

# Kildalton Chapel, Islay Reconstruction

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Kildalton Chapel is of an oblong shape measuring 17.3 metres from east to west by 5.7 metres within walls that are 0.9 metres in thickness (Ancient and Historical Monuments of Scotland, 1984, 203). The church served the medieval parish of Kildalton, which was an independent parsonage in the patronage of the Bishops of the Isles, and although the earliest documentary record dates from 1425, the architectural characteristics of the building indicate that it was erected in the late 12th or early 13th century (Ancient and Historical Monuments of Scotland, 1984, 206). The building as it currently stands has been heavily restored, although some interior features including the remains of the piscina and aumbry are still seen (Ritchie and Harman, 1985, 108). The building remained in use until the end of the 17th century, when services were transferred to a site at Lagavulin (Ancient and Historical Monuments of Scotland, 1984, 206).



Figure 1. Kildalton Chapel Location. Image sourced from Google Earth

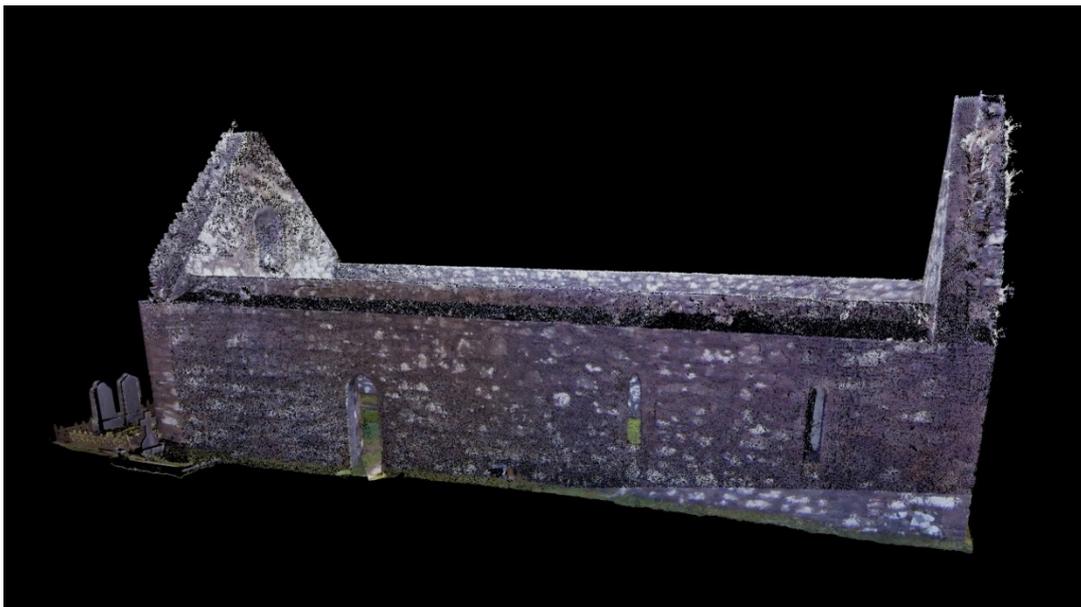
## Survey

The recording at Kildalton was broken down into several stages. The first survey was conducted by Topcon and involved the laser scan recording of Kildalton Chapel. This survey focused on the building remains and very little of the surrounding area was captured. Although the scan data provides an overview of the building, the resolution and quality could be increased in the future by adapting the recording methodology and utilising another scanning system. The laser scan model could have provided a richer dataset to work: the point spacing of the model has been reduced from the original to save on data size and there appear to be issues with the registration of the individual

scans. For the purposes of the reconstruction, a greater emphasis of the surrounding areas was required.



*Figure 2. Overview of the laser scan model of the northeast corner of the chapel*



*Figure 3. Overview of the laser scan model of the south elevation of the chapel*



*Figure 4. Internal view of the internal east interior of the chapel*

To complete the survey for the purposes of the reconstruction, and to provide a context of the landscape and building, an aerial drone survey completed.

The aerial survey was completed using a DJI Inspire Zenmuse X5 PRO and 1831 aerial images were captured. These were captured in their RAW format and processed as JPEG images.



*Figure 5. Aerial image of Kildalton Chapel. Image Credit: Kieran Baxter*



*Figure 6. Aerial image of Kildalton Chapel and local landscape. Image Credit: Kieran Baxter*

In addition to the aerial photographs, 4157 ground-based photos were also captured. The aerial images provide an overview of the landscape but are limited in their perspective to accurately model the building and the features contained. The capturing of the ground-based images allow this detail to be included and add to the overall functionality of the images for use within our 3D reconstruction.

In total 5988, images were utilised in the production of the photogrammetry model of the site. The model that has now been created provides a replica of the site as it is today. This is not only useful for reconstruction purposes but allows for future analysis and comparisons. For online viewing, the photogrammetry model was created in twelve stages, with the final version containing 6.5 million polygons. This modelling process began with the creation of an overall model of the building and the surrounding landscape. Each additional production stage added greater resolution models of particular areas, such as the eighth century Kildalton cross. This process of focussing on specific parts, allows for a greater web interaction, allowing users to interact with the model, and still see the important features in as high a resolution as possible, whilst reducing the amount of bandwidth and computer power needed.

The photogrammetry model was created in Agisoft Photoscan, and as each aerial image contained a GPS coordinate, the model produced has been automatically scaled to the correct size and geographic position. The original trees of the landscape have been removed and replaced with 3D model assets. Trees move during the capture process due to wind and in order to correctly model these, movement within the images must be minimal. Rather than introduce an error in the alignment process, these were simply removed and the focus of alignment concentrated on the building and landscape only. The below renders provide an overview of the model produced and

these were used in the reconstruction of the chapel. This model will be available in our online interaction.



*Figure 7. Photogrammetry model of the current Kildalton Chapel, facing west*



*Figure 8. Photogrammetry model of the current Kildalton Chapel, facing southwest*



*Figure 9. Photogrammetry model of the current Kildalton Chapel, facing north-west*



*Figure 10. Close-up photogrammetry model of the Kildalton Chapel, facing southwest*

### 3D reconstruction

The 3D reconstruction of the chapel is based on its earliest form and resembles how it would have appeared during the 13<sup>th</sup> and 14<sup>th</sup> centuries. The model has been completed through documentary research and through the advice of Professor Richard Fawcett, an Emeritus Professor from the University of St Andrews. The model follows our own interpretations and variations on its form and

style are still possible, given the decay found within the building work and the unknowns surrounding the internal design.

