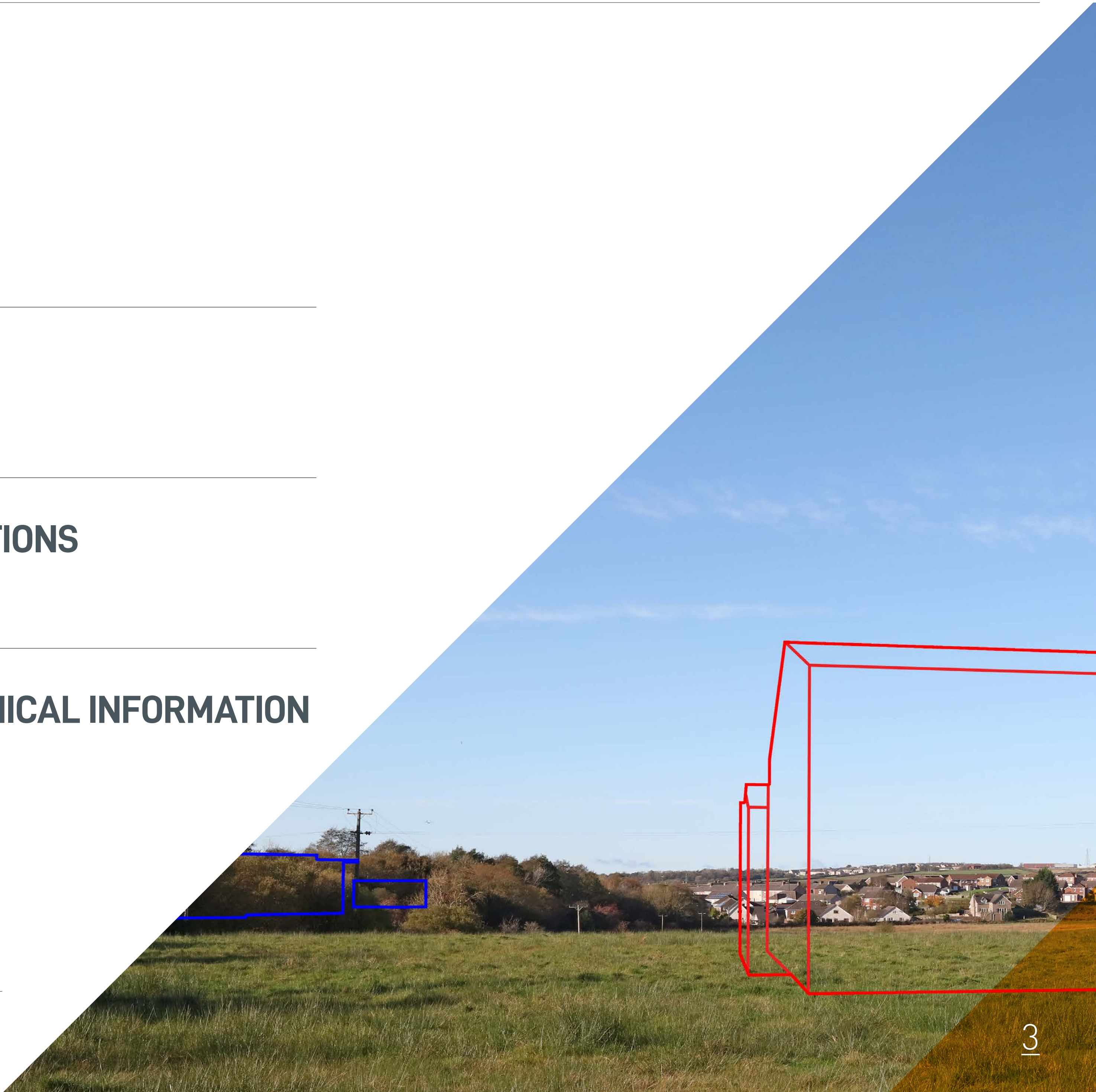
CLEATOR MOOR INNOVATION QUARTER

VIEW VERIFIED PHOTOMONTAGES

MAY 2022

CONTENTS



01

INTRODUCTION

This report forms part of the planning application for a new proposed development known as Cleator Moor Innovation Quarter

PB imaging were commissioned in November 2021 by One Environments to produce dimensionally accurate photomontage images of the proposals.

Photographs of the existing views are overlaid with rendered representations of the Proposed Development. All design information has been supplied by Norr Architects and One Environments Landcaspe Architects, images should be read in conjunction with the architectural drawings.

