APPEAL BY HARTMIRES INVESTMENTS Ltd.

Land North of Turners Hill Road, Turners Hill, West Sussex

APPENDIX 12 TO PROOF OF EVIDENCE

DRAFT PHOTOMONTAGE OF THE CREMATORIUM AND CHAPEL FROM LVA VIEWPOINT 4

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PLANNING INSPECTORATE REFERENCE:
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LOCAL PLANNING AUTHORITY REFERENCES:
DM/20/2877 AND AP/21/0009

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VIEWPOINT 4 - DRAFT 'Type 3' GPS verified photomontage 3D massing representation of proposed CREMATORIUM and approved CHAPEL (not indicative of colour/finishes)

130.53 degree Horizontal Field of View and 24.89 degree Vertical Field of View.

To be viewed **digitally at 125% enlargement** - see notes below.

Existing view - Winter - 23rd February 2021, 15:08

DRAFT Photomontage 3D massing - Winter - 23rd February 2021, 15:08

Panoramic view looking northeast through to south-southwest from Footpath 68W as it passes through the Site.

NOTE: Photomontage shown without mitigation planting.

GPS verified Latitude / Longitude	51.104087, -0.096443
GPS verified elevation	159.35m AOD.
Approximate distance to closest edge of Site	Viewpoint is located within the Site.

Notes: Cylindrical panoramic image - **to be viewed digitally** (see instructions for viewing below). If printed on A3 paper this image is for context only.

Instructions for viewing digitally: All images must be viewed with the horizontal markings ascending the left page border 100mm apart (achieved by adjusting PDF zoom level). This represents a 125% enlargement (refer to Technical Methodology at the end of this Appendix). The images should then be viewed at comfortable arm's length (exact mathematical reference point = 542mm from eye to image) by maintaining the head in a constant position (without turning) and panning the image from side to side - this maintains a constant viewing distance across the panorama and provides the best recommended representation of the view found on site.

Technical Methodology - Presentation of Photomontage

1.1. Introduction

1.1.1. All photomontages presented within this Appendix are "Type 3" photomontage, which have been GPS verified, and are presented following the guidelines set out within the Landscape Institute Technical Guidance Note (TGN) 06/19.

1.2. Camera equipment used

1.2.1. Photographs have been taken with a Nikon D3400 digital SLR camera (cropped frame sensor) with a 35mm prime lens with fixed focal length (Nikon Nikkor AF-S 35mm f1.8G DX lens). With this lens the camera produces an individual 6000 x 4000 pixel image which has a field of view of 36.79 x 24.53 degrees,[1] and the 35mm focal length together with the manufacturer's stated sensor multiplication factor of 1.5 gives a focal length of 52.5mm. This type of lens has low distortion and a field of view close to that of a human eye.

1.2.2. A Rollei C6i tripod has been used for optimal image quality and to ensure a level camera position throughout each panorama. On the tripod, a Nodal Ninja 3 Mk2 panoramic head was used to ensure the photographs are taken at regular intervals whilst panning across the scene. Intervals were set to 15 degrees with the camera in portrait orientation, providing approximately 39% overlap between adjacent frames.[2]

1.2.3. All photographs have been taken at 1.67m above ground level to replicate normal eye level views. Time and date has been recorded for each photograph.

1.3. GPS Survey

1.3.1. In combination with the photography a site survey was conducted using Leica GS07 GPS survey equipment set to the OSGB36 coordinate system.[3]

1.3.2. Coordinates were recorded for each camera position and for several points of reference visible within each of the photographs taken. Reference points were recorded on fixed features that are also present on the topographical survey.

1.4. Photostitching

1.4.1. All photographs have been stitched together using Photomerge ('reposition only' layout) in Adobe Photoshop, with manual control over image alignment.

1.5. 3D modelling

1.5.1. A 3D model was produced for both the proposed crematorium building and the approved chapel using SketchUp 3D modelling software.

1.5.2. The approved chapel has been shown with its 'basement' which would be below ground level on three sides, and its Finished Floor Level (FFL) has been shown with a dashed line on the photowire views (see Figure 1 opposite).

