Environmental Impact Assessment Report (EIAR)

Volume 3 Part 4.2 Appendices

In respect of
The Royal Canal Urban Greenway

On behalf of
Fingal County Council

October 2026

This Volume should be read in conjunction with the EIAR Main Document. This Volume (Part 4.2) contains certain Appendices associated with Chapter 10 (Landscape and Visual) as follows:

Chapter 10 Landscape and Visual

Appendix 10.3: Verified Views (Photomontages) and Methodology

Appendix 10.4 DART+ WEST Technical Note for FCC

KPMG

Royal Canal Urban Greenway

Environmental Impact Assessment Report

Appendix 10.3 Verified Views (Photomontages) and Methodology (Gnet 3D Document)

October 2026

APPENDIX

VERIFIED VIEW MONTAGE METHODOLOGY

Document to be printed on A4. Prepared by G-Net 3D, NSC Campus, Cork. Tel: 021-230 7043

A **Verified View Montage (VVM)**—also known as an Accurate Visual Representation (AVR) or Visually Verified View—is a highly accurate, technical image that combines professional site photography and on-site viewpoint and reference markers surveying with 3D computer-generated imagery (CGI) to show exactly how a proposed development will appear in its surrounding environment. These images are "verified" because they are technically defensible and can be cross-checked against real-world survey data.

Verified views are essential for contentious or sensitive planning applications (especially in the UK and Ireland):

- **Planning Submissions:** Providing planners, inspectors, and objectors with an accurate evidence base.
- **Visual Impact Assessment:** Helping to evaluate how a new project fits into the existing landscape or streetscape.
- **Transparency:** Eliminating guesswork, allowing stakeholders to see a realistic, objective representation.

1. Purpose and Scope

This document defines the methodology used for the production of **Verified View Photomontages** for planning, design, and visual impact assessment purposes.

The process is aligned with the *Landscape Institute's Visual Representation of Development Proposals* (2019) and other established industry best practices.

The primary objective is to ensure that all outputs are:

- geometrically accurate,
- geographically and survey referenced,
- reproducible and verifiable,
- suitable for planning submission and stakeholder review.

2. Software

The following software tools are used throughout the workflow:

- 3D Modelling software: we mostly use Autodesk 3ds Max or Lightwave 3D for modelling, scene assembly, camera matching, and spatial integration.
- Physically based rendering engines such like Corona Renderer, V-Ray or equivalent software.
- Adobe Photoshop – compositing and final photomontage post-production.
- Optional: aerial photogrammetry software where drone imagery of the site can be obtained.

The workflow supports multiple CAD/BIM formats including Revit, SketchUp, Archicad, IFC, DWG, PDF, and other client-supplied datasets.

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3. Photography

Site photography is conducted using:

- Sony Alpha ILCE-7RM3A
- Fixed focal length lenses: 50mm, 24mm or 14mm (used only in exceptional circumstances where a wider field of view is required).

For each viewpoint, two photographic versions are captured (24mm and 50mm), allowing selection of the most appropriate composition depending on contextual clarity and planning requirements.

The *Landscape Institute's Visual Representation of Development Proposals* (2019) states that a 40° horizontal field of view captured using a 50 mm lens most closely represents normal human visual perception and is recommended for the verified view photomontages.

A 24mm - wide angle is selected for the photography to provide more information on the context around the proposed development and in the close-up views where the proposed development doesn't fit into the view. The horizontal field of view of these photographs is 74°. In the cases where the wide lens is used, there should be an indication of 40° field of view, which is shown at the bottom of all the views.

When printed at A3 size, the recommended viewing distance is approximately 500 mm for images captured using a 50 mm lens and 300 mm for images captured using a 24 mm lens.

Capture methodology:

- Use of tripod with integrated spirit level to ensure a level horizon.
- Use of laser measuring device to record camera height above ground level.
- RAW image capture for maximum post-production flexibility.
- Controlled exposure settings based on site conditions.
- Photographs are captured at approximately 10° intervals, providing coverage of up to 120° and allowing the most suitable viewpoint to be selected during subsequent processing.

Fig 3.1 Illustration of camera positioned on tripod on site.

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4. Essential Metadata Capture

To accurately record metadata for Verified View Montages all technical details of site visit are documented to be used in rendering suite. This is step by step workflow we follow:

- Clock Calibration. Before heading to site we synchronize camera's internal clock with survey equipment and GPS clock to ensure exact alignment with solar calculation software.
- Record Weather Conditions:
    - Sky Condition/ Cloud Cover. We log the description of cloud types and percentage of coverage (e.g., clear sky, overcast, broken clouds) which dictates direct sunlight vs diffuse ambient light.
    - Visibility: we assess the air clarity (e.g. clear, hazy, misty) to account for atmospheric attenuation on long-range views.
    - General Description is recorded: Short descriptive text accompanying the viewpoint metadata (e.g., "bright sunny intervals", "even overcast light" or "clear visibility).
- Spatial & Survey Coordination: we document the precise XYZ coordinates of the camera's optical node and target points retrieved via an RTK GNSS receiver.

5. Post Site Work on the Photographs

Following the site visit, the photographs are reviewed to determine the most appropriate viewpoint and focal length for representing the proposed development. The selected baseline photos are then issued to the client for confirmation. Once confirmed, the photos would be post-processed and tidied up – minor transient elements, such as litter, may be removed. Vehicle registration plates and identifiable faces are obscured to comply with GDPR requirements.

Fig 4.1. Sample of baseline photography

6. Survey Data and Input Information

Base spatial information is typically provided by the client in the form of:

- CAD drawings
- topographical and contextual site data
- Additional site data is captured by our on-site surveyor using GNSS surveying equipment: GeoMax Zenith60.

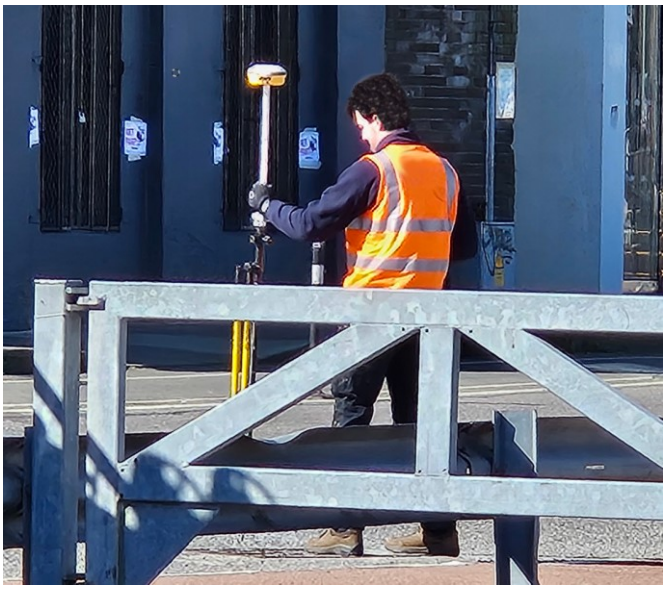
Each photographic viewpoint is recorded with precise:

- horizontal coordinates
- elevation data
- spatial reference information

This ensures accurate georeferencing of all camera positions within the 3D environment.

Viewpoint locations are indicated in the Viewpoint Map provided with Verified View Montage booklet, viewpoint coordinates and information on photography is under each photo.

Fig 5.1 Illustration of our surveyor on site recording coordinates of the viewpoints and reference markers.



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7. Camera Positioning and Georeferencing

Following site photography and surveying, spatial data is provided in the form of:

- DXF file containing surveyed camera positions (GNSS-based)
- TXT file containing coordinate and elevation data for each viewpoint

Fig 6.1. Illustration of camera position and adjustment. In this case traffic lights and lamp posts were used as reference points. The coordinates of these were recorded on site, heights of traffic lights were measured.

Workflow in 3D environment:

1. Import DXF camera positions into Autodesk 3ds Max.
2. Import client-provided DWG survey and topographical data.
3. Align all datasets within a unified real-world coordinate system.
4. Construct spatial reference geometry based on identifiable site features.
5. Generate virtual cameras using EXIF-derived camera parameters.
6. Position cameras at surveyed coordinates.
7. Refine orientation by matching:
    - photographic background imagery
    - surveyed site reference points visible in both the photograph and the 3D model
8. Iteratively adjust camera alignment to ensure high spatial accuracy.