Visualisation Consultant: Peter Bailey, PB Imaging

Photographer: Daniel Vaughn, Digital Fire

Land Surveyor: Eric Hinds, Landform Surveys

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METHODOLOGY

2.1 Photography

A separate professional photographer who has experience with working on verified imagery is used to take the photography. The photographer uses an ultra-high resolution digital SLR with fixed focal length lenses. Following the visualisation consultant's guidance, the photographer will set up the viewpoint using an initial draft photograph normally from a previous site visit or supplied by the design team.

Once the camera is located it is set on a tripod and set to a height of 1600mm from ground level this is thought to best represent human eye level. The visualisation consultant will then cross check the photo frame before the photography is taken.

The location is then marked using a survey nail and marking paint with photographic records also being made. For further information on the technical specifications please refer to Section 04.

2.2 GPS Survey

An independent professional land surveyor is commissioned that has experience in surveying for accurate visually verified photomontage work.

The surveyor is issued from the visualisation consultant a marked-up photograph for each view showing which fixed topographic points to survey normally there will be 10-15 per viewpoint. These may include lighting columns, building ridge lines, roof verges, or similar such details. The surveyor will also accurately survey each camera location using the survey nail located from plans and photographic records following the photography site visit.

The final land survey information will record for each point surveyed the Easting, Northing and Height AOD relative to the Ordnance Survey grid coordinates. The information is then issued as a excel sheet, text file and 3d AutoCAD file.

2.3 Camera Match Photography

Following the GPS survey, the visualisation consultant will then import the survey data into 3d software. Each camera is then virtually created within the software using the same focal length as the background photography and positioned at each viewpoint location. Each viewpoint photograph is then set into the software as a backplate with adjusting the virtual camera target until the surveyed points overlay at the surveyed locations. Once all points are checked the virtual camera is locked in position and is classed as camera matched to the photograph.

2.4 Digital Model Creation

Using the architects two dimensional drawings the visualisation consultant will create an accurate three-dimensional model of the proposed scheme by using 3d software. In some cases, the architect may provide a 3d model of the proposals which can be used if compatible and checked for accuracy to current architectural drawings.

The model is then positioned relative to the proposed masterplan and at the correct easting and northing coordinates to align exactly with the survey data. The building is then set to correct AOD height and cross checked with the architectural drawings.

2.5 Materials and Lighting

Once the model is created and positioned photorealistic materials are then applied to the surfaces of the model.

Once the model has materials applied to the surfaces lighting can be added to simulate how the model would appear in reality and ultimately in each photograph. By using the metadata for each photograph and using the latest 3d software the suns position can be set within the 3d software matching the light and shadow relative to each of the background photographs.

Alongside accurately portraying the sunlight the software also produces ambient light, shadows and reflections.

2.6 Rendering

Using a specialised third-party render engine, the software will then produce a computer-generated image of the proposals taking into account the Materials and Lighting applied to the model. The final resolution of the rendered image is then matched to the resolution of the photography to allow the rendered image to overlay exactly in the correct posistion.

2.7 Post Production

Finally, photoshop is used to blend together the rendered image and photograph. Using render passes from the 3d software the buildings materials, lighting and reflectance can be adjusted. Any foreground elements that may hide the proposals can then be masked out. Lighting enhancements or additional entourage can be added to create the final image.

This documnet has been prepared in accordance with the Landscape Institute's - Visual Representation of Development Proposals - September 2019