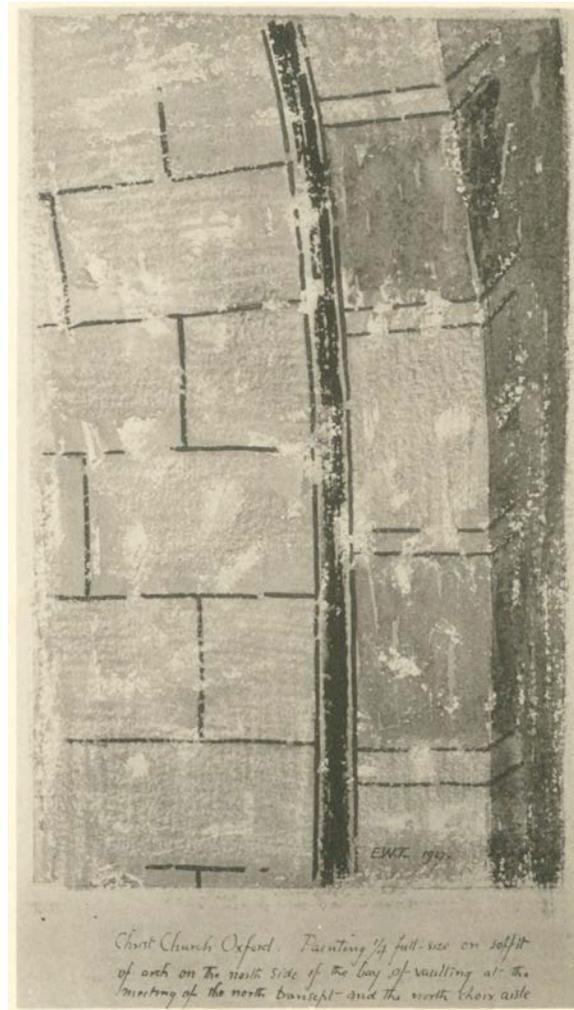
The reconstructed chapel was modelled using the photogrammetry model produced, as well as the laser scan data that was recorded by Topcon, as a guide to establish the footprint of the structure, its height and positioning of the windows and doors. The height of the laser scan and photogrammetry model in comparison to the reconstructed model differs slightly due to the subsidence and decay of the building, as well as the development of the surface of the surrounding landscape within the church walls. The below images provides an overview of how the photogrammetry model was utilised in the design of the reconstructed chapel.



*Figure 11. Screenshots showing the alignment of the model with the Kildalton photogrammetry survey mesh*

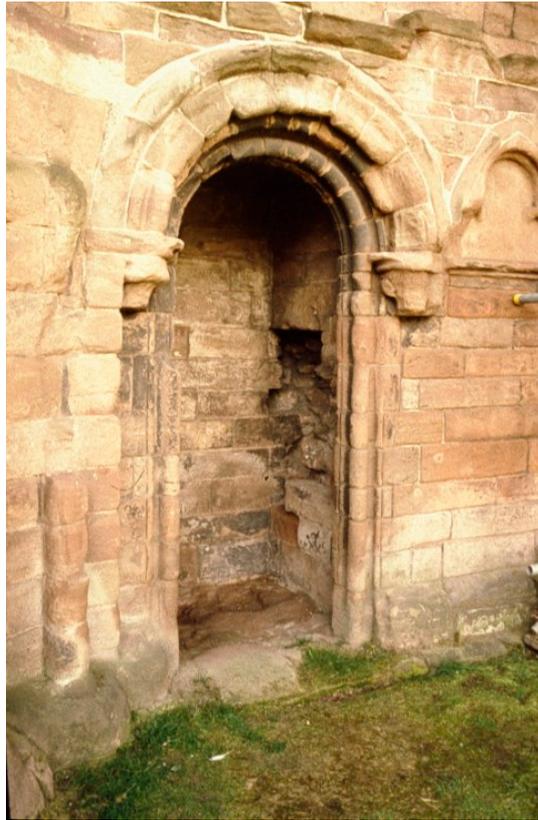
Much of the reconstruction is based on the extensive knowledge of Prof. Richard Fawcett and we have utilised his experience in developing the chapel. As advised, the external wall of the chapel would have been a lime slurry and aggregate stone, with the colour similar to the local stone. This would have been in an irregular and the roof would have been in the form of flagstone which is a sandstone composed of feldspar and quartz. The internal aspects would have been of a finer plaster finish and would have been painted on the walls, similar to the remains found at St Mary Church,

West Chiltington, West Sussex and Torphichen Preceptory Church, West Lothian. Remains of wall paintings in Scotland are extremely rare, examples can be seen at Glasgow Cathedral which date to the twelfth century and the presbytery of Ewenny Priory in Glamorgan (Rosewell, 2014, 7). The inclusion of these painting at Kildalton would have consisted of red outlines on the windows and walls, symbolising brick work, as discussed by James and Tristram (1927) who examined Christ Church, Oxford, as shown in the below image.



*Figure 12. Decorative painting found at Christ Church, Oxford (James and Tristram, 1927, Plate II)*

As advised by Prof. Richard Fawcett the mouldings around the doorways of the chapel at Kildalton (which has been heavily robbed in antiquity) were re-modelled with decorative dressed stone. The mouldings included within the reconstruction are based on one of the sketches produced by Prof. Fawcett during our initial consultation meeting, as well as photographs from Arbroath Abbey and Kilmory Church. Although included the night stair door at Arbroath has been included as an example, Prof. Fawcett noted that it was unlikely that the doorways at Kildalton were so heavily hooded, and a simple form was chosen instead.



