quality later repairs within the window, particularly the heavy-handed repairs of 1969-70. These use a different stone type and removed Peckitt-era fabric. The fire of 1984 also had a negative effect on the aesthetic value of the window, causing cracking to the glazing and requiring the use of bonding materials during the subsequent restoration which have caused some discolouration.

Therefore, the South Transept is of *Considerable* aesthetic value

Communal Value
The Rose Window has particular significance as a religious symbol, alluding to specific wheel imagery in the bible and the more general symbology of light and beauty (see above). There are also national symbols incorporated into the design of the window, such as Peckitt's English marigold motif, and more specific regional references to York via the use of the white rose motif. Overall, this is a deeply symbolic expression, with motifs used deliberately for their wider relevance as symbols of church and state.

The Rose Window also has communal value as a survivor of the 1984 fire. YGT has suggested the window would have 'would likely have remained in near obscurity' otherwise.[35] The saving of the window was a great triumph which remains a symbol of resilience and precedent for future restoration projects (including, for example, the post-fire reconstruction of Notre-Dame).

32 Brown (2003), p. 13.

33 Roy Martin Haines, 'Walter de Gray (d. 1255) Archbishop of York." *Oxford Dictionary of National Biography* (2004) Accessed 12/10/2026. https://www.oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-11566.

34 Brown (2003), p. 33.

35 York Glaziers Trust (October-December 2025), p. 3.

Summary of Initial Investigation

Survey of Glazing

Initial Report: Assessment of Condition and Evaluation

An account of the Rose Window's history, its historic repair and current condition can be read in the paper supplied by YGT, appended to this submission.

In summary, following the fire in the South Transept in 1984, the Rose Window was removed for emergency conservation and repair. With consent, conservation began in 1985. Informed by a material scientist, the conservators of YGT intended to use Ablebond 342-1 (resin and hardener) to seal the micro-cracks in the glass caused by heat of the fire.

On panes with excessive cracking, clear 2mm glass plates were applied to both the internal and external faces to provide additional support. On panes with less micro cracking, a plate was fixed to the external face only. Packages of sandwiched glass were then sealed with silicone along the perimeter. Allowing for the increased thickness of the glass panes, the Rose Window was re-leaded and reinstalled in 1987.

As summarised in the first YGT research report, the works undertaken in the 1980s are considered to be irreversible. As such, this proposed programme of conservation of the existing glazing will focus on the careful cleaning of panels, repairing lead breakages and, where seals in the plated glass are broken, plates will be dismantled and treated. As YGT note *'This generally non-invasive strategy ensures that the fragile paint is not further damaged by another invasive intervention.'*[1]

Addendum: Assessment of the Trial Panel

Following the approved removal of a further 7no. panels, YGT were able to undertake analysis of the condition of the glazing in closer detail. The permission to remove and further investigate a number of additional panels of glass from locations all round the rose has afforded a much improved insight in the past conservation materials, and an improved understanding of present risks and issues.

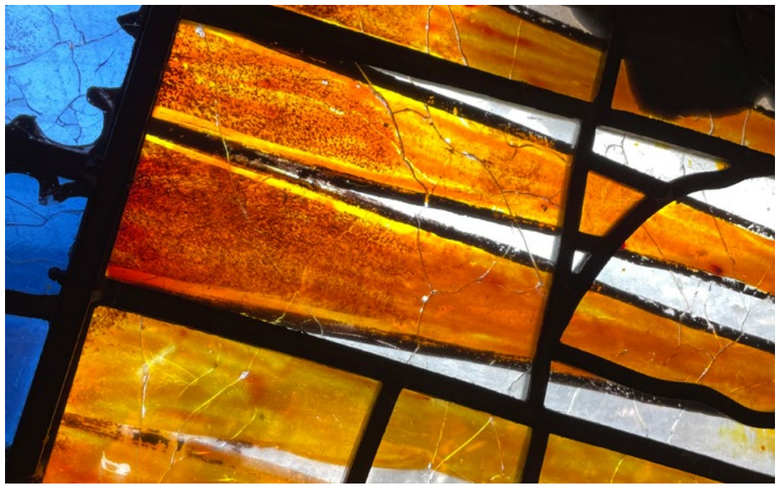
For this purpose, panel C12 was utilised as it is an appropriate exemplar of a heavily damaged panel. Two sandwich packages within the panel were chosen for investigation, one which was situated behind a lead plate, and the other with severe multi-cracking to the stained glass.

The extraction of the first package was made difficult by the silicone used to seal the glazing to the lead plate behind. The act of removing this broke the outer clear plate, however, once the plate glass was removed, the historic glass was easily extracted. This demonstrated the risk in the removal of any packages backed with silicone.

Assessment of the second package, once extracted from the 2mm clear plates, found the historic pane to be highly fractured. The degraded and failing Ablebond meant that these junctions were loose and extremely difficult to maintain in position as removal was underway. Analysis of the historic glass showed that silicone had been applied to the face of the pane, as well as the perimeter, and found Ablebond had yellowed considerably and was very brittle. Full explanation of the condition of the glazing, and the historic repair, is detailed in the appended research addendum by YGT.



10. Fracturing of glazing from the 1984 fire



11. Interlocked and lacing of the glass cracking



12. Pane of C12, with front and back clear plates removed to allow assessment of original glass

1 York Glaziers Trust 'The Rose Window Report' (October-December 2025).

Survey of Stone

Summary of Findings

The Surveyor and Masons surveyed the exterior and interior of the Rose Window stone frame following the removal of the glass panels by YGT in late September 2026.

With this access the Team were able to inspect the full depth of the window, gaining a better understanding of the construction and profile of the tracery.

The Rose Window is formed of an inner and outer ring of interlocking arches, supported by short shaft columns with a decorative base and capital. The central oculus is open, with 6 cusps. As noted in the YGT Report, Window Type A was introduced into the tracery following the fire in 1984.

The exterior is predominately formed in a blond or yellow magnesium limestone, where as the interior is largely indented and faced with a neutral grey stone, which is thought to be Portland Limestone, with poor and debonding fixings.

Both faces of tracery present historic conservative repairs. A variety of methods and materials have been used, some overlaying previous conservation. It has been difficult to identify which of campaign or works may have been undertaken concurrently. These repairs are described in detail in *Assessment of Historic Repairs*. Archival research has not yet revealed information or details on which we could reliably sequence and date these repair campaigns (see above WRT to G.E.Street's work, which is better recorded, but does not precisely define the surviving Street work).

Exterior



13. Decorative Roll loose and removed during inspection (E1)



14. Previous cementitious repair loose and now de-bonding (A16)



15. Column Shaft (E7) showing signs of delamination



16. Cementitious re-building and repair with glue to base of springing stone (E5)

Interior



17. Evidence of repair with glue



18. Previous indent in grey stone, with pocket formed into existing masonry



19. Stress cracking to E6, reflected on the exterior as well



20. Loose indent removed for safety during inspection. Previous indents glued and dowelled only, no mortar used. the glue is brittle, impermeable and the bond is failing

Survey of Stone

Exterior

Generally, the exterior shows typical signs of weathering, with loss of definition to decorative features. Two new springer stones have been carved with alternative bosses.

A thin, smooth, yellow crust is visible across the Rose Window stonework, which is consistent with the known reports on the application of linseed oil which was applied as a consolidant across stonework in the past. In most areas this has resulted in a brittle crust and can be flaked off the surface of the masonry. In some instances this appears to exacerbate the granular disintegration of the masonry behind by trapping moisture.

A sulphate crust is also present across some elements, concentrated in areas of the masonry and tracery where moisture sits. In instances this also appears to exacerbate the decay of the masonry behind, by preventing movement of moisture and salts out of the surface of the stone.

Despite the presence of netting, there is evidence of pigeons nesting on ledges and in pockets within the tracery of the Rose Window. This is most severe there where springing stones are skyward facing, and there is a build up of guano and debris.

Previous attempts to limit water traps across the Rose Window have been made by adding mortar fillets to decorative rolls. Dressed or chamfered edges where rainwater is clearly pooling have been partially filled. However this has not been consistently applied across the façade, with some mortar fillets only added to one channel or cavetto. Many of these applied fillets are loose and have lost their bond to the masonry, with the junction now cracked, allowing moisture to penetrate the joint.

Small amounts of algae and biological growth is visible, though this is limited to specific areas where rainwater is resting.

The surrounding masonry pockets to the Type-A windows shown signs of active decay, in particular towards the external face of the glazing. Here the stone is powdering (granular disintegration) significantly. There is evidence of historic repair and infill with smoothed surfaces of cement. No A-Type windows were removed for analysis so as yet the Project Team do not have sight of the condition in these areas or what may be obscured by the glass.

By allowing early removal of a number of glass panels, we now have a good understanding of the decay and defects in the stone frame of the Rose window. More will be understood once all the glass is removed and the stonework can be surveyed in full. Our understanding is sufficient, we feel, to have a good level of confidence in the methods required to conserve the stone frame. The CCM approval should allow for some review and revision of the overall scope of repairs as we define in Stone Practice.



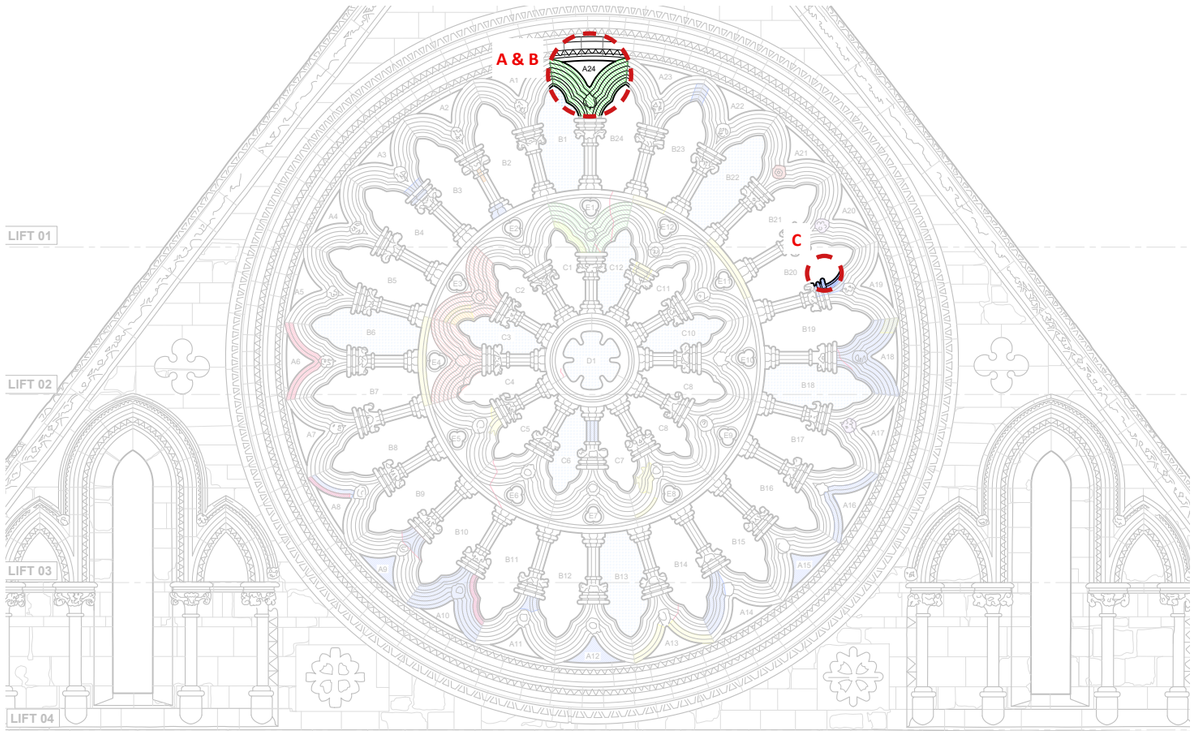
21. Loss of detail to boss (E24) [A]



22. Build up of guano in tracery pocket (E24) [B]



23. Mortar filled water traps, with some channels not addressed [C]



Findings of Initial Survey of Stone

Interior

We are now aware of internal stone repairs and facing indents to the Rose Window tracery which appear to be of the late 20th C but precede the 1984 fire, and are understood to be from a 1969-70 repair programme. The condition of these repairs are one of a range of technical matters that can only be fully addressed once the windows have been removed. Whilst it may be possible retain and re-fix the Portland facing stones, the CCM seeks approval to remove and replace this, allowing for the impermeable glue layer to be removed and for new stone and fixings.

The masonry of the interior is slender with simpler profiles in comparison to the exterior. Where elements such as a capital or base extend beyond the line of the frame in the external stonework, on the interior, these features do not exist and the frame surrounding the glass broadens substantially.

There are few a areas where moisture is penetrating, this is indicated by leaching, staining or a deposit of salts. In some areas it is consistent with the introduction of an indent, in others this appears where rainwater is clearly sitting on an external ledge. Our survey suggests that the water ingress is through failures in the glazing and is not penetrating through the joints in the stone frame.

A large number of the masonry components have been indented or re-faced, particularly the shafts of the columns. These facings are in a dense grey limestone that has very little variation or character to its appearance - assumed to be Portland (used elsewhere on the Minster by Bernard Fielden). The majority of these indents are to a depth of 75mm. There is no evidence of mortar being used to attach these, instead glue has been used, some of which is de-bonding. The glue is now brittle. Two 6mm non-ferrous dowels are generally used, within a anchor into the window to a depth of only approx. 35mm. Where the piecing meets the glass, the stone has been roughly chamfered. A cardboard like material has been used as spacers in the joints.

The lower shafts of the inner circle show signs of separation, with joints at the junction to the centre opening, and one area of fracture which is indicative of stress.



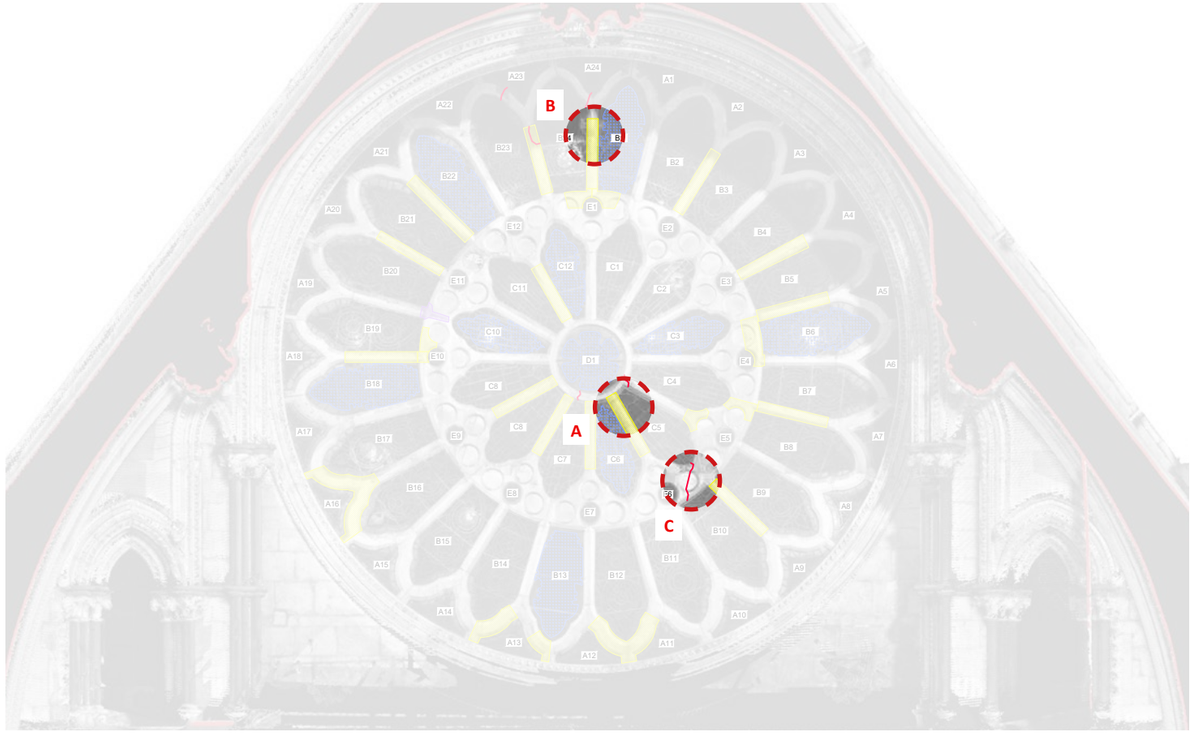
24. Loose internal indent, glued and dowelled [A]



25. Indented column shaft (B1) [B]



26. Continuous crack to E6 [C]



Assessment of Condition



Granular disintegration

Location
Present within pockets and sheltered areas of external tracery

Condtion
Areas of stone disintegrating into a fine powder. This is most common in areas of stone have are slightly protected, such as between rolls, or within small openings, and where moisture has sat and not been able to travel, saturating the masonry.

Proposed Action
Gentle brush back to sound base. Investigate condition of masonry behind for further signs of deterioration.



Surface crust

Location
Present across face of all external masonry

Condition
Two crusts have formed on the masonry surface; a sulphur crust with a black appearance, as well as a yellow-tinted thin crust or skin which is likely the linseed oil covering. Both crusts mask the condition of the stone behind, in some areas the crust remains intact and appears to accelerate the decay of the stone behind, leading to granular disintegration.

Proposed Action
Gentle brush back where crusts are loosening. Investigate condition of masonry behind for further signs of deterioration.



Cracking - hairline or micro

Location
Present in select external stones

Condition
Micro-cracking or hairline cracking is visible in a few areas across the external elevation. The cause for these cracks likely varies, some appear to be natural seams in the stone, where as others show signs of fracture encouraged by resting rainwater and cycles of freeze-thaw. These are most apparent on decorative rolls.

Proposed Action
Investigate the extent of cracking and the looseness of the stone. Review with Structural Engineer and Mason. Where suitable to retain existing masonry, pin back into sound base.

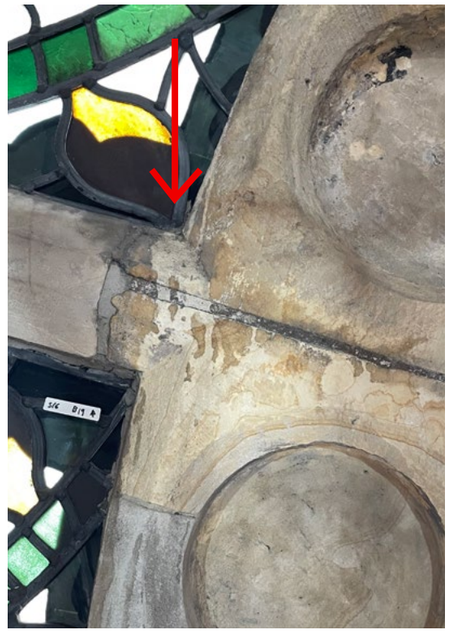


Stress cracking

Location
Present in small selection of external and internal stones

Condition
Stress cracking is apparent in 3 - 4 no. stones across both faces. Vertical cracking, in some cases across joints, is suggestive of movement. This may include settlement following the historic repairs.

Proposed Action
Investigate the extent of cracking. Review with Structural Engineer and Mason. Ascertain extent of repair possible. Some stone replacement of full components is antcipated, subject to a full survey



Water ingress & salts deposit

Location
Present in small areas of the internal elevation

Condition
Areas of staining area visible on the internal surface of the masonry. In most cases this appears to be as a result of failing waterproofing, either the glazing sealant or mortar. In a small number of areas, moisture is tracking through joints and/or indents and leading to the deposit of salts internally which is beginning the deterioration of surrounding masonry.

Proposed Action
Gentle brush back to sound base. Where a cause has been identified complete works to mitigate future ingress. Where no cause has been identified, include area within future monitoring programme.

Assessment of Historic Repairs



Cementitious repairs and rebuilding

Description
Rebuilding of decorative details across the external face of tracery

Condition
Cementitious and/or Roman Cement repair, utilising timber dowel and nails (now rusting) to support the re-forming of the decorative roll. Other rebuilding of detail has been used throughout the exterior of the Rose, with patch infills to decaying areas.

Action
Inspect areas with cementitious build-up. Remove all loose material and re-form detail either with mortar repair or indent.



Indenting and dowelled stone

Description
Indents to 3 no. decorative features, secured with metal dowel

Condition
Indents appear secure though the junction between existing and original stone is unclear (obscured by mortar or sulphate crust). It is not clear how well bedded these indents are, or how deep the dowels sit.

Action
Inspect indents. One appears slightly loose, if necessary carefully remove to ascertain the depth of dowels and the bedding used.

Retain and monitor if stable; remove and replace in new stone if not.



Partial or full replacement

Description
Numerous replacements, partial and full across both the internal and external tracery

Condition
Stone replacements across the tracery vary in stone type and extent of intervention. It is unclear whether these replacements are full depth (this will become clear upon removal of the remaining glazing panels). Condition varies, largely these appear sound with similar weathering as the surrounding masonry.

Action
Identify and inspect replacements with Structural Engineer. Check joint for interaction between stones and mortar. Ascertain depth of intervention and whether these are suitable for following life cycle. Some replacemnet of whole components may be called for, when fully scheduled.



Metal Cramp/Dowel

Description
Single visible metal cramp or dowel (A2)

Condition
A (painted?) metal dowel or cramp is visible over an existing crack in column shaft A2. This repair is not visible on initial inspection elsewhere in the tracery. However this would not rule out the use.

It appears stable, with no clear signs of worsening to the crack (no open junctions, salt deposits or deterioration within the vicinity).

Action
Review with Structural Engineer. Monitor for further movement or failure as glazing is removed for conservation.



Gluing of decorative elements

Description
Repair of areas both internally and externally with an adhesive such as glue

Condition
Adhesive or glue has been used on small sections of rolls or edges of loose masonry. There is no evidence that this has been accompanied by a dowel or any additional fixings should the glue fail. The glue is clearly visible, lighter in appearance, and has been applied liberally, leaving streaks and overflow in the joints.

Action
Identify all areas in which glue has been used. Check stability of repair, where required, pin back to sound base. Where loose, carefully remove and reinstate with pin, mortar repair or indent.

Statement of Approach

Conservation of Glazing

Extract from the YGT Addendum

Given the complexity of the panels, particularly the range and condition of the conservation materials used throughout the window, it is recommended that only a minimal, light-touch conservation methodology is used.

Removing individual glass packages or dismantling the panels has the potential to cause further damage and may result in the loss of unsecured fragments, which can easily be dislodged. At present, the glass remains mechanically secured between the support plates. The silicone bonds, both around the edges of the packages and within the cracks, also remain serviceable. The greater-than anticipated presence of silicone is therefore [in the broadest sense] beneficial, particularly as it is generally in better condition than the degraded Ablebond.

Avoiding unnecessary intervention consequently represents the safest approach and minimises the risk of further disruption to the glass. The UV/IR glass will help to prolong the lifespan of this material further and prevent its discolouration which would be disfiguring to the window.

As the conservation of the Rose Window glass gets underway, it is possible that some deviation from the methodology suggested above will need to occur. Where there are broken plates, the glass package will need to be removed so that it can be replaced. This is likely to be necessary for a few glass pieces. Additionally, if we find that there is a package where there are glass fragments that have rattled out of position inside the plated 'package', and are therefore in danger of damage, these will also be removed, repositioned and reinserted.

Conservation of Stonework

As noted in Stone Practice Policy, conservative repair will be the underlying principle taken in works to the tracery of the Rose Window. Intervention will take our 'return period' into consideration and will be as little as possible, but as much as is necessary for the long-term conservation of the building and its fabric to act as an effective and stable frame for the glazing. Stability and safety of the external faces must reflect the Rose's position above a public entrance and public open space; the lack of access available for monitoring and maintenance; and the losses,defects and past repairs already present across the original masonry.

All the works envisaged within this project are covered within the methodologies and principles which are defined in Stone Practice, which remains the Stoneyard's basis for care, conservation and renewal practice, as adopted by Chapter in consultation with the statutory bodies.

At this point in the project, further assessment and understanding of the tracery is still required. Greater clarity of the condition of the stonework will be afforded with removal of the glass panels, when a full scheduling of works will be developed defining how these conditions are to be dealt with.

It cannot be ruled out at this point of investigation that replacement of some masonry units will be required. As such, the Project Team are raising in this application the possibility of a small number of replacement units. Replacement will be carried out in accordance with Stone Practice Policy.

Methodology for Recording

Archaeological
The standard archaeological method of recording is set out in detail in the Stone Practice Policy. This approach will be used for assessment of the Rose Window and South Transept.

An archaeological mark up and Interpretative Report will be developed based upon the metric survey information and supported by archival research. Particularly relevant for the Rose Window and South Transept will be a geological and observational record of repair campaigns as this will indicate cycles of works to the elevation and may illuminate findings to date.

Following completion of works, an Archaeological Report will be written and submitted with the records of the interventions and materials used for repair.

Environmental monitoring, research and maintenance inspections:
A detailed description of the proposed environmental monitoring can be found in section *Monitoring and Maintenance*.

There is an existing data-gathering network within the Minster which currently retrieves information from various internal spaces, including some recently conserved windows. This network is due to be upgraded, and will move to a cloud-based platform allowing data to be gathered in situ, and issued to various stakeholders within the Minster.

The Project Team proposes to harness this opportunity, utilising the historic information from the existing network to provide a baseline understanding of the Minster's environmental conditions and thus the context of the Rose Window will be better understood. The upgraded, cloud-based service will allow external experts with as Tobit Curteis Associates to join YGT in providing a holistic assessment of any changes to condition and thus inform understanding of the benefits of the EPG, and to flag any remaining risks such as condensation events or insufficient ventilation.

Technical Proposals

Conservation of Glass Panels

Conservation of historic glass is proposed as the following:

- It is intended that, in the absence of any alternative driver or reason, the sandwiched glass packages are to be maintained as they are. Any removal of silicone and Ablebond is extremely complex and potentially impossible in the case of the micro fissures and interlocking glass sections. Removal of these components is likely to exacerbate paint loss issues. Only if the historic glass is at risk (ie if there is a break in the plating, or if the historic glass has become jumbled within the sandwich) will there be a need to intervene. Were this to arise, each will be taken on a case by case basis, as it may still be best to leave the sandwich un-disturbed, even with a known defect.

- Panels are to retain the existing leading structure. Releading of the panels is not proposed or needed, as the lead is in good condition and there would otherwise be potential to damage fragile paint and further break fragile glass.

- The panels will undergo minimal intervention. They will be conservation cleaned' leading breaks will be mended. Plates will only be dismantled and treated where a seal has broken, and where the benefits of invasive intervention justifies (see above).

- The panels will be framed in a supporting frame, as used in the conservation of windows across the Minster, which will be detailed in conjunction with the support.

- The historic glass will be reinstated behind a new layer of environmentally protective glazing. This will protect the panels from the external environment, ensuring any humidity and temperature fluctuations are minimised (this is especially volatile on south facing windows), and will limited further loss and deterioration of the paintwork and past conservation treatments and materials.

- This non-invasive strategy ensures that the fragile glazing and paint is not further damaged by another invasive intervention.

Installation of External Protective Glazing

In order to conserve the historic glass, a new layer of environmental protective glazing (EPG) will be installed. This proposal intends to use IR & UV Protective Glass, a product developed by Lamberts in Germany.

A detailed rationale for this specification can be found in both reports by York Glaziers Trust. The dominant motivation for this specification is to prevent or at least slow down the rate at which the 1980s repairs continue to deteriorate or discolour. This installation would also acts primarily as a protective barrier to the historic glass, removing the panels from exposure to extreme fluctuations in temperature, condensation, weather exposure and pollution.

The EPG will be installed in the position of the original glazing, and designed with leading patterns informed by that of the historic glass. This would be reviewed by the project team prior to commencement of works.

Whilst we have addressed the CFCE's enquiries about the nature and anticipated performance of the UV/IR glass specification proposed, it is important to note that the critical, most important, beneficial effect of the protective glass is to act as a barrier to the external environment. The data we have indicates the added benefit to the historic glass of the fused/embedded performance qualities of the UV/IR - these are not ephemeral coatings. The monitoring regime proposed will enable the performance of the glass in this application and specific context of the south facing rose window to be evaluated and widely disseminated, over time.



27. EPG installed at the apex of the East Window, prior to the installation of the conserved historic glass

Glass Armature System

Similar to the conservation of other windows at the Minster, an armature will be required to support the protected historic glass in its new location. This structure will also maintain the interspace needed between the two planes for the ventilation of the glass and must incorporate daylight masking and ventilation perforations. The armature is also designed to enable future inspections of the historic glass.

Unlike EPG systems applied to previous window conservation, the Rose Window has a relatively thin masonry skeleton which does not provide sufficient depth for both planes of glass to sit within the depth of the stone frame. The proposed design of the armature has considered this and accommodates the variances of panel orientation, centre of gravity, light spill and the need to orient the ventilation flow according to orientation of each particular panel.

Ventilation of the interspace within a Rose Window
The window is effectively formed of 73 small windows, all of which are have a different *orientation*: no two panels will have the same configuration for convective ventilation. Details in this application demonstrate the support and ventilation requirements, which will be developed to RIBA 5 with the expertise and guidance of YGT with input from TCA on environmental conditions in the most suitable manner. Experts such as Tobit Curteis have been consulted to undertake environmental analysis, testing (if required), and to inform the development of a suitable research and monitoring design. As noted further below, this project presents an important opportunity to collate existing knowledge of EPG performance and to advance understanding.