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TECHNICAL VISUALISATIONS

3.1 Eleven Viewpoint positions were agreed in consultation with the local authority.

View	Page	Notes	OS - E (M)	OS-N(M)	Height AOD (M)	Type	Projection	Enlargement	FOV	Camera Make	Lens/Focal Length	Distance to Site (M)	Direction of View	Camera Height	Date	Time
3	10		302199.307	516218.204	106.020	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	431M	SOUTH WEST	1.6M	04/11/2021	12:39
4	12		302237.488	515508.924	87.081	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	1M	NORTH WEST	1.6M	04/11/2021	13:07
8	14		304460.110	513732.579	183.085	Type 4	Planar	100%@ A3	39.6	Canon EOS 5DSR / FFS	50mm F1.4 DG HSM | Art 014	2850M	WEST	1.6M	04/11/2021	14:02
10	16		303733.695	513054.636	342.646	Type 4	Planar	100%@ A3	39.6	Canon EOS 5DSR / FFS	50mm F1.4 DG HSM | Art 014	2900M	WEST	1.6M	04/11/2021	15:14
11	18		301872.917	515255.635	88.566	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	0M	NORTH	1.6M	04/11/2021	16:09
13	20		301416.062	515393.636	80.235	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	24M	NORTH EAST	1.6M	04/11/2021	16:24
21	22		301718.156	515924.437	79.371	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	7M	SOUTH EAST	1.6M	04/11/2021	12:53
A	24		301553.173	515859.295	87.536	Type 4	Planar	115%@ A1	73.74	NIKON D850	24mm f/3.5	93M	SOUTH EAST	1.6M	13/12/2021	12:18
B	26		301651.232	515865.295	83.201	Type 4	Planar	115%@ A1	73.74	NIKON D850	24mm f/3.5	15M	SOUTH EAST	1.6M	13/12/2021	12:26
C	28		302033.699	515419.356	82.390	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	232M	WEST	1.6M	04/05/2022	13:29
D	30		301932.349	515085.449	90.051	Type 4	Planar	115%@ A1	73.74	Canon EOS 5DSR / FFS	24mm F1.4 DG HSM | Art 015	98M	NORTH WEST	1.6M	04/05/2022	13:39


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GREGGS

03

04

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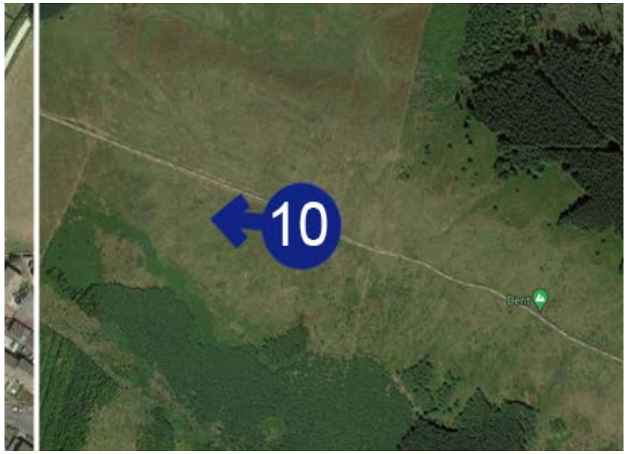

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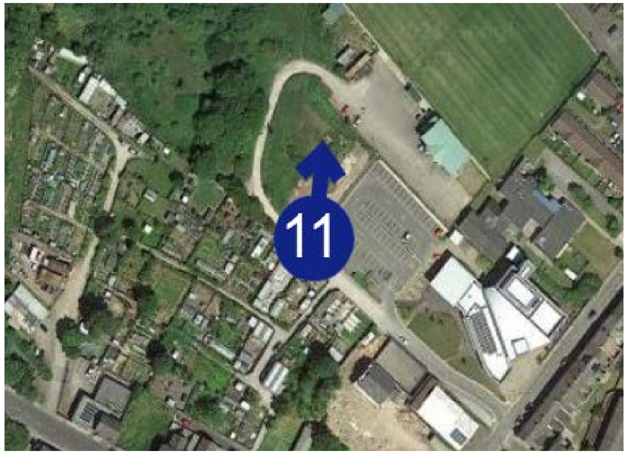

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Thermometers & Instrumentation

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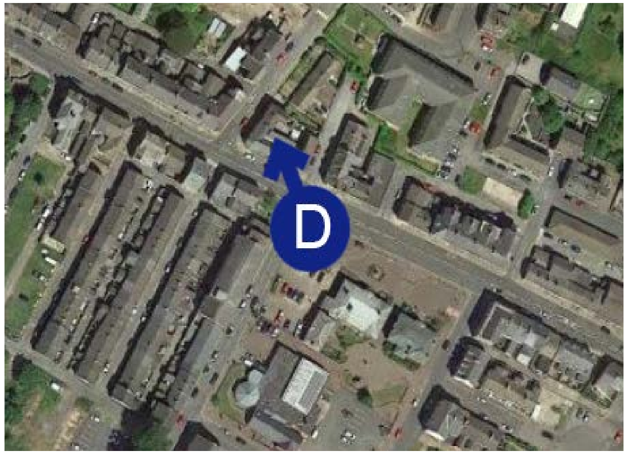
MARK THOMPSON
CLOSE

D

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BETFRED
GREGGS

04

EQUIPMENT AND TECHNICAL INFORMATION

4.1 PHOTOGRAPHY

In order to achieve complete accuracy, we use ultra high resolution cameras and fixed focal length lenses. The sensor and lens information syncs with our software along with the geographical location and elevation. The range of lenses we use ensures a range of views and perspectives. (Kit specifics - Canon 5DSR & Sigma Art / Canon lenses, focal lengths ranging from 17mm - 200mm). See Figure 1 for example of camera and tripod.