All scenes are constructed in real-world scale units.

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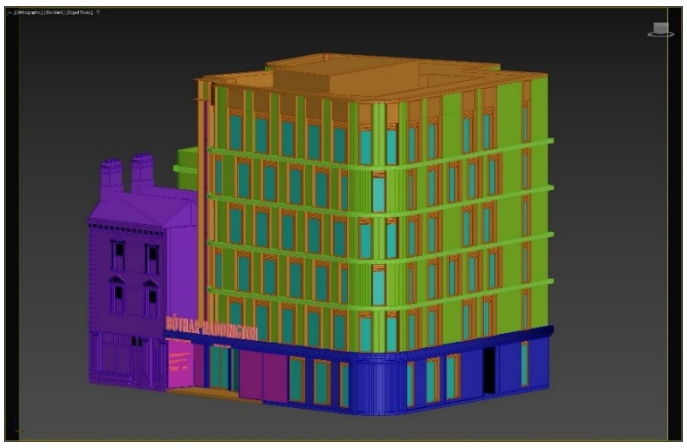
8. 3D Model Development

A highly detailed model is created internally based on architectural drawings and design specifications.

All models are constructed in true scale and integrated into the georeferenced environment.

Fig 7.1

Illustration of the 3D model. Screen capture from Autodesk 3ds Max software.



9. Representation of Proposed Landscape

Where proposed landscaping is included within a development, it is illustrated in the verified view photomontages using landscape architects' drawings, including soft and hard landscape proposals, planting schedule plans, and boundary treatment plans.

Where required, photomontages may be prepared to show the proposed landscape at different stages of establishment, typically:

- Post-construction (Year 0)
- Year 5
- Year 15

The representation of planting growth is based on the information provided by the design team and is intended to illustrate the likely appearance of the landscape at each stage.

10. Lighting and Environmental Simulation

Lighting conditions are configured to replicate real-world photographic conditions.

- Sun position is calculated based on:
    - exact date and time of photography
    - geographic location of the site

This ensures accurate reproduction of:

- shadow direction
- solar elevation and azimuth
- environmental lighting conditions

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11. Rendering Process

Photorealistic rendering is performed using:

- Corona Renderer, V-Ray or equivalent rendering software.

Render outputs include:

- physically accurate lighting simulation
- correct material response
- high-resolution image generation for compositing.

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12. Photomontage Creation and Post-Production

Final compositing is carried out in:

- Adobe Photoshop

Post-production process includes:

- integration of rendered CGI elements into the site photography. This includes the accurate positioning of the rendered model and the masking of foreground features (such as buildings, trees, and street furniture) to ensure correct visual depth and occlusion relationships
- precise alignment refinement where required
- exposure, contrast, and colour matching
- atmospheric blending (depth, haze, environmental consistency)
- final visual verification of realism and coherence

Fig 11.1 Illustration showing transparent view of rendered building over the existing photograph

Fig 11.2 Illustration of proposed building positioned behind existing building, tree, and other foreground elements through the use of image masking techniques.

4. Use the model as an auxiliary reference for:
    - improved camera alignment accuracy
    - validation of site geometry
    - enhanced spatial verification

Note:

This method is supplementary and does not replace primary surveyed data or official topographical information. Its application depends on project feasibility and availability.

Verified View Photomontages for Proposed

ROYAL CANAL GREENWAY

Prepared for: DBFL Consulting Engineers

September 2026

Document at A3 prepared by

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Tel: 021-230 7043

www.gnet3d.com

Photomontage Methodology

Photography

The photography was carried out on the February 14th, 19th and 28th, 2024 and June 23rd, 2026. Sony a7RIII camera was used for all photography. A 24mm lens was used for the photography. This wide lens was selected for the photography to provide more information on the context around the proposed development. The horizontal field of view of these photographs is 74°. The above-mentioned guidance suggests that 40° angle is the closest to human eye vision and is recommended for the verified photomontages. In the cases where the wide lens is used, there should be an indication of 40° field of view, which is shown at the bottom of all the views.
A recommended viewing distance of the photomontages taken using 24mm lens is approximately 300mm from eyes when printed on A3 paper.

Geomax Zenith 60 GPS Antennae was used to accurately record the viewpoint and reference markers' coordinates and height levels. Viewpoint locations are indicated in the viewpoint map to the right, viewpoint coordinates and information on photography is under each photo.

Modelling

Preparation of accurate 3D models of the proposed greenway development including new road surfaces, barriers, lighting, bridges, etc.

Setup

The following information is used to accurately position the model of the proposed development into the photographs:
-Site survey,
-Photographs,
-Verified viewpoint coordinates and height levels are accurately marked on the location OSi map.To match the 3D camera view with the photograph we take the following steps:
The camera height is taken from information gathered on the levels from where the photos are taken (table below). The height levels of the proposed development are outlined on the site. Focal length is based on the photograph EXIF info.
This data is imported into our 3D software and the 3D camera is matched with the selected photographs. To match the 3D camera accurately we use all the above data and the reference 3D models. The reference 3D models are existing structures i.e. buildings, roads, lamps, etc which are visible on the photographs. These items are modelled based on the survey information. After all the above conditions are fulfilled and we are satisfied that the camera matches correctly, we proceed to the next step.

Rendering

We apply the materials and textures prior to rendering the photomontage images. Light settings are adjusted to match the brightness of the photographs and sun is positioned according to the date and time the photo was taken.

Post processing

This process means incorporating a 3D image of the proposed development into the photograph to achieve the final result.

Full Verified View Methodology used to produce photomontages in this booklet is in attached as Appendix and available online at www.gnet.ie/vvm-methodology

BASELINE VIEW NO 1. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:34
Camera: Sony a7RIII

Viewpoint location (ITM): 701671.408;737019.727
Viewpoint Height: 56.761

VVM NO 1. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:34
Camera: Sony a7RIII