*Figure 13. The doorway at Arbroath Abbey*

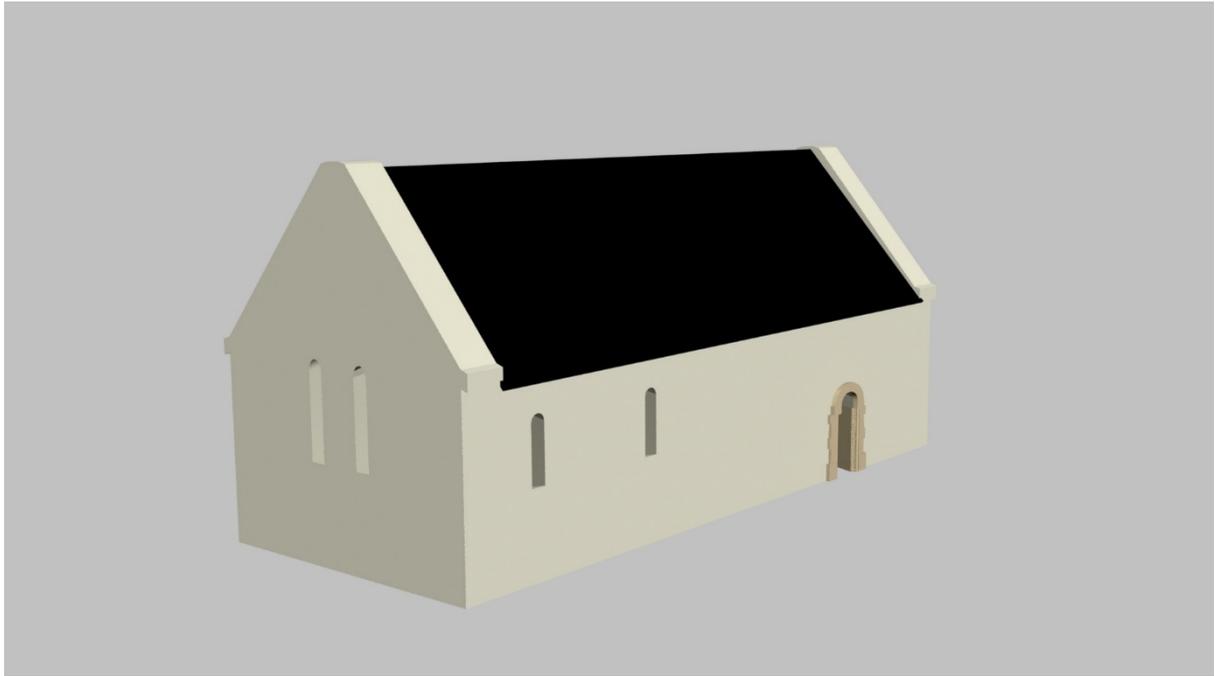


*Figure 14. A photograph of Kilmory Church*

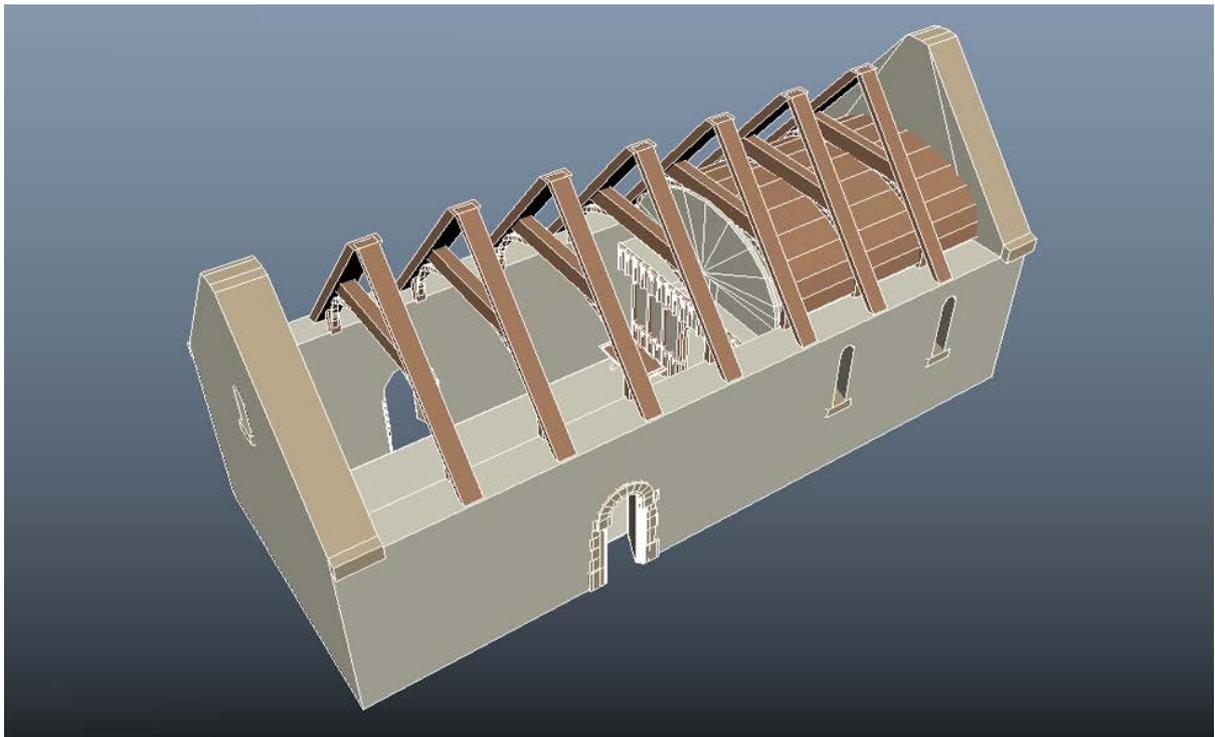


*Figure 15. Kildalton model doorway*

An early example of the recreated model is shown below, and following further consultation with Prof. Fawcett, edits were added to the model. The images below provide an overview of the simplistic nature of how the model has been created, with realism created through the addition of textures. The model has been created to be viewed an interactive WebGL online viewers, and requires the model to be a low resolution in terms of polygons to enable the model to load correctly for users. If the purpose of the 3D reconstruction was to create a photorealistic representation, the model would have been designed to include a greater number of polygons to enable a more precise reconstruction. For our purposes, the reconstructed model meets the needs of the online viewer.