Figure 01

4.2 GPS SURVEY

Landform Surveys Ltd. (LFS) were contracted to undertake the survey of each viewpoint as marked on the ground beneath the camera at the time the photograph was taken (and recorded by way of digital photograph) and all the required points on the relevant buildings (as marked on the background plate).

The survey was co-ordinated onto the Ordnance Survey National Grid (OSGB36) by using Global Positioning System (GPS) equipment and processing software. The Ordnance Survey National Grid (OSGB36) was chosen as it is the most widely used and because it also allows the captured data to be incorporated into other available digital products, such as Ordnance Survey maps. The height datum used was Ordnance Survey Newlyn Datum which is also derived using GPS.

The method employed for the GPS was using the Network RTK (Real Time Kinematic) as utilised by the Trimble VRS Now service. This service enables the surveyor to determine the coordinates of a point instantly and will achieve accuracies of around 10-20mm in plan and 20-40mm in height, as outlined in the guidelines for using the GPS in land surveying produced by the Royal Institution of Chartered Surveyors.

LFS used a base line consisting of two semi-permanent GPS base stations for each viewpoint. Generally one of the baseline stations used was the viewpoint from which the photograph was taken. This has the advantage of helping the surveyor with the identification of the points to survey as the theodolite has the same field of view as the camera. The stations were located far enough apart so as to optimise the results for the area of operation, and were tied into the National GPS Network as described above. Where this was not possible due to the presence of objects restricting the satellite signal – for instance tall buildings and trees – other stations were set out using conventional survey techniques for instance a traverse.

The particular points on each building as marked up on the background plate are surveyed using conventional survey techniques utilising electronic theodolite and reflectorless laser technology. The theodolite was positioned on the viewpoint which forms on end of the baseline as described and a reference angle was taken to the second station on the baseline. The points required were pre-marked on the photographs and were measured using reflectorless laser technology, which can measure a point up to 200 metres away, with a stated of accuracy of +/- 3mm.

The equipment used was a Trimble S5 Total Station – See Figure 1 and a Trimble R8 satellite receiver – see Figure 2. The survey data was processed using specialised survey software (LSS) and the resulting positions were output to Autocad.

Figure 01

Figure 02

4.3 IMAGE PRODUCTION

Once the accurate 3d model of the proposals is built we can begin the process of applying materials to the surfaces. The design team will provide references of the proposed materials (Brick, Glass, Metal etc). We have a vast library of high-resolution images of real-world materials we can use to create the bespoke textures for each project. See Figure 1 for material library examples.

In order to create accurate lighting, we can use a Daylight System within the software which by specifying a geographic location date and time will set the virtual sun at the correct Azimuth and Altitude. Another method we use to simulate environmental lighting is by using High Dynamic Range images (HDR) files See Figure 2 for an example.

Once the Lighting is complete, we can then input the metadata from the background Photograph into our virtual camera which mimics a real-world camera in terms of the f-stop, iso, etc. See Figure 3 for further details.

When the model is ready to be rendered, we have high powered PC's and a render farm capable of producing high resolution rendered images in very short time frames.

Figure 02

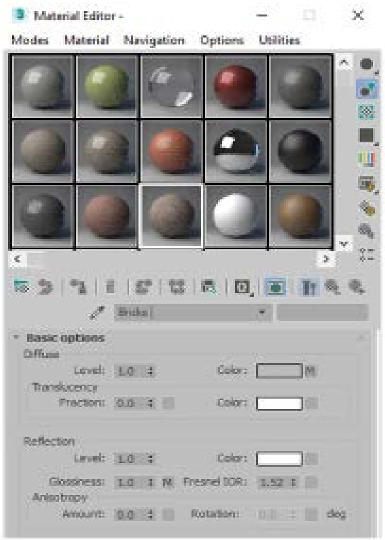

Figure 01

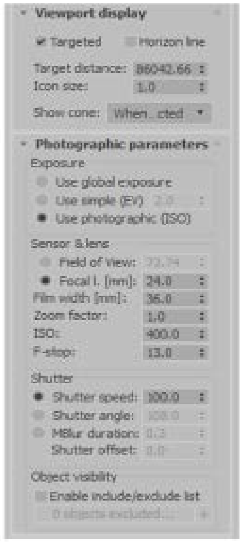

Figure 03

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