Viewpoint location (ITM): 701671.408;737019.727
Viewpoint Height: 56.761

Prepared By G-Net 3D

BASELINE VIEW NO 2. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

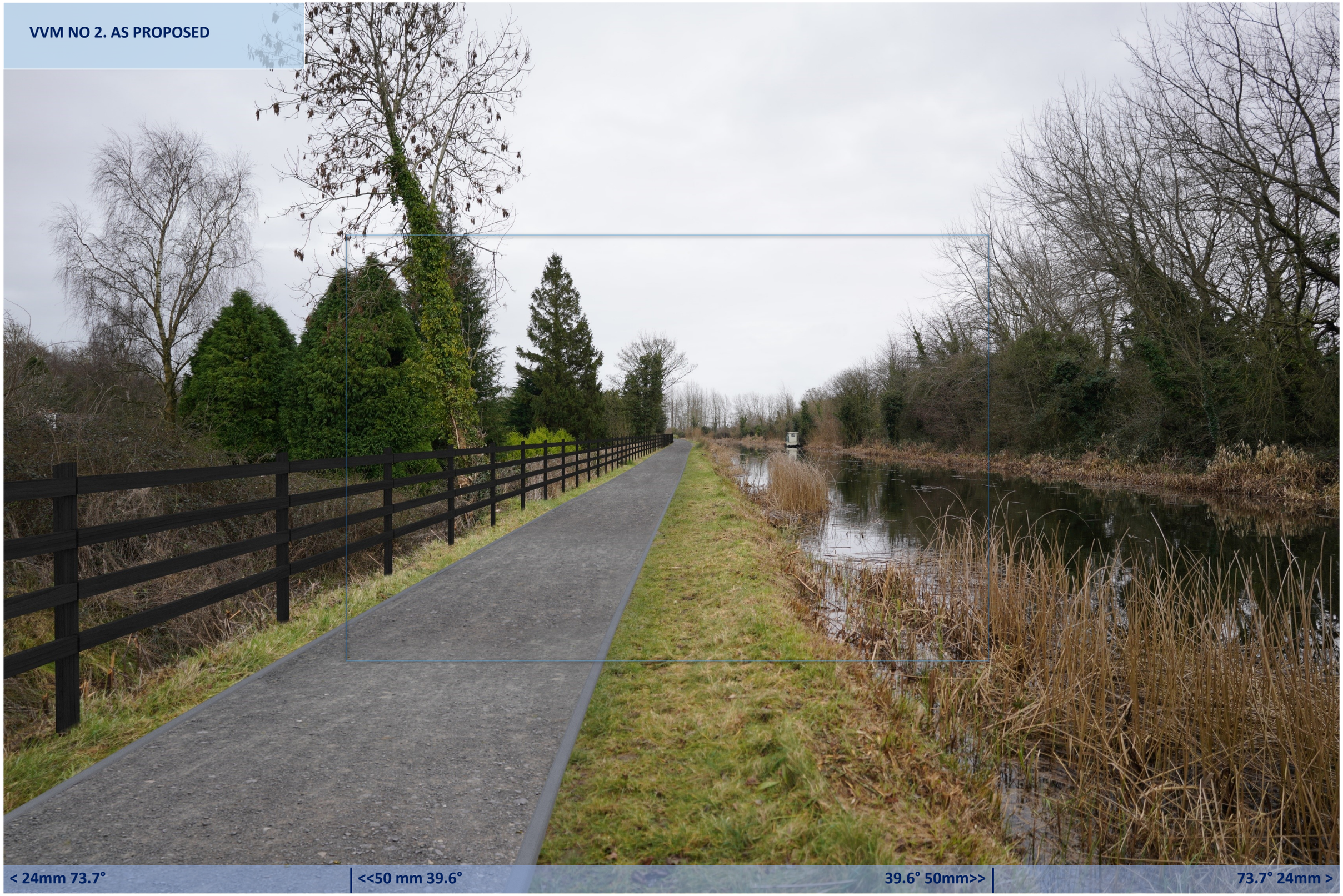
Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:43
Camera: Sony a7RIII

Viewpoint location (ITM): 702082.390;736898.515
Viewpoint Height: 56.779

Prepared By G-Net 3D

VVM NO 2. AS PROPOSED



< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:43
Camera: Sony a7RIII

Viewpoint location (ITM): 702082.390;736898.515
Viewpoint Height: 56.779

BASELINE VIEW NO 3. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:52
Camera: Sony a7RIII

Viewpoint location (ITM): 702672.973;736816.279
Viewpoint Height: 56.705

VVM NO 3. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:52
Camera: Sony a7RIII

Viewpoint location (ITM): 702672.973;736816.279
Viewpoint Height: 56.705

BASELINE VIEW NO 4. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:54
Camera: Sony a7RIII

Viewpoint location (ITM): 702684.005;736821.189
Viewpoint Height: 56.709

VVM NO 4. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 13:54
Camera: Sony a7RIII

Viewpoint location (ITM): 702684.005;736821.189
Viewpoint Height: 56.709

BASELINE VIEW NO 5. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:07
Camera: Sony a7RIII

Viewpoint location (ITM): 703189.709;737480.516
Viewpoint Height: 56.976

VVM NO 5. AS PROPOSED

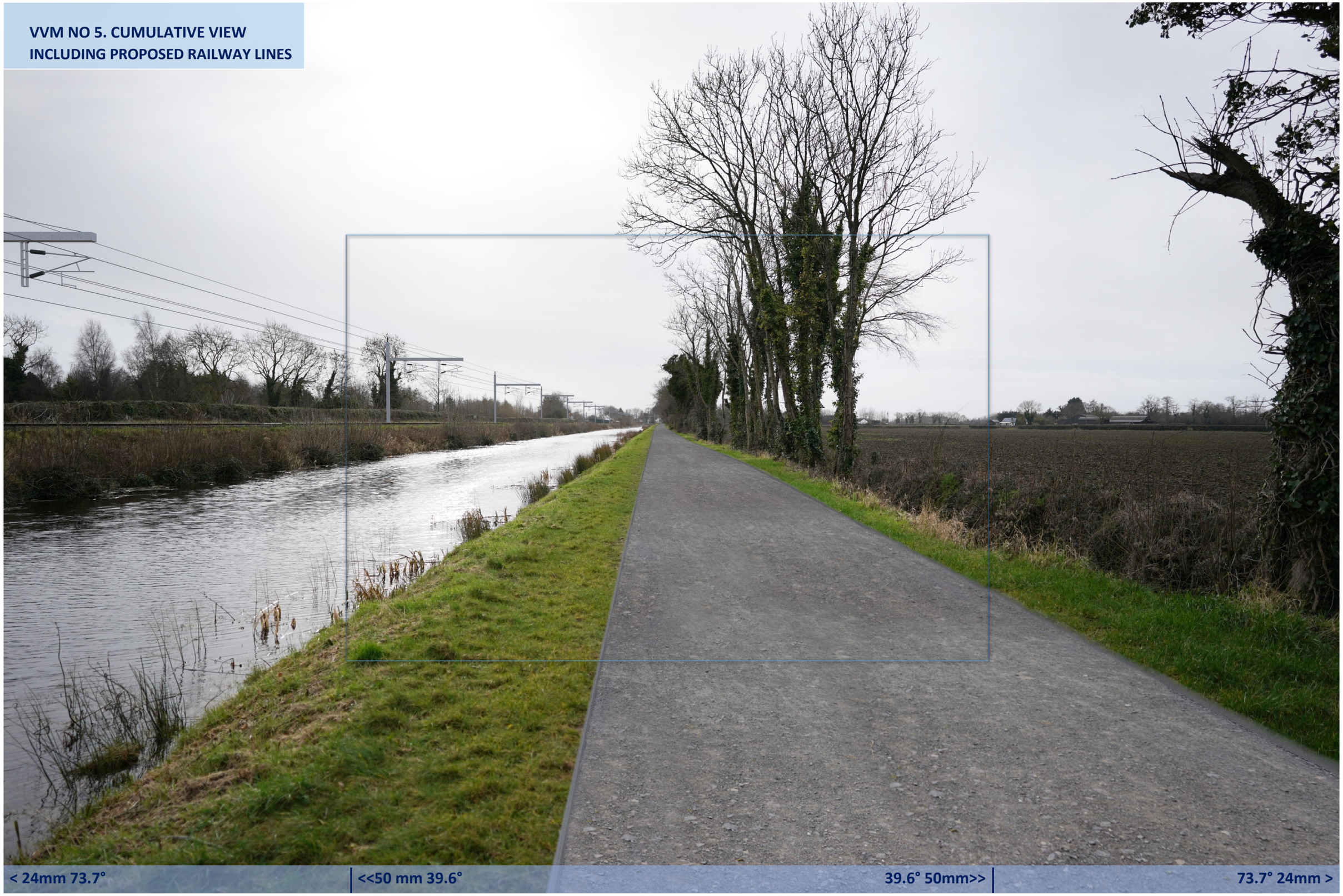
< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:07
Camera: Sony a7RIII

Viewpoint location (ITM): 703189.709;737480.516
Viewpoint Height: 56.976

VVM NO 5. CUMULATIVE VIEW
INCLUDING PROPOSED RAILWAY LINES



< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:07
Camera: Sony a7RIII

Viewpoint location (ITM): 703189.709;737480.516
Viewpoint Height: 56.976

Prepared By G-Net 3D

BASELINE VIEW NO 6. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:12
Camera: Sony a7RIII

Viewpoint location (ITM): 703256.203;737583.598
Viewpoint Height: 57.650

VVM NO 6. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:12
Camera: Sony a7RIII