*Figure 16. Early stage of the chapel reconstruction showing the exterior outline of the recreated typology*



*Figure 17. Early stage of the chapel reconstruction showing the interior details of the recreated typology with the roof removed*



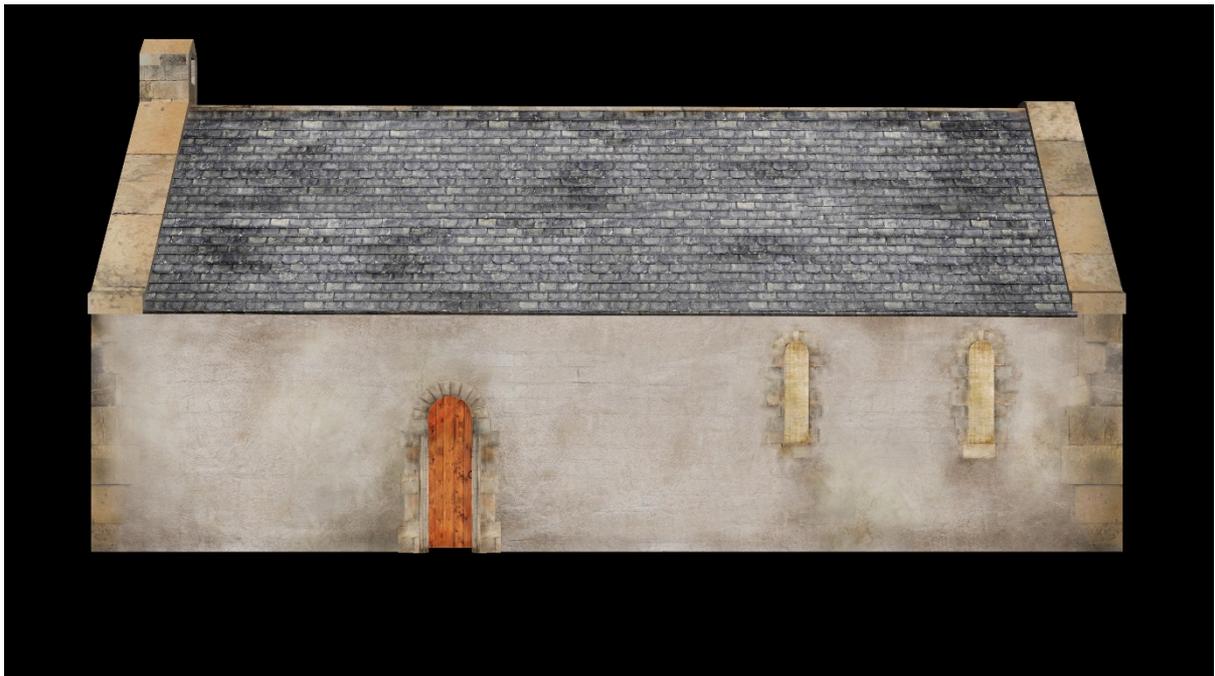
*Figure 18. Early stage of the chapel reconstruction showing the interior detail of the recreated typology*

Following the first edition of the model, Prof. Fawcett commented that only half of the gable heads would have been exposed at each end of the roof, and the end rafters would have rested on rebates on the inner halves of the gables. The roof timbers would also have been of a lighter scantling and would have been more closely spaced, as is found at Tullibardine. Prof. Fawcett also added that the inclusion of the projecting windowsills would have been unlikely and the model was edited to remove these features. A bell tower was also included as this was an important feature within church construction to signify to the local community that mass or prayer was to shortly commence. Unlike other churches found in England, where a separate free standing bell towers are found (Philip McAleer, 2001), the bell at Kildalton was added above the east wall, and although of a much smaller design to the bell tower found at Dunblane (Fawcett et al., 2010, 281), the position remains similar. The bell has been designed as being iron, similar in design to the hand-bells found at Angus in Guthrie (Bourke, 1983, 467).

## External Textured Reconstruction



*Figure 19. Textured reconstructed exterior of Kildalton Chapel, facing southwest*



*Figure 20. Textured reconstructed exterior of Kildalton Chapel, facing south*



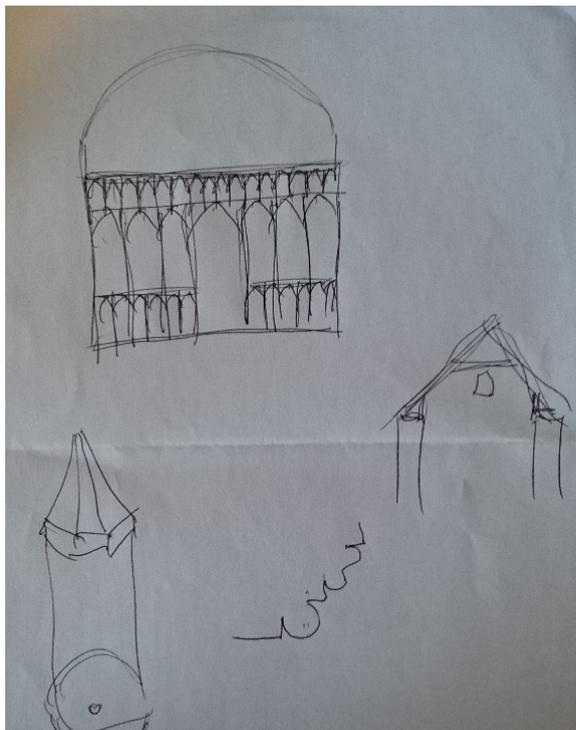
*Figure 21. Textured reconstructed exterior of Kildalton Chapel, facing northwest*



*Figure 22. Textured reconstructed bell tower with iron bell included.*

## Interior

The interior design of the chapel is unknown, save for the inclusion of a piscina and aumbry. The piscina can be seen to be original but the aumbry found at Kildalton appears to be of a later form. Following traditional church form, the inclusion of a font, screen and altar would have been present and through a basic knowledge of church construction, one can extrapolate an interpretation of the original form of the chapel. Following Prof. Fawcett's sketches from our consultation meeting, the overall appearance of the screen was obtained and this provides the divide between the chapel interior. He noted that the screen could have had altars on either side, with imagery painted on the panel above but rather than guess as to their inclusion, these additional paintings have been left out of our reconstruction. The design of the screen, as shown in the below image, would have been of a simple decorated wooden construction and would have included painting of the crucifixion, as seen as Fowlis Easter Church, near to Dundee.



*Figure 23. Prof. Richard Fawcett's sketches*

At Elgin Cathedral, a back-to-back representation of both the crucifixion and the last judgement is found on the screen. This inclusion within a cathedral is sensible, but within a smaller chapel, it was felt better to have a single painting of the crucifixion above the screen, signifying that people should live without sin. As no other example can be found that is similar in design, the same image found at Fowlis Easter Church has been used within the internal reconstruction. Bob Marshall has also used this design in the artistic drawing of Ardrossan Parish Church.