1.5.3. The GPS survey data was then verified against the Site topographical survey, and inserted into the 3D model.

1.5.4. For each viewpoint created the surveyed coordinates were used to locate the virtual camera within the model, and the virtual camera was set up with the same field of view and at the same height as the real camera. The lighting of the proposal was then simulated within the model to match the date, time and conditions of the photographs taken for each viewpoint, and both wireframe and 3D massing images of the model were exported to match the individual frames of the panoramic photograph.
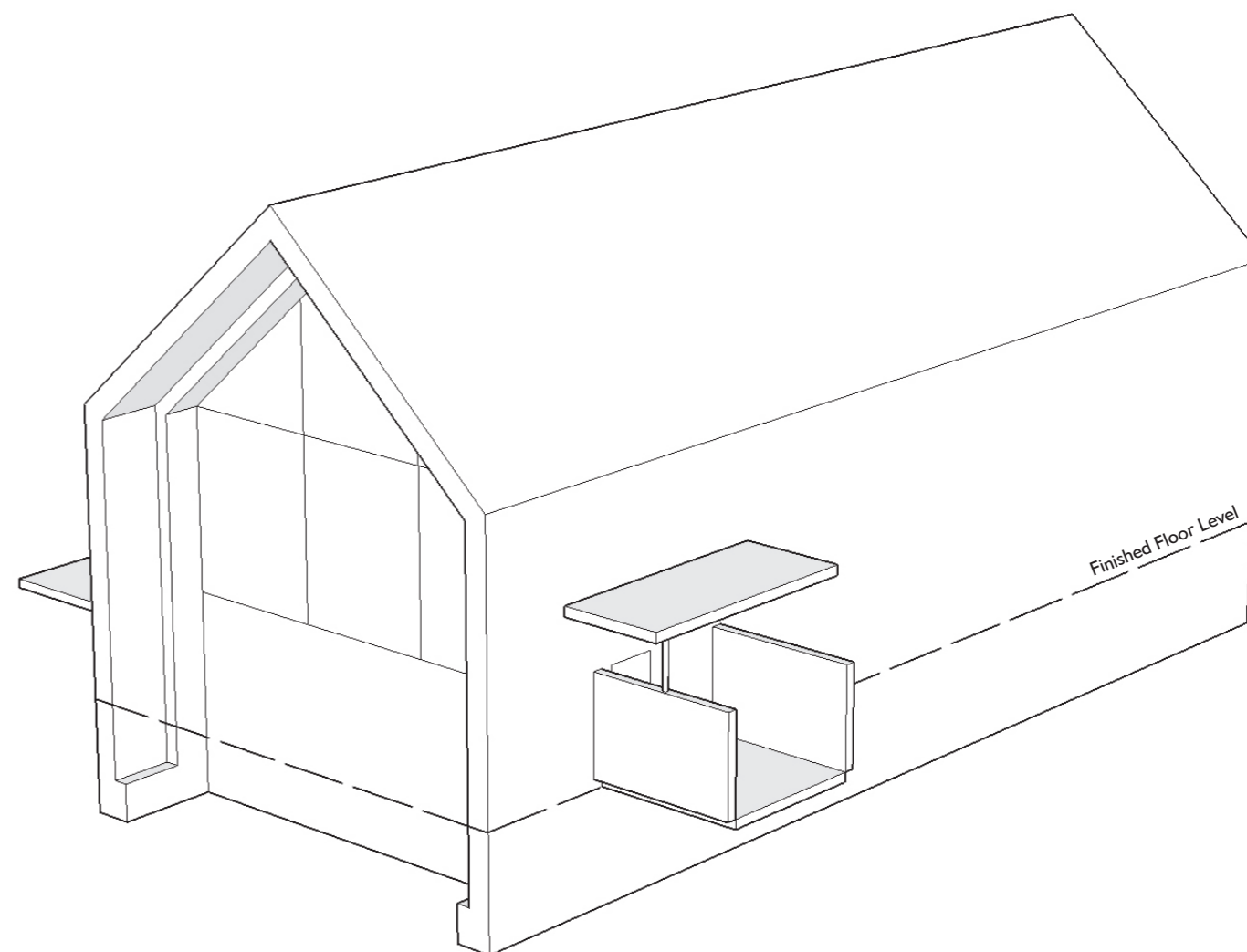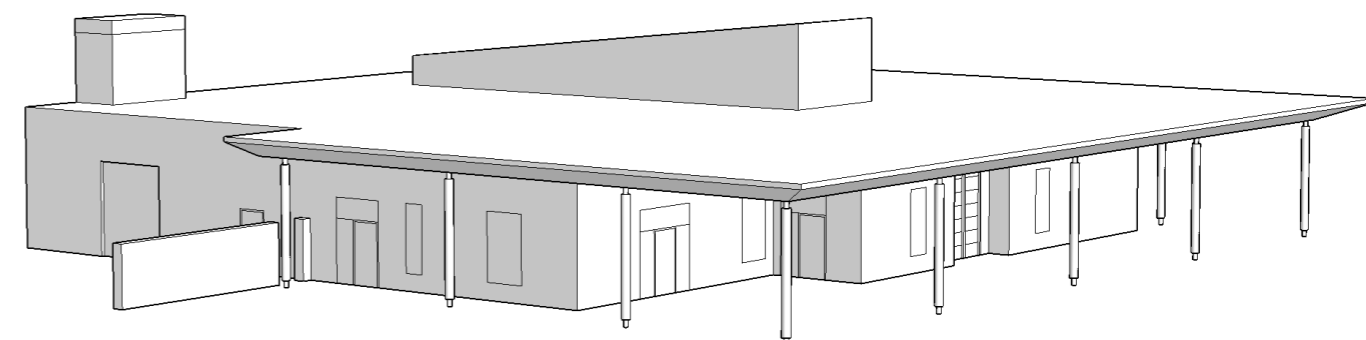