28. Previous metal armature design used to support the historic glass of s11 to s15

Structural Considerations

Excerpt from The Morton Partnership initial assessment of survey information and proposal, Structural Engineer

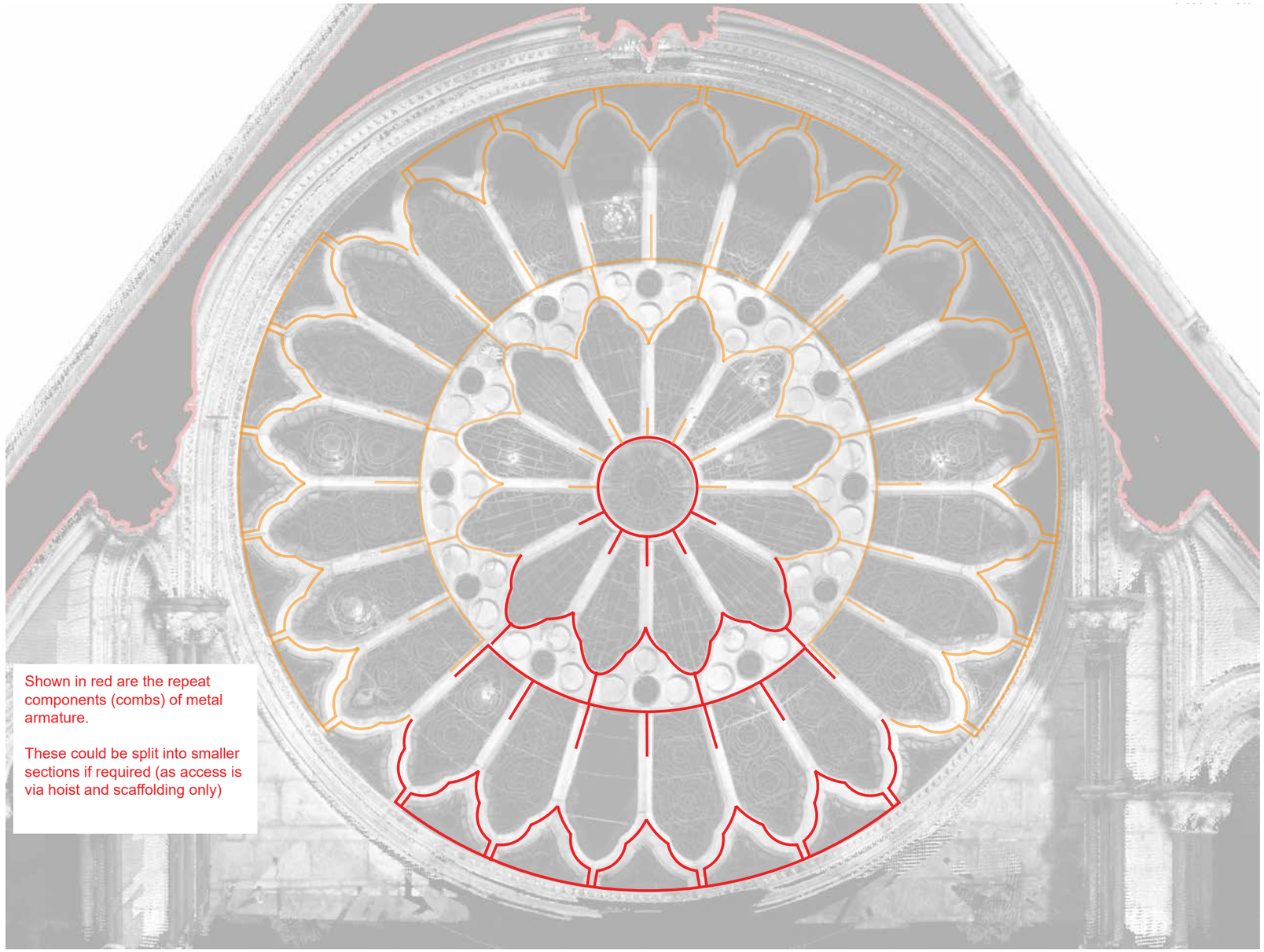
The proposals include the repair and refurbishment of the stonework. We have not inspected the window but from the survey data provided it is clear that a number of repairs will be required to deal with stone erosion and inappropriate or failed historic repairs and interventions. A large number of stone indents have been applied to the internal face in the 1970's using glue and pins and it is proposed to remove these and replace using more appropriate techniques. Other historic repairs have been carried out to some of the spokes, particularly to the bottom half of the window.

The Rose Window appears from the survey data to be relatively free from movement, distortion and structural cracking. There are a number of cracks and these are highlighted on the condition survey drawing and these will be repaired during the works.

The external protective glazing is currently shown either fixed into an existing rebate or fixed to a flat surface via a metal perimeter frame. Wind bars are shown attached to the metal frame. Timber blocking is shown between the stone and metal frame and consideration will need to be given to damp issues from condensation etc. Consideration will also be required for fixings, stiffness of the supporting structure and issues related to thermal movement.

The internal refurbished historic glazing is currently shown being fixed to stainless steel brackets that are fixed back to a metal exo skeleton. The indicative metalwork structure drawing illustrates a preliminary proposal of an array of repeating frames that could be installed and act as a stiffening frame to the window. The size of these frames will need to be carefully considered to ensure that thermal expansion and contraction of the frames will not apply stresses or pressures to the stone window to which it is fixed. The size and weight of these frames will also need consideration as these will need to be manhandled into position.

All the above design considerations as identified by the engineer will be resolved in the technical design stage prior to fabrication.



Design Principles of the Armatures

The EPG is installed the position of the historic glass, sat within the existing masonry rebate. *Refer to Detail 02 and 03 for greater detail of this component.*

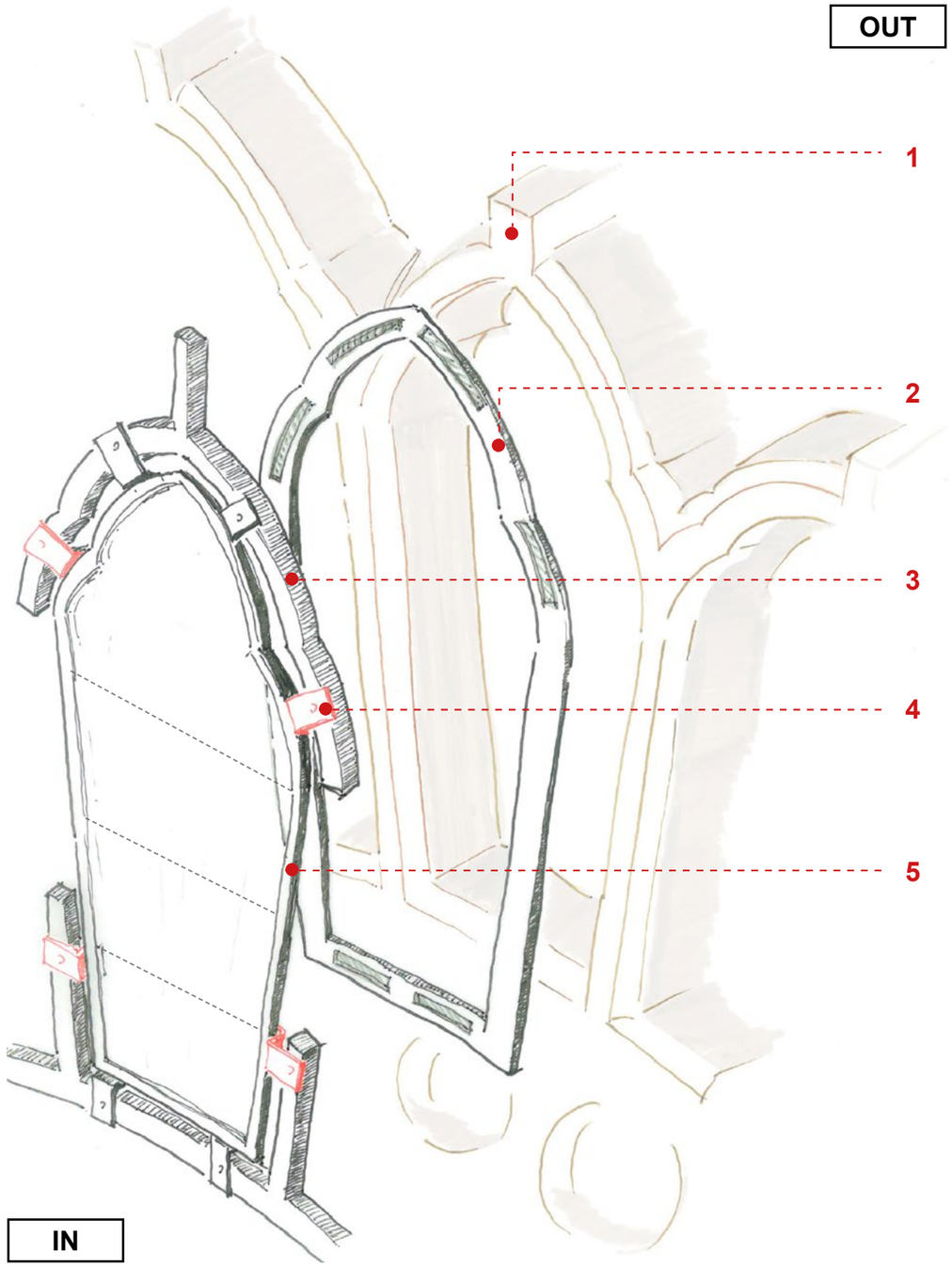
A broader perimeter frame of thin sheet metal sits on the interior face of the masonry. This is laser cut to the unique form of the window, and has perforations in the surface to allow the ventilation required for the interspace between the external and internal window glazing. The position of these perforations can be altered based on the orientation of the panel in the Rose Window to optimise air-flow characteristics.

A metal exo-skeleton supports cleats which hold the historic glass. By thickening the brass framing of the historic glass, the cleat fixings can be suitably spaced so as to firmly secure the glass panels and also to facilitate ease of installation and future removal for inspection. By carefully engineering the components the aim is to provide the right number of fixings to suit the load of the glass, which varies depending on orientation around the Rose.

Following the conservation of the masonry tracery, this exo-skeleton acts as additional support to the masonry, with the metalwork fixings acting as pins for new indents into the existing stonework. However the internal armature is not designed as a structural support for the stone - which the engineer indicates as in satisfactory condition.

Similar to the armatures across the Minster, this metalwork is proposed to be powder-coated stainless steel and all fixings will be non-ferrous.

The design of these armatures will be conditioned, and delegated to the FAC with the support of experts such as Dr Ivo Rauch, one of Europe's leading glass conservators, with experience working on various Rose Windows.



DETAIL 01
NTS

KEY

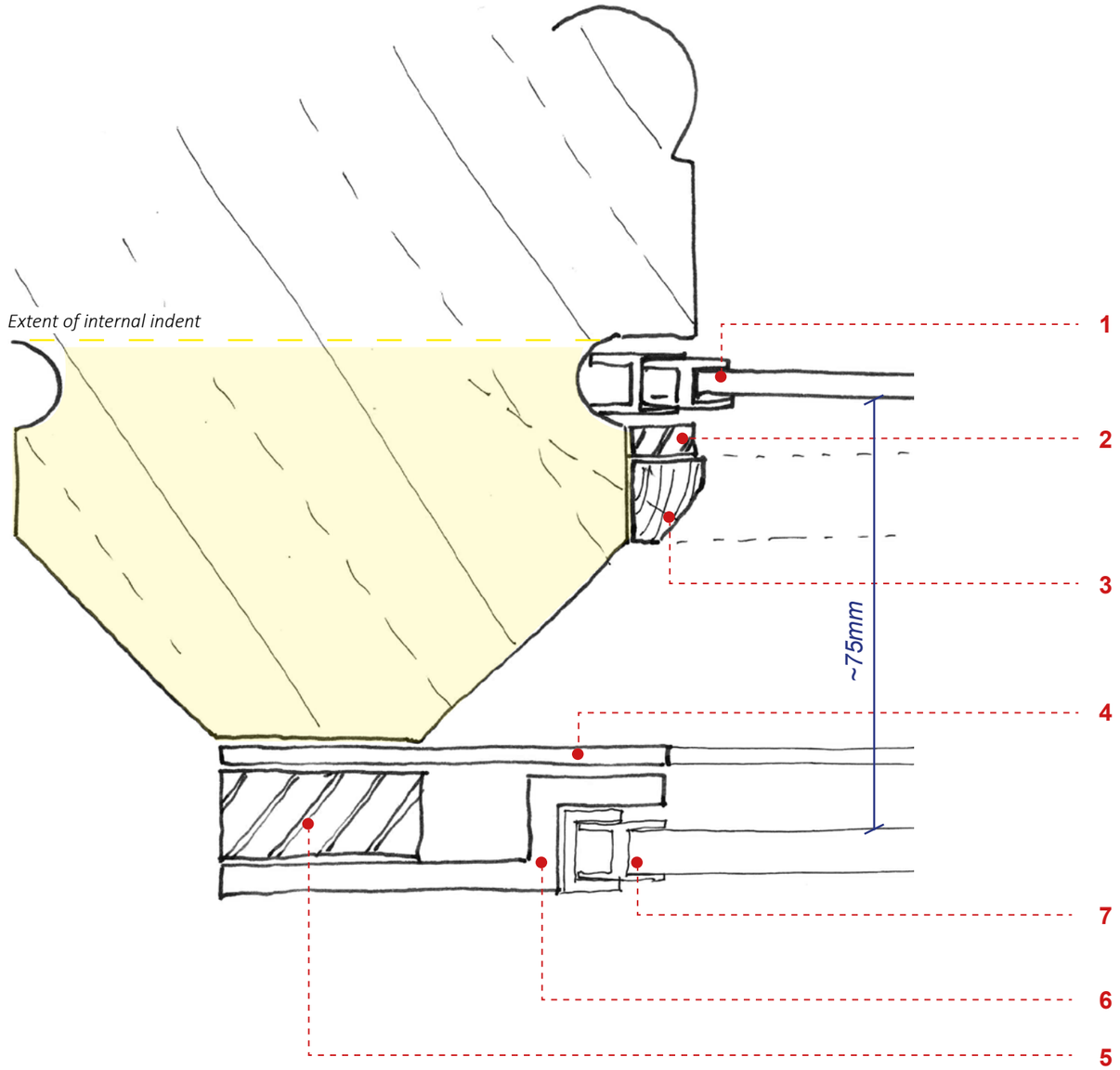
1. Masonry tracery with EPG installed
2. Thin laser-cut metal 'gasket' for light and ventilation control. Perforations for ventilation to align with the orientation of the glass. Mesh installed to control light
3. Metal exo-skeleton on to which protected glass support panel cleats are fixed. (Structural requirements tbc)
4. PPC S/S Cleat to support protected glazing panels oriented to suit centre of gravity
5. Protected historic glazing (conserved) in new bronze framing with wind bar.

Installation of Protective Glazing

Around the perimeter of the glass panel, a metal frame is used to hold the EPG in place. It is held in place with small sections of hardwood timber bead fixed into the masonry.

Where historic indents have been installed (highlighted in yellow) it will be pertinent to ensure that the pinning of any masonry does not clash with the fixing of any beading.





DETAIL 02
PLAN 1:1
0 *50*

KEY

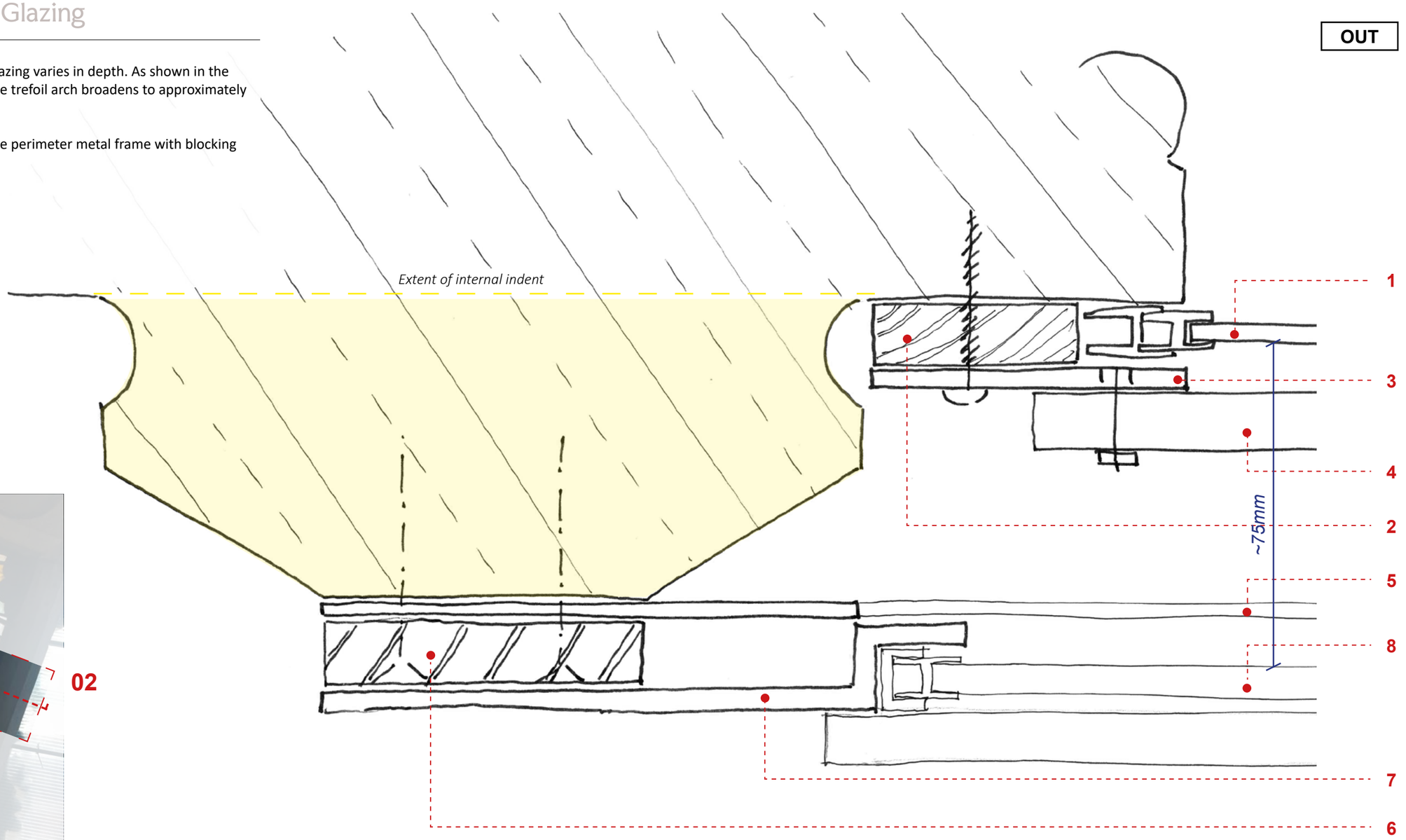
1. Protective Glazing, specialist IR/UV Glass, re-leading with double lead margin (pointed externally)
2. Metal perimeter frame all-round, laser cut - compression weatherseal
3. Non-continous hardwood timber bead to hold frame in place, at narrow perimeter
4. Thin laser-cut metal 'gaskett' for light and ventilation control. Perforations for ventilation to align with the orientation of the glass. Mesh installed to control light
5. Metal exo-skeleton on to which protected glass support panel cleats are fixed. (Structural requirements tbc)
6. PPC S/S Cleat to support protected glazing panels oriented to suit centre of gravity
7. Protected historic glazing (conserved) in new bronze framing with wind bar.

Installation of Protective Glazing

The rebate in the tracery that supports the glazing varies in depth. As shown in the photo below the thickness of the rebate at the trefoil arch broadens to approximately 70mm.

Here, the proposal will secure the EPG and the perimeter metal frame with blocking timbers.





DETAIL 03
PLAN 1:1

0 50

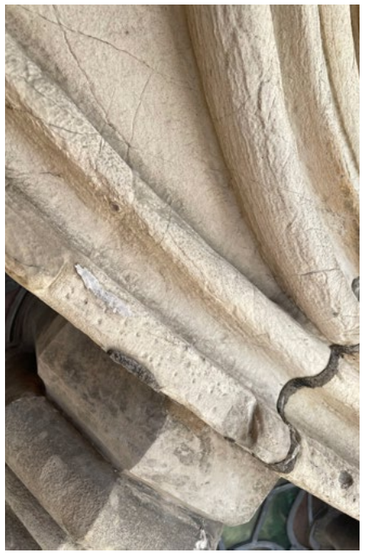
KEY

1. Protective Glazing, specialist IR/UV Glass, re-leading with double lead margin (pointed externally)
2. Timber or similar blocking, shaped to tracery as spacer, to hold frame in place
3. Metal perimeter frame all-round, laser cut - compression weatherseal
4. Wind bar
5. Thin laser-cut metal ‘gaskett’ for light and ventilation control. Perforations for ventilation to align with the orientation of the glass. Mesh installed to control light
6. Metal exo-skeleton on to which protected glass support panel cleats are fixed. (Structural requirements tbc)
7. PPC S/S Cleat to support protected glazing panels oriented to suit centre of gravity
8. Protected historic glazing (conserved) in new bronze framing with wind bar.

Conservation of Stonework



30. Outer circle of the Rose Window, with historic indents in what is understood to be the older stonework of the tracery



31. Previous indent, now lost, showing the lack of adhesion and fixings present



32. Horizontal and cubiodal cracking to a column shaft (A18)



33. Example of previous replacement and recarving of decorative elements in the conservation of the Great East Window

Developing our understanding of condition

Afforded early access to the tracery and an opportunity to assess the masonry with some glazing panels removed, the Project Team have established a better understanding of condition than would be expected at this point in the project's development.

Based on initial inspections by the Surveyor and the Masons, the team has commenced the scheduling of condition and the historic repairs the tracery has undergone. These schedules are helping the team to assess the interior and exterior together, and aid investigation of the structure holistically. The initial repair drawings are annotated on the following pages, and are appended shown to scale in the Appendix. They show:

- *Assessment of External Condition*
- *Assessment of Historic Repairs to the Exterior*
- *Assessment of Historic Repairs to the Interior*

As noted, this investigative work will continue once all the glass panels are removed and a clearer picture of the stonework can be afforded. Prior to any commencement of works, a finalised record of these schedules will the undertaken.

Understanding the extent of works required

Armed with a good understanding of condition and historic repair, the Project Team will set out the extent of work necessary to safely and effectively conserve the stonework.

For areas such as the Rose Window which is above a public route and the South Transept plaza, and accessible only by major scaffolding, Stone Practice suggests that any masonry unlikely to achieve a further 75 years of life should be replaced (reference Item 27 in SPP). We are proposing that in principle a shorter return period is reasonable and thus a more conservative approach, backed up with mitigation and maintenance approaches that are defined below.

We have inspected the variously weathered decorative details of the existing window. There are decorative features which are being lost or are heavily weathered. We have taken the decision that we would not seek to conserve or re-instate these decorative elements, We judge that the design and visual significance of the window is not so harmed or at risk that renewal or heavy conservation is yet needed. See following report section on these details for further particulars.

As noted earlier in this paper, there is a possibility that some stone replacement will nevertheless be required.

How that will be undertaken

Informed by the methods set out in Stone Practice, the following approaches will be employed in the conservation of the stonework:

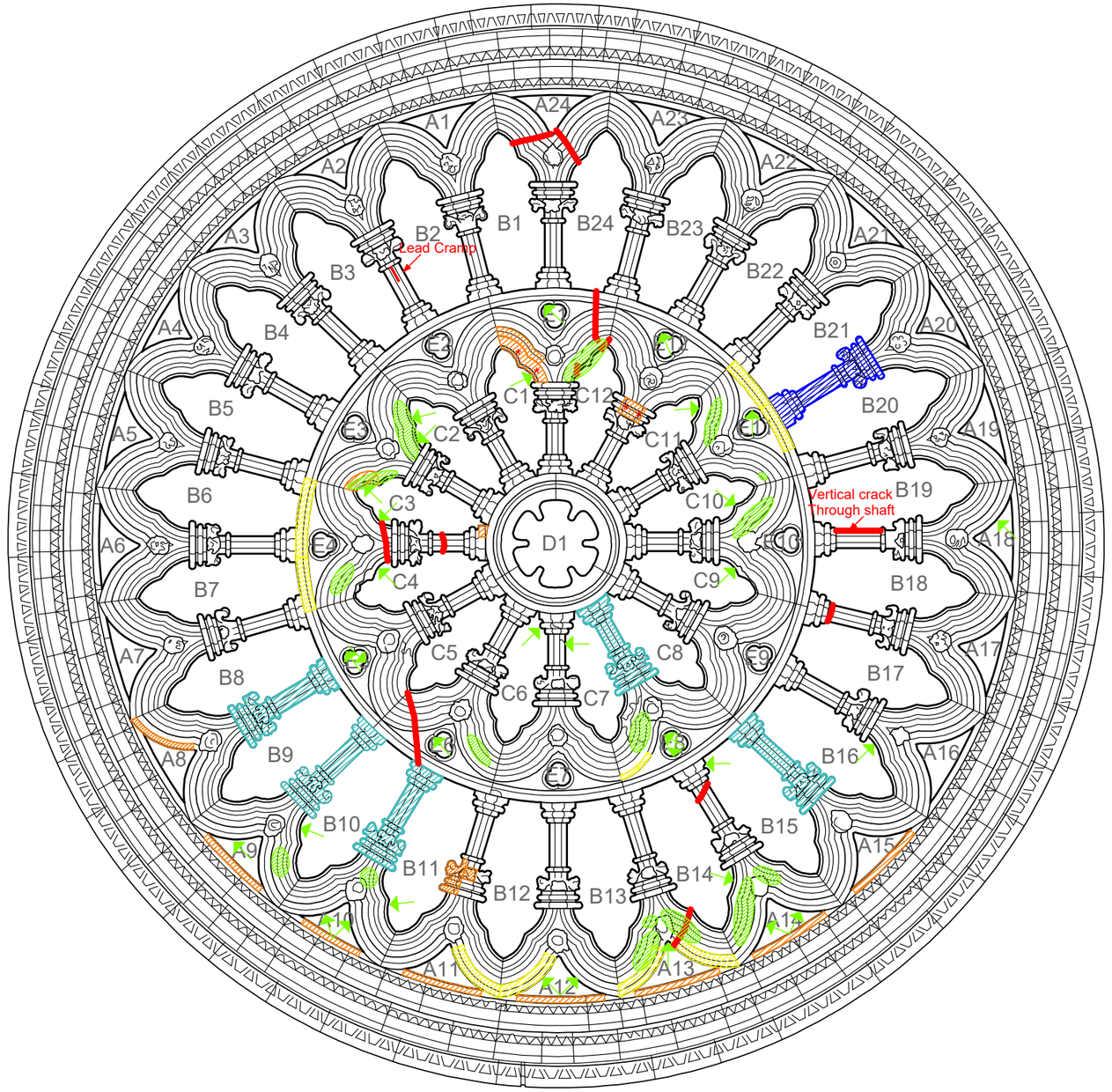
- 'Plastic' mortar repair
- Pinning
- Partial replacement or indents
- Full replacement of components
- General works; including gentle brush back / de-frass and re-pointing

Profiles and moulds will be taken from surrounding decorative elements, and will inform any remaking or rebuilding required.

Final specifications for replacement stone and mortars will be in line with Stone Practice Policy and finalised following further inspection and analysis.

Conservation of Stonework

The following pages include detailed scheduling by Peter Arts (Mason, Works Department). These reflect surveys and research undertaken to date. It should be noted that with greater access following the removal of the remaining glass in January 2027, further clarity will be provided and this initial record may be subject to change and development of detail - but we do not anticipate a major shift in approach or scope.