Figure 24. Fowlis Easter Church crucifixion painting found on the original screen. Image provided by Prof. Fawcett.



Figure 25. Illustrative drawing of Ardrossan Parish Church in the 1500s (Marshall, 2016)

On Prof. Fawcett's advice, the internal roof structure would have been of an A-frame construction like the church at Guthrie, with large exposed wooden beams and supports. Over the choir area it is possible there would have been a wooden barrel ceiling, the remains of which are found at the National Library of Scotland. An open-timber roof over the nave similar to Tullibardine chapel could have been used, but given the size of Kildalton chapel, a small variation of the Guthrie church roof has been used.



*Figure 26. Guthrie Collegiate Church, Guthrie Aisle, interior, roof*



*Figure 27. Open form roof of Tullibardine Chapel(Woolf, 2016)*

A barrel wooden roof structure was added to the model above the altar as found at Guthrie Church in Angus, whose design also included painted depictions. These painted images dates to the late 15th century and are one of only a few of painted ceilings that survive from before the Reformation. The paintings found at Guthrie depict the Last Judgement, where Christ sits on a rainbow in judgement on humanity, with John the Baptist and the Virgin Mary interceding for the souls of the faithful.



*Figure 28. Part of a ceiling of painted oak From Guthrie Church, Angus (National Museums Scotland, 2017)*

With the painting included on the screen at Kildalton, the inclusion of paintings was also felt to be of importance within the barrel-vaulted roof. The paintings and decoration of the screen and barrel that are included within the reconstructed model of Kildalton are based on the Doom paintings found at Fowlis Easter church.



*Figure 29. The barrel ceiling at Guthrie*

Images of Hell were a prominent part of church culture, and these Doom paintings were used to symbolise the need for each person to consider their choices made throughout their life. Through Church teachings, each individual would meet their salvation through Heaven or their damnation in Hell (Rosewell, 2014, 41) and these paintings, as with sermons, were used as a reminder of this. Other examples of Doom paintings survive at the Holy Trinity Church, Coventry, Marston Moretaine, Bedfordshire and Great Harrowden, Northamptonshire. These were usual depicted on church walls, but in some instances, as shown at Guthrie Church, Doom paintings were also present on wooden boards and this has been utilised within the reconstruction at Kildalton.



*Figure 30. Hell painted on the a wooden ceiling from the Guthrie Collegiate Church (Bartlett, 2009)*

In Rosslyn Chapel, south of Edinburgh, there is a 15<sup>th</sup> century depiction of the Mouth of Hell with a devil that carries a carving of fireworks bursting from his pitchfork. The Mouth of Hell appeared in church paintings and carvings as a war. Hell was commonly represented as the jaws of a dragon, as on the representation of the harrowing of hell on the font at Fowlis Easter. The inclusion of this depiction was of paramount importance with the Kildalton model.



*Figure 31. Stone version of the Mouth of Hell at Rosslyn Chapel (Greenteeth, 2017)*

For the barrel vaulted ceiling, a depiction of the Mouth of Hell from Pickering was agreed upon as it still had evidence of colour, which is often missing from present remains. Colour was an important aspect in the Doom imagery and was often removed from church buildings following the Reformation.



*Figure 32. The Descent into Hell at Pickering Church, Yorkshire (Ross, 2017)*

The inclusion of the Mouth of hell was added to one side of the barrel roof. It would have been unusual for a single depiction to be present and to add to the overall effect of the imagery, we have added a painting of the weighing of souls from Rotherfield as another representation.

St Michael weighing souls was a prominent depiction shown in Doom paintings, often seen with the Dance of Death and Mouth of Hell images (Rosewell, 2014, 44). The first known representation of St Michael weighing souls dates to c.1200 and can be found at Chaldon, Surrey and by the fourteenth century, the image became a standardised depiction (Rosewell, 2014, 45). Examples of this depiction survive at Catherington, Hampshire, Croughton, Northamptonshire, and Swalcliffe, Oxford.

There is evidence in Surrey that dates to the 12th Century as shown in the below image. This representation however is present on an interior wall is too elaborate in detail to be included on the ceiling, whilst fitting within the overall theme of the chapel.



*Figure 33. The Purgatorial Ladder, or Ladder of Souls, with the Seven Deadly Sins: Chaldon, Surrey c.1200 (T.Marshall, 2008)*

A later edition of this representation is found at Rotherfield in East Sussex and dates to the 15<sup>th</sup> century. DStretch (Harman, 2017) was applied to this image to extract more detail and an amalgamation of the colour extracts has been included on the ceiling.



Figure 34. *St. Michael Weighing Souls, Catherington, Hampshire (Portsmouth) c.1350 (T.Marshall, 2005)*



*Figure 35. St. Michael Weighing Souls at Rotherfield, E. Sussex (Chichester) (T.Marshall, 2000)*



*Figure 36. DStretch images of the weighing of souls painting from Rotherfield*

A consideration was also made in using a simplistic drawing of Mary and John the Baptist kneeling beside Our lord at the Last Judgment from Ickleton church in Cambridgeshire. This however was felt to be too large to be include within a ceiling design, and representation of the Lord and Mary are found elsewhere within the chapel.



*Figure 37. Mary and John the Baptist kneeling beside Our lord at the Last Judgment from Ickleton church in Cambridgeshire (Marshall, 2002)*

The imagery that has been chosen was based on the best-fit date and in accordance with the overall aesthetic of the chapel, though consideration was also given to reference material that could be best projected for digital painting with limited distortion.

The internal aspect of the chapel has already been noted above but the interior masonry would have likely been painted in a similar style to Torphichen Preceptory Church where red paint outlines the bricks, with the irregularity of the stonework showing through the paintwork.



*Figure 38. Torphichen Preceptory Church, interior, painted masonry lining above north side pulpitum arch*

In Bob Marshall's reconstruction a similar design can be found but his walls appear too perfect to be correct and we have added a more representative hand drawn style, suggested by the evidence at Torphichen Preceptory Church in the hope that it is more authentic

The font and piscina would have been simple and made of local stone. The piscine remains in situ at Kildalton and a reference photo from Forteviot Church was used as a basis for the font. The windows in the chapel would have been oiled parchment rather than glass (Albers, 1971, 14, Goldstein, 1976, 43, Weaver, 1978, 62, McKeel, 2016, 261).