FIGURE 1 - Approved chapel 3D model

FIGURE 2 - Proposed crematorium 3D model

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1   Calculated by horizontally measuring a 360 degree, manually stitched panoramic photo (taken using the same Nikon D3400 camera and 35mm fixed focal length lens in landscape orientation) to establish the relationship between pixel dimensions and degrees of field of view, and then dividing the number of pixels per photograph width (or height) by the number of pixels per degree to give the Horizontal or Vertical Field of View. In this case a 360 degree montage measures 58,704 pixels, so the number of pixels per degree of field of view = 58,704 ÷ 360 = 163.06666. The HFoV of a landscape image therefore measures 6000 ÷ 163.06666 = 36.79 degrees; and the VFoV of a landscape image therefore measures 4000 ÷ 163.06666 = 24.53 degrees.

2   Exact percentage of overlap = 38.85038%.

3   This equipment records data points to within 50mm accuracy.

1.6. Alignment with photographs

1.6.1. The images from the 3D model were then stitched together using Photomerge ('reposition only' layout) in Adobe Photoshop and the images were overlaid upon the pre-prepared photographic panoramas. A minimum of three surveyed reference points visible from each viewpoint was used to confirm this alignment and to verify that the process had been successful.

1.6.2. For the photowire representations the wireframes generated were simply placed over the photographic panoramas to show the location of the buildings relative to foreground features (topography, vegetation etc).

1.6.3. For the photomontage 3D massing representations, the images were edited to remove those elements of the model that would be hidden by the foreground features. The buildings have been modelled as white solid forms, which with the shadows created in the model present as tones of white and grey. Finished materials have not been applied.

1.7. Additional components

1.7.1. Proposed planting can be added in Photoshop (based on available plant data and positional information in the 3D model), but this has not been done in this case.

1.7.2. The images presented are shown without any mitigation either in the form of materials or planting.

1.8. Presentation of the final images

Panoramic images:

1.8.1. Cylindrical panoramic images have been presented throughout, as humans typically have wider peripheral vision than the 39.6 degree Horizontal Field of View (HFoV) captured in a single photograph taken with a 'full frame' 50mm focal length SLR camera (or equivalent). Furthermore humans are not static, and when taking in a view we generally move our heads from side to side and therefore experience a wider field of view.

Image scaling and viewing distance:

1.8.2. Landscape Institute Technical Guidance Note (TGN) 06/19 (paragraph 3.8.3) recommends viewing images at "comfortable arm's length" of between 500 and 550mm, and paragraph 3.8.4 sets out the 'mathematically correct' viewing distance of 542mm for a monocular view 100% reference[1] 50mm focal length image presented at 390mm x 260mm on an A3 sheet.

1.8.3. Using this viewing distance, the size at which the images must be presented (in both digital versions and as printed images) can be found by plotting a horizontal distance of 542mm from the theoretical centre of the viewers eye (the 'eye co-ordinate') to the centre of a vertical line which represents the photograph, in elevation see Figure 3 below). The camera's Vertical Field of View (24.53 degrees for a landscape image) is then plotted as a widening 'cone' from the eye co-ordinate towards the vertical line, and the distance between the points where this cone intersects the vertical line is the appropriate image height dimension for presentation of the 4000 pixel height (landscape) image created by the camera at a 542mm viewing distance – this gives a dimension of 235.66mm though this is for a monocular view using the camera's focal length of 52.5mm. The image is then scaled according to the enlargement details below to take account of both the 'binocular' nature of human vision and to correct the focal length to 50mm equivalent.