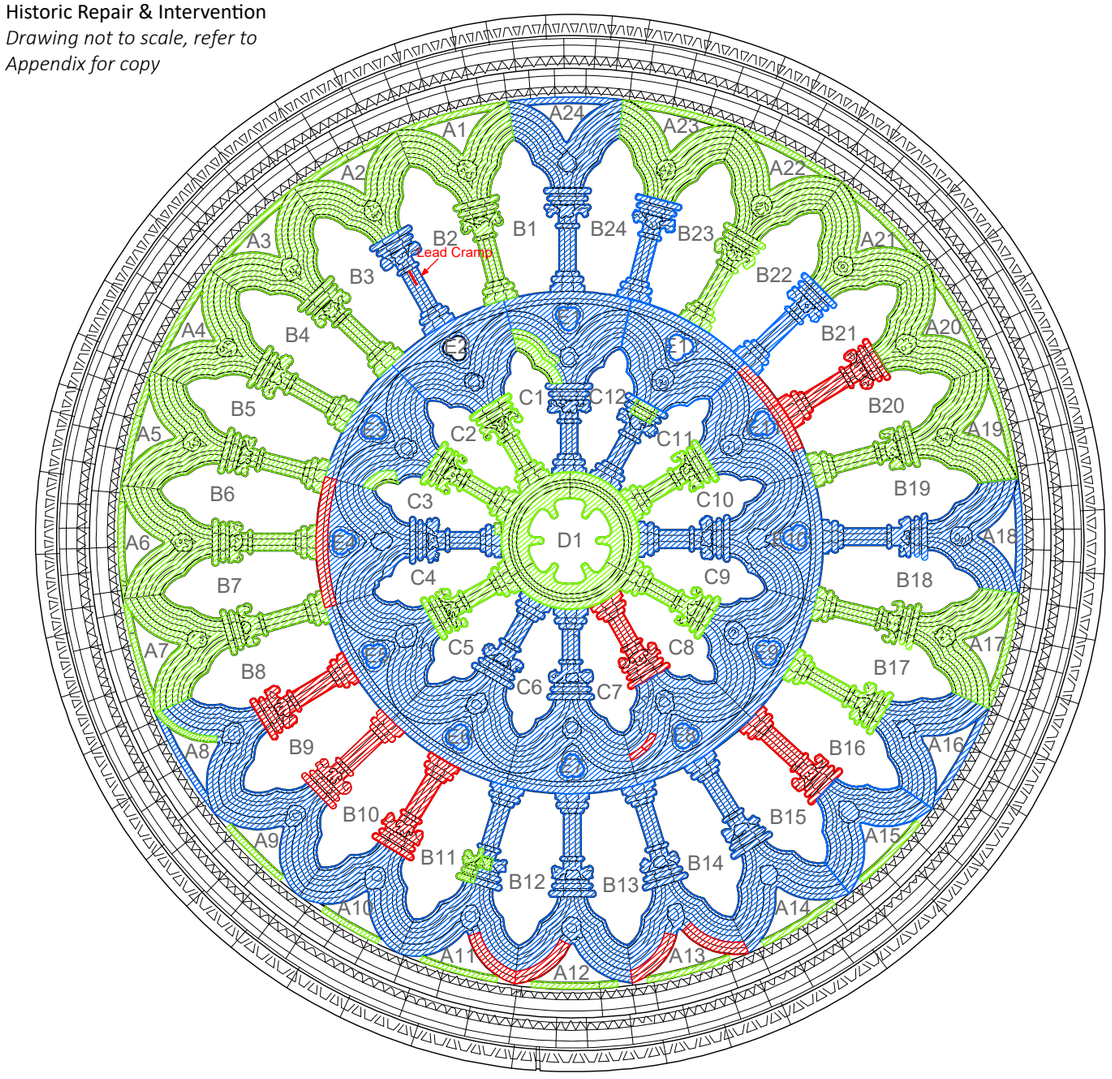


External Elevation
Condition Survey
Drawing not to scale, refer to Appendix for copy

- Portland Limestone Full Replacement (ca. 1970) 205 mm depth
- Portland Limestone Replacements (ca. 1970) Replacements presumably up to glass line
- Portland Limestone Indents (ca. 1970) various in depth
- Early 1870's Indents (G.S. Street intervention) various in depth
- Fixings_Location of Dowels
- Sheltered Decay/Cavitation
- Structural Cracking

Conservation of Stonework

External Elevation
Historic Repair & Intervention
Drawing not to scale, refer to Appendix for copy

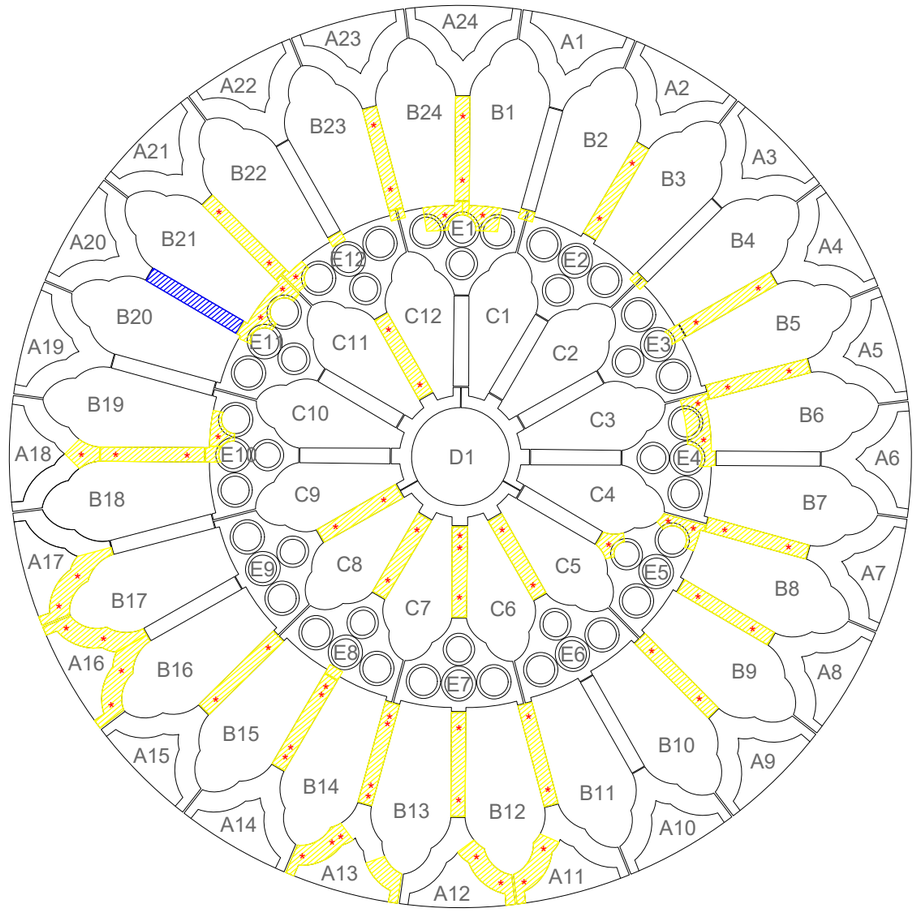


Possible Original 13th C

Early 1870's Replacement (G. Street)

Early 1970 Portland Limestone Replacement

Internal Elevation
Historic Repair & Intervention
Drawing not to scale, refer to Appendix for copy



Portland Limestone (ca. 1970)
Full Replacement (205 mm depth)

Portland Limestone (ca. 1970)
Partial Replacement (70 mm depth)

Fixings_Location of Dowels

Conservation of Stonework

Loss of Detail

The extent of loss to decorative features of the Rose varies across the elevation. Where original stones remain, any protruding and highly decorative elements such as bosses and foliate capitals now lack definition through weathering. In some instances details have been lost entirely.

On the majority of original stones, decorative rolls still appear relatively well defined, with only fine points or arrises having been worn down with exposure to the elements.

It has become apparent on closer inspection that during previous campaigns of work authors have reinterpreted the language of the decorative elements almost entirely. Two clear campaigns of work now stand out for their introduction of distinct additions. We can be certain these works were completed at different points as they utilise two very different stone types.

Indicative dates have been ascribed to the visible range of historic repairs and interventions to the tracery. As further assessment and research is undertaken these dates may become clearer, however at present they appear to be:

1870s, G.E. Street's works to the South Transept
Foliate boss to the outer circle of the rose

At the springing point of each trefoil arch is a boss. In the original stones of the outer circle this appears as a Rose, or petalled flower, see fig. 36. (This is replicated on the inner circle, if these were the same, fig. 38.) Where springing stones have been replaced (which we presume to be Street), these bosses are foliate clusters, see fig. 37.

There is a distinct flat end to the stem of these leaves which are similar to the foliage capitals on the rest of the South Elevation.

1970s, Feilden's works to the Rose
Bunched scroll capitals to the outer circle

In a small number of locations across the Rose, column shafts, capitals and bases have been replaced. These have been formed in what appears to be a Portland limestone and are clearly legible as distinct. In the remaking of these, the design of the capital has been altered from a three-bunched foliage design, to a three-bunched scroll design.

Prior to works commencing on site, an archaeological record will be taken of the differing decorative elements as per the requirements set out in Stone Practice Policy. These will be supported by the drawings undertaken by the Works Department which clearly depict groupings of the historic campaigns.

Due to the extent of loss to the boss of the outer circle, it would be pertinent within this scope of works to remake this detail should replacement of this stone type be required.

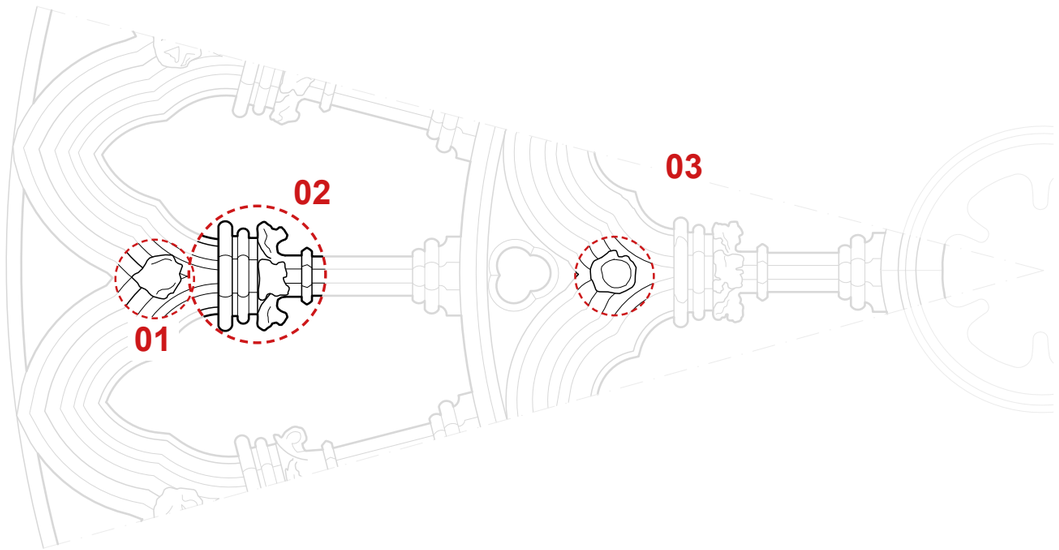
The stoneyard have carved and fixed many new decorative elements in recent works, which has allowed the briefing process for new carvings to be agreed, tested and confirmed. This process sits within the Stone Practice methodology and remains a collaboration between the carvers and Surveyor. The renewal of any decorative elements will be dealt with in this manner.



34. Original capitals have three-bunched stiff-leaf, replicated across the South Transept

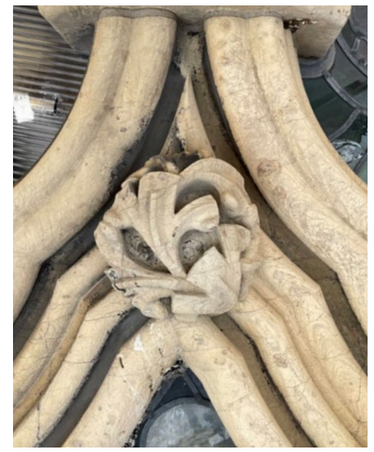


35. Capitals remade in Portland Limestone have a more stiff and classical appearance with three-bunched scrolls





36. Loss of detail to boss, suggestive of a floral motive such as a rose? (A13 Springer Stone) We are proposing a 'conserve and stabilise' approach.



37. Replacement springer stones have been remade with foliate bosses, with similar detailing to Street's adjacent work on the South Transept



38. The boss within the inner circle shares the floral motive. These are is in much clearer condition, with definition and clarity of form on the majority of examples

Conservation of the South Transept, South Elevation

Assessment of Condition

A survey of the South Transept Elevation has been undertaken; this has shown that the extensive restoration by Street has held up well, in the main. Across the elevation, various historic repairs are present which reflect the works and materials seen on the tracery of the Rose Window. This includes decorative features with distinct tool marks, and differentiated profiles, as well as cementitious rebuilding to areas such as hood mouldings. Following preparatory removal of damaged stone poor mortar repairs and/ or damaging cement, the Team will finalise scope of conservation works proposed for the South Elevation.

All affected areas will be subject to archaeological recording and documentation of the conservation works in line with Stone Practice policies.

Proposed Works

Works to the South Elevation of the South Transept will be aligned with the requirements of Stone Practice Policy. Like the Rose Window, the South Transept stands overlooking a major public open space with a public entrance at the centre. Maintenance and repair of the facade is generally only possible via major scaffolding. The conservation approach will necessarily address the risks of falling stone or future detachment of repairs.

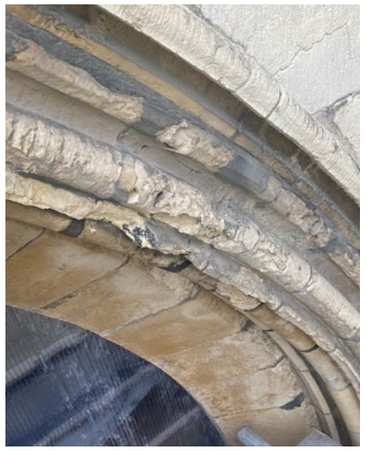
This CCM therefore proposes a programme of conservation that will predominantly comprise repair and consolidation, with only a few components requiring replacement. Removal of past mortar and cementitious repairs as we prepare the stonework for conservation will ultimately reveal and determine the range of indents or components which will be renewed. As per Stone Practice, a detailed schedule of condition will be developed following an initial phase of preparatory work, with the resulting scope, details and methods carried into the implemented programme of conservation.

General Works
General works will include the removal of loose material. Weathered and loose pointing , both cementitious and lime, will be removed to a sound base. If stonework demonstrates decay or deterioration to the face, this will be cut out, back to a sound base.

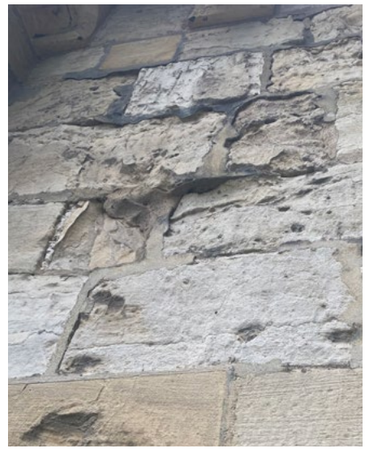
Repair
Where necessary and where possible, any masonry demonstrating loose components or details will be carefully pinned in position. ‘Plastic’ mortar repairs will be limited to suitable areas and will be carefully tied back to the elevation to mitigate risks of large repair areas detaching and failing in future.

Renewal
Where deterioration is beyond consolidation and repair, renewal will be proposed, mostly small indents, but we do not rule out renewal of some components.

Supplementary Works
Whilst on the scaffolding, adjacent QIR related works will be undertaken such as consolidation of cabling, light cleaning and replacement of lead and flashings where required.



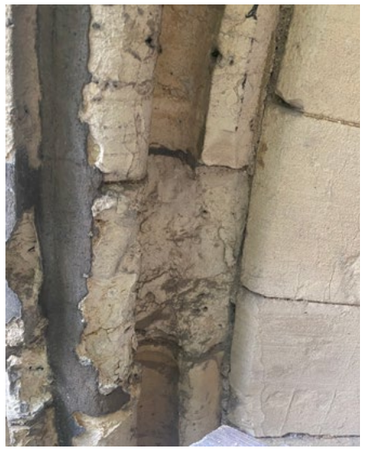
39. Deterioration to hood mouldings with cementitious rebuilding in areas - candidate areas for mortar repair and consolidation



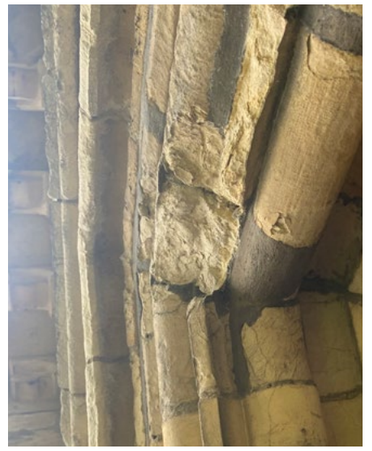
40. Cementitious pointing with ledges acting as water traps - to be re-pointed and locally flaunched.



41. At close inspection, original pointing appears behind, with thin application of cementitious pointing to flush the joint



42. Cementitious rebuilding may be causing deterioration of the masonry behind. We would expect to remove this repair and then decide the conservation required of the substrate.



43. Loss of large sections of masonry where historic repairs may have worsened condition and accelerated loss. This component is scheduled for renewal.



44. Much of the decorative detail and forms of the facade are in good condition; note however the Roman Cement repair in the reveal - these will be examined and probed; if found to be sound and doing no harm, they may be allowed to remain.

Maintenance and Monitoring

Maintenance

Provision for future maintenance will be provided as part of these works, internally and externally.

Externally, the primary role will be to undertake cyclical checks for detaching stone fragments which might fall to below; this will be part of the existing safety inspection cycle. However there will be enhanced checks of the rose window and reporting on the rate of decay, including checking on stone fragments that are caught by the protective netting. This is important to mitigate the risks which are a consequence of the relatively light touch conservation programme for the Rose.

Internally, there needs to be a more deliberate inspection and maintenance regime for the historic glass. it is an accepted neccessity that deep conservation of the historic glass is not possible or approproiate. But there are known risks with the conserved glass which can only be evaluated by regular and systematic checks. Therefore there needs to be an embedded process for safe access and the means to un-clip and lower panels of glass safely (for people and the glass). It is proposed that access for light-touch inspection is managed through steeple jack and building in the means for attachment of ladders and ropes. By these means, a suitably skilled and experienced contractor can inspect the historic glass, the EPG, masonry and any monitoring points positioned within the structure.

The lower level of the Rose Window is accessed via the Tower, to a small walkway indicated by the dashed red line. A protective barrier was previously installed along the length of this walkway. This offers a safe guarding from which steeplejacks could erect temporary ladders to a panel identified for inspeciton. To support ladders and harness points, fixing points are proposed as indicated on the adjacent drawing.

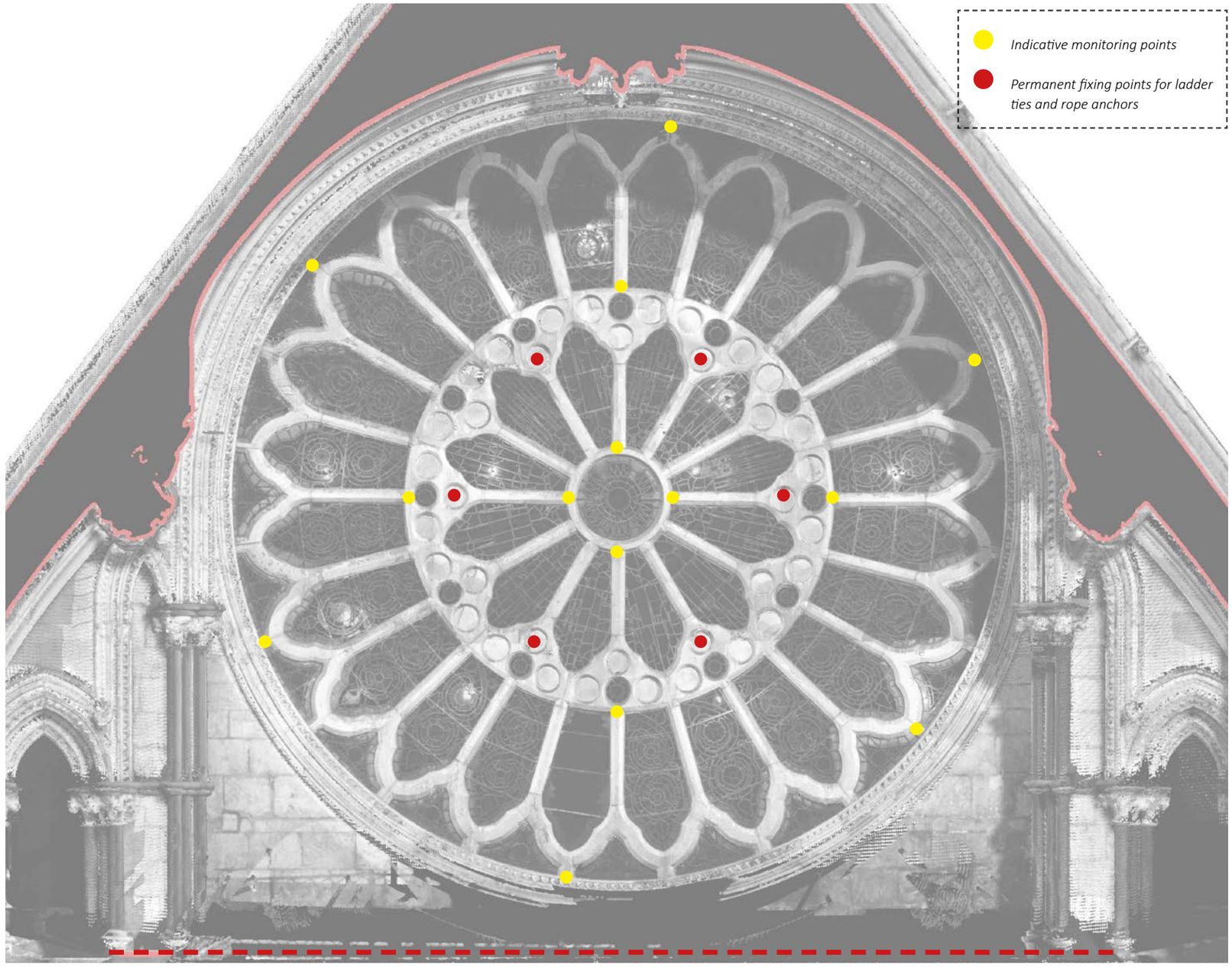
Monitoring

It is proposed that an allowance is made within the project for monitoring of the Rose and the new internal environment it sits within. The motivation for this monitoring are as follows:

- To understand the impact UV/IR glass has on the internal environment
- To monitor how the internal environment may be impacting the historic glass
- To monitor how the internal environment may be impacting the EPG and masonry
- And to inform a broader understanding of how changing climatic conditions are affecting the Minster and the delicate heritage assets

A research proposal is included within this submission to support this research it is proposed that there will be a number of fixed sensors installed. These have to be maintainable themselves; therefore the proposal is that the sensors will be hard-wired back to the safe walkway, where battery systems can be provided in a maintainable location. The installation will be light touch and reversible.

Data gathering, in conjunction with information of the Minster as a whole will inform our understanding of how conditions are changing following completion of the conservation programme. This will allow the team to evaluate and report changes to the environment, fabric and glass and to ascertain whether the works have sufficiently achieved their aim.



Research Opportunities

The condition of the glass, as well as the challenge of designing protective glazing for a Rose window, offers unique learning and research opportunities.

This could take the form of both internal investigation and assessment, as well as providing external opportunities such as contributing to papers and broader research in the field or working with a university to offer research alongside practical conservation work.

During Stage 4, Technical Design, we will be gathering as much guidance and expert understanding where possible to finalise the research aims and methods. We are aware that there is not an extensive amount of research or examples within the UK of similar contexts, and therefore we will have to undertake our own investigations as well.

Therefore each of the following categories will form a critical line of enquiry in these investigations:

Material science

How do existing and proposed materials interact and function in new conditions

Questions such as:

How does UV/IR glass perform?
How does protected glass perform in its protected state?

The upcoming Rose window conservation provides a unique opportunity to compare different glass conservation techniques in a closely controlled context. During the 1984 post-fire conservation campaign, silicone, an epoxy resin known as Ablebond, and traditional lead repairs were all used within the Rose window to stabilise and mend areas of damaged glass. Because these repairs are of the same age and are exposed to comparable environmental conditions within the same window, they offer an unusually strong basis for assessing the benefits, limitations and long-term performance of each treatment. It is not usual to find repair techniques so drastically different that are all the same date. More commonly, different repair techniques on a window signal different phases of restoration, and comparisons are difficult/unfair as they represent very different ages of application.

Building science

How does the conserved and protected window now impact the Minster, and vice versa

Questions such as:

How does heating impact EPG and PG Systems?
How does ventilation of a Rose Window perform?
What is the relationship between the protected and un-protected glass in the Minster?

The environmental protective glazing (EPG) research should examine comparable system designs used on rose windows elsewhere, rather than treating this window in isolation. This would involve identifying examples of EPG design for Rose windows and assessing how well they have performed in practice. The research should consider how each system responds to the shape, scale, orientation, and vulnerability of Rose windows, including whether it has led to unintended problems such as condensation, restricted ventilation, visual intrusion, or additional stress on surrounding stonework.

The slender profile of the stonework in York Minster's Rose Window also makes the EPG system particularly difficult to design, so any support system would need to be carefully developed to carry the weight of both the protective glazing and the framed stained glass without placing unnecessary load or stress on the historic tracery. That being so, particular focus should be given to any comparably delicate rose windows elsewhere.

Environmental science

How do changing environmental conditions impact the Rose Window

Questions such as:

What conditions is the protected glass now subject to?

To our knowledge, although there is relatively speaking more data on temperature and humidity in relation to protected windows, there is little that explores air movement. The potential on a Rose window for 'dead space' in terms of air circulation is much greater than on windows where there is greater ability to provide a chimney effect. The radial nature of a Rose window makes this a very interesting and pioneering area of examination.

Airflow monitoring of the window will be a very fruitful research topic, over and above the monitoring of environmental conditions. There are vast bodies of data already which confirm conclusively that EPG systems have a positive impact in terms of providing climatically stable conditions, thereby arresting the formation of moisture (by way of condensation) on the window. Research framed on these grounds would just confirm further what has already been established. The UV/IR glass has also undergone extensive testing, and if we did not believe that this testing is credible, we would not be investing so significantly in the product. It would have little contribution to the sector to test things that have already received extensive testing and which we know to be systems that work.

No studies have suitably addressed however the idiosyncratic nature of Rose windows in terms of air flow, and also whether the dead space in terms of air buoyancy is significant or not given the use of the UV/IR glass. This would be the first study of its kind, and which we would welcome collaboration with colleagues in various specialisms.

The dissemination of this learning will be a key part of the project aims, contributing to current industry research, with the support of conservation expertise in the team. The proposed outputs will be designed to reflect their contents, but will be based upon, and informed by, the guidelines provided for Churchcare conservation reports.

We hope this would demonstrate to our stakeholders the role York Minster plays in research and innovation within the profession, industry and this field of conservation.

Maintenance and Monitoring

Additional Works

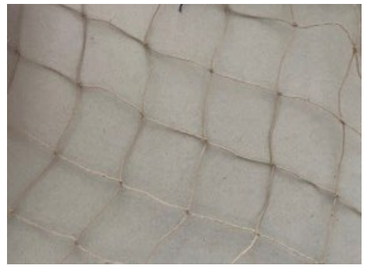
Bird netting & fall arrest
As part of these works, the existing bird netting will be renewed. The netting will continue to prevent nesting and will deter the build up of guano.

It is proposed that this netting is reinstated but with new detailing such that it could be easily unhooked to allow for close inspection and maintenance. In addition, the fixing points required for this bird netting will double up as fixing points for a fall arrest system. Should high level rope access be required for inspection, these fixing points could provide additional restraint.

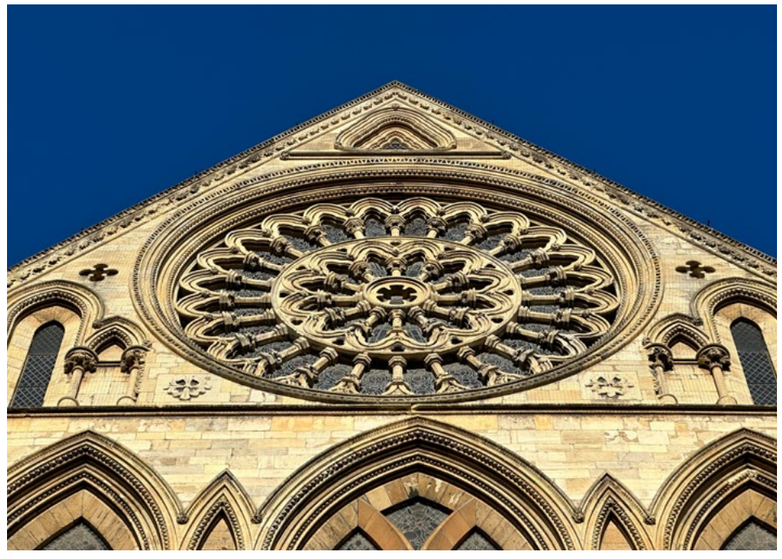
It is proposed for the lower portion of the bird netting (to a height of 1m), that a secondary layer of protective nylon mesh is installed in addition to the bird netting. Should any masonry deteriorate further and come loose, this mesh layer would prevent it from falling on to the public open space below.

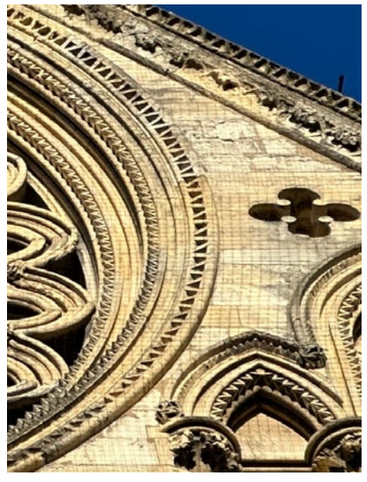
The netting will be installed by a competent specialist. This would be the same team who installed the netting to the Queen's Statue to the West Front. Similar to the Queen's Statue, a 'stone' or 'buff' colour netting is proposed, this is as visually unobtrusive against the background as possible.

Detail of both the netting and mesh will be will be developed following this CCM application. It is requested that the approval of these details is deferred to FAC.

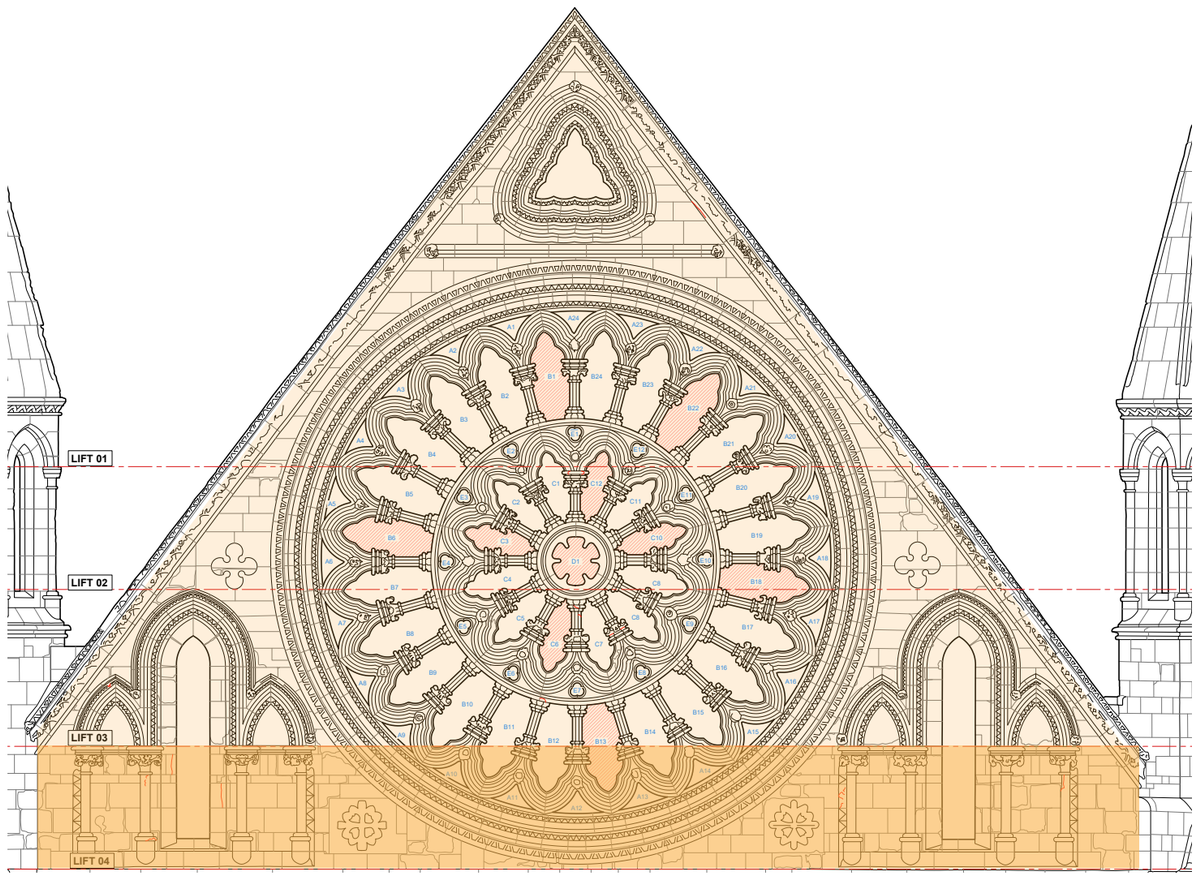


46. Proposed buff/stone coloured bird netting





45. The existing bird netting covers the extent of the gable. Renewed netting would replicate this. No viewer is aware that the Rose is netted at present.