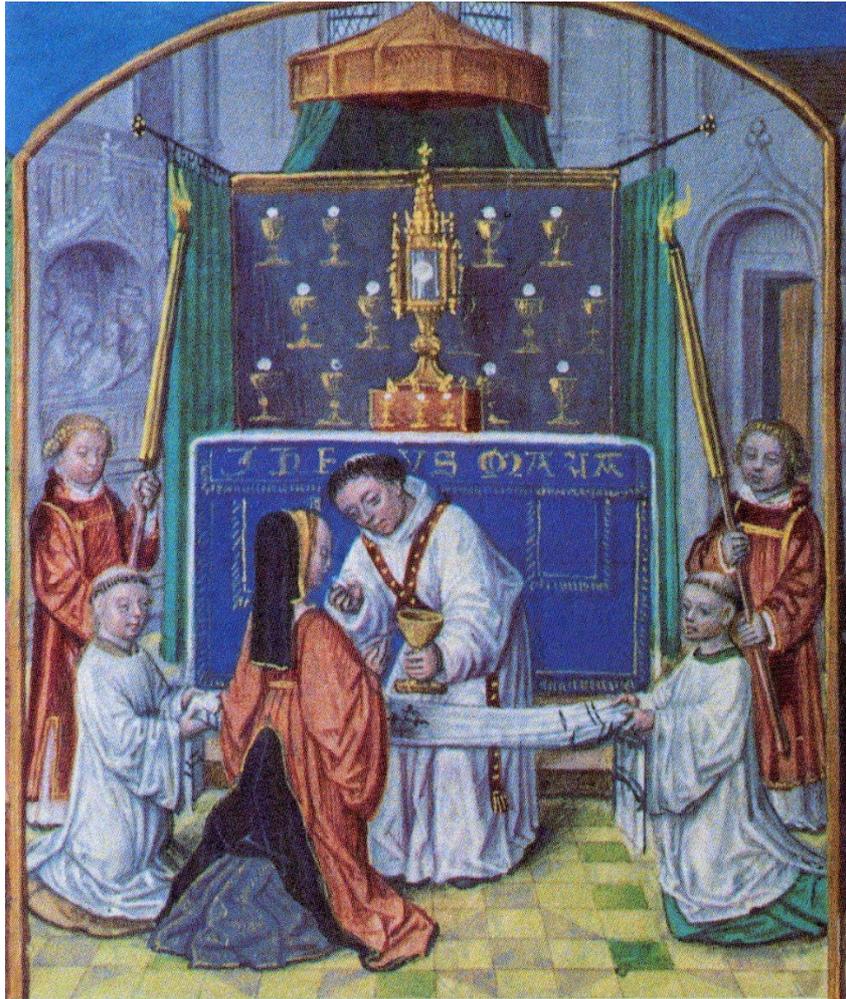


*Figure 39. The font at Forteviot (Image supplied by Prof. Fawcett)*



*Figure 40. Kildalton Church, piscina (Image supplied by Prof. Fawcett)*

The altar of the chapel would have been in a simple form, raised by steps and would not have been housed within a canopy, rather masked by two side curtains to allow the altarpiece to be the focal point (Clifford, 1982, 98). These curtains were textured in a similar pattern and colouration to those found in the 15<sup>th</sup> century scene of communion painting from Oxford, Bodleian and the more current curtains at St Wilfrids church in Cantley, Yorkshire.



*Figure 41. Scene of communion painting from Oxford*



*Figure 42. St Wilfrids, Cantley in Yorkshire (Chadwick, 2013)*

The altar table would have been furnished with a rich textile frontal (Clifford, 1982, 97) and a white cloth was added to the model to provide this, white being the emblem of innocence. The table was adorned with a small-hinged altarpiece screen, decorated in a similar style to the mid-14<sup>th</sup> century triptych from the National Galleries collection, which depicts imagery of both the Virgin Mary and the crucifixion. The altarpiece used in the model relates to work completed Italy but the commissioning of such work was often completed across the continent, as shown in the Hugo van der Goes Trinity altarpiece at the Holy Trinity in Edinburgh, which was completed by the Netherlandish painter.



*Figure 43. 14th century triptych from the national Galleries Scotland collection (Reeve, 2017b)*

An alternative triptych, as shown below, could have been used within the reconstruction, but it was felt that having two representations of the crucifixion as central features would have been incorrect within a small religious building.



NATIONAL GALLERIES SCOTLAND

Triptych, 1338, Bernardo Daddi  
Photography by Antonia Reeve

Creative Commons - CC by NC

Figure 44. The Bernardo Daddi Triptych dating from to 1338 (Reeve, 2017a)

## Internal Textured Reconstruction



*Figure 45. View of the internal aspect of the Kildalton Chapel reconstruction showing the screen, painted walls, font and internal roof design*



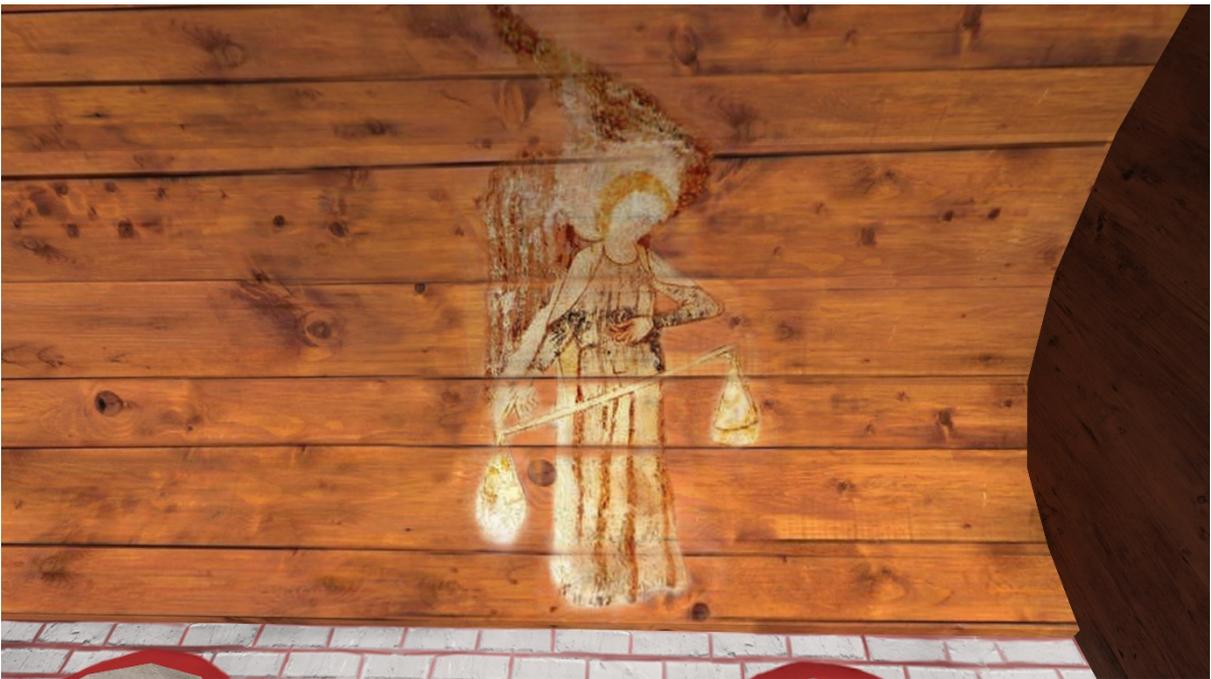
*Figure 46. View of the internal aspect of the Kildalton Chapel reconstruction showing the screen, painted walls, font and internal roof design*