Viewpoint location (ITM): 703256.203;737583.598
Viewpoint Height: 57.650

VVM NO 6. CUMULATIVE VIEW INCLUDING PROPOSED RAILWAY LINES

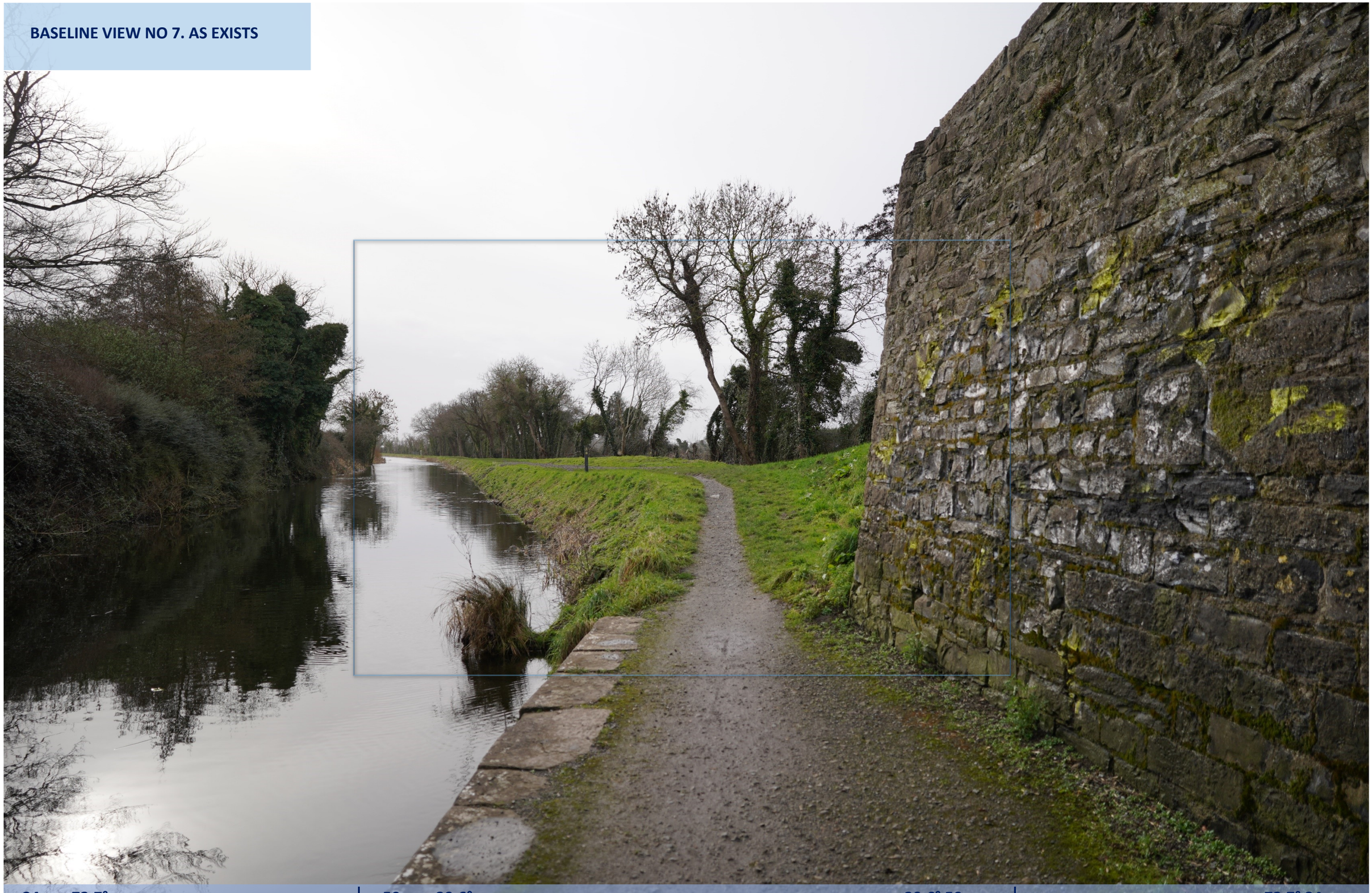
< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:12
Camera: Sony a7RIII

Viewpoint location (ITM): 703256.203;737583.598
Viewpoint Height: 57.650

BASELINE VIEW NO 7. AS EXISTS



< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:25
Camera: Sony a7RIII

Viewpoint location (ITM): 703759.604;738219.895
Viewpoint Height: 57.201

VVM NO 7. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:25
Camera: Sony a7RIII

Viewpoint location (ITM): 703759.604;738219.895
Viewpoint Height: 57.201

BASELINE VIEW NO 8. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:27
Camera: Sony a7RIII

Viewpoint location (ITM): 703769.829;738229.581
Viewpoint Height: 57.208

VVM NO 8. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:27
Camera: Sony a7RIII

Viewpoint location (ITM): 703769.829;738229.581
Viewpoint Height: 57.208

VIEW NO 9. AS EXISTS - WORKS COMPLETED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 28.02.2025
Photo Time: 14:16
Camera: Sony a7RIII

Viewpoint Coordinates (ITM): 704134.555;738412.565
Viewpoint Height: 61.377

BASELINE VIEW NO 10. AS EXISTS

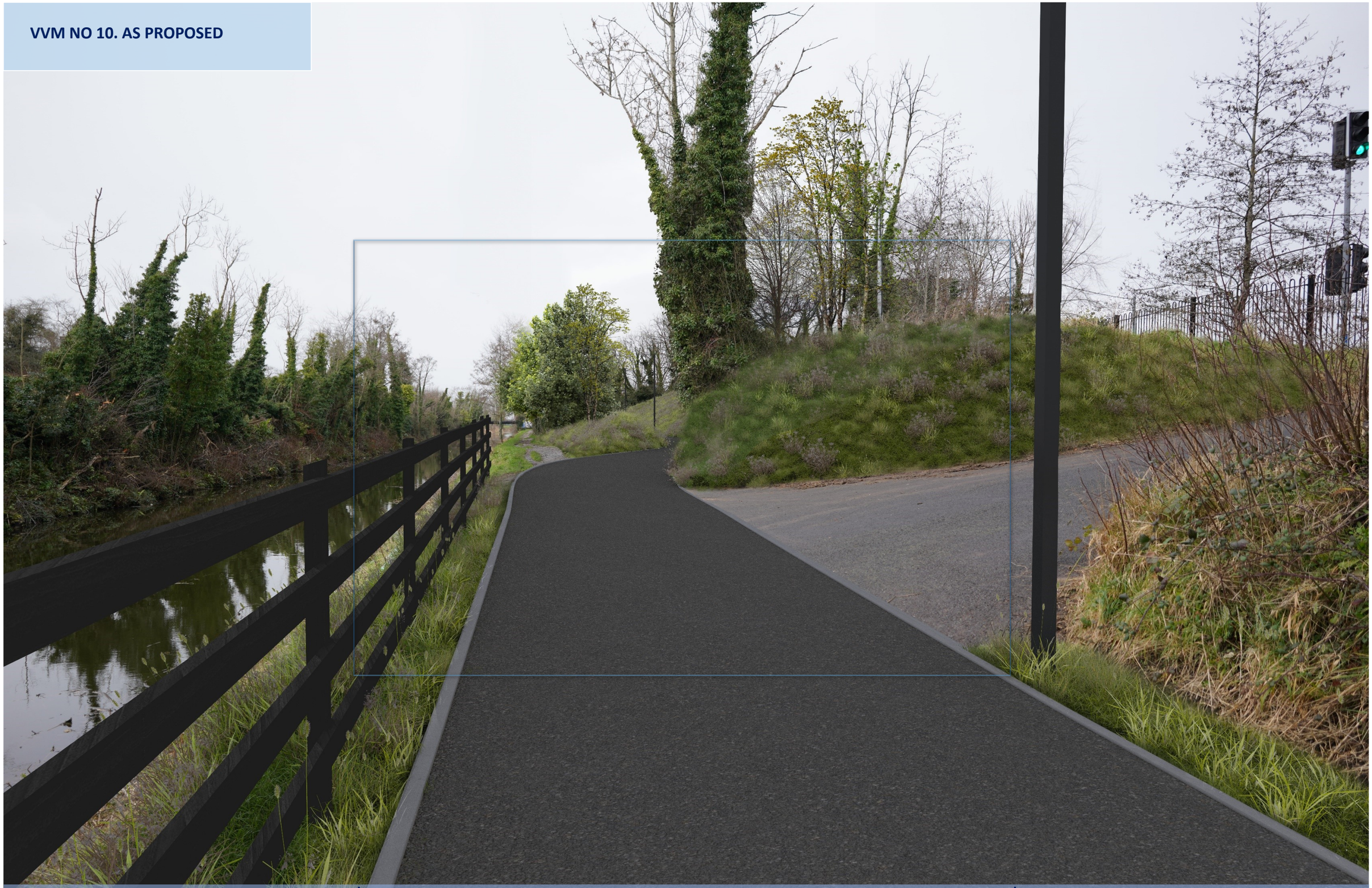
< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:44
Camera: Sony a7RIII