Heritage Impact Assessment

Visual Impacts

There will be a small visual change to the interior face of the window. The historic glazing will be set back from the glazing rebate and there will be a visible supporting armature. However, these will be very minor changes when viewed from ground level within the South Transept interior. The rich colouration and symbolism of the window will remain legible, and the works will follow the approach already adopted to other windows within the Minster. Therefore, in visual terms, we suggest there will be **No Impact** overall to the internal face of the window.

There will be a small visual change to the glazing externally. The EPC glass is modern. The UV/IR glass will have a different quality and appearance to the existing leaded light, which mixes plated glass panels with conventional leaded glass. When considered closely, the existing glass is in a modest way detrimental to the plane of the glass, with the plated panels presenting a 'lumpy' visual appearance. We suggest that whilst there will be a slight change in appearance, it will remain a neutral background to the complex window tracery — key to the visual significance of the window exterior. We therefore suggest there will be **No Impact** visually to the window exterior.

The proposed bird netting will replace netting which has been applied to the window in recent years and will therefore cause **No Impact** to significance. However, the mesh to the lower portion of the window may result in a visible change. We have not specified this yet, so it would not be possible to say more that there is potential for a visual impact. This can only be judged once the specification is complete - which we suggest can be evaluated by the FAC to determine under condition of this approval. As a major entrance to the Minster, it is important to ensure the safety of the approach from falling masonry, particularly given a further restoration is not anticipated for at least 75 years. We therefore believe a slight heritage impact could be justifiable.

Physical Impacts

There will be fixings required into the shafts of the window tracery to fix the frame containing the historic glass in place and to support the EPG glazing. This has the potential to be a **Minor Detrimental** intervention. However, research has revealed that most of the internal shafts proposed for fixings have been replaced in the 1970s, and, externally, either replaced at this time or in the 1870s. Moreover, the way the 1970s shafts are currently glued in place is insufficient and requires a fixing to ensure its safety in future. We therefore believe this heritage impact is justifiable.

Bird netting is proposed for the exterior face of the window. There is a precedent for bird netting in this location, and fixings from this will be re-used. There may be additional fixings required for the lower mesh, but these will be applied to mortar joints rather than directly into stonework. All fixings will be non-ferrous. We therefore suggest that the netting will have **No Impact** in terms of physical heritage harm to the window.

The above analysis has revealed a number of issues with the current condition of the tracery, including de-lamination, stress cracking, surface crust and water ingress. These currently have a cumulative visual affect and pose a risk of getting worse. Works are proposed to address these issues with sensitive and appropriate repairs in accordance with the York Stone Practice Policy. This is considered a **Moderate Positive** intervention.

The conservation works to the glazing will be light-touch (the 1980s restoration is considered to be irreversible) and will therefore cause **No Impact** to significance of the previously conserved historic glass. .

The works to control the environmental conditions within the window will slow if not fully arrest the degradation of the glazing, ensuring any humidity and temperature fluctuations are minimised. This will have a **High Positive** effect. There are already signs of yellowish discolouration to parts of the window where silicon and/or Ablebond has been applied. In time, this will effect all parts of the window if no action is taken.

Conclusion

Overall, the conservation of the Rose Window will result in a small visual change which may cause a low level of harm to significance in some cases. This has been mitigated as far as possible with careful design, and is justified by a number of major physical benefits to the presentation, condition and longevity of the glazing. The works also incorporate a number of tracery conservation repairs which will have a positive effect on the presentation of the window and avert future losses of carved stonework.

Level of Impact	Likely effect
High Positive	The proposed alterations or development will have a major positive impact, improving the character, setting and/or heritage values of the heritage asset(s). The change would have the potential to reveal and/or enhance several heritage values assigned to the building or setting as defined in the Assessment of Significance.
Moderate Positive	The proposed alterations or development will have a considerable beneficial impact, improving the character, setting and/or heritage values of the heritage asset(s). Moderate positive impact on the heritage asset(s) as a whole may be caused by the cumulative minor positive impact on the heritage values of several features. This effect can be direct or indirect.
Minor Positive	Minimal beneficial improvements to the character, setting and/or heritage values of the heritage asset(s) brought about by the proposals. This can be direct or indirect.
No Impact	There is no change incurred by the development or alteration on the character, setting and/or heritage values of the heritage asset(s).
Minor Detrimental	A minimal impact will be brought about on the setting, character or heritage values of the heritage asset(s). Localised, minor detrimental impact may be accepted should demonstrable mitigation be in place.
Moderate Detrimental	The proposed alterations or development will have a negative impact, adversely affecting the character, setting and/or heritage values of the heritage asset(s). This may be brought about to the heritage asset(s) due to the cumulative minor detrimental impact on the heritage values of several features. This affect can be direct or indirect. Detrimental impact of this nature should be avoided, but it may be possible to accept if demonstrable positive mitigation is in place.
High Detrimental	The proposed changes will have a seriously negative impact on the overall character, setting and/or heritage values of the heritage asset(s). Features that contribute to the overall heritage values, character or significance of the heritage asset would be disturbed. Major detrimental change should not be considered acceptable.

Suggested Conditions with an approval

As noted above, there may be matters relating to the conservation of the glass on which YGT will welcome external comment and peer review. Therefore it is recommended that the CCM approval acknowledges a formal role to the York Minster Standing Committee for Glass as a advisory reference group which can determine questions of approach or detail if required.

The principles of design of the window armatures, fixing and proposed installation (and removal) methods will be finalised at RIBA 4 and we request that these details are deferred to the FAC to sign off. Similarly there will be details of rope access and ladder ties to finalise and sign off.

Detail of mesh and bird netting would also be determined by the FAC once finalised.

Conclusion

Since we have been afforded unprecedented scaffold access (internally and externally) and have been able to remove a number of glass panels, it has been possible to study the glass and the stone frame of the rose window in much greater detail than many of our CCM applications for conservation works. As a result we are as well informed as we could wish to be at this stage.

We are not over-confident, however, and there are some uncertainties and possible residual risks in the approach, which will not be realised until all the glass panels are removed to the conservators studio. Nonetheless the Glaziers Trust have invested in substantive exploratory research which provides both general and specific assurance in the philosophy and approach.

We have been similarly blessed with close access to inspect the stone frame, internally and externally, which allowed us to complete many of the key stages and steps in our enquiry process that are expected by stone practice. The stone conservation programme is also well defined - subject to final surveys when the glass is fully removed.

There have been excellent and interesting pre-application discussions with FAC and CFCE so that we all have a full sense of the primary issues which are of interest. CFCE have been particularly interested in the specification of the UV/IR Lamberts Glass and, understanding this interest, we have been able to convene a seminar and workshop which has directly answered the questions raised by the Commission.

We therefore hope that this application is presented with a proportionate and full set of information, presented in a cogent and legible manner by this report, with further detail and materials appended for closer reading and enquiry.

The case for an intervention to protect the Rose window, 40 years after the fire that so damaged the historic glass, has been vindicated by close inspection by YGT's expert conservators. There is a clear imperative to make this intervention and, by scholarly research as well as close hands on inspection there is now a well defined set of proposals for a necessary programme of repair and conservation which will be of invaluable benefit to this exceptional historic asset.

We trust that the CFCE and consultees will support the approval of this CCM application.

Appendices

YGT Report 01: Assessment of Condition and Evaluation of Conservation Options through Analysis of a Trial Panel

YGT Report 02: Addendum

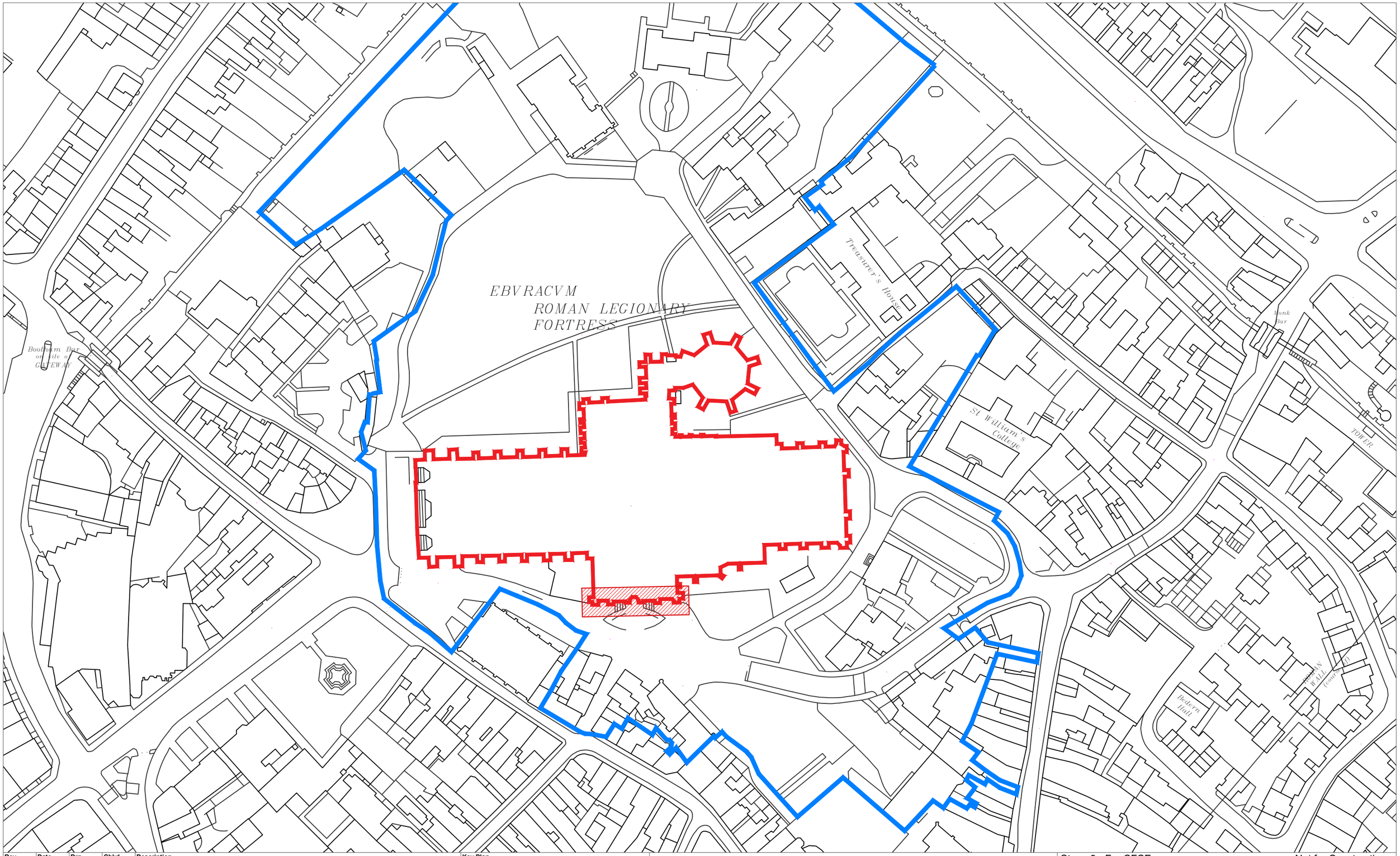
CFCE Delegation: Response to Initial Walk Around

Structural Engineer's Statement

Supporting Drawings by Works Department

Supporting Drawings by Caroe Architecture Ltd.

Also available, if required, is the adopted Stone Practice Policy (not appended).



Rev.	Date	Drn.	Chkd.	Description

Filename: (EX)001 Site Location Plan.dwg
Printed: 2026-10-26 12:47 PM

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Key Plan

- Area of Proposed Works
- St Peter's Cathedral
- York Minster Precinct

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0 1:1250 125m

Stage 3 - For CFCE — Not for Construction

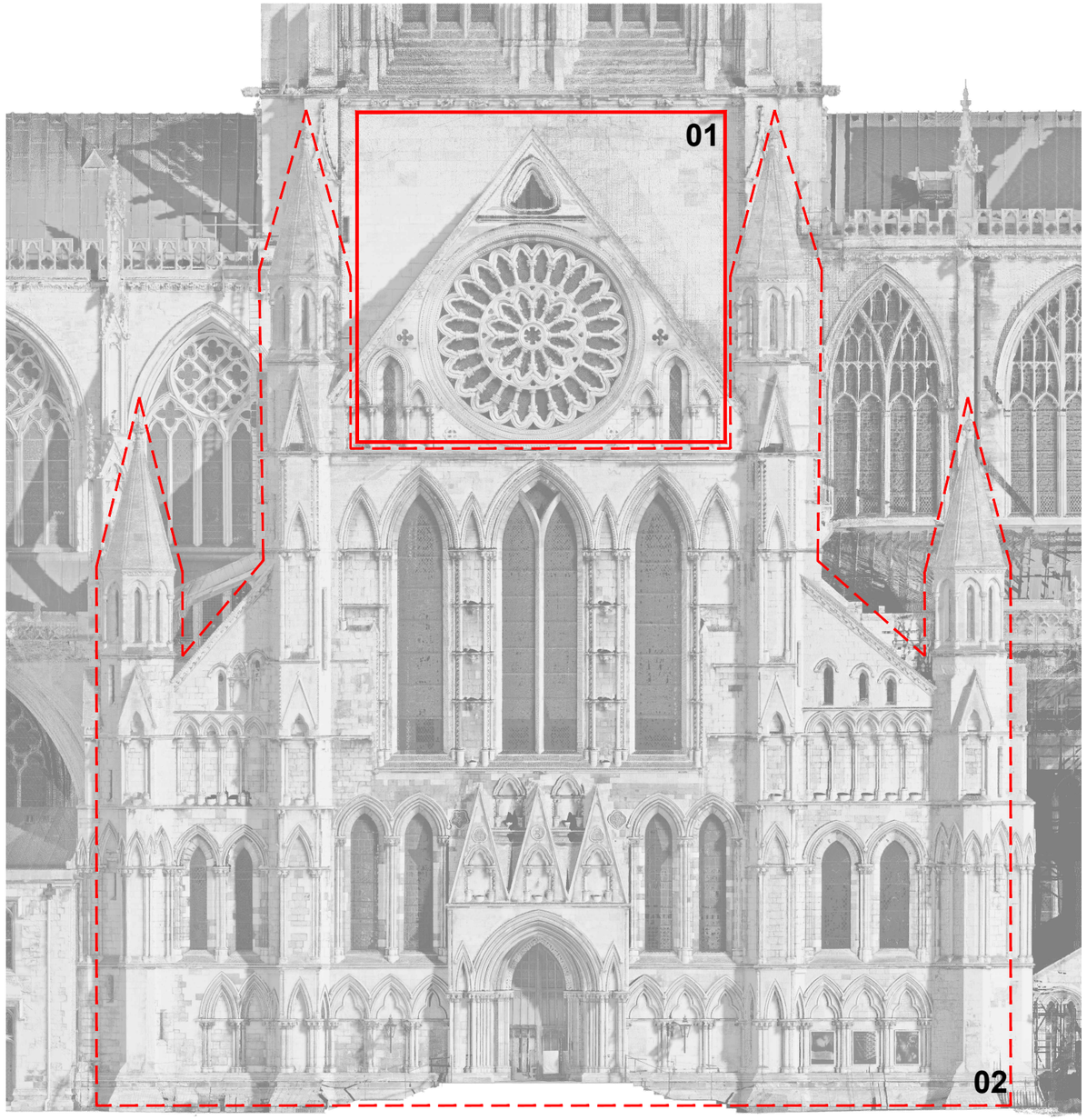
CLIENT: York Minster
SCALE: 1:1250
DATE: 26.11.26
PROJECT: Conservation of the Rose Window
DRAWN: CP
CHECKED: OC
DRAWING TITLE: Rose Window, South Transept Location Plan
JOB NUMBER: 122-12
DRAWING NO.: (EX)001
REVISION: 3.00

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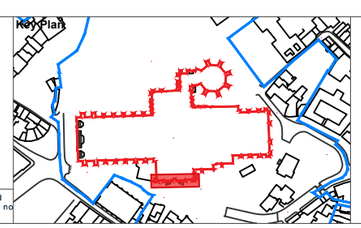
01 Rose Window S16 Conservation of Glass and Stone Tracery
Primary subject of CCM application.

02 South Transept facade
Other stonework conservation and repair, in accordance with Stone Practice. Works to be undertaken within scope of this CCM, as described in submission, with benefit of scaffold access.

01 (EX)401 **South Transept**
Elevation

Rev.	Date	Drn.	Chkd.	Description

Key Plan



N

0 1:200 20m

Stage 3 - CFCE — Not for construction

CLIENT	SCALE		DATE
York Minster	1:200 (A3)		26.10.26
PROJECT	DRAWN		CHECKED
Conservation of Rose Window	CP		OC
DRAWING TITLE	JOB NUMBER	DRAWING NO.	REVISION
South Transept External Elevation	122-12	(EX)401	3.00

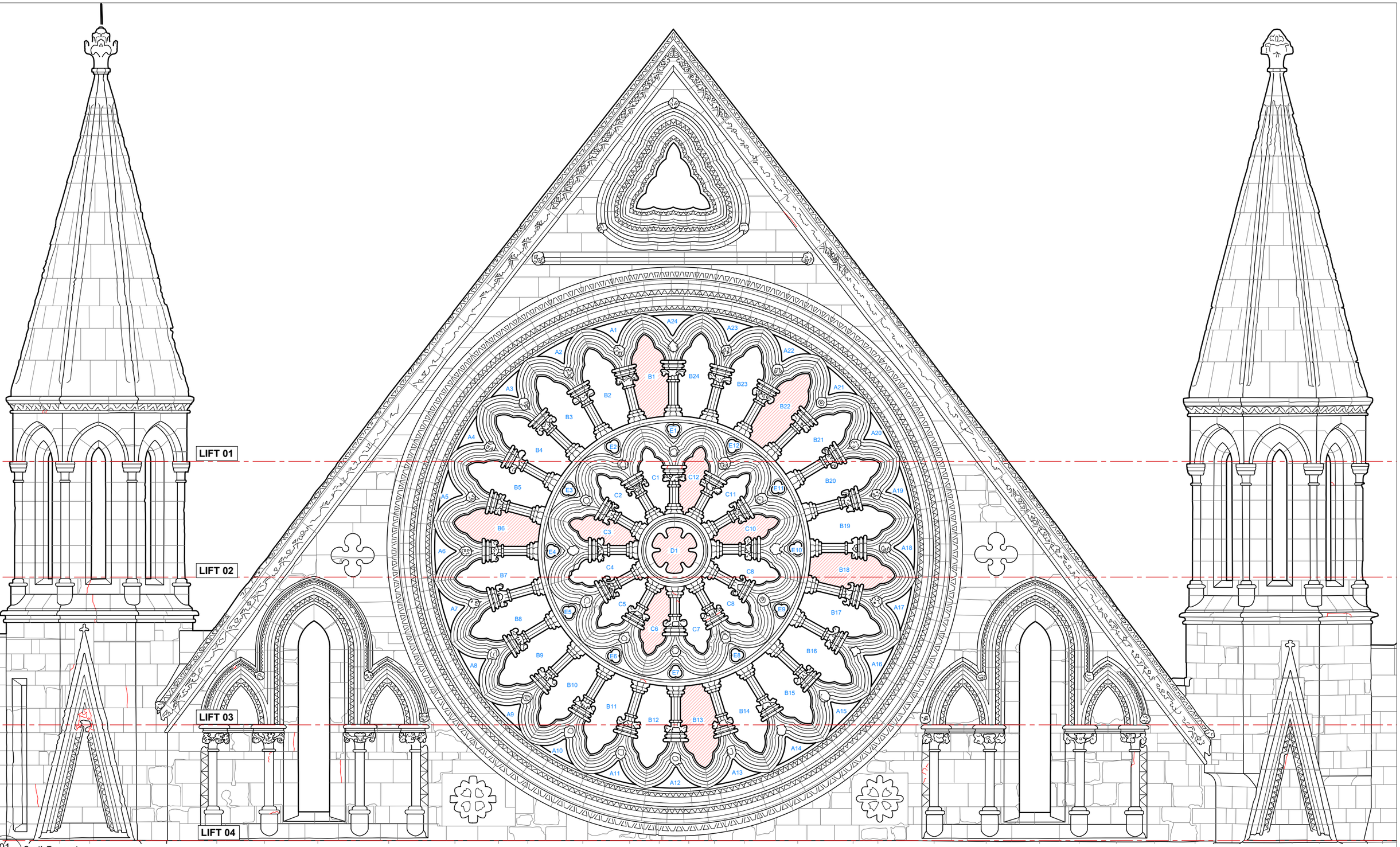
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01 (EX)403 **South Transept**
Upper Part

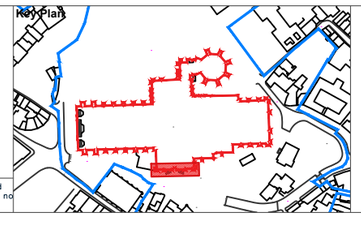
Panels removed for inspection by YGT

Rev.	Date	Drn.	Chkd.	Description

Filename: (EX)402 External Elevation.dwg
Printed: 2026-10-26 12:49 PM

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Key Plan



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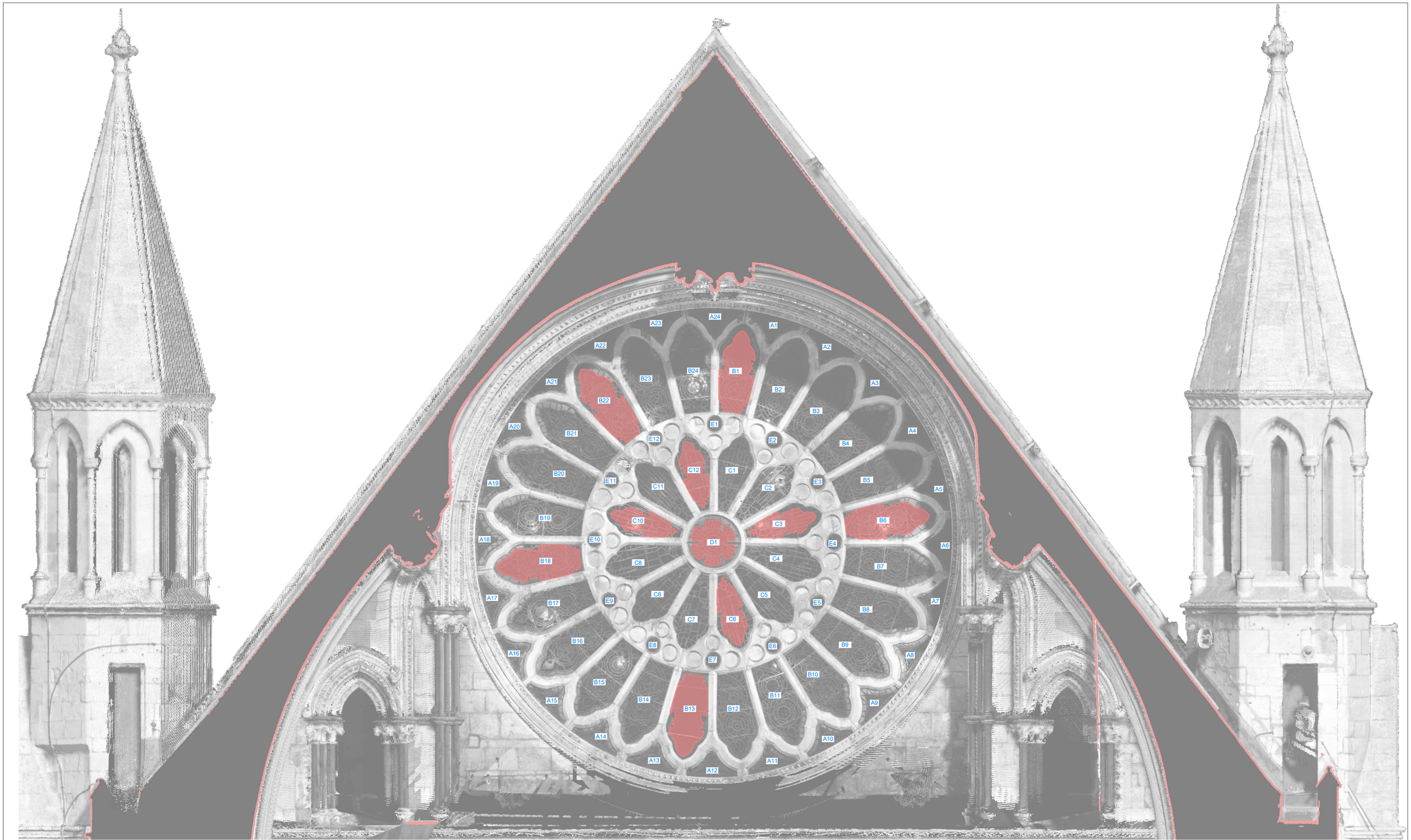
Stage 3 - CFCE — Not for construction

CLIENT	SCALE		DATE
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PROJECT	DRAWN		CHECKED
Conservation of Rose Window	CP		OC
DRAWING TITLE	JOB NUMBER	DRAWING NO.	REVISION
South Transept External Elevation - Rose Window	122-12	(EX)403	3.00

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Rev.	Date	Drn.	Chkd.	Description

Key Plan

YORK MINSTER

0 1:50 5m

Stage 3 - For CFCE — Not for construction

CLIENT	SCALE		DATE
York Minster	1:50 (A3)		26.10.26
PROJECT	DRAWN		CHECKED
Conservation of Rose Window	CP		OC
DRAWING TITLE	JOB NUMBER	DRAWING NO.	REVISION
Rose Window South Transept Internal Elevation	122-12	(EX)405	3.00

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Filename: (EX)405 Internal Elevation.dwg
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Our ref: PC/24XXX~01

15th October 2026

Charlie Porter
Caroe Architecture
Office 5, Unit 8
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Cambridge
CB1 2LG

by email only

Dear Charlie

RE: YORK MINSTER: SOUTH TRANSEPT ROSE WINDOW

The Morton Partnership have been asked to review the initial proposals for the repair and refurbishment of the South Transept Rose Window at York Minster. We have been provided with the following documentation:-

- Conservation of the South Transept Rose Window: Stone Survey
- Rose Window: External View condition survey
- Rose Window: External View showing indents
- Rose Window: External View showing historical interventions
- Rose Window: Internal View showing indents
- Rose Window: Initial Sketches Rev A
- Rose Window: Indicative Metalwork structure to support historic glazing

It is intended to carry out a major refurbishment and restoration of the Rose Window and to install an external protective glazing system as well as re-introduce the refurbished historic glazing into a new support frame.

Below we set out our initial considerations to the proposals.

The proposals include the repair and refurbishment of the stonework. We have not inspected the window but from the survey data provided by yourselves it is clear that a number of repairs will be required to deal with stone erosion and inappropriate historic repairs and interventions. A large number of stone indents have been applied to the internal face in the 1970's using glue and pins and it is proposed to remove these and replace using more appropriate techniques. Other historic repairs have been carried out to some of the spokes, particularly to the bottom half of the window.

The Rose Window appears from the survey data to be relatively free from movement, distortion and structural cracking. There are a number of cracks and these are highlighted on the condition survey drawing and these will be repaired during the works.

The external protective glazing is currently shown either fixed into an existing rebate or fixed to a flat surface via a metal perimeter frame. Wind bars are shown attached to the metal frame. Timber blocking is shown between the stone and metal frame and consideration will need to be given to damp issues from condensation etc. Consideration will also be required for fixings, stiffness of the supporting structure and issues related to thermal movement.

The internal refurbished historic glazing is currently shown being fixed to stainless steel brackets that are fixed back to a metal exo skeleton. The indicative metalwork structure drawing illustrates a preliminary proposal of an array of repeating frames that could be installed and act as a stiffening frame to the window. The size of these frames will need to be carefully considered to ensure that thermal expansion and contraction of the frames will not apply stresses or pressures to the stone window to which it is fixed. The size and weight of these frames will also need consideration as these will need to be manhandled into position.