*Figure 47. View of the internal aspect of the Kildalton Chapel reconstruction showing the altar, piscina and the painted barrel vaulted ceiling containing representations of the Mouth of Hell and St Michael weighing souls.*



*Figure 48. View of the internal aspect of the Kildalton Chapel reconstruction showing the painted barrel vaulted ceiling containing the representation of the Mouth of Hell*



*Figure 49. View of the internal aspect of the Kildalton Chapel reconstruction showing the painted barrel vaulted ceiling containing the representation of St Michael weighing souls.*



*Figure 50. View of the internal aspect of the Kildalton Chapel reconstruction showing the altar and piscina*



*Figure 51. The reconstructed altarpiece*



*Figure 52. View of the internal aspect of the Kildalton Chapel reconstruction showing the west internal wall*



*Figure 53. View of the internal aspect of the Kildalton Chapel reconstruction showing the reverse of the screen*



Figure 54. View of the internal aspect of the Kildalton Chapel reconstruction showing the reverse of the screen



Figure 55. The reconstructed piscina



*Figure 56. Window in the reconstructed model showing the oiled parchment*



*Figure 57. The reconstructed font designed in a simple form*

## Medieval Landscape

The original chapel would have been surrounded by a small settlement of houses and a priest's house (sacristy) within the chapel boundaries. In the Lowland areas, the evidence of an outward-opening door on the north side of the chancel area suggests that there was a structurally distinct sacristy at many churches. In the Highland areas, there is little evidence for sacristies as offshoots on the north side of the chancel, and there is no such evidence at Kildalton. The priest would have vested himself either in his own house or in a screened-off area of the church. The priest's residence would have been in the form a turf-roofed cottage, with ancillary accommodation for his horse and a barn for the storage of the tithes, which would have been his chief source of income. The priest would not have been particularly wealthy or of a high social origins, and his house is likely to have been little better than those of his better-off parishioners.

The chapel grounds at Kildalton were the subject of much debate and it was agreed that in the absence of sufficient evidence for the path of the original wall (the current day wall dating to the 19<sup>th</sup> century) that the model retain the overall wall location but re-model the wall as a drystone construction. Similarly the location of the priest's house and any additional settlement were none existent, as such the priest's house was placed on the rise to the west of the chapel where a geophysical survey had indicated evidence for a possible structure. The priest's house was based on a simple turf-roofed cottage with walling for animals. Inspiration for this was taken from the blackhouse style of construction, popular on the west coast of Scotland at the time, though using a turf roof as oppose to a thatch. Any other features that were shown in the geophysical survey are more likely to have been post-Reformation burial enclosures than medieval buildings. The location of the priest's house may differ from the original, but based on the evidence, the location provided is the most logical.