Viewpoint location (ITM): 704611.167;738259.995
Viewpoint Height: 57.876

VVM NO 10. AS PROPOSED



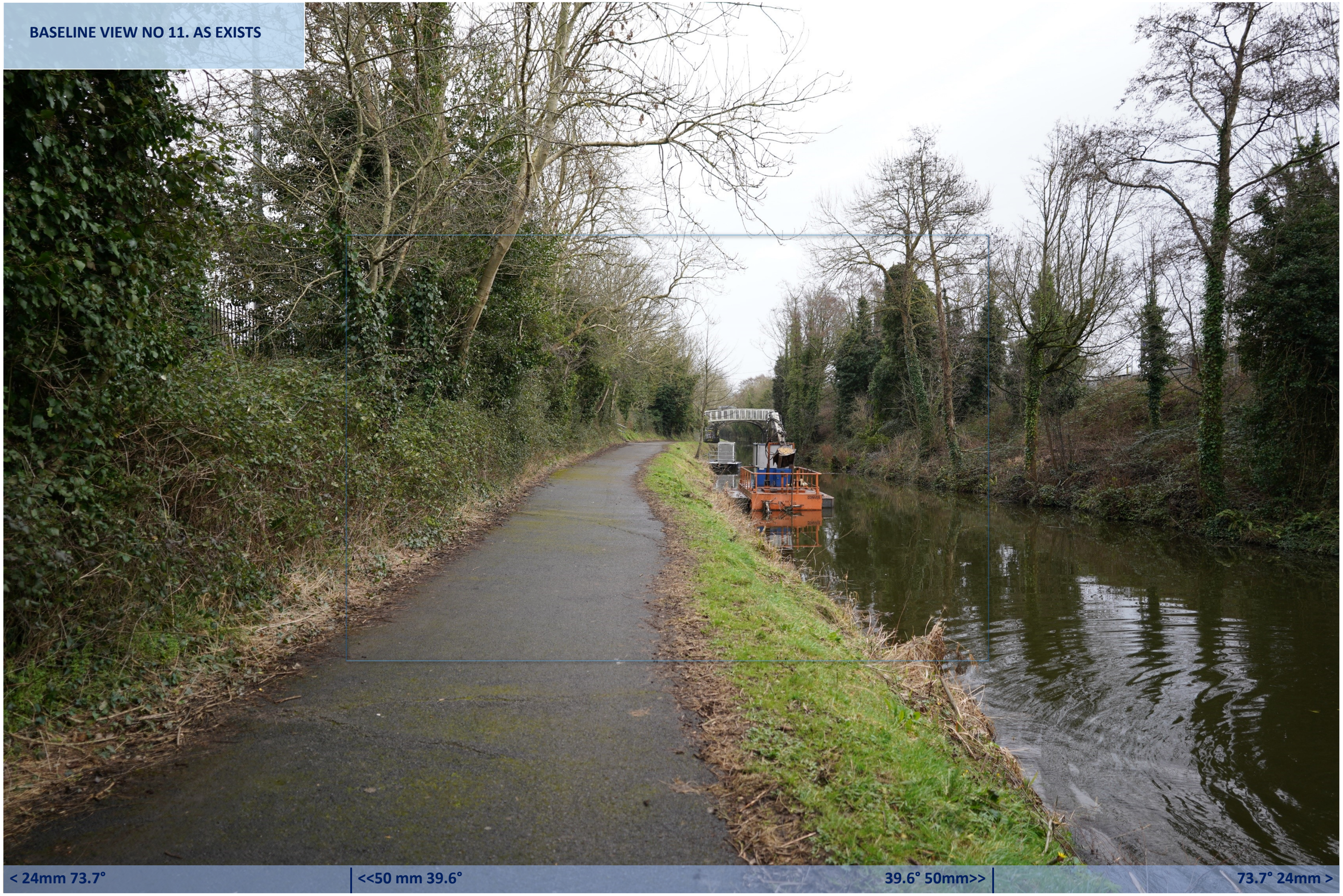
< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:44
Camera: Sony a7RIII

Viewpoint location (ITM): 704611.167;738259.995
Viewpoint Height: 57.876

BASELINE VIEW NO 11. AS EXISTS



< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:50
Camera: Sony a7RIII

Viewpoint location (ITM): 704796.575;738207.492
Viewpoint Height: 58.037

VVM NO 11. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:50
Camera: Sony a7RIII

Viewpoint location (ITM): 704796.575;738207.492
Viewpoint Height: 58.037

BASELINE VIEW NO 12. AS EXISTS

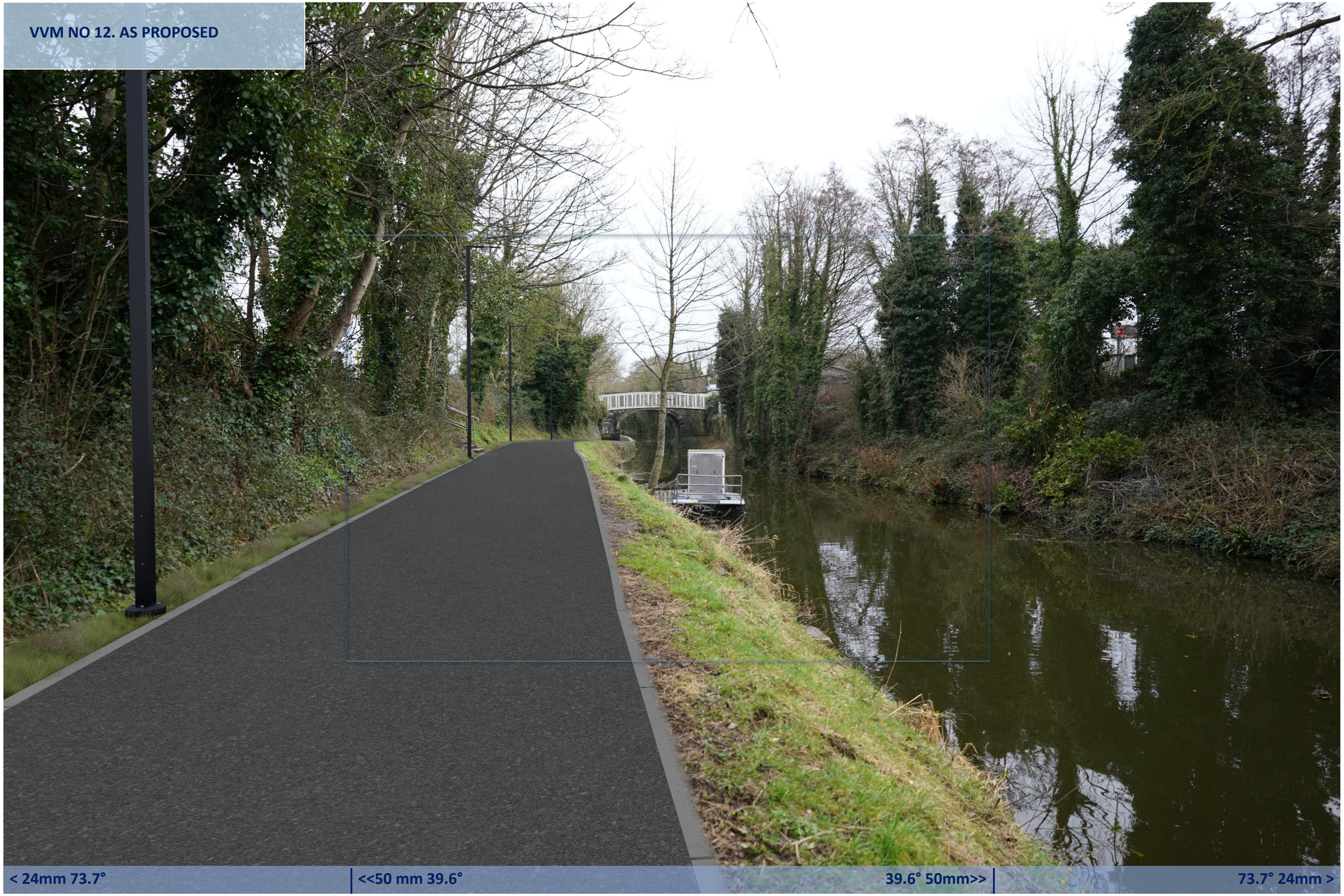
< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:53
Camera: Sony a7RIII