RE: YORK MINSTER: SOUTH TRANSEPT ROSE WINDOW

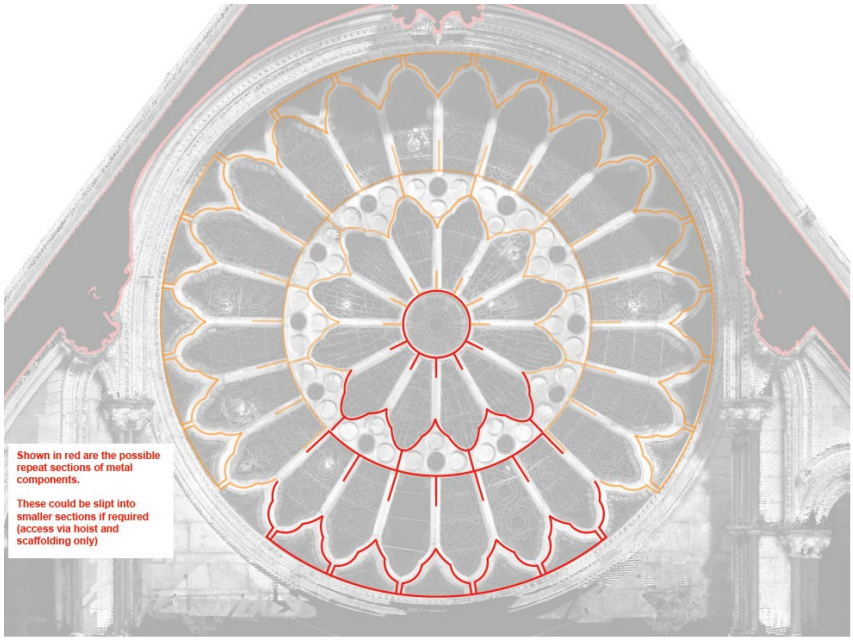


Image 1: Excerpt of Indicative metalwork structure

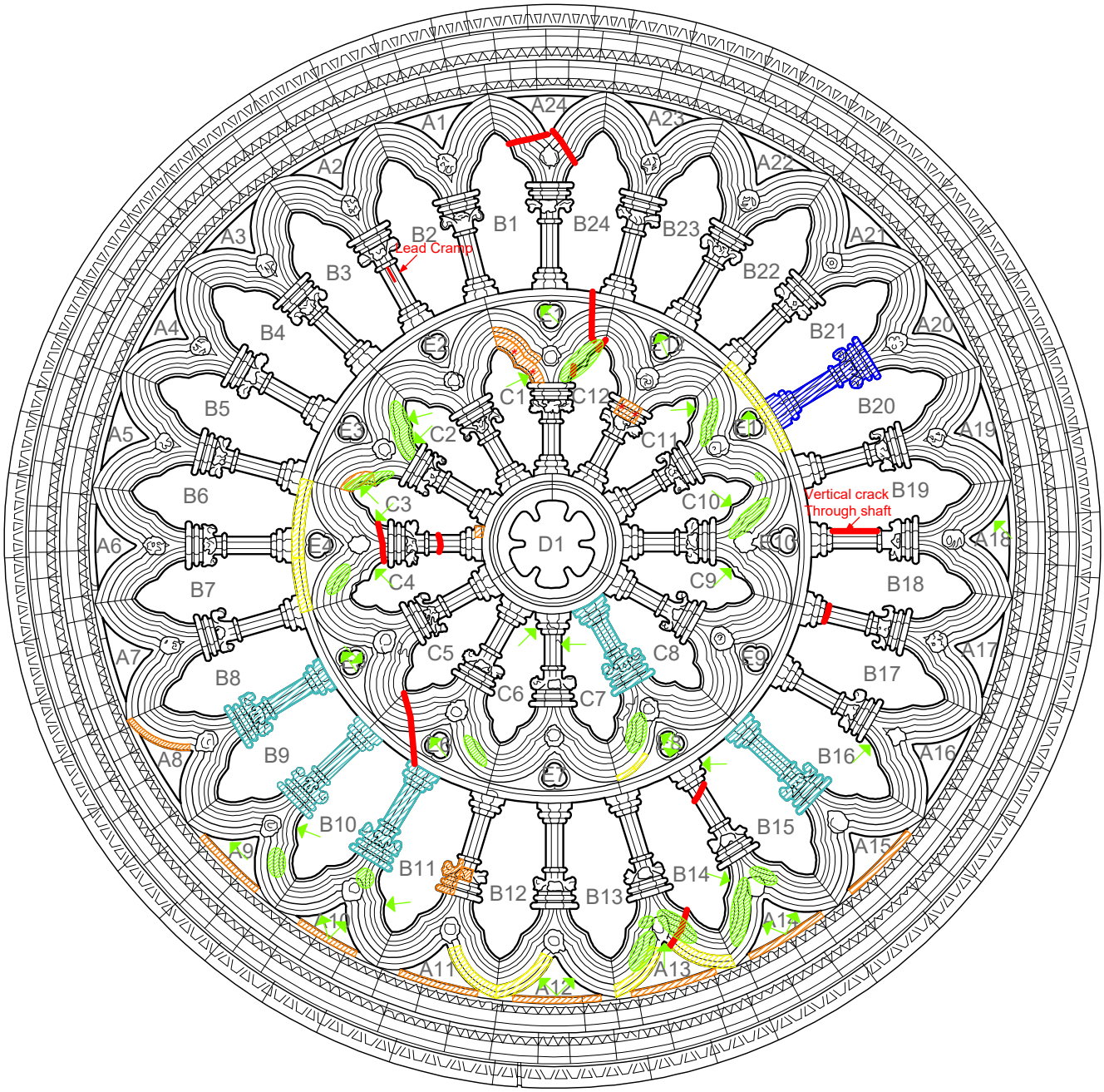
As part of the next phase, it will be necessary to conduct our own inspections and assessment of the masonry elements. We will also carry out more detailed assessments of the components for durability, galvanic corrosion compatibility and thermal movements.

If you have any comments or queries on the above then please let me know.

Yours sincerely
FOR THE MORTON PARTNERSHIP LIMITED,

PETER CORCORAN BSc (Hons) CEng MICE
Technical Director

South Transept, South Elevation, Rose Window_External View



Portland Limestone Full Replacement (ca. 1970)
205 mm depth

Portland Limestone Replacements (ca. 1970)
Replacements presumably up to glass line

Portland Limestone Indents (ca. 1970)
various in depth

Early 1870's Indents (G.S. Street intervention)
various in depth

Fixings_Location of Dowels

Sheltered Decay/Cavitation

Structural Cracking

York Minster_South Transept

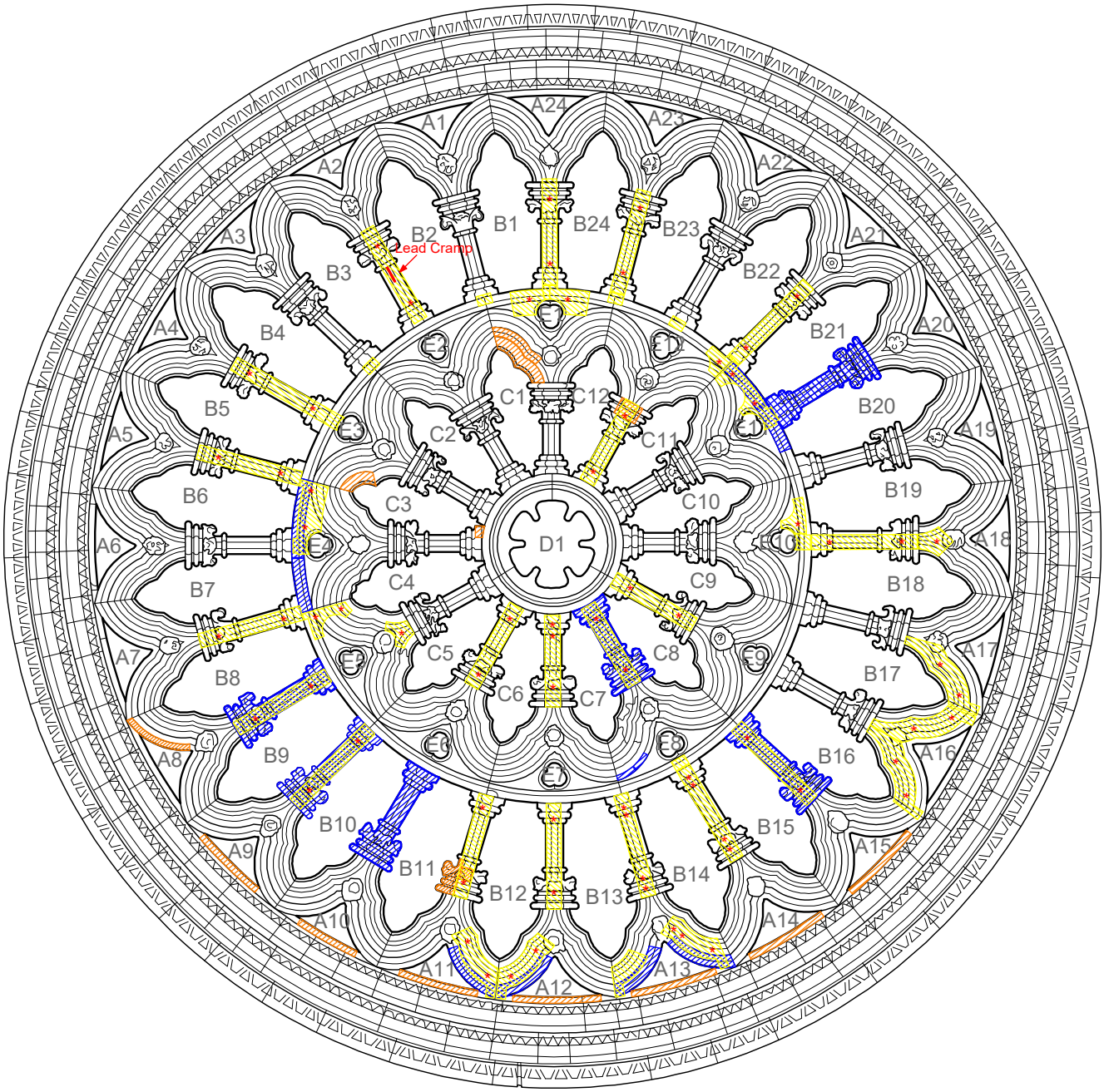
South Elevation_Rose Window
Survey of Condition of Stonework

Annotated drawing prepared by Peter Arts, York Minster Stoneyard, October 2026. Director of Works and Precinct:Alex McCallion FRICS. Surveyor of the Fabric: Oliver Caroe. Photogrammetry supplied by Downland, Lychgate House, Ramsbury, Wiltshire, SN8 2PD

Not to scale

South Transept, South Elevation, Rose Window_External View

Diagram showing the relationship between major indents/replacement stone on internal and external faces of the Rose Window



Portland Limestone Full Replacement (ca. 1970)

Portland Limestone Replacement on Exterior Face (ca. 1970)

Portland Limestone Replacement on Interior Face (ca. 1970)

Early 1870's Indents on Exterior Face (G.S. Street intervention)

Fixings_Location of Dowels

York Minster_South Transept

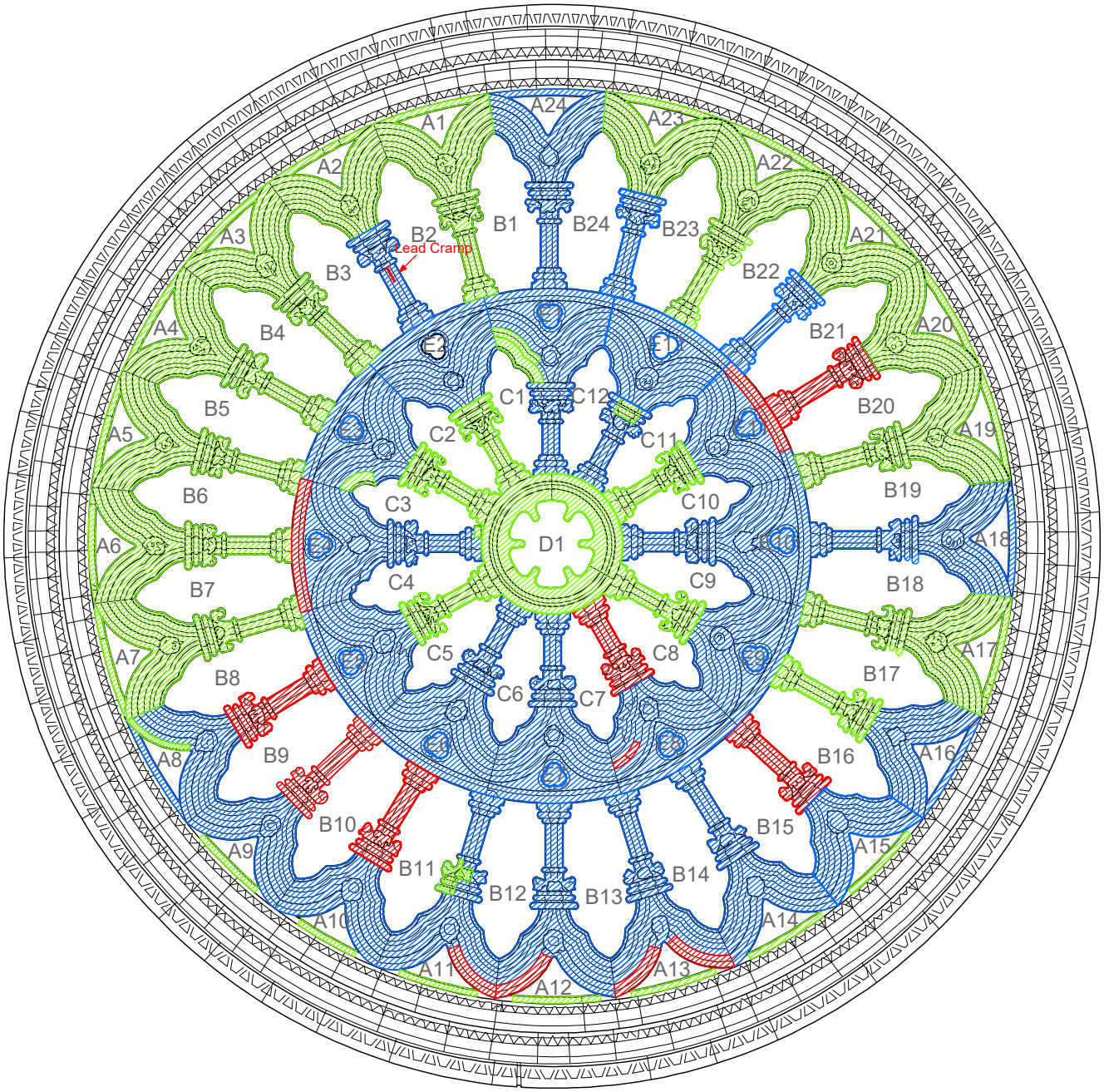
South Elevation_Rose Window
Survey showing the relationship between major indents on internal and external faces

Annotated drawing prepared by Peter Arts, York Minster Stoneyard, October 2026. Director of Works and Precinct:Alex McCallion FRICS. Surveyor of the Fabric: Oliver Caroe. Photogrammetry supplied by Downland, Lychgate House, Ramsbury, Wiltshire, SN8 2PD

Not to scale

South Transept, South Elevation, Rose Window_External View

Diagram showing likely successive historic interventions



Possible Original 13th C

Early 1870's Replacement (G. Street)

Early 1970 Portland Limestone Replacement

York Minster, South Transept

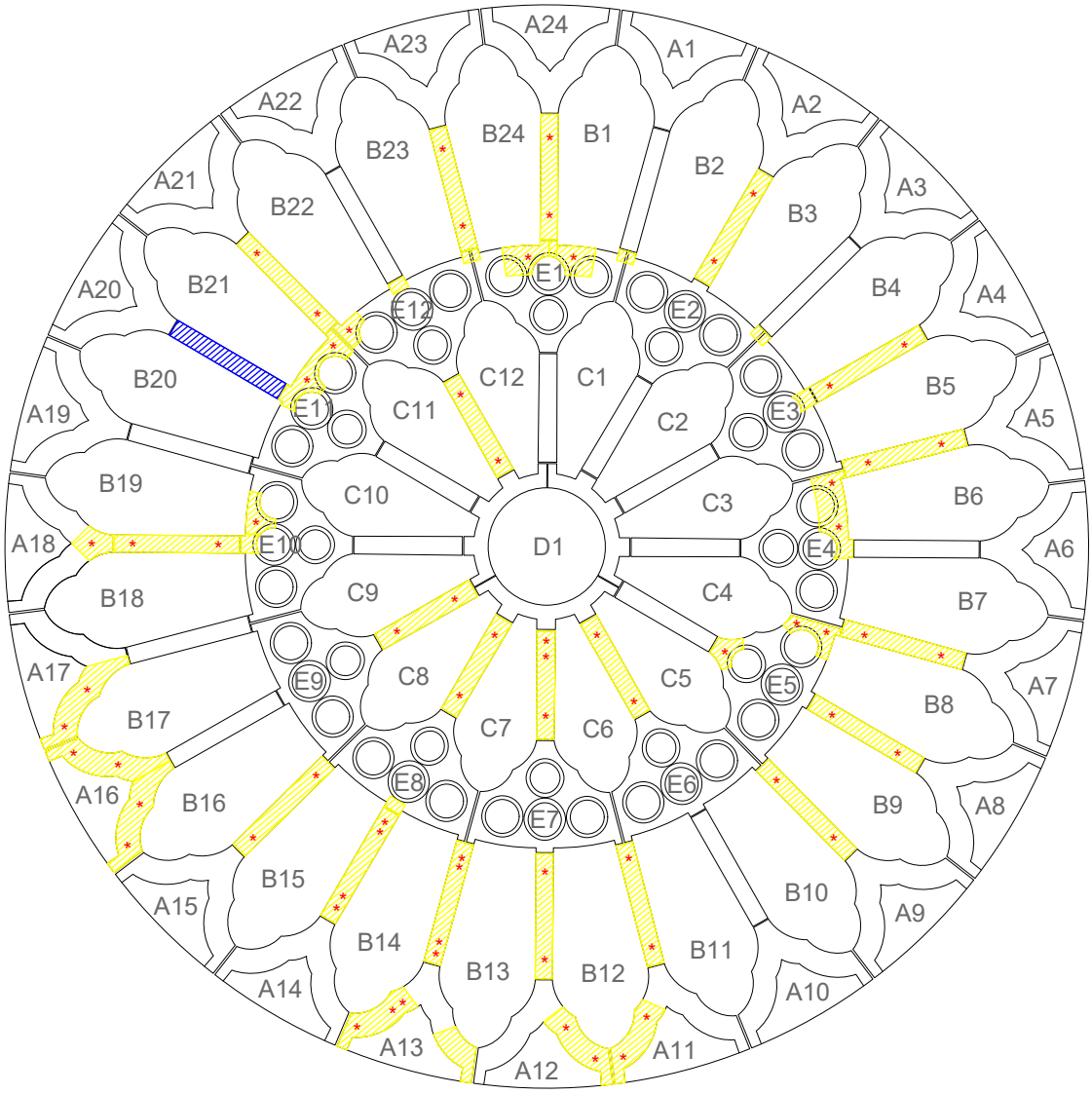
South Elevation, Rose Window
Survey of Historical Interventions

Annotated drawing prepared by Peter Arts, York Minster Stoneyard, October 2026. Director of Works and Precinct:Alex McCallion FRICS. Surveyor of the Fabric: Oliver Caroe. Photogrammetry supplied by Downland, Lychgate House, Ramsbury, Wiltshire, SN8 2PD

Not to scale

South Transept, South Elevation, Rose Window_Internal View

Diagram showing indents/replacement stone on internal face of the Rose Window



Portland Limestone (ca. 1970)
Full Replacement (205 mm depth)

Portland Limestone (ca. 1970)
Partial Replacement (70 mm depth)

Fixings_Location of Dowels

York Minster_South Transept

South Elevation_Rose Window_Internal
Survey of Indents and Fixings from Early 1970's Intervention

Annotated drawing prepared by Peter Arts, York Minster Stoneyard, October 2026. Director of Works and Precinct:Alex McCallion FRICS. Surveyor of the Fabric: Oliver Caroe. Photogrammetry supplied by Downland, Lychgate House, Ramsbury, Wiltshire, SN8 2PD

Not to scale

THE YORK GLAZIERS TRUST

Over 50 Years of Excellence in Stained Glass Craft and Conservation

Client: Chapter of York, Cathedral of St Peter (York Minster), York

Client Representative: Alexander McCallion RICS, Director of Works and Precinct

Project: The Rose Window (S16), South Wall of the South Transept

Scope: Assessment of Condition and Evaluation of Conservation Options through Analysis of a Trial Panel

Date: October-December 2025



1. Introduction and Restoration History of the Window

York Minster's Rose window has been largely neglected in scholarship and even ridiculed for its lack of arresting imagery, and for the relatively crude application of paint and stain. It is not regarded as being by the hand of a great virtuoso artist. Both from an art historical and from a technical perspective, it suffers when placed alongside York Minster's other rich visual material. There has so far been no sustained publication which relates to this window.

In essence, the imagery of the window is basic. There are 73 panels depicting single red roses, and double red and white roses, as well as repeating sunburst motifs. This design possibly represents the marriage between the houses of York and Lancaster, but the rose is also a symbol of the Virgin Mary.[1] The window most likely dates to the sixteenth-century – although, again exacerbated by the lack of scholarly attention - even the window's dating has remained ambiguous. However, it is generally regarded as part of the last major work of York Minster's medieval glass painters.

The most credible theory relating to the maker of the window is that it can be associated with the Petty family of York. The Petty family of glaziers appear in York Minsters fabric accounts with regularity. John Petty was a freeman glazier from 1470 until his death in 1508. The business was carried on by Robert Petty thereafter.

Since its inception the Rose window is likely to have undergone several phases of repair and restoration. Celebrated York-based Georgian period glass painter William Peckitt (1731-1795) was known to have provided painted restoration pieces for the Rose window as well as others in York Minster. His notebooks record: '1791 and 1793: supplied new painted repairs for the transepts including the rose window'.[2] This phase of work likely includes the distinctly Peckitt-esque central sunflower radiating from which are 12 panels with gold rays emerging from blue heavenly clouds.[3]

Another significant milestone was the re-leading of the window in 1969-70.[4] It was at this stage that it was rededicated as a memorial to Lawrence Roger Lumley (1896-1969), Earl of Scarborough and the first High Steward of York Minster, who had died in 1969. It was during this restoration that the small triangular shaped panels on the outer edges of the window (A panels – see window plan further below) depicting a sun with the letter 'S' were added.[5] The post conservation photos from this conservation campaign are kept at the Minster's archive. This was by all accounts an incredibly invasive restoration campaign, transforming the window and causing significant loss of historic fabric.

[1] (Brown S. , 2017, p. 88)
[2] (Brown S. , 2017, p. 92)
[3] (Gibson, 1979, p. 31)
[4] (Gibson, 1979, p. 31)
[5] (Gibson, 1979, p. 31)

This window would likely have remained in near obscurity had it not been for the catastrophic fire of 1984, following a lightning strike. It was catapulted into the modern public consciousness by this disastrous event, and the fact it had undergone such a thorough restoration less than two decades previous undoubtedly enabled it to withstand the blaze. While some outside York saw its perilous condition as an opportunity for a new stained glass commission, Peter Gibson OBE, then superintendent of the York Glaziers Trust (YGT), was adamant in his advice to the Chapter that the window could and should be saved. Following removal of the glass for detailed examination, and research into conservation options, conservation measures were approved in January 1985. The conserved window was reinstalled by the end of January 1987 and unveiled during the rededication of the Minster in the presence of HM Queen Elizabeth II on 8 November 1988. It has since become an iconic image of York Minster, and was used as the logo of the York Minster Fund for many years.

While it had survived this serious fire, the materials used to restore it had an unknown lifespan. The Rose window has sat outside of the usual gamut of conservation concerns as conservators due to these experimental 1980s materials. For this reason it has been a cause for concern to stained glass conservators who have struggled until now to adequately monitor the window. The window is very high on the building and the issue, as is ever the case, became one of safe access to enable monitoring.

When scaffolding was erected for the conservation of windows s20-22, for the first time in 40 years the York Glaziers Trust team and Minster colleagues were afforded close physical access to the base of the Rose window. This enabled the removal of a panel for close studio analysis. Panel B13 was removed by the York Glaziers Trust and this was analysed by senior team members Dr Marie Groll BA (Hons) MA PhD FSA, Nancy Georgi Dipl. Rest. MA ACR, Anna Milsom BA (Hons) ICON CTQ, and led by Sophie Gwynn BA (Hons) MA ACR. This report was compiled by Sophie Gwynn with assistance from Marie Groll.

2. Context of the Trial and Limitations

To conduct an informed trial on the Rose Window, it was necessary to comprehensively determine the techniques and materials employed previously. Of most concern was the interventions following the fire that devastated the south transept on the night of the 9 July 1984. Through Peter Gibson's report to Chapter in October 1984 - which outlines the condition of the window following the fire as well as York Glaziers Trust's proposed conservation strategies - and through press clippings and articles written during and after the conservation work, it is possible to piece together the timeline and conservation methodology. The surviving documentation, though incomplete, adds detail. This document therefore represents the first comprehensive account of the window.

The pre- and post- conservation photographs that are referred to by Peter Gibson are sadly mostly missing. However, black and white photographs of three panels from the rose window, B3, B7 and D1 were found, which provide a valuable insight into the condition of the window immediately after the post-fire conservation and provide details of panels originating from different positions in the window.

Additionally, as part of the research for this trial, former York Glaziers Trust employee Anthony Temperton, who worked for the trust during the Rose Window's conservation, was interviewed. He provided interesting first hand anecdotal evidence. This allowed senior conservators to ask technical questions that otherwise proved incomprehensible or elusive. To supplement the findings of examination of panel B13, diagnostic photos using a medium format camera with full frame capture with a powerful manual focussing telephoto lens attached were taken of the Rose window from the floor of York Minster. From these photos, it is possible to see some additional detail of the condition of the window.

It should be noted though that the York Glaziers Trust was only permitted to remove a single panel from the Rose window and could not take a sample of panels from different locations within the window. The only accessible panel was one at the base of the Rose window. Yet the fire would have been more intense in the upper registers, and this is where we expect to see the most severe damages. The sample is not therefore representative of the whole window, and in fact only allows us to understand more about the best persevered and least damaged panels.

3. Timeline of the Disaster

3.1 The fire

At 2:30am, on the morning of 9 July 1984, a fire alarm activated in York Minster signalling that a fire had started. The detection point was located in the void between the roof and the ceiling in the South Transept. This fire, likely started by lightning strike, soon gained strength and within half an hour the roof of the south transept was visibly alight.[6] Photographs taken during the fire show the Rose Window glowing from the light of the fire, indicating the proximity of the fire to the window. By 3:10am, less than an hour since the smoke detectors had triggered, a third of the roof had collapsed,[7] and by 3:45am, the rest of the south transept roof was deliberately collapsed by the fire brigade in order to create a fire break and gain control of the fire that was starting to spread towards the central tower.[8]

The window likely came into contact not just with heat but with cold water, directly or indirectly from the fire hoses dousing the flames. One article, of middling credibility, even refers to some of the firemen deliberately spraying above the rose window to allow the water to trickle onto the glass. Perhaps their thinking was to ensure the flames did not spread there, so they should make the window wet. Or maybe it was a misguided attempt to prevent the glass from reaching a dangerously high temperature.

In terms of conservation implications, this account speaks of a rapidly spreading fiercely hot fire, directly above the rose window, followed by in all likelihood a blast of cool night air as the roof collapsed in. The heat from the flames was also potentially mixed with icy cold water hitting the glass either intentionally or not. This is of major interest to us as conservators as it confirms that the window was exposed to massive thermal shock.

[6] (Brown, 2024)
[7] (Potts, 2014)
[8] (Booth, 2024)



Fig. 1 The south transept of York Minster ablaze on the night of 9th July 1984. Copyright: York Press

As a material, glass is especially vulnerable to failure from thermal shock due to its low strength and low thermal conductivity.[9] Thermal shock is invariably caused by rapid and extreme temperature changes.[10] If the glass is suddenly exposed to extreme heat, or indeed suddenly cooled, the stress will cause the glass to break.[11] The faster the temperature of the glass rises, the lower the temperature needs to be before it cracks.[12] During experiments conducted by the Building Research Institute of Japan using 3mm glass with heat evenly applied to the glass surface, the glass temperature reached 240ºC at which point it shattered[13] Many articles about the fire in the south transept of York Minster state that it is thought that the glass reached 450ºC. While it is potentially plausible, it is not clear where this number originated from.[14] What is clear is that the temperature of the glass composing the Rose Window will have risen aggressively and to a exceedingly high temperature as the fire took hold, and likely cooled very quickly as the roof fell in. This explains the extreme multi-cracking evident across the panels of the window.

[9] (Wang, Chen, Wang, & Sun, 2013, p. 717)
[10] (Wang, Chen, Wang, & Sun, 2013, p. 117)
[11] (Wang, Chen, Wang, & Sun, 2013, p. 717)
[12] (Wang, Chen, Wang, & Sun, 2013, p. 718)
[13] (Babrauskas, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2010, pp. 2-3)
[14] (Potts, 2014)



Fig. 2 Peter Gibson, Superintendent of the YGT, holding a panel with severe fire cracking. Copyright Press Association

3.2 Original Damage Assessment Following the Fire

Just hours after the fire was put out, Peter Gibson examined the condition of the Rose Window. To do this he was apparently 'strapped to a fire brigade ladder and hoisted 100 feet into the air.'[15] The glass was still warm and thousands of cracks, caused by thermal shock, were already observed. Many of the solder joints joining the leaded matrices together were noted as being melted,[16] though the lead calmes themselves were remarkably observed to be 'reasonably sound.'[17] Gibson attributed the lead withstanding the heat to the re-leading of the window 13 years previously.[18] Following the initial check on the window, a three day hiatus was necessary during which 'precarious temporary scaffolding' was constructed, after which daily visits were made to check on the glass.[19] It was noted that cracks continued to appear in

[15] (Davenport, 1896)
[16] (Gibson, 1984, p. 1)
[17] (Gibson, 1984, p. 1)
[18] (Gibson, 1984, p. 1)
[19] (Gibson, Restoring a Tudor Rose, 1987, p. 60)

the days following the fire, consistent with the fact that the highly fractured glass was now subject to pressure from wind, rain and the daily fluctuations in temperature in summer.[20] A more secure scaffolding was erected during the 3 weeks that followed the fire, and after its completion and handover, removal work began by a team from the York Glaziers Trust.