Image enlargement:

1.8.4. The photographs are presented as enlarged images, with enlargement factors stated on individual photosheets. This is to account for the difference between the camera's 52.5mm focal length and the mathematically correct 50mm focal length for a 100% reference image (a difference of 5%); and the fact that humans generally have 'binocular' vision (whilst cameras are 'monocular' in nature) and that a degree of image enlargement provides a better impression of scale for most viewers using two eyes (refer to Landscape Institute Technical Guidance Note 06/19, Section 3.8). Our approach is therefore to use **150% enlargement** for viewpoints in expansive / open landscapes or seascapes, where components are more distant (in accordance with TGN 06/19, paragraph 3.8.8); and **125% enlargement** in mid to smaller scale landscapes / townscapes (refer to TGN 06/19, paragraph 3.8.10).

Calculating the field of view presented:

1.8.5. The images presented in this appendix have been cropped both horizontally and vertically for presentation purposes, and both the Horizontal Field of View and the Vertical Field of View has been indicated on the images presented.

1.8.6. To do this the field of view of the photographs presented has been calculated by horizontally measuring a 360 degree manually stitched panoramic photo and determining the number of pixels in one degree of the field of view (1 degree = 163.06666 pixels as set out in footnote 1 above); and then, by counting the pixels presented on both the digital and printed images, both the Horizontal Field of View and the Vertical Field of View has been calculated.

Final images:

1.8.7. For the **digitally presented images** the final images are 'Type 3' GPS verified photomontage images with a Horizontal Field of View of 130.53 and a Vertical Field of View of 24.89. These have been presented at 300dpi in PDF versions of the Appendix and are **intended to be viewed digitally**.

1.8.8. For the **reference images** the final images are 'Type 3' GPS verified photomontage images and have a Horizontal Field of View of 71.67 and a Vertical Field of View of 21.86. **These are intended for presentation in printed form on A1 paper**.

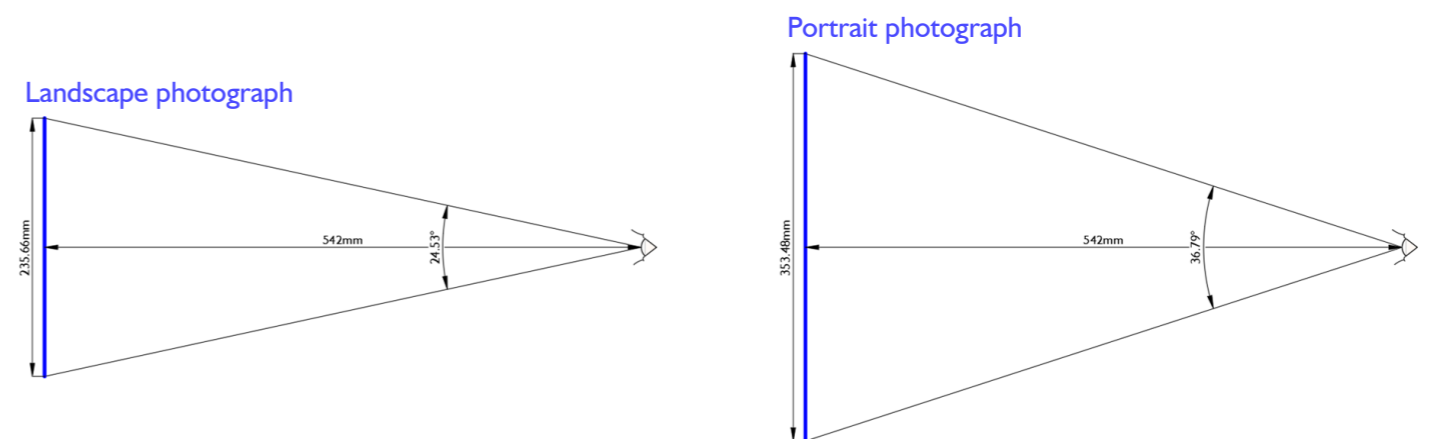1.8.9. Instructions for viewing all images are given on the individual photosheets.

FIGURE 3 - Image geometry

Landscape photograph

Portrait photograph

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1   A 100% reference image = without enlargement.