Viewpoint location (ITM): 704833.434;738195.357
Viewpoint Height: 58.212

VVM NO 12. AS PROPOSED



< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:53
Camera: Sony a7RIII

Viewpoint location (ITM): 704833.434;738195.357
Viewpoint Height: 58.212

BASELINE VIEW NO 13. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:58
Camera: Sony a7RIII

Viewpoint location (ITM): 704918.082;738154.561
Viewpoint Height: 57.570

VVM NO 13. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:58
Camera: Sony a7RIII

Viewpoint location (ITM): 704918.082;738154.561
Viewpoint Height: 57.570

BASELINE VIEW NO 14. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:59
Camera: Sony a7RIII

Viewpoint location (ITM): 704935.091;738146.480
Viewpoint Height: 57.148

VVM NO 14. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 14:59
Camera: Sony a7RIII

Viewpoint location (ITM): 704935.091;738146.480
Viewpoint Height: 57.148

BASELINE VIEW NO 15. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:04
Camera: Sony a7RIII

Viewpoint location (ITM): 704998.996;738126.521
Viewpoint Height: 59.280

VVM NO 15. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:04
Camera: Sony a7RIII

Viewpoint location (ITM): 704998.996;738126.521
Viewpoint Height: 59.280

BASELINE VIEW NO 16. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:10
Camera: Sony a7RIII

Viewpoint location (ITM): 705326.547;737992.818
Viewpoint Height: 58.678

VVM NO 16. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:10
Camera: Sony a7RIII

Viewpoint location (ITM): 705326.547;737992.818
Viewpoint Height: 58.678

BASELINE VIEW NO 17. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:24
Camera: Sony a7RIII

Viewpoint location (ITM): 705968.872;737841.714
Viewpoint Height: 64.443

VVM NO 17. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:24
Camera: Sony a7RIII

Viewpoint location (ITM): 705968.872;737841.714
Viewpoint Height: 64.443

BASELINE VIEW NO 18. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 16:29
Camera: Sony a7RIII

Viewpoint Coordinates (ITM): 706016.811;737843.615
Viewpoint Height: 64.637

VVM NO 18. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 16:29
Camera: Sony a7RIII

Viewpoint Coordinates (ITM): 706016.811;737843.615
Viewpoint Height: 64.637

BASELINE VIEW NO 19. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:34
Camera: Sony a7RIII

Viewpoint location (ITM): 706083.165;737827.277
Viewpoint Height: 62.759

VVM NO 19. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 15:34
Camera: Sony a7RIII

Viewpoint location (ITM): 706083.165;737827.277
Viewpoint Height: 62.759

BASELINE VIEW NO 20. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 16:36
Camera: Sony a7RIII

Viewpoint Coordinates (ITM): 706090.497;737826.724
Viewpoint Height: 62.781

VVM NO 20. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 14.02.2024
Photo Time: 16:36
Camera: Sony a7RIII

Viewpoint Coordinates (ITM): 706090.497;737826.724
Viewpoint Height: 62.781

BASELINE VIEW NO 21. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:02
Camera: Sony a7RIII

Viewpoint location (ITM): 706286.990;737751.350
Viewpoint Height: 71.208

VVM NO 21. AS PROPOSED

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:02
Camera: Sony a7RIII

Viewpoint location (ITM): 706286.990;737751.350
Viewpoint Height: 71.208

VVM NO 21. CUMULATIVE VIEW INCLUDING PROPOSED RAILWAY LINES

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:02
Camera: Sony a7RIII

Viewpoint location (ITM): 706286.990;737751.350
Viewpoint Height: 71.208

BASELINE VIEW NO 22. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:08
Camera: Sony a7RIII

Viewpoint location (ITM): 706298.738;737741.296
Viewpoint Height: 71.515

VVM NO 22. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:08
Camera: Sony a7RIII

Viewpoint location (ITM): 706298.738;737741.296
Viewpoint Height: 71.515

BASELINE VIEW NO 23. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:29
Camera: Sony a7RIII

Viewpoint location (ITM): 706945.910;737623.396
Viewpoint Height: 65.403

VVM NO 23. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:29
Camera: Sony a7RIII

Viewpoint location (ITM): 706945.910;737623.396
Viewpoint Height: 65.403

BASELINE VIEW NO 24. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:38
Camera: Sony a7RIII

Viewpoint location (ITM): 706973.792;737616.954
Viewpoint Height: 65.052

VVM NO 24. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:38
Camera: Sony a7RIII

Viewpoint location (ITM): 706973.792;737616.954
Viewpoint Height: 65.052

BASELINE VIEW NO 25. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:42
Camera: Sony a7RIII

Viewpoint location (ITM): 706979.905;737590.362
Viewpoint Height: 65.292

VVM NO 25. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:42
Camera: Sony a7RIII

Viewpoint location (ITM): 706979.905;737590.362
Viewpoint Height: 65.292

BASELINE VIEW NO 26. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:26
Camera: Sony a7RIII

Viewpoint location (ITM): 706973.354;737623.997
Viewpoint Height: 65.030

VVM NO 26. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:26
Camera: Sony a7RIII

Viewpoint location (ITM): 706973.354;737623.997
Viewpoint Height: 65.030

BASELINE VIEW NO 27. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:53
Camera: Sony a7RIII

Viewpoint location (ITM): 707457.298;737767.803
Viewpoint Height: 60.414

VVM NO 27. PROPOSED NOT VISIBLE OUTLINED IN RED

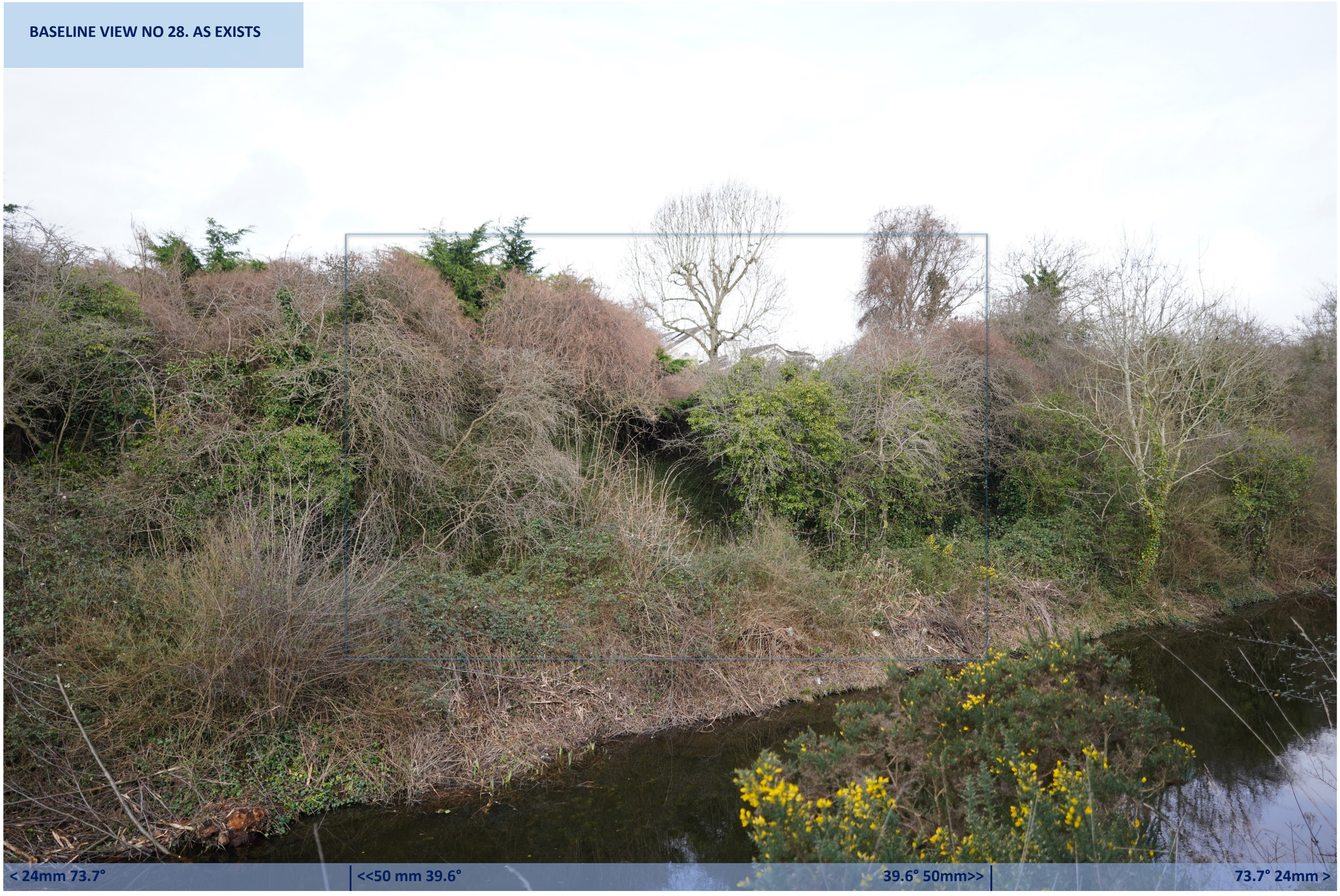
< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:53
Camera: Sony a7RIII