Fig. 3 Recent image taken with medium format camera by the YGT. Copyright YGT

[20] (Gibson, Restoring a Tudor Rose, 1987, p. 62)



Fig. 4 Recent image taken with medium format camera by the YGT. Copyright YGT

3.3 Removal of the fire-damaged window in 1984

In order to remove the severely microcracked stained glass panels safely from the window openings, Fablon, a transparent adhesive covering, was affixed to the 'external surface of the multi-cracked glass'.[21] This allowed the panels to withstand being removed from the stone groove into which they were mortared, using hammer and chisels, and to be transported to the glazing studio, a process which was completed by 17 August 1984.[22] Given the fragility of the glass, this was a rapid removal process for panels that were heavily shaped and set within a part rebated groove. It was not until January 1985 that YGT received permission from the Dean and Chapter of York Minster to start remedial work on the Rose Window. It is not clear exactly how the panels were stored during this 4 month period between removal and commencement of bench-based works. It is possible then that further cracking of the glass may have taken place during its storage too, depending on the storage setting and level of support afforded to each panel.

3.4 Studio work in 1985

[21] (Gibson, 1984, p. 1)
[22] (Gibson, 1984, p. 1)

It is clear from Gibson's report that the intended methodology was to dismantle the panels, clean the glass, edge-bond the broken pieces where possible, and replace the glass pieces with an equivalent glass where it was not. Silicon was the material of choice for edge-bonding at the York Glaziers Trust at this time, and the report stated that they would be using this where possible.

For the multi-cracked glass, they knew that they needed to find an alternative, likely an epoxy resin, to edge-bond with. The conservators planned to plate the edge-bonded glass pieces (to protect it from contact with moisture, as epoxy resin is sensitive to moisture), seal the edges with silicon and re-lead the panels.[23] Although the lead calmes were noted to be in relatively good condition, it would not have been possible to access the glass pieces and extensively plate the extant glass without losing the leaded matrix. As this leaded matrix was introduced by the team at the York Glaziers Trust just 13 years before, it had no great historic significance and was therefore a necessary sacrifice.

While this is broadly what happened, the complexity of the project, and their inexperience with the techniques and materials they eventually employed, led to changes in conservation strategy as they progressed through the project.

Once the panels were brought safely to the York Glaziers Trust studio, a photographic record and rubbings were created.[24] Unfortunately, the photographs that were taken pre-conservation have not been found. One photo taken for an article shows a panel before conservation next to a panel post conservation; this demonstrates how much soot and dirt was on the panel, though unfortunately not much additional detail is discernible.

[23] (Gibson, 1984, pp. 1-2)
[24] (Gibson, Restoring a Tudor Rose, 1987, p. 61)



Fig. 5 Image of rose window panels before and after cleaning. Copyright The Telegraph

The panels were cleaned with warm water and mild detergent applied with soft cloths, though towards the top of the window where more fire-damage occurred, 'sensitive brushing' was necessary.[25] Presumably this cleaning was to remove the worst of the soot on the surface of the lead and glass. After a week during which the panels were left to dry (underlining how much they were saturated during the cleaning), methylated spirit (denatured ethanol), and then acetone were used to clean the internal surface of the glass. These safe chemicals were bizarrely switched in favour of trichloroethane on the grounds of the glazier's safety[26], a move puzzling to a modern conservator given the common and safe use of the two disregarded solvents in conservation today and the highly toxic nature of the trichloroethane. This was queried during interview with one of the team from the time of the restoration, as it felt more plausible that it was a misprint. According to Temperton, a 'near miss' with acetone and an open flame was the main reason for abandoning the solvent. The window was then dried with hair dryers post cleaning. This re-introduction of heat to the fragile glass is not something that we would wish to attempt today.

Fire damage to stained glass is rare and the level of damage to the glass of the Rose Window was extreme. Likely, it was far beyond the experience of anyone at the YGT, or even those further afield. The simpler bonds were bonded with silicone sealant, a process the YGT team

[25] (Gibson, Restoring a Tudor Rose, 1987, p. 62)
[26] (Gibson, Restoring a Tudor Rose, 1987, p. 62)

were comfortable with, however, their usual methods of edge-bonding using a silicone sealant[27] - was recognised to be an inappropriate solution for the more severe fire damaged micro-cracked glass - and a new solution had to be found.[28] Gibson wrote in his report to the Dean and Chapter of York Minster:

'Once dismantled, the multi-cracked glass will be repaired by applying a silicone sealant directly to the edges of the broken glass thereby securing the pieces. Alternatively, with some of the most seriously cracked glass an injection of sealant by means of capiallary[sic] action may be used as a more effective technique to secure the glass.' [29]

Norman Tenant, a materials scientist based at that time at Glasgow University, was contacted to help choose the appropriate adhesive to edge-bond the fractured glass. [30] Several glass pieces were removed from the panels and transported to Glasgow to use in a trial.[31] In 1985, Tenant concluded that Ablebond was the most appropriate adhesive, based on the low viscosity, low surface tension, good light refractive index match to glass and suitable curing time.

Tenant's recommendation to use Ablebond was adopted by the YGT team of the 1980s. While it is clear from his report that YGT initially thought that edgebonding would be undertaken, as was usual, after the panels had been removed from the lead net, faced with the difficulty of dismantling glass that was so severely damaged, the decision was made to bond the glass pieces while still held within their leads before dismantling. To do this, the Fablon globally covering the exterior of each panel was finally removed, and individual pieces cut to the corresponding size and shape, were more precisely adhered to the surface of each glass piece. [32] Anecdotal evidence supplied by Temperton describes how the Fablon already adhered to the exterior of the panels was used, the Fablon over the leads was cut out and removed, leaving the plastic covering only on the glass.[33]

The chosen adhesive for complicated multi-cracked glass, Ablebond 342-1 (resin and hardener), was mixed and applied using a pipette to the interior surface of the glass. Capillary action drew the adhesive into the cracks and the excess adhesive was cleaned off using 'soft white tissues'.[34] Temperton described how acetone was used to clean off the adhesive while it was still wet. This is potentially worrying as it is unknown how the acetone would interact with the Ablebond - could it effect the setting of the adhesive for example? It is also likely that this cleaning wiped out some of the adhesive from the cracks, leaving them less full than is

[27] (Gibson, Restoring a Tudor Rose, 1987, p. 61)
[28] (Gibson, Restoring a Tudor Rose, 1987, p. 61)
[29] (Gibson, 1984)
[30] (Gibson, Restoring a Tudor Rose, 1987, p. 62)
[31] (Gibson, Restoring a Tudor Rose, 1987, p. 62)
[32] (Gibson, Restoring a Tudor Rose, 1987, p. 62)
[33] (Temperton, 2025)
[34] (Gibson, Restoring a Tudor Rose, 1987, pp. 62-63)

required for a strong and stable bond. As the Ablebond cured, the panels were left flat on the bench, a process that took a week.[35]

While it is understandable - given their lack of experience with epoxy adhesives, and additionally given how terribly shattered the glass was - that this method was chosen, it is unsurprising to a modern conservator that they encountered significant problems. The Ablebond leaked into the weatherproofing under the lead flanges, and effectively glued the glass to the lead, meaning that 'difficulty was encountered in removing some of the multi-cracked glass from the lead cames.' Some of the properties and behaviour of Ablebond that were given as reasons for its choice over other adhesive alternatives - the low viscosity and long curing time - would have been part of the reason that the adhesive leaked so extensively into the waterproofing and leadwork. Gibson describes: 'the pressure that had to be applied to extract the pieces of glass occasionally resulted in the Ablebond seal breaking.' These broken edge-bonds were re-bonded with silicon, a material the YGT team of the 1980s better understood. [36] The extent to which this happened was not made clear. The documentation for the panels only records which glass pieces that were edge-bonded, but does not specify the material used to do so.

Post dismantling, the glass was yet further cleaned with acetone and dichloroethane to remove the traces of Ablebond from the surface of the glass.[37] In order to provide support and some environmental protection, multi-cracked glass pieces were double plated (externally and internally) with 2mm thick modern clear glass. Glass pieces with only a few cracks were plated externally only. This also provided the insurance that should the edge-bonding materials fail, the plate glass would prevent the loss of any glass pieces. The plates were then sealed around the edge with silicon sealant, [38] presumably to prevent moisture or dirt ingress between the glass pieces.

The panels were releaded with a wide hearted lead able to accommodate these heavily plated sections. 'Multi-cracked modern, clear and tinted 'antique' background glass, especially in the borders of the 'B' panels and the backgrounds of the 'C' panels which had been inserted in the 1969-70 restoration of the window, was replaced by glass of similar tone and quality.'[39]

After glazing the panels were waterproofed with a butyl mastic sealant for the plated pieces and leaded light cement for the rest.[40] Butyl mastic was thought to have a softer hold on the glass, as it was regarded at the time as being 'non setting'. This was an attempt then to try and not add stress to the fragile damaged glass.

[35] (Gibson, Restoring a Tudor Rose, 1987, p. 63)
[36] (Gibson, Restoring a Tudor Rose, 1987, p. 63)
[37] (Gibson, Restoring a Tudor Rose, 1987, p. 63)
[38] (Gibson, Restoring a Tudor Rose, 1987, p. 63)
[39] (Gibson, 1984)
[40] (Gibson, Restoring a Tudor Rose, 1987, p. 63)

The window conservation was completed in November 1986 and by January 1987 all the panels had been reinstalled in their positions in the South Transept of York Minster.

4 1984 Conservation Materials - the Salient Complicating Factors/Concerns

4.1 Conservation Materials

Silicone:

Silicone sealant, which had been in commercial use as a weather seal and structural bonding agent since the 1930s/1940s is a synthetic polymer and has been adopted by conservators from the 1960s and has been used on thousands of projects ever since. There is no definitive lifespan specified for silicon used in conservation. It is acknowledged that there are many factors that affect the longevity of the material. Exposure to moisture, temperature fluctuations and high temperatures all contribute to the degradation of silicone. Degradation of silicone takes the form of cracks and tears in the silicon seal, discolouration and loss of flexibility.

In 2010, the Constglass project saw an appeal for as many stained glass studios as possible from around the world to submit examples of resins and sealants, used in projects 30-40 years previously, for testing. As part of this, silicone samples from the 1970s and 1980s from Canterbury Cathedral, Cologne Cathedral and Chartres Cathedral were submitted and tested. None of the silicone samples tested and observed showed any observable signs of degradation in the 30-40 years since it had been applied.

Ablebond:

There is very little written about Ablebond or its aging properties. This is likely in part due to the fact that it was in production for such a short period of time; from 1979-1989, only ten years. According to a conservation supplier's newsletter apparently written shortly after its discontinuation, the volume of Ablebond 342-1 consumed by conservators was 'simply not enough to warrant its continued manufacture.'[41] However, there are also references to the product being unreliable. Norman Tenant summarised: 'Ablebond 342-1, which had good aging behaviour but whose quality control resulted in product variability and the discontinuation of the brand in 1989'.[42] Given the short period of time the adhesive was in production, it is unsurprising that there is little information to be found on how it ages. This means that it is hard to predict what the condition of the Ablebond will be in the Rose Window after 40 years.

The Position of the Rose Window:

[41] (Conservation Materials Ltd, 1989?)
[42] (Norman H. Tennent, 2019, p. 126)

In 2018, the YGT conducted environmental monitoring on three windows, n26, n25 and s32 to better understand the environmental conditions that the windows of York Minster are subjected to. The results showed that the window on the south side, s32, regularly reached temperatures above 40 degrees Celsius. The report states:

'The surface temperatures of the stained glass of both windows, when compared, show that (as expected) the south side has overall higher temperatures and more extreme fluctuations of temperature. The vulnerable glass in these windows is more likely to break down internally due to these fluctuations: the 'gel layer', a layer of silica within the body of the glass, can be cracked due to temperature and relative humidity fluctuations, as well as by thermal stresses, which causes irreparable damage and promotes glass corrosion.'[43]

The Rose window is located on the south wall of the south transept of York Minster. Its position is very high, almost at roof level internally. As a result, unlike s32, externally there is no shade whatsoever provided by surrounding buildings, and therefore it is exposed to the full force of the heat of the sun for a large part of the day. It is likely therefore that the surface temperature of the glass in this window would be even higher than of the glass measured in window s32. It is worth noting, that the monitors measuring the glass temperature on s32 were installed near the base of the window due to access restrictions, so the height difference is even more disparate.

It is evident that stained glass is adversely affected by spikes in temperature. Being high up on the building without shelter from the surrounding buildings also means that the window is also subjected to the full impact of other aspects of the weather. Driving rain and wind hits the Rose Window without its pressure dissipated. However, it could be argued that the plated glass pieces shield the vulnerable conservation materials from the worst of the exposure to moisture and flex from wind pressure. However, sealed plated glass is subjected to even higher heat and humidity build up than single glazed glass. This is a cause for concern.

[43] (York Glaziers Trust, 2018, p. 32)

5 Panel Condition and Trial

5.1 Removal:

In August 2025 panel B13 was removed from the Rose window in York Minsters' South Transept and taken to the YGT studio. This was done to facilitate a trial that was to be carried out to investigate the present condition of the window, and the condition and longevity of the conservation work carried out in the mid 1980s.

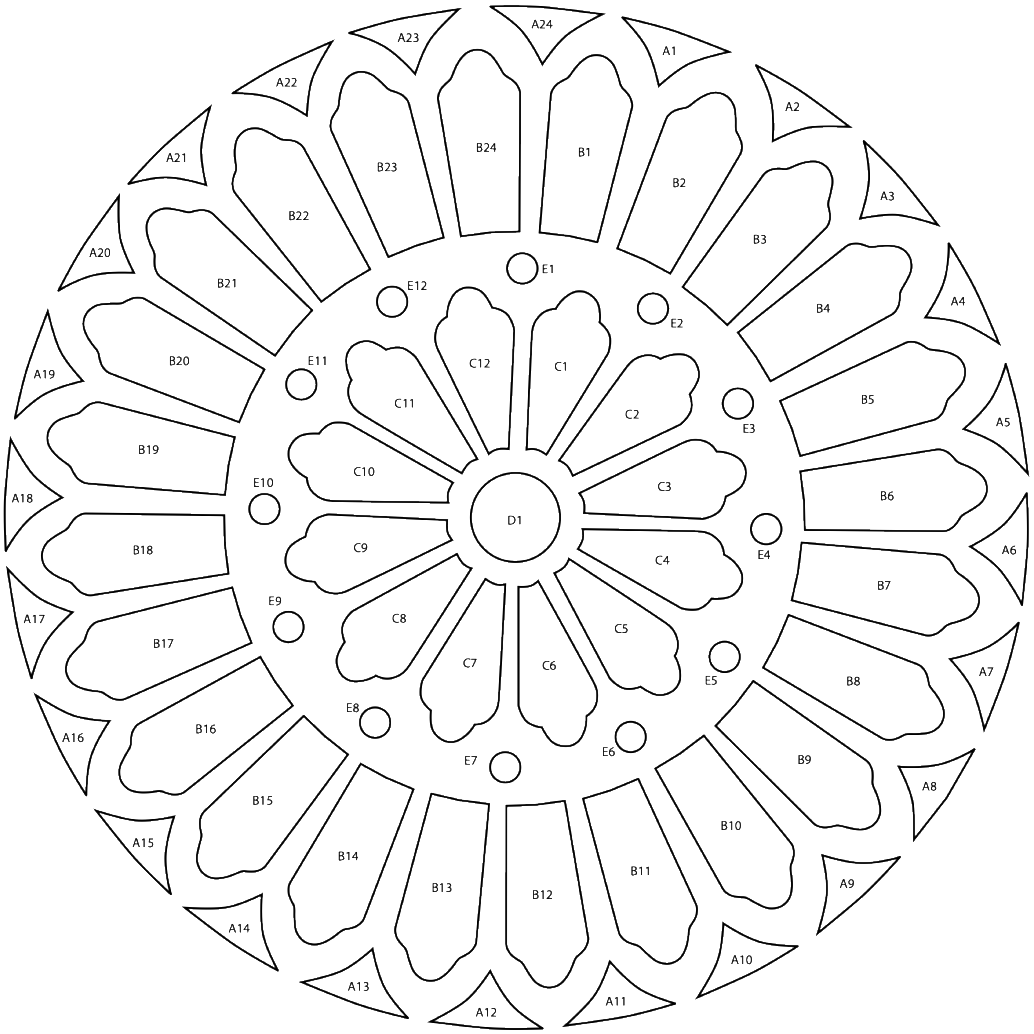


Fig. 6 Window plan of the Rose window of York Minster

Unfortunately, due to the nature of the access available, it was only possible to remove one panel from the window. This was from the base of the window. The trial panel is likely to have been more mildly affected by the fire of 1984 than those panels closer to the intense heat

created by the blazing roof. We can therefore predict that any findings from the trial may be less severe than other panels higher up in the window and not fully indicative of the extent of damage to the window. Nonetheless, the ability to view any of the Rose's panels at close quarters is beneficial as very little has been known about the behaviour of the conservation materials used.

The 2025 conservators assessed that (from what could be seen) the mortar was in good condition, though the seal had broken in large sections which could explain the evidence of extensive water ingress found. The mortar was excavated using traditional hand tools, hammer and chisel. The panel was set into a rebate in the stone, though this sloped down and inwards towards the base of the panel, meaning that the panel had to be lifted up and over the stone to remove it from its opening.

From a photo taken in 2025 from the cathedral floor with medium format camera with telephoto lens attached (and deliberately overexposed to gain an idea of the condition of the stone), it is apparent that there is some as yet unexplained water movement. This could be from condensation running off the windows, or problems with the mortar failing around the panels (as mentioned above). This needs further investigation, preferably in conjunction with the York Minster stone masons.



Fig. 7 Image showing water tracks on the stone

Remains of a grey silicone, likely used in a previous installation system of the panel was found on the exterior of the stone. This is most likely to be from the 1970s reinstallation – the restoration of the window before the fire.



Fig. 8 Residue of a grey silicone

5.2 Studio work:

In October 2025, the examination of panel B13 commenced in the YGT studios by an exclusively senior team, due to the complexities of the window.



Fig. 9 Panel B13, Window S16, York Minster

5.3 Lead:

The extant external leads are 20mm flat, and the internal leads range from 16mm to 5mm flat. From anecdotal evidence (Temperton), we know that the lead was from the Yorkshire-based manufacturer Heaps, Arnold and Heaps.[44] The lead is in a very good condition with few lead breaks and very little lead corrosion. The solder joints are similarly intact and remain in good condition. The copper ties are still holding strong and are well adhered to the panel.

On the exterior of the panel there is shaped lead sheet, soldered to the leads, and sealed with black Dow Corning 795 silicone sealing mastic according to contemporary images. This is repeated on all the B and C panels. The purpose of this lead sheet is due to the differing stone profiles internally and externally. While the internal stone is relatively simple, its shape echoing that of the panel, the external stone has more intricate mouldings. These lead sheet sections are placed where the stone covers the outside of the panel, giving the installation team something to mortar against, and protecting the glass beneath during the subsequent removal of the panel.

[44] (Temperton, 2025)

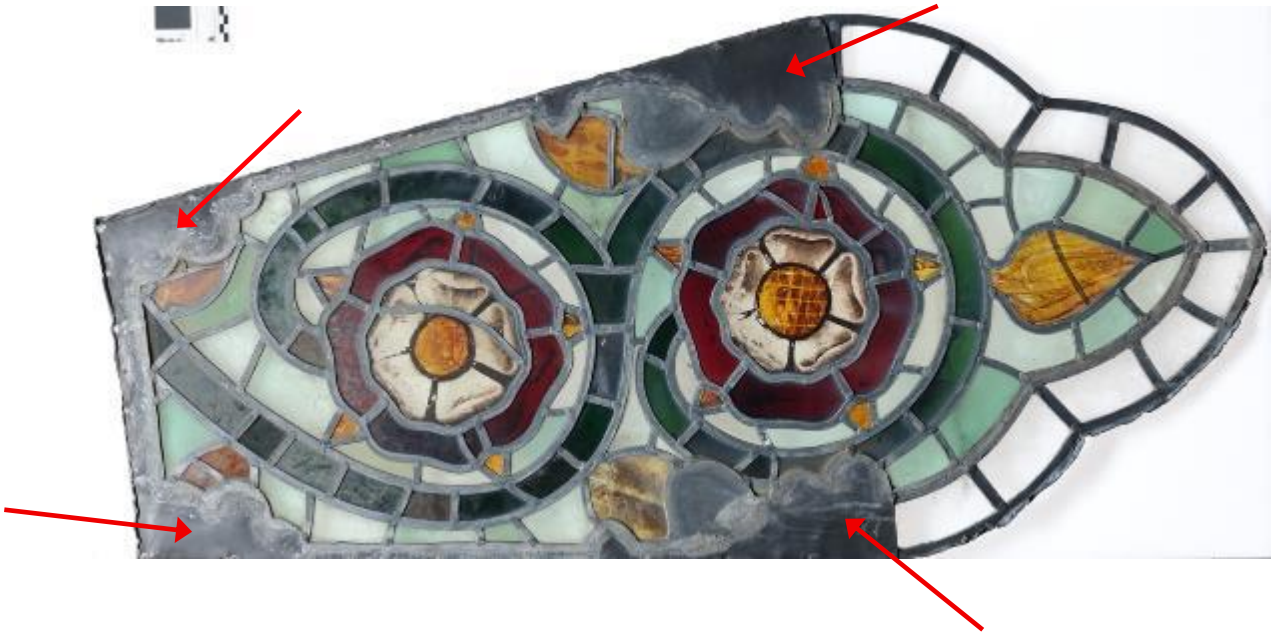


Fig. 10 Panel B13, Window S16, York Minster, lead flanges applied in the 1980s



Fig. 11 Panel B13, Window S16, York Minster, 1980s image during conservation

These shaped lead sheet pieces were attached during the post fire conservation. It seems that this was an additional measure introduced by the 1980s conservation team, as a photograph from the removal after the fire suggests that these were not in place before this and were not in existence during the 1970s restoration of the window.

5.4 Glass:

The glass is also in very good condition, generally, but with evidence of damaging cleaning (see below *The 1984 Use of Glass Fibre Brushes and the Implications for the Rose Window* for more information). There is a high proportion of modern clear and tint glass, which given its young age of about 40 years - dating from the post fire conservation - is unsurprising. The original medieval glass, comprising white, red, and green glass is also in good condition, with very little signs of aging.

5.5 Surface Decoration:

The paint has some visible signs of loss but is stable (
Fig. 12). From the black and white photos likely taken post conservation, it is clear that this pattern of paint loss can be seen elsewhere in the window. The original silver stain is heavy-handed in application, with streaky brush marks, but is in good condition.

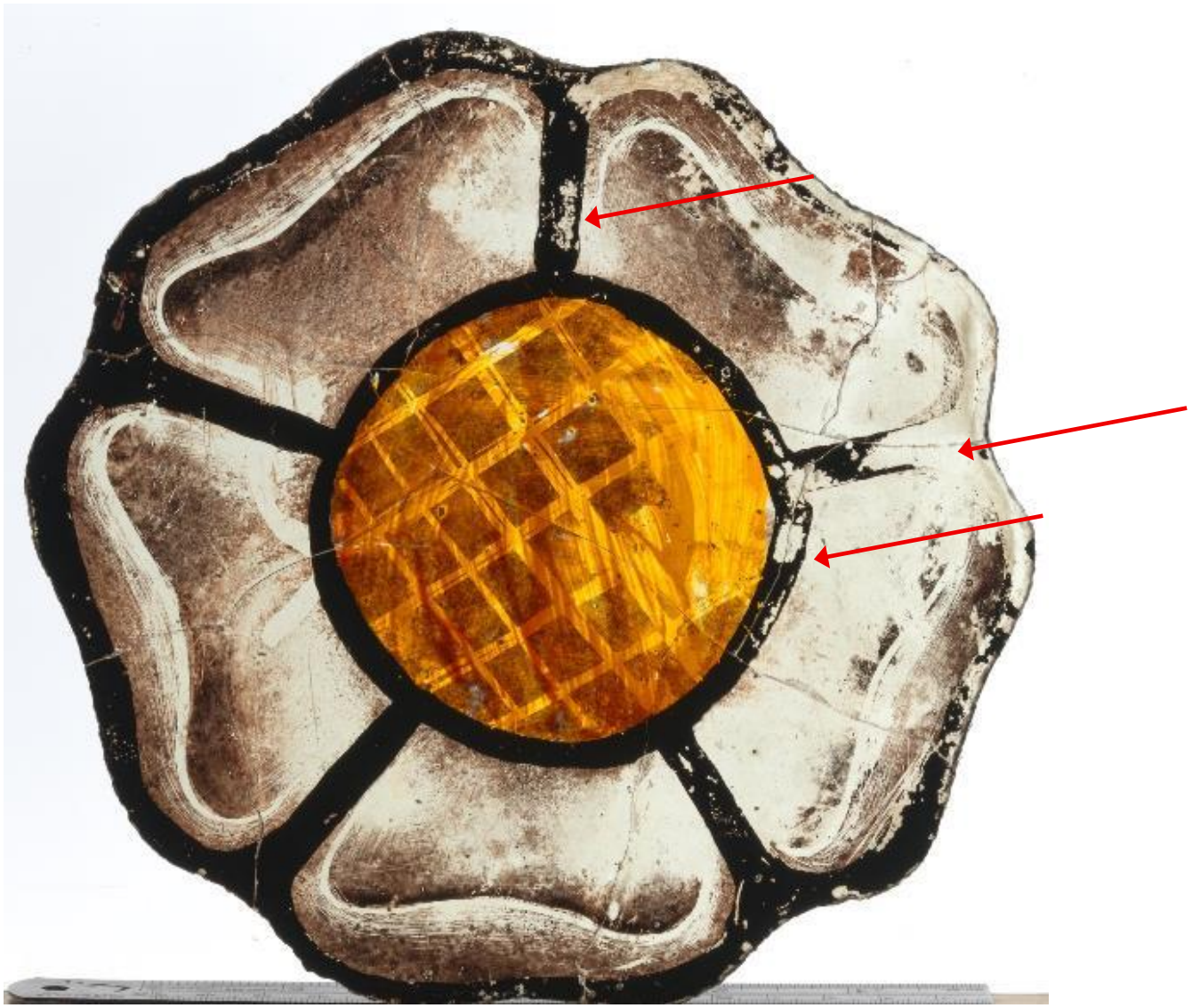


Fig. 12 Glass piece removed from panel B13 showing paint loss as indicated by red arrows.

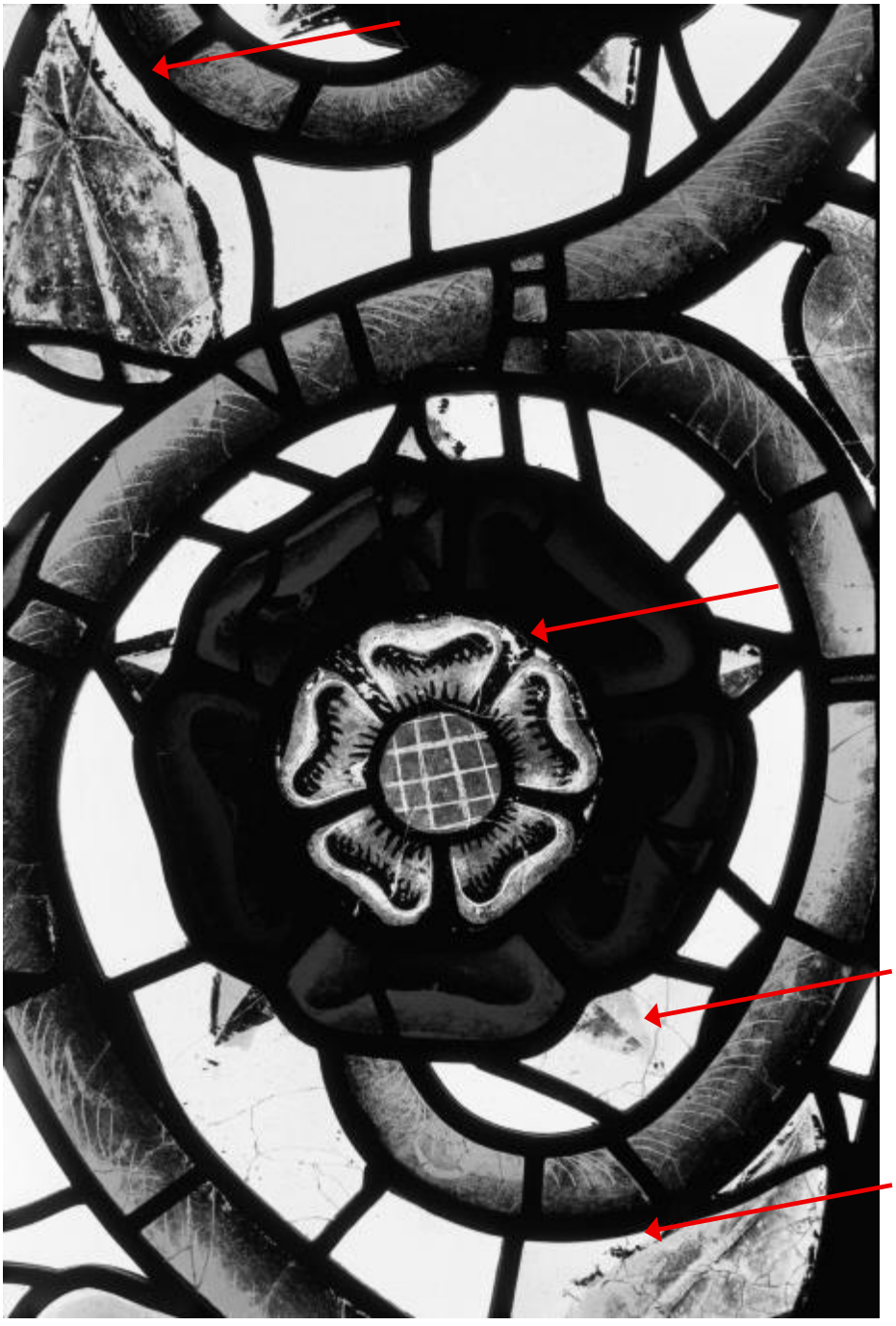


Fig. 13 post conservation photo from the 1984 conservation campaign showing paint loss as indicated by red arrows

5.6 Weatherproofing:

The weatherproofing appears to be in good condition, and is almost completely intact. Interestingly, anecdotal evidence suggests that a butyl mastic tape was used to waterproof the

plates. There was no evidence of this in panel B13, however it is possible that this material may be found elsewhere in the window.[45]

5.7 Plates:

As part of the trial, 6 plated glass pieces from panel B13, installed in the 1984 post fire conservation campaign, were removed for close examination. Two white glass, two green and two red pieces were chosen. The variety in pieces chosen was hoped to determine if the colour of the glass effected the condition of the adhesives. This was due to the possibility that thermodegradation could be more likely in darker glass pieces, as they can retain heat for longer and reach measurably higher temperatures. Five of the glass pieces chosen were double plated, and one was single plated. The plates were two millimetre modern white glass. The plated glass 'packages' were sealed with silicone.