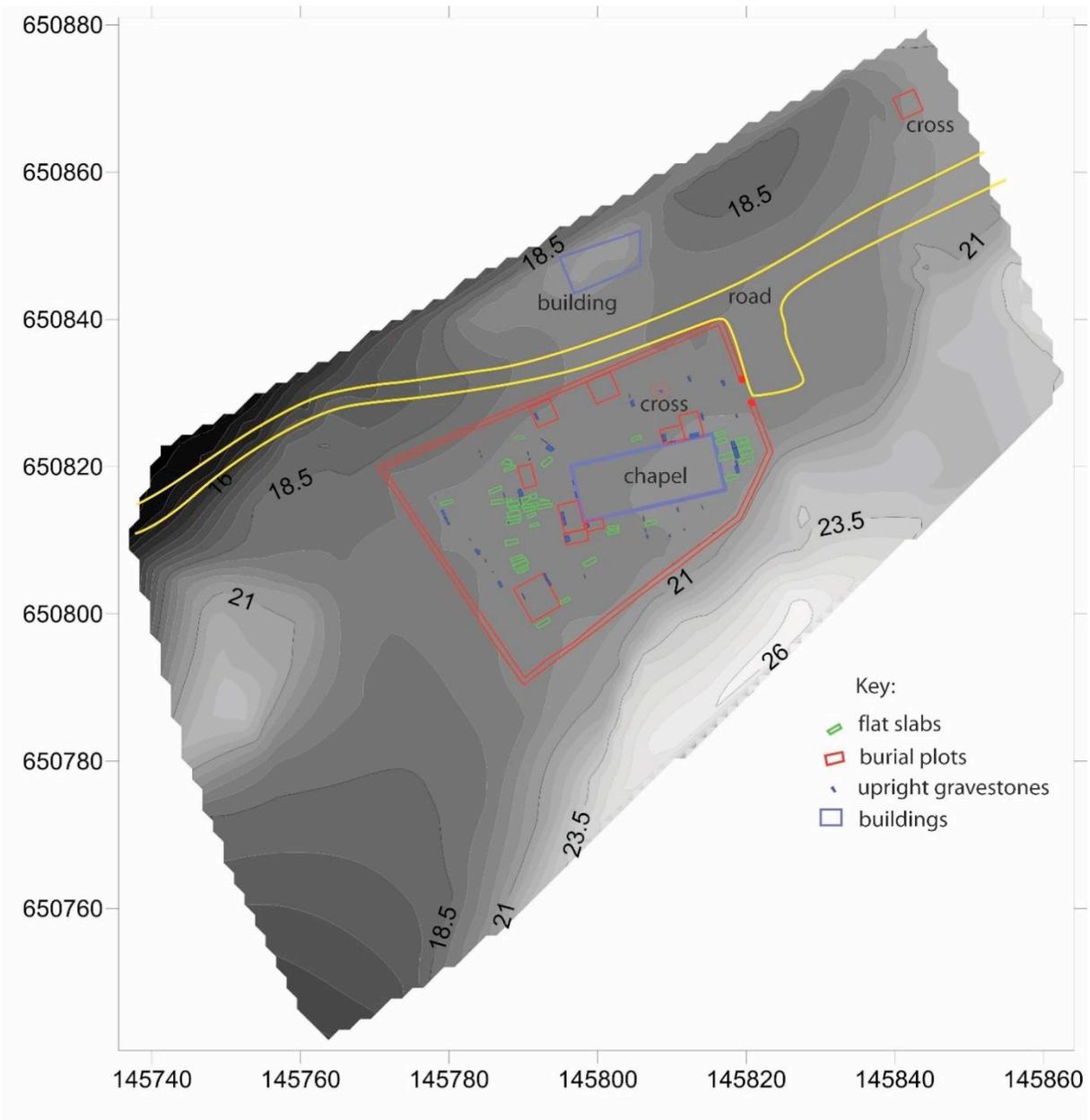


Figure 58. Contour survey of the burial ground and its surrounding with the plan of the burial ground (Maričević et al., 2017, 4)

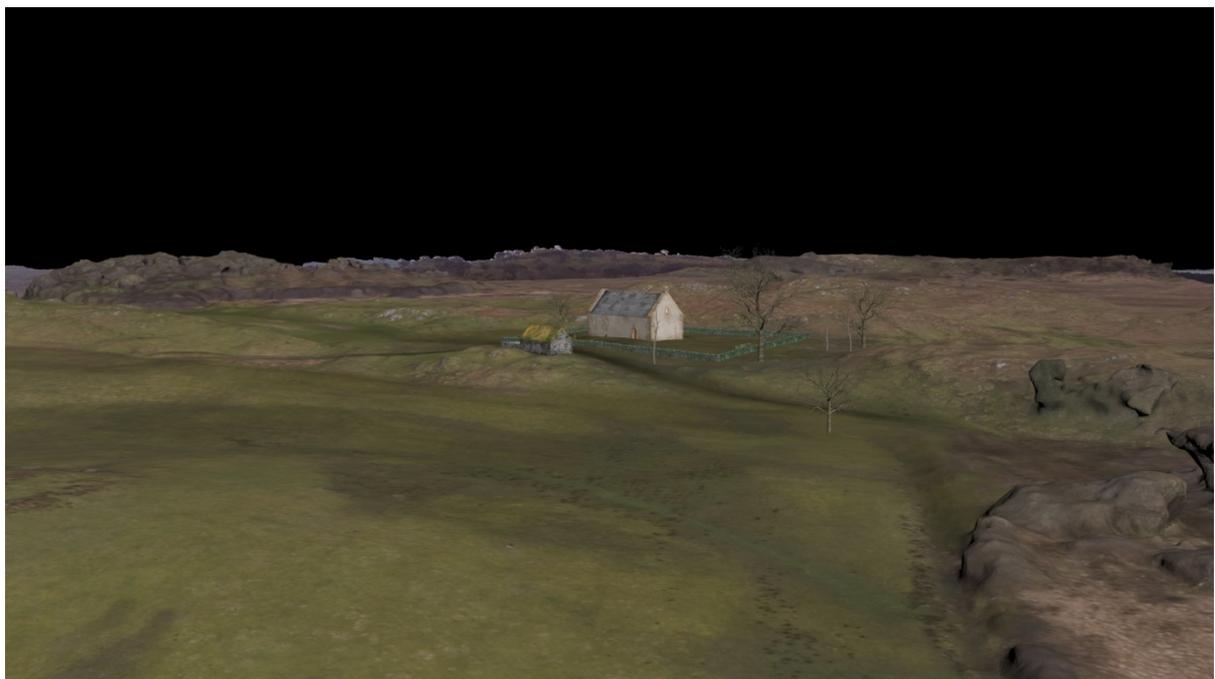
The graves that are included within the model are contemporary with the chapel and are believed to have been in the form of simple boulders, the exception being the Kildalton Cross, which was removed from its modern plinth. The location of the cross remains the same in the reconstruction though it is likely that it was elsewhere within the grounds during the original use of the chapel.

The photogrammetry mesh that was produced for the current landscape was digitally sculpted and painted to remove evidence of modern farming and roads, though pathways in the landscape remain similar to modern routes, albeit represented as dirt tracks rather than tarmac. The reconstructed model has been placed in the appropriate position and a representation of the model and medieval landscape will be included in the online viewer. Originally, the local settlement would have surrounded the chapel, but rather than falsify an incorrect representation of the unknowns, these additional supplementary houses belonging to the local parishioners have been excluded from

the overall model. A further geophysical survey, focussing on the collection of Ground Penetrating Radar data may provide further insight into these houses. This extra data would only be evident if the houses were formed of stone, as the remains of wood would have decayed and evidence would only be extracted through excavation.



*Figure 59. View of the reconstructed Kildalton chapel in the medieval landscape facing southeast*



*Figure 60. View of the reconstructed Kildalton chapel in the medieval landscape facing northwest*



*Figure 61. Top down view of the reconstructed Kildalton chapel in the medieval landscape*



*Figure 62. Close-up view of the reconstructed Kildalton chapel in the medieval landscape facing northeast*



*Figure 63. Close-up view of the reconstructed Kildalton chapel in the medieval landscape facing southeast*



*Figure 64. Close-up view of the reconstructed Kildalton chapel in the medieval landscape facing southwest*



*Figure 65. View of the reconstructed Kildalton chapel in the medieval landscape facing northwest*



*Figure 66. Close-up view of the reconstructed priest's house at Kildalton chapel*



Figure 67. Close-up view of the reconstructed priest's house at Kildalton chapel

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