Viewpoint location (ITM): 707457.298;737767.803
Viewpoint Height: 60.414

BASELINE VIEW NO 28. AS EXISTS



< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:55
Camera: Sony a7RIII

Viewpoint location (ITM): 707457.298;737767.803
Viewpoint Height: 60.414

VVM NO 28. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:55
Camera: Sony a7RIII

Viewpoint location (ITM): 707457.298;737767.803
Viewpoint Height: 60.414

VVM NO 28. OUTLINE OF PROPOSED

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 12:55
Camera: Sony a7RIII

Viewpoint location (ITM): 707457.298;737767.803
Viewpoint Height: 60.414

BASELINE VIEW NO 29. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 13:49
Camera: Sony a7RIII

Viewpoint location (ITM): 707672.717;737918.967
Viewpoint Height: 59.570

VVM NO 29. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 13:49
Camera: Sony a7RIII

Viewpoint location (ITM): 707672.717;737918.967
Viewpoint Height: 59.570

BASELINE VIEW NO 30. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 23.06.2026
Photo Time: 13:27
Camera: Sony a7RIII

Viewpoint location (ITM): 707675.951;737926.656
Viewpoint Height: 59.498

VVM NO 30. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 23.06.2026
Photo Time: 13:27
Camera: Sony a7RIII

Viewpoint location (ITM): 707675.951;737926.656
Viewpoint Height: 59.498

BASELINE VIEW NO 31. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:37
Camera: Sony a7RIII

Viewpoint location (ITM): 707761.413;737894.391
Viewpoint Height: 57.641

VVM NO 31. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:37
Camera: Sony a7RIII

Viewpoint location (ITM): 707761.413;737894.391
Viewpoint Height: 57.641

Prepared By G-Net 3D

VVM NO 31. CUMULATIVE VIEW
INCLUDING PROPOSED RAILWAY LINES

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:37
Camera: Sony a7RIII

Viewpoint location (ITM): 707761.413;737894.391
Viewpoint Height: 57.641

Prepared By G-Net 3D

BASELINE VIEW NO 32. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:31
Camera: Sony a7RIII

Viewpoint location (ITM): 707992.363;737987.256
Viewpoint Height: 57.559

VVM NO 32. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

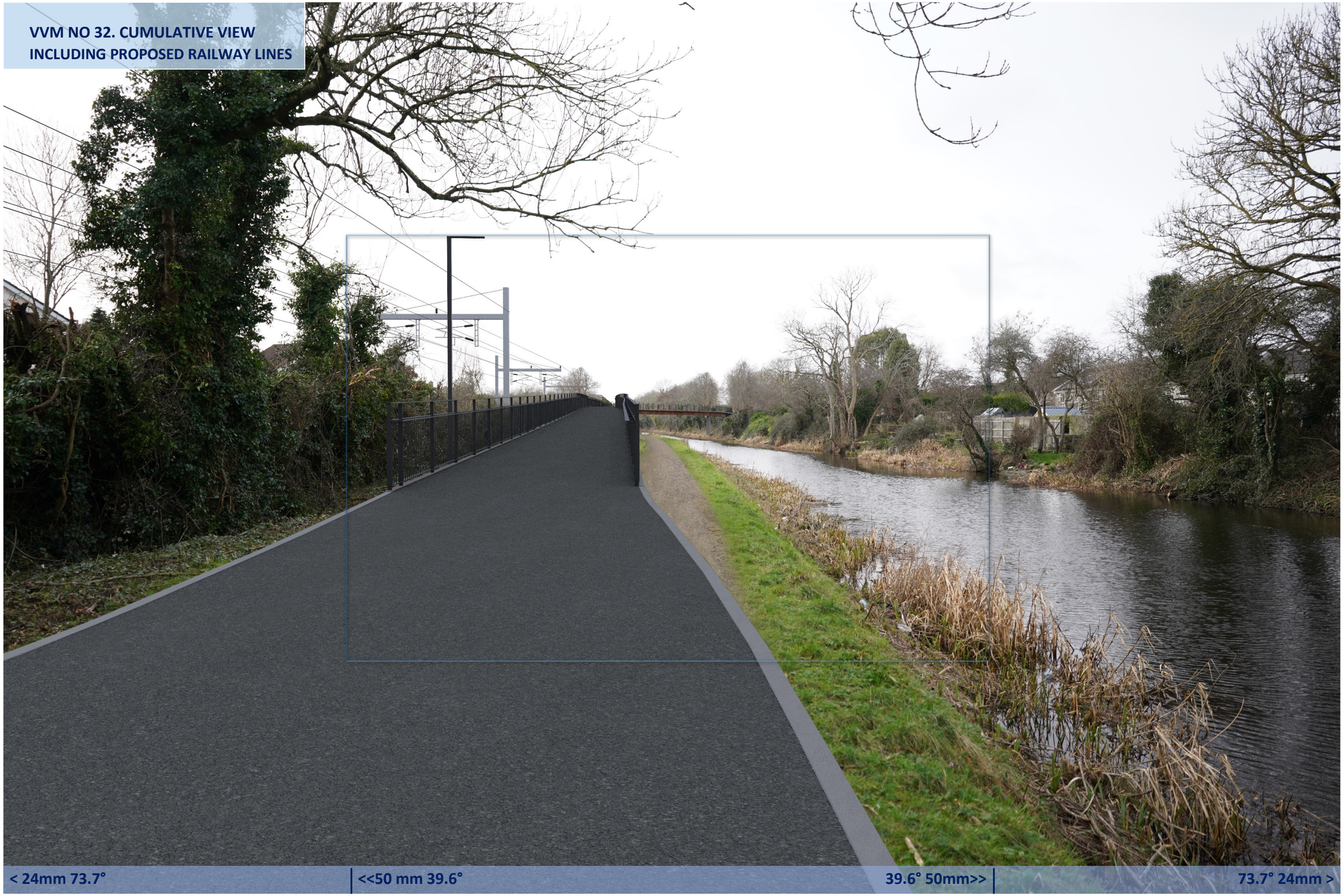
Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:31
Camera: Sony a7RIII