To remove the plated glass packages from the panel, the leads flanges were cut in strategic places that allowed them to be lifted without tearing or distorting. The lead flanges were folded upwards, and the weatherproofing compound was removed to free the glass it encased. Where glass pieces sat adjacent to one another, the lead that divided them was cut out from the panel (and reinserted later) to minimise the damage caused to the lead during the trial. A clean cut is easier to repair than an uncontrolled tear.

Once removed from the lead, a scalpel and stiff but flexible thin plastic substrate was used to remove the silicone and free the plates from the stained glass piece they encased.

[45] (Temperton, 2025)

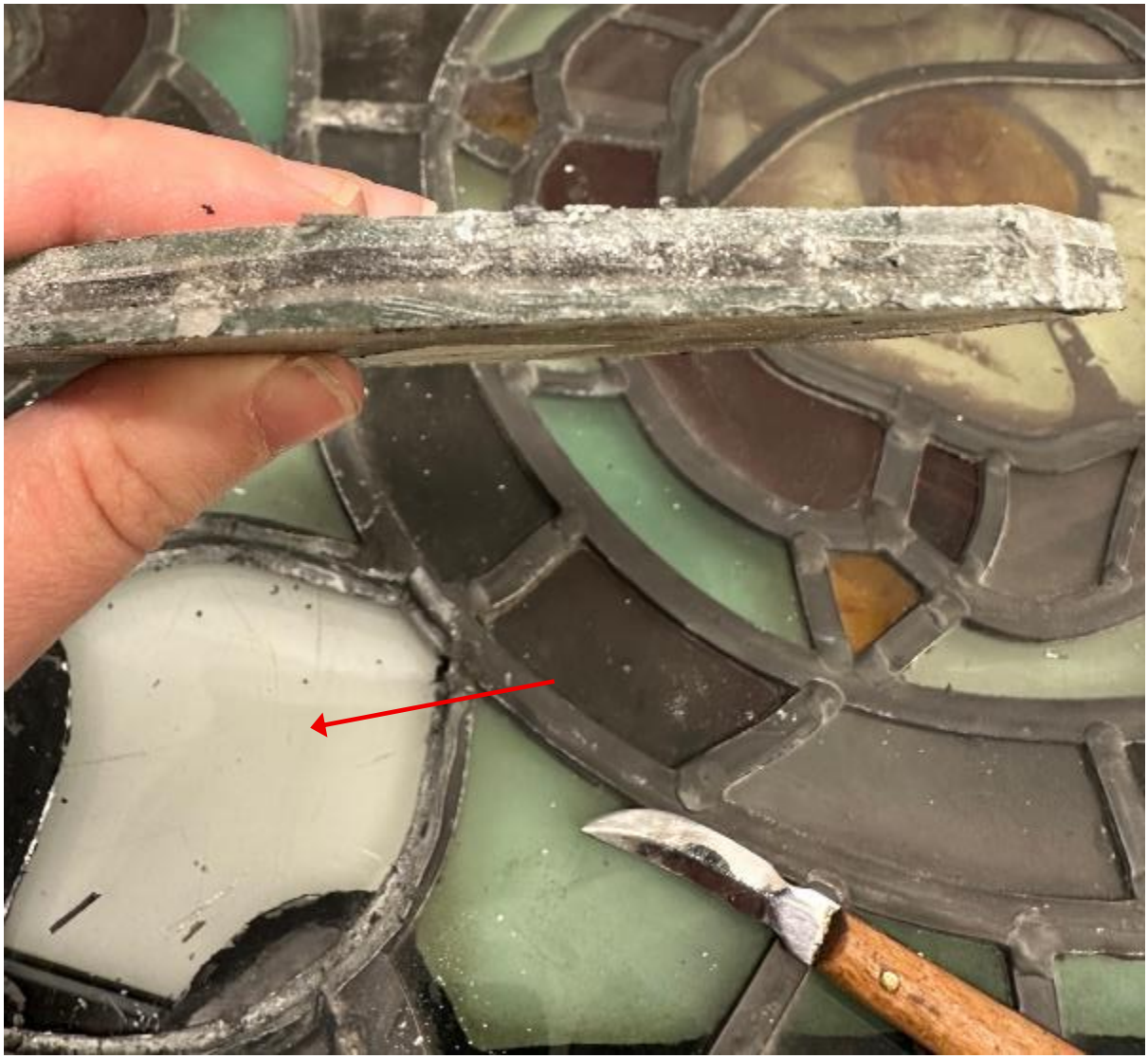


Fig. 14 Image showing the edge of the glass package with the silicon edge, and its original position in the lead matrix in the background indicated with an arrow

All the silicone that remained on the glass edges was laboriously removed mechanically using a scalpel prior to photography. There is no means to chemically dissolve silicone. Once removed from the sealed glass packages, the glass pieces were photographed using medium format photography and a digital microscope. They were also closely examined in transmitted, reflected and raking light. The silicone edge-bonds of the glass pieces (not those removed around the edges of the plates) were closely examined and stress tests were performed to ascertain their continued effectiveness. This involved gently putting pressure on the bonds to see if the silicone bond held. Unfortunately, none of the bonds on the trial panel used Ablebond resin, so this could not be assessed.

6 Trial Outcomes

During the trial the following observations were made:

6.1 Lead and Weatherproofing:

The soft and flat profiled lead was easy to fold back to expose the glass held within them and the glazing was not tight allowing for uncomplicated and swift removal of the plated glass packages. It is acknowledged that multiple people with differing glazing styles may have worked on the rose window, and therefore we cannot assume that all the panels will allow for such easy glass removal. Some glaziers naturally glaze their panels tight or loose. The leaded light cement was soft and easy to remove.

6.2 Plated multi-cracked glass:

The areas of severely fire-damaged glass encased in plates, and likely flooded with Ablebond, are a cause for serious concern. There are several unknowns as to how this glass would behave if removed from the plates. Firstly, the Ablebond could be in excellent condition, or conversely have totally failed. If found in good condition, it is unknown how long this material would survive, as it has a reputation for being unreliable. To remove and replace the adhesive with a more suitable adhesive would be extremely time consuming, and potentially impossible, as the Ablebond will have likely been drawn into fissures not fully broken in the glass. There is no way to fully remove edge-bonding material from micro-fissures, and if the material is not fully removed, re-treatment with another bonding material will not work: you cannot have different bonding agents sat on top of one another.

If it has failed, the cracked glass could fall apart. This would create complex shaped pieces that may or may not sit neatly together ever again. This was a worry shared by the 1980s conservators, who chose to avoid the issue of not being able to force the pieces to fit together by bonding them in situ so that they could not fall apart. On the other hand, the interlocking shapes of the cracks may physically lock pieces together, limiting their movement and making it impossible to take the glass fragments apart should we wish to clean any remaining Ablebond or dirt off the individual pieces. It is quite possible that both scenarios could be true in different areas or even within the same glass piece. It is clear that attempting to remove the Ablebond and clean each crack enough to allow for re-bonding would be time consuming, potentially damaging to the glass, and perhaps even ultimately not achievable.

6.3 Silicone Bonds

The silicon edgebonds are also problematic. Once silicon has been used in practical terms it is then impossible to go on to use another adhesive. There are no conservation-approved safe

means of chemical removal of silicone. Similarly, it is not possible to mechanically remove the silicone to the degree needed to use a modern epoxy resin adhesive, without damaging the glass surface, especially the vulnerable gel layer of the glass. Therefore, the only solution would be to replace the old silicone with a new silicone bond. While this may increase the time before the bond fails, the benefits of this approach are arguably not worth the consequences of accessing the plated glass pieces.

The removal of all plates from the panel (not carried out in this trial) would unavoidably lead to a partial releading, if not a full re-leading of the whole window as the existing lead would be damaged beyond reasonable repair by the process. It is reasonable to conclude that should the decision be made to 'unpack' all the glass plates, the entire window would need to be releaded. Something that is not justified by the condition of the lead alone. This would be extremely expensive and extremely invasive.

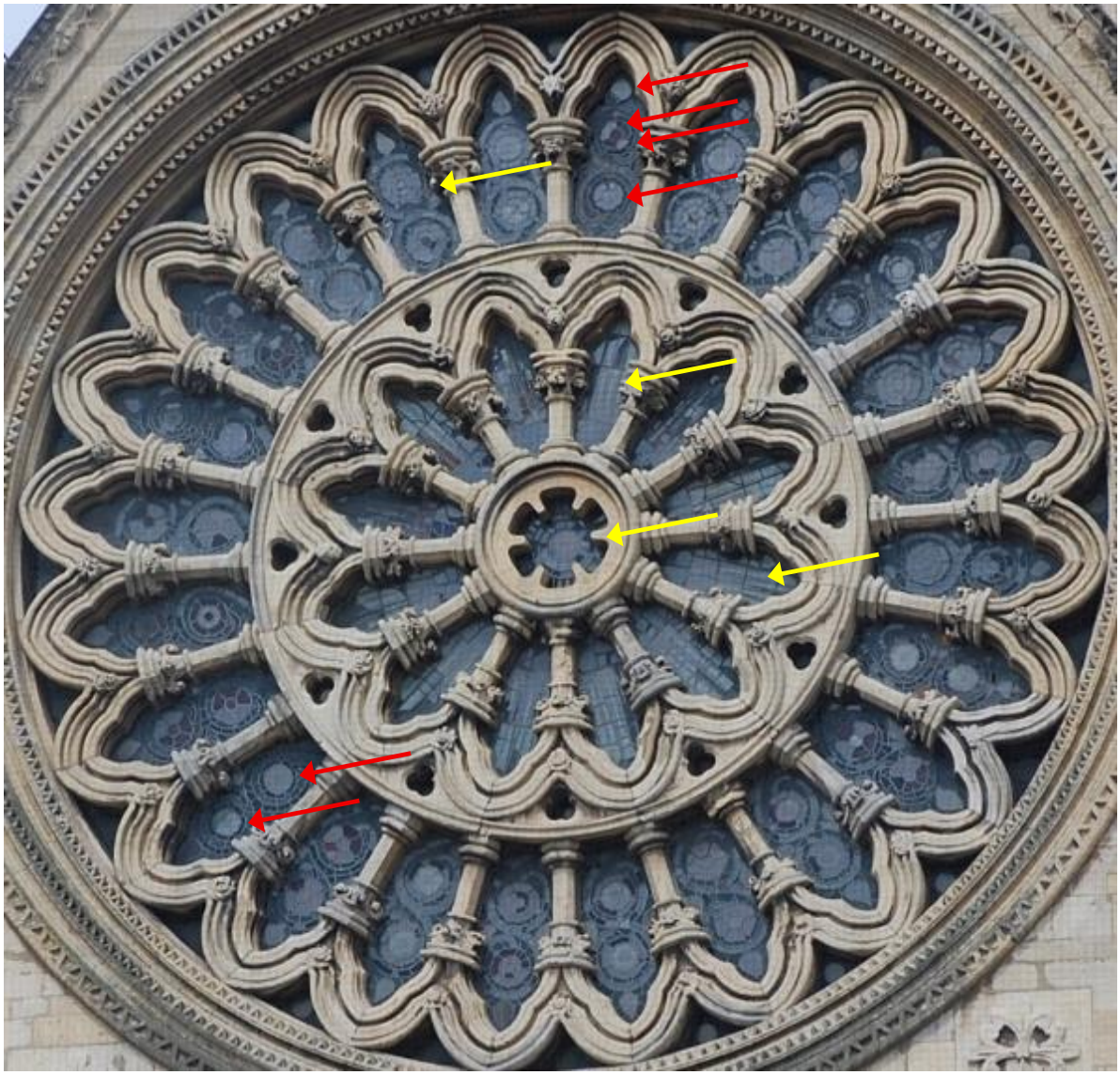


Fig. 15: External view of the Rose Window, showing the extent of the plates on the exterior (appearing lighter grey) as demonstrated with red arrows on two of the panels. Some panels very heavily plated, examples denoted with yellow arrows

Surprisingly, against the anecdotal information supplied, the plates on the trial panel were waterproofed with what appeared to be leaded light cement not butyl mastic. The waterproofing was intact but fairly soft and crumbly making it easy to remove.

The silicone perimeter seals were in good condition on all six plated glass packages. This is reassuring, and while we cannot guarantee that this is the case throughout the window, it is hopeful that most of the silicone sealed glass packages remain watertight, and protected from dirt ingress.

Unfortunately for the purposes of this trial, it was found that all the cracked glass bonds in the glass pieces sampled from panel B13 were treated with silicone. In his report to the Dean and Chapter prior to work commencing on the window, Peter Gibson specified that they would use silicone where possible, and Ablebond for the glass pieces much more severely affected by fire cracking. The panel removed for trial is at the base of the window, as this was the panel that was accessible. It is possible that the majority of the highly damaged glass pieces that were therefore mended using Ablebond are higher up where the heat from the fire was fiercest. Additionally, in his article in *Architects Magazine*, Gibson notes that many of the Ablebond bonds broke during dismantling of the panels, and they were re-bonded with silicone. It is possible then that we are dealing with more silicone bonds than we are Ablebond.

The silicone bonds held and did not fail under more flex and pressure than they would be normally subjected to within the window, supported as they are by plates. The silicone, though dirty in places, is still functioning to bond the glass edges together. There is some evidence of the beginnings of degradation of the silicone in places, and some areas where very little sealant has been used. No difference was found in the condition of the sealant based on the glass colour or whether they had been supported by a single or double plate. It is acknowledged that the small sample size cannot supply a definitive conclusion to the condition of the sealant throughout the window. The continued exposure of this bonding material to UV and IR (increasing with severity due to the higher numbers of heatwaves now in the UK) remains an ongoing concern. This could see the acceleration of deterioration. While the silicon from panel B13 seems to be stable, there is no established lifespan and at any moment it could reach a cliff-edge.

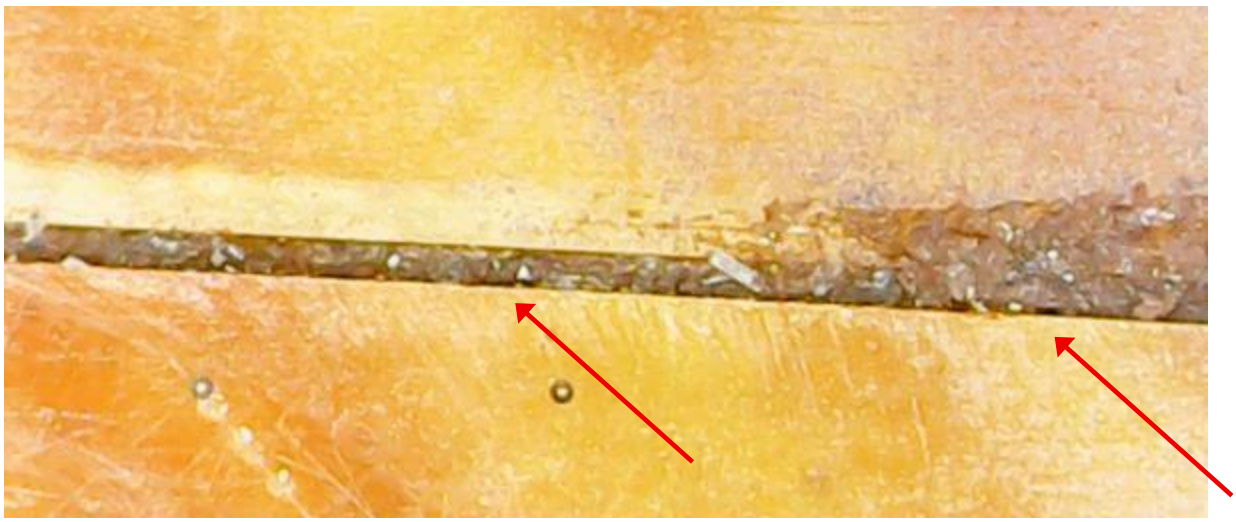


Fig. 16 Shallow silicone bond and areas where the silicon bond has failed

6.4 The 1984 Use of Glass Fibre Brushes and the Implications for the Rose Window

The use of glass fibre brushes for the cleaning of historic stained glass was common practice at the time of the 1984 Rose Window conservation campaign, and indeed they remain in use in less up-to-date studios to this day. However, it has long been established that their use has a damaging impact on the condition of the glass being cleaned, as we will see below. In none of YGT reports does it specifically say that glass fibre brushes were used for the Rose window. However, during the examination of the Rose Window glass pieces removed from panel B13, it became very evident that glass fibre brushes were used in the cleaning of the Rose Window glass during the post-fire conservation.

In an article, seemingly written after she visited to the studio during the Rose window conservation, Helen Pickles describes one of the YGT team 'dipping glass into a washing-up bowl of warm water and painstakingly cleaning each piece with a tiny glass-fibre brush.'[46] In his article 'Glass Conservation', published three years after the fire, and the year the Rose Window was reinstalled, Peter Gibson describes the use of glass fibre brushes as 'an essential tool for any conservation workshop'.[47] Indeed, evidence for the use of glass fibre brush cleaning can be seen on the glass pieces removed from panel B13. There are what appears to be fragments of glass fibre strands stuck into the silicone bonds, and there are scratches and markings caused by the tool's use to be seen in the paint and glass. These scratches can be seen both with the naked eye and, in more detail, under the microscope.

[46] (Pickles, Unknown) Source is an article clipping kept by a YGT employer (tony Temperton) and found as part of the research for this trial

[47] (Gibson, Glass Conservation, 1987, p. 65)



Fig. 17 Silicon bond with glass fibre brush bristles stuck in the silicon bond

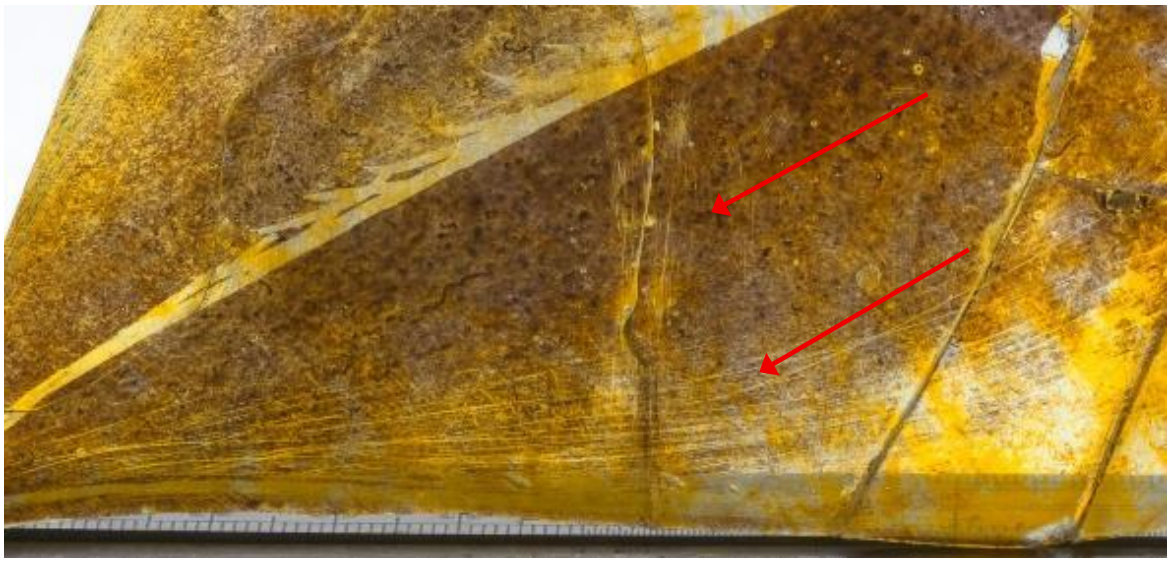


Fig. 18 Scratches in the paint and the glass caused by glass-fibre brush cleaning

Gibson describes how the tool is 'manually propelled […] on to the surface of the glass.' While he acknowledges that 'in the hands of an unskilled person, damage can be done to ancient glass unless great care is taken,' it is unlikely that he was aware of the damage to the paint and the glass's gel layer that studies - published after the conservation of the Rose Window - have shown that these tools can cause, even in the hands of careful conservators.

The gel layer refers to a layer on the surface of the glass, built up over time that contains a higher proportion of silicate molecules than that found in the bulk of the glass. These silicate molecules have migrated from the centre, towards the outer surface of the glass, where they effectively form a protective layer that is harder, and more chemically stable than the bulk of the glass.[48] In most cases, medieval glass will typically have gel layers around 20 to 50 pm thick,[49] which protects the bulk glass from corrosion.[50] [51]

It has been shown that the use of glass fibre brushes damages this protective gel layer, causing glass corrosion in the damaged areas to accelerate. In his article 'Corrosion Phenomena of Medieval Stained Glasses' Muller describes the result of tests studying the use of a glass fibre brush on medieval glass, saying:

'This gel layer protects the glass core against further corrosive attack. Therefore its maintenance is of greatest importance for the survival of the medieval stained glass windows. Glass samples from Cologne Cathedral had been cleaned mechanically before the preparation for microprobe investigation. The applied glass fibre brush has obviously lead to the demolition of the gel layers, only relics of them could be found by electron microscopy.'[52]

Damage to this gel layer can have serious consequences. When water gets into the cracks in the gel layer, it forms gypsum and syngenite, causing more damage.[53] Corrosion will accelerate leading to the loss of historic glass and paint. The damage to the gel layer of the glass in the Rose Window of York Minster means that a stable environment, especially regarding humidity and condensation, is vital to the retardation of the corrosion process.

[48] (Rauch, 2004, p. 4)
[49] (Müller, Torge, & Adann, Primary Stabilization Factor of the Corrosion of Historic Glasses: the Gel Layer, 1995, p. 288)
[50] (Scholze, 1985)
[51] (Müller, Torge, & Adann, Primary Stabilization Factor of the Corrosion of Historic Glasses: the Gel Layer, 1995, p. 291)
[52] (Müller, 1992, p. 229)
[53] (Rauch, 2004, p. 4)

7 Proposed Conservation Methodology

The work of the 1980s post-fire conservation saved the window against very difficult odds. They were working at a time where new materials were being invented and rapidly tested for suitability within conservation, which allowed for much more glass to be saved than would have been previously possible. Scientists were working with people within the heritage sector to provide a new level of scientific knowledge and processes such as age testing and scoring based on light refractive index was allowing the informed selection of new materials, not hitherto used in the repair of stained glass.

While the best intentions were employed, the materials used however have proven to be problematic in the years since. **The intervention of the 1980s is regarded by the senior conservation team of 2026 to be irreversible.** A strategy has needed to be developed that best preserves the 1980s materials, rather than seeks to remove then and re-treat.

Ablebond was discontinued ten years after it went into production based on concerns of quality control. Unfortunately, it has not been possible to assess the Ablebond in this trial given the lack of access to more than one panel. Therefore it is impossible to predict the condition that this material will be found elsewhere in the window. From research and photographs however, it is clear that undoing edge-bonding of the interlocking cracks would not be possible regardless of its condition. If this material still exists in any quantity on the window, it is now very definitely operating beyond its likely lifespan. The latter statement also applies to the silicone.

The only feasible option is to establish a conservation strategy that preserves the conservation materials existing in the window for as long as possible. Peter Gibson's insurance policy, the double plating, will continue to provide the reassurance that, should the adhesives fail, no glass will be lost. However, the window is also under huge stress from wind, rain, condensation, ultraviolet (UV) radiation and infrared (IR) radiation. In other words, the fragile and extremely fire damaged window should be retired from movement and thermal stressors, and be placed in as inert an environment as possible. The overarching conservation concept for the 2027 works will be as follows:

- Leave the glass packages alone. The removal of silicone and Ablebond is extremely complex and potentially impossible in the case of the micro fissures and interlocking glass sections. Also likely to exacerbate paint loss issues.
- Intervention on the plates would cause the whole window to be re-leaded. Not ethical as the lead is in good condition and potential to damage fragile paint and further break fragile glass. Very costly and time consuming option, especially given that there is a viable alternative.
- The panels should instead undergo minimal intervention. They should be conservation cleaned, and lead breaks mended. Plates should only be dismantled and treated where a

seal has broken, and where the benefits of invasive intervention justifies. The panels should be framed and the window provided with internally ventilated environmental protective glazing.

- A fixing system must be developed that adapts to the unique centre of gravity for each panel, as the rose window's panels rotate around a central axis.
- Reinstall the historic glass with an outer glass capable of completely controlling the climate around the panels, ensuring any humidity and temperature fluctuations are minimised (especially volatile on south facing windows). This will keep the plates in good condition, as well as the bonding materials. It will also ensure that the gel layer stabilises, and paint loss is arrested. It is proposed that specially made UV/IR glass is used. This is glass fully embedded with filtering capability. It is not a film applied to the surface of the glass. It therefore has an indefinite lifespan.

While there is concern about the lifespan of both the Ablebond and the silicon used within the window, the YGT's conservation strategy proposal, resulting from the trial of panel B13, is to protect these materials to halt the deterioration process as much as is possible. To this end, the installation of environmental protective glazing is recommended. This non-invasive strategy ensures that the fragile paint is not further damaged by another invasive intervention.

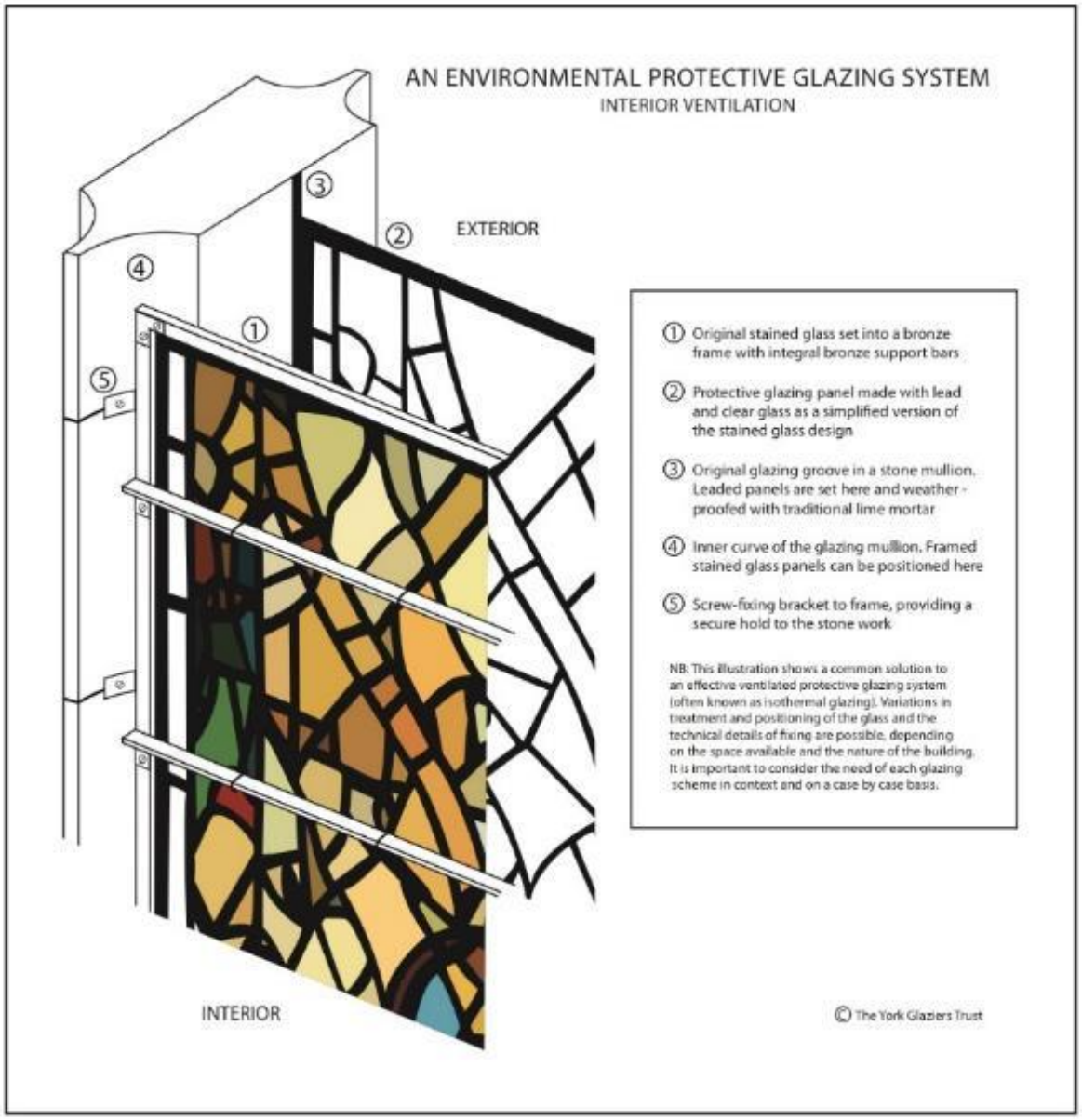


Fig. 19 Diagram showing environmental protective glazing

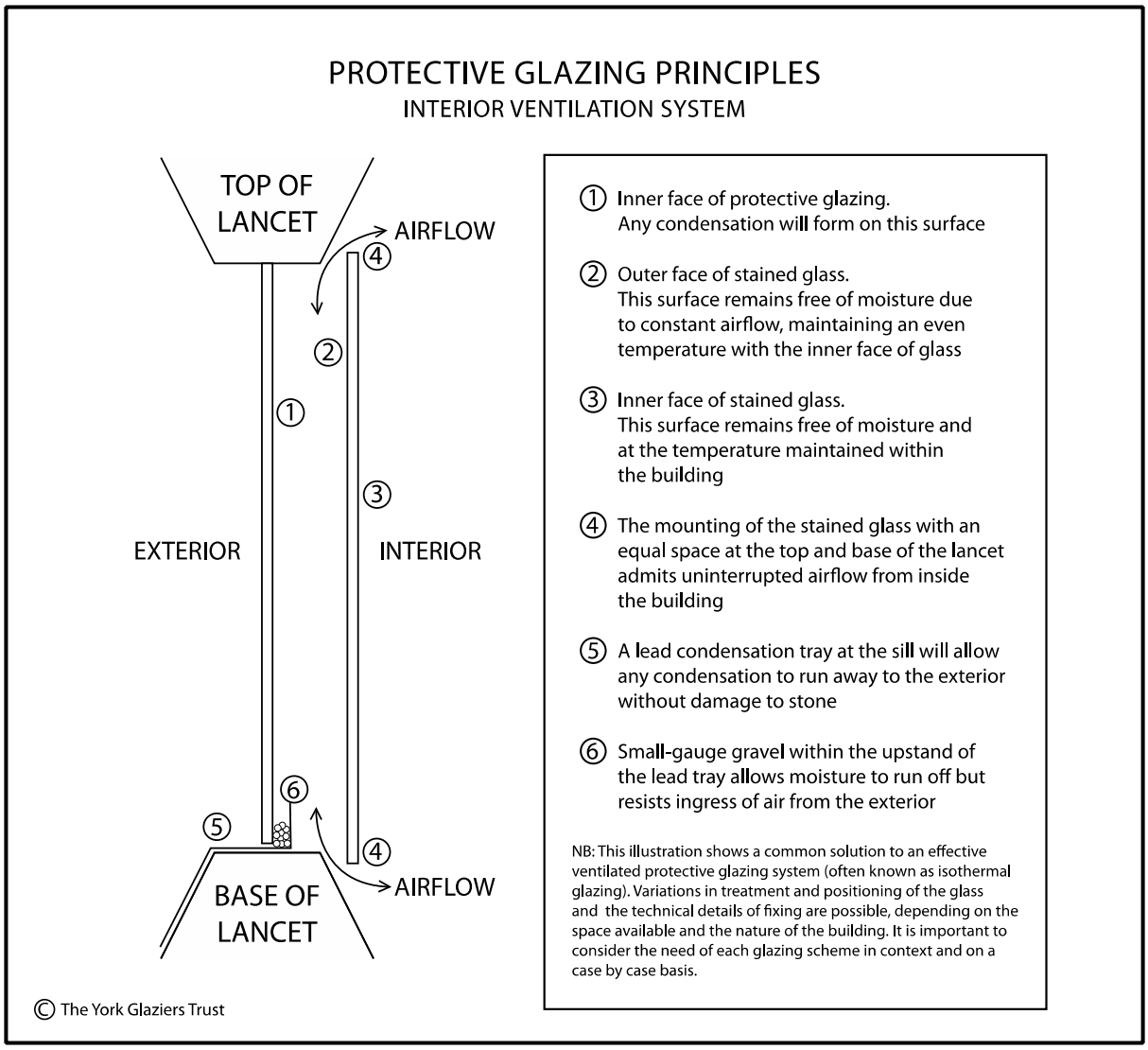


Fig. 20 Diagram showing environmental protective glazing

Properly designed protective glazing seeks to arrest the most serious issue facing the historic stained glass - the detrimental environment that the panels have been subjected to, both internally and externally. This has manifested in detectable levels of paint loss which, in the long-term, if left untreated will deprive the glass of its artistic value and historic and iconographic significance. The opportunity to slow or entirely arrest this issue would be a very timely and beneficial intervention. It would preserve the windows in their present state, and represent a pro-active rather than entirely reactive approach to the care of these historic windows. As these windows currently function as a weather shield, and come in to permanent contact with the elements, the paint, lead, and glass remain susceptible to attack from processes associated with the presence of moisture. Any failure of a sealed plates would result in the plates filling with water. Given that these plates protect the most high significance oldest

parts of the window, this would be a disaster. Water held against fragile historic glass will almost certainly result in heavy deterioration of the glass pieces and its associated painted decoration. The protective UV/IR filtering glass has the added benefit of reducing any thermal stress and wind load on already heavily compromised glass.

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Project: The Rose Window (S16), South Wall of South Transept.

Scope: Assessment Of Condition and Evaluation of Conservation Options Through Analysis of Trial Panel – Supplementary Report to Include a Second Trial Panel



Figure 1 Panel C12, Rose window (S16), York Minster

This report is supplementary to the York Glaziers Trust's report 'Assessment of Condition and Evaluation of Conservation Options Through Analysis of Trial Panel' from October-December 2025, which explored the history and condition of the Rose window, through examining at close quarters and trial treating panel B13, located at the base of the window. At the time, this panel was the only one that was possible to remove given the available access - the walkway beneath the window - and the report raised concerns that this panel, being the furthest from burning roof of the 1984 fire, was likely not typical of the scale of damage we could expect from the rest of the window. With this in mind, the construction of a full scaffolding for the Rose window has allowed for further panels to be removed, and panel C12, located higher in the window (fig.1.), was selected to undertake further trials.

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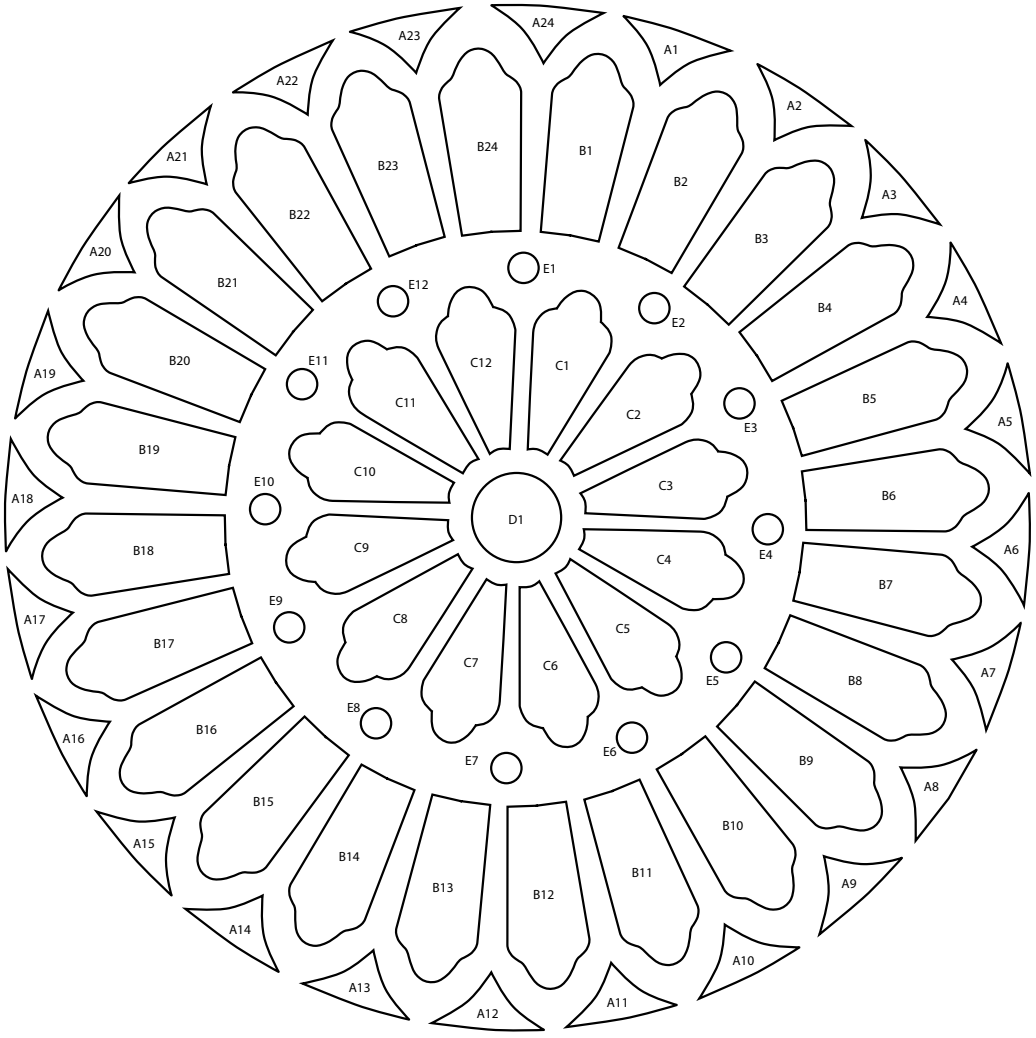


Figure 2 Window plan of the Rose Window (S16), York Minster.

The panel C12 was selected for the second stage of the rose window trial because it appeared to be among the most heavily damaged panels in the Rose Window. Visible soiling within the cracks, yellowing, and degraded conservation materials suggested that it represented a particularly challenging example of the window's condition. As many of the principal problems observed across the Rose Window were present within this single panel, it offered a useful case study through which to gain a broader understanding of the window's overall condition. Investigating this panel therefore allowed the trial to consider a worst-case scenario

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and assess how the proposed conservation approach might perform in the most challenging cases.

Consistent to panel B13 previously trialled, the lead on C12 was found to be in very good condition, retaining its structural integrity with very few lead breaks and minimal corrosion. The glass surfaces were a little dirty, but nothing beyond what would be expected after four decades of exposure. On the interior surface was a light film of oily black dirt, consistent with the soiling on the surface of other windows in York Minster. On the exterior there are some pale brown dusty deposits as well as stone dust, especially on the panel edges.

A particularly badly multi-cracked glass piece (approximately 16.5mm x 12.5mm with an estimated minimum 100 cracks) was selected for extraction from the panel.



Figure 3 First glass piece removed from panel C12, front and back plates removed

As is typical of severely fire damaged glass in the window, the piece was double-plated and sealed around the edge with silicone. The surrounding leads were strategically cut and folded back to allow access. The glass package then had to be separated from the exterior lead sheet, which was bonded to the back plate with a large amount of blackened silicone. This was

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carried out by cutting between the back plate and the lead sheet using a long, thin, flexible blade. However, the awkward working angle and the force required to cut through the silicone caused the back plate to crack. Once separated, the historic glass was removed with relative ease as the glazing was loose, and the waterproofing compound was soft and crumbly.

Consistent with the findings on panel B13, the glass package remained fully sealed with silicone around the edge, though it is possible that there were gaps or tears in this not seen by the naked eye. The presence of a small amount of microbial spores between the plates suggests some failure of the outer seal.

The silicone seal around the edge of the glass package was cut to separate the stained glass from the front and back plates, releasing the package. When the plates were removed, the highly multi-cracked stained glass flexed significantly. The stained glass piece was examined under the microscope in both transmitted and reflected light. This showed that both Ablebond and silicone had been used within the same piece of glass, with more silicone present than had been anticipated. The presence of silicone explains the ability of the bonds to flex.

The application of the silicone was notably complex and neat, suggesting that it had been applied to the surface and forced into the cracks, with excess material then cleaned from the surface after application. It seems very unlikely that given the complexity of the cracking structure that the silicone could have been applied to the edges and slotted together as is the usual method. This interpretation is also consistent with evidence that Fablon was adhered to the back of the glass pieces during treatment which would have prevented the glass pieces being slotted together piece by piece as the silicone was applied. Additionally, under magnification, it was possible to see areas where the silicone had only partially penetrated the cracks, leaving bubbles and unfilled voids. This is problematic because some cracks were either unbonded or only partially bonded. The thick viscosity of the silicone would have made more complete crack penetration extremely difficult.

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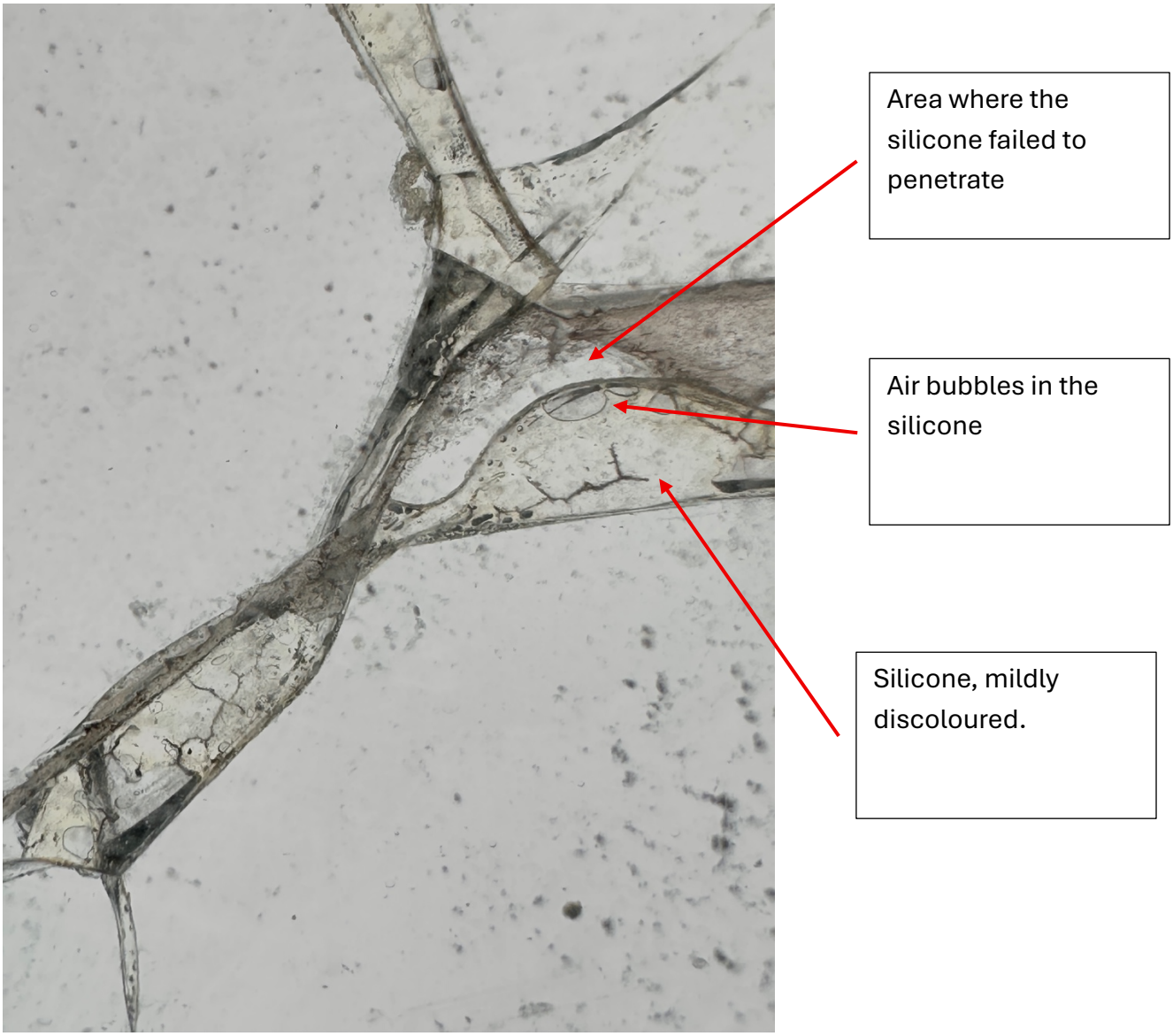


Figure 4 Crack bonded with silicone

Silicone that had been in contact with the external environment was discoloured and opaque, while protected internal silicone, not exposed to dirt or environmental conditions, more often retained its clarity. The Ablebond was harder to identify as the cracks were tighter, as is to be expected from a material with lower viscosity; however, where visible, it had yellowed considerably and was very brittle. It appears to have almost entirely failed, underlining the unreliability of Ablebond as a conservation material. In some places it has crumbled, in others it has simply detached from the glass to which it was bonded.

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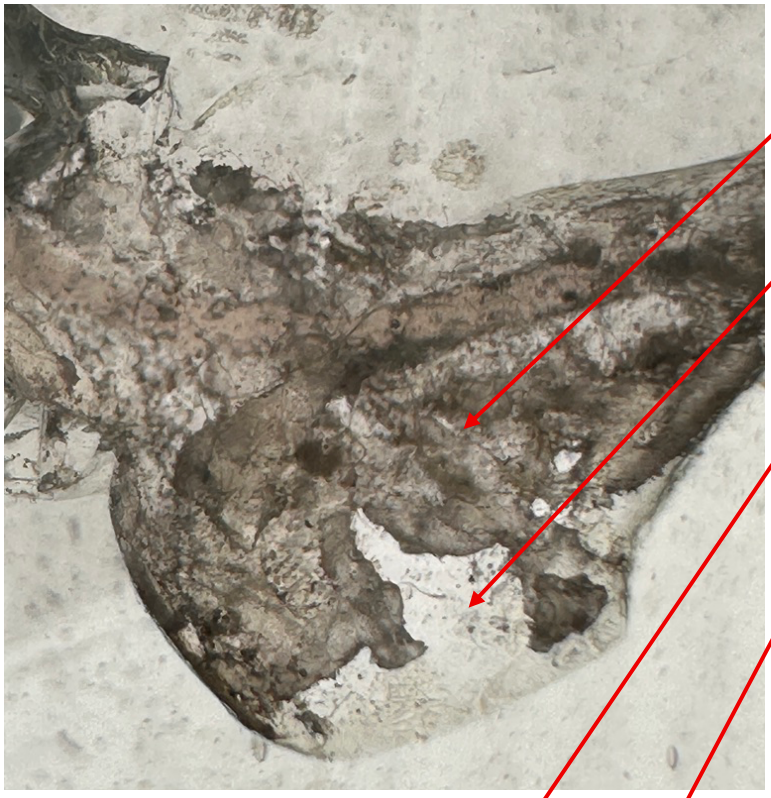


Figure 5 Ablebond in situ, crumbling and discoloured

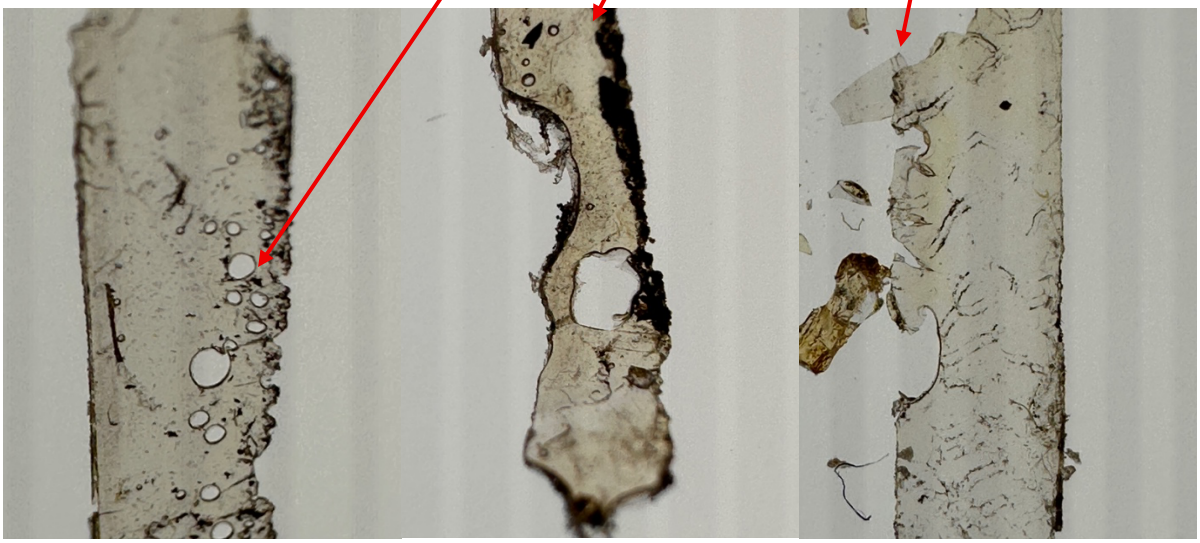


Figure 6 Three pieces of Ablebond removed from the glass showing the degradation of the resin

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Overall the glass piece had many failed bonds and as a result, small glass pieces were prone to dislodging from their positions.

The second glass piece removed from the panel also had severe multi-cracking, though slightly less densely than the first piece removed. This glass piece had both silicone and Ablebond too, though most breaks were mended with degraded and failing Ablebond, only a few contained the much more stable silicone. Consequently, once the plates were removed, the tiny glass fragments were more liable to shift out of position, and extreme care was required to avoid losing or dislodging any shards. Given the complexity of the fragmentation, establishing the correct position of every piece would be extremely time-consuming should the fragments become jumbled. The remaining silicone along the edge of the glass piece acted to help hold the glass fragments in position with compressive force. It will be a delicate and time-consuming job to remove this silicone in order to reinstate the plates for reinsertion into the panel.



Figure 7 Second glass piece removed from panel C12, front and back plates removed

On some of the glass packages, a white 'blooming' effect was observed. When one of these packages was opened during the trial, the blooming was found to be present on the internal face of the external support plate. As mentioned above, this bloom deposit is suspected to be microbiological growth. Its presence suggests that, despite the glass package having been visibly sealed, some form of water or moisture ingress must have occurred. As a precaution,

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a test of this microbial growth is planned to help inform how aggressive it may be, and how best to treat it.

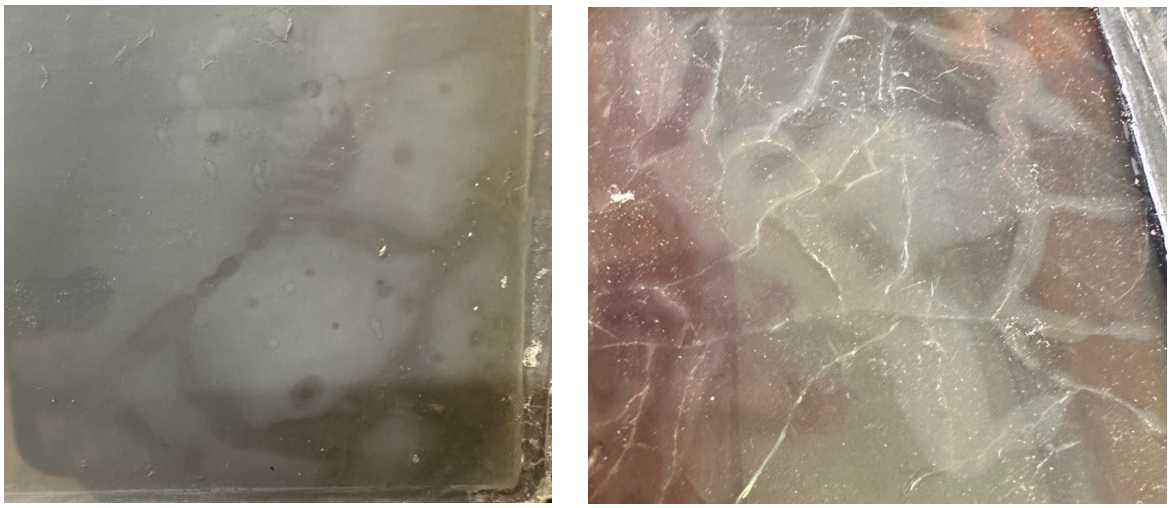


Figure 8 Suspected microorganisms found on plates

Given the complexity of the panels, particularly the range and condition of the conservation materials used throughout the window, it is recommended that only a minimal, light-touch conservation methodology is undertaken. The premise holds, that removing individual glass packages or dismantling the panels has the potential to cause further damage and may result in the loss of unsecured fragments, which can easily be dislodged. At present, the glass remains mechanically secured between the support plates. The silicone bonds, both around the edges of the packages and within the cracks, also remain serviceable. The greater-than-anticipated presence of silicone is therefore beneficial, particularly as it is generally in better condition than the degraded Ablebond. Avoiding unnecessary intervention consequently represents the safest approach and minimises the risk of further disruption to the glass. The UV/IR glass will help to prolong the lifespan of this material further, and also prevent its discolouration which would be disfiguring to the window.

As the conservation of the Rose Window gets underway, it is possible that some deviation from the methodology suggested above will need to occur. Where there are broken plates, the glass package will need to be removed so that it can be replaced. This is likely to be necessary for a few glass pieces. Additionally, if we find that there is a package where there are glass

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fragments that have rattled out of position inside the plated 'package', and are therefore in danger of damage, these will also be removed, repositioned and reinserted.

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THE CHURCH OF ENGLAND
CATHEDRALS FABRIC COMMISSION FOR ENGLAND

Alexander McCallion FRICS
Director of Works and Precinct,
York Minster

alexm@yorkminster.org

The Reverend Canon Adrian Daffern FSA
Cathedral and Major Churches Officer

9th September 2026

Dear Alex

YORK MINSTER: Rose Window

Thank you for seeking the advice of the Cathedrals Fabric Commission for this proposal, which is informed by a visit made by a delegation of the CFCE on Thursday 30th July 2026. The proposals were considered by the Commission at its meeting on Thursday 3rd September 2026, when it had before it had before it:

York Glaziers Trust Assessment and Evaluation report
Photographs of the Rose window taken on the site visit

The Commission heard that the Minster intends to make an application to the Commission for conservation works to the Rose Window in the South Transept. The recent trial undertaken by the York Glaziers Trust (YGT) has necessarily assessed the conservation techniques and materials previously employed on the window, as well as the establishment of a new approach to conversation.

The YGT is clear that, while the conservation methods employed after the fire of 1984 saved the window, the materials used – in particular Ablebond – have proved problematic. Therefore the proposed way forward is a conservation strategy that preserves the conservation materials already existing in the window.

The Commission understands the proposed conservation strategy to be as follows:

1. To leave the glass packages alone, due to the complexity of removing the silicone and Ablebond, which is likely to exacerbate paint loss issues.
2. The panels should undergo minimal intervention. Intervention on the plates would cause the whole window to be re-leaded, which is not ethical as the lead is in good condition, and the potential to damage fragile paint and break fragile glass is considerable. They would be conservation cleaned, and lead breaks mended. Plates would only be dismantled and treated where a seal has broken, and where the benefits of invasive intervention is justified. The panels would be framed, and the window provided with internally ventilated environmental protective glazing.
3. To develop a fixing system that adapts to the unique centre of gravity for each panel, as the rose window's panels rotate around a central axis.

4. To reinstall the historic glass with an outer glass capable of completely controlling the climate around the panels, ensuring any humidity and temperature fluctuations are minimised (especially volatile on south facing windows). This would keep the plates in good condition, as well as the bonding materials. It would also ensure that the gel layer stabilises, and paint loss is arrested.
5. It is proposed that specially made UV/IR glass is used. The UV and IR elements are two separate flashes on a clear (white) mouthblown glass. It is not known how long the lifespan of the glass will be, as it is a new technology, but it will certainly not delaminate from the support glass.

The Commission has agreed the following advice:

1. The Commission supports the proposed methodology, and warmly commends the YGT's work.
2. The Commission recognizes, with the YGT, the complex conservation history of the window, and agrees that this scheme provides an excellent opportunity to chart the intersection of heritage and conservation technology as the work of different conservators is fully recognised and recorded.
3. While the Commission is not opposed, in principle, to the use of UV/IR glass, it will need to see the research behind it and know about its properties and longevity, before it could formally approve its use.
4. The Commission notes the concerns re the effects of heat on the (south-facing) window, and supports the proposals for ventilation, given the increasing temperatures of UK summers, the Commission would like to have confidence that the UV/IR glass can mitigate against these higher temperatures
5. The Commission understands that details of stone damage will not be fully known until the work is understood. (The difference in patterning between the exterior and interior stone was acknowledged by the delegation). The Commission encourages the Minster to work to its Stone Policy and apply for the relevant permissions as necessary.
6. The Commission invites the Minster to consult partners in this country (Canterbury, Lincoln) and in Europe (Notre-Dame de Paris) for mutual learning, in particular after the 2019 fire at N-D. It also encourages the team to engage with the wider heritage science community regarding research into the deterioration of the Ablebond.
7. The heritage conservation science community through the RICHeS infrastructure may be able to provide instrumentation for research into degradation and potential treatment of the adhesive if the team finds this is necessary to address degradation of adhesive-treated glass 'pockets' whilst maintaining the pocket intact.
8. A representative selection of panels, including more severely fire-damaged panels and examples containing Ablebond, should inform the final methodology.
9. The application should demonstrate, on a panel-specific basis, how the proposed glazing and ventilation will manage heat, humidity, condensation and water movement.
10. The thermal, optical and environmental performance of the proposed UV/IR glass should be supported by appropriate technical evidence and testing.
11. A monitoring and action plan should define measurable performance criteria, review arrangements and corrective measures. This should include close-up inspection and long-term temperature and humidity/condensation monitoring

We trust that this advice is helpful, and look forward to receiving the application in due course.

As always, we will be very glad to offer additional advice and support in the meantime: do please get in touch in the usual way.

Yours sincerely

Adrian

cc. The Acting Dean of York
The Surveyor of the Fabric
The Chair of the FAC
The Secretary of the FAC
The Cathedral Archaeologist
The Stoneyard Office Manager
Historic England
The Joint Committee of the National Amenity Societies
City of York Council

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