Viewpoint location (ITM): 707992.363;737987.256
Viewpoint Height: 57.559

Prepared By G-Net 3D

VVM NO 32. CUMULATIVE VIEW
INCLUDING PROPOSED RAILWAY LINES



< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:31
Camera: Sony a7RIII

Viewpoint location (ITM): 707992.363;737987.256
Viewpoint Height: 57.559

BASELINE VIEW NO 33. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 15:20
Camera: Sony a7RIII

Viewpoint location (ITM): 708417.273;738084.283
Viewpoint Height: 60.547

VVM NO 33. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 15:20
Camera: Sony a7RIII

Viewpoint location (ITM): 708417.273;738084.283
Viewpoint Height: 60.547

VVM NO 33. CUMULATIVE VIEW INCLUDING PROPOSED RAILWAY LINES

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 15:20
Camera: Sony a7RIII

Viewpoint location (ITM): 708417.273;738084.283
Viewpoint Height: 60.547

BASELINE VIEW NO 34. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:17
Camera: Sony a7RIII

Viewpoint location (ITM): 708422.202;738096.082
Viewpoint Height: 60.831

VVM NO 34. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:17
Camera: Sony a7RIII

Viewpoint location (ITM): 708422.202;738096.082
Viewpoint Height: 60.831

BASELINE VIEW NO 35. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:14
Camera: Sony a7RIII

Viewpoint location (ITM): 708518.932;738145.680
Viewpoint Height: 55.027

VVM NO 35. AS PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:14
Camera: Sony a7RIII

Viewpoint location (ITM): 708518.932;738145.680
Viewpoint Height: 55.027

VVM NO 35. OUTLINE OF PROPOSED

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:14
Camera: Sony a7RIII

Viewpoint location (ITM): 708518.932;738145.680
Viewpoint Height: 55.027

BASELINE VIEW NO 36. AS EXISTS

< 24mm 73.7° | <<50 mm 39.6° | 39.6° 50mm>> | 73.7° 24mm >

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:13
Camera: Sony a7RIII

Viewpoint location (ITM): 708518.932;738145.680
Viewpoint Height: 55.027

VVM NO 36. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:13
Camera: Sony a7RIII

Viewpoint location (ITM): 708518.932;738145.680
Viewpoint Height: 55.027

VVM NO 36. OUTLINE OF PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:13
Camera: Sony a7RIII

Viewpoint location (ITM): 708518.932;738145.680
Viewpoint Height: 55.027

BASELINE VIEW NO 37. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:08
Camera: Sony a7RIII

Viewpoint location (ITM): 708711.165;738175.487
Viewpoint Height: 55.309

VVM NO 37. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:08
Camera: Sony a7RIII

Viewpoint location (ITM): 708711.165;738175.487
Viewpoint Height: 55.309

BASELINE VIEW NO 38. AS EXISTS

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:05
Camera: Sony a7RIII

Viewpoint location (ITM): 708729.146;738157.480
Viewpoint Height: 56.697

Prepared By G-Net 3D

VVM NO 38. AS PROPOSED

< 24mm 73.7° | **<<50 mm 39.6°** | **39.6° 50mm>>** | **73.7° 24mm >**

Project Name:
ROYAL CANAL GREENWAY

Photo Date: 19.02.2024
Photo Time: 14:05
Camera: Sony a7RIII

Viewpoint location (ITM): 708729.146;738157.480
Viewpoint Height: 56.697

Royal Canal Urban Greenway

Environmental Impact Assessment Report

Appendix 10.4 DART+ WEST Technical Note for FCC

October 2026

DART+ WEST

Clonsilla Pedestrian/Cycle Bridge Pier Study

For Fingal County Council

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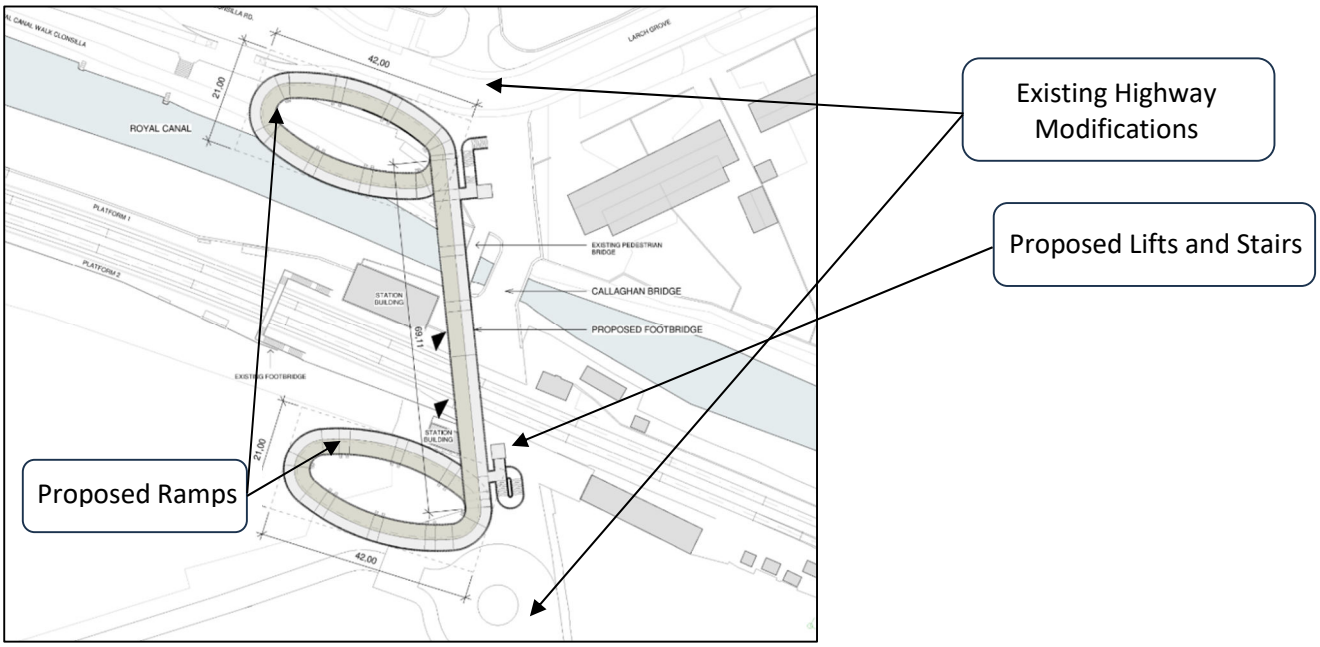
1 Background

The Clonsilla Pedestrian/Cycle Bridge proposal forms part of the DART+ West programme and supports removal of the existing level crossing by providing a grade-separated route for pedestrians, cyclists and mobility-impaired users. Alongside the bridge itself, the current preliminary design also interfaces with station works including platform modifications, OHLE and signal foundations, and retained station buildings, barriers, ticketing equipment and signage. The technical focus of this note is the pier strategy for the northern ramp and how it interfaces with the Royal Canal towpath within the developing preliminary design.

Figure 1 - Architects Image of Clonsilla Pedestrian/Cycle Bridge



2 Location

The proposed bridge is located at Clonsilla Railway Station on the Dublin to Sligo railway line (Connolly to Maynooth line), at approximately 7 miles 140 yards chainage. The site lies immediately adjacent to the Royal Canal corridor, with the canal and towpath running alongside the railway alignment at this location. The crossing is positioned in the vicinity of the existing Callaghan Road Bridge, which carries the R121 over the canal and is identified as a protected structure, with the proposed Pedestrian/Cycle Bridge spanning the twin-track railway together with the canal and towpath. The site sits within a generally suburban/agricultural setting on the western edge of Clonsilla, with connections required to Clonsilla Road to the north and to the station side to the south.

3 Constraints

A minimum vertical clearance of 2.4 m shall be maintained over the Greenway in accordance with the requirements of DN-STR-03005-02. In addition, a minimum clear width of 3.0 m shall be provided for the Greenway beneath the proposed bridge. The Civil & Structures (C&S) Design and Build (D&B) Contractor shall develop the overbridge ramp and pier arrangement to demonstrate that these clearance requirements are achieved in a coordinated manner, including agreement with IÉ stakeholders, Waterways Ireland and the Fingal County Council prior to detailed design and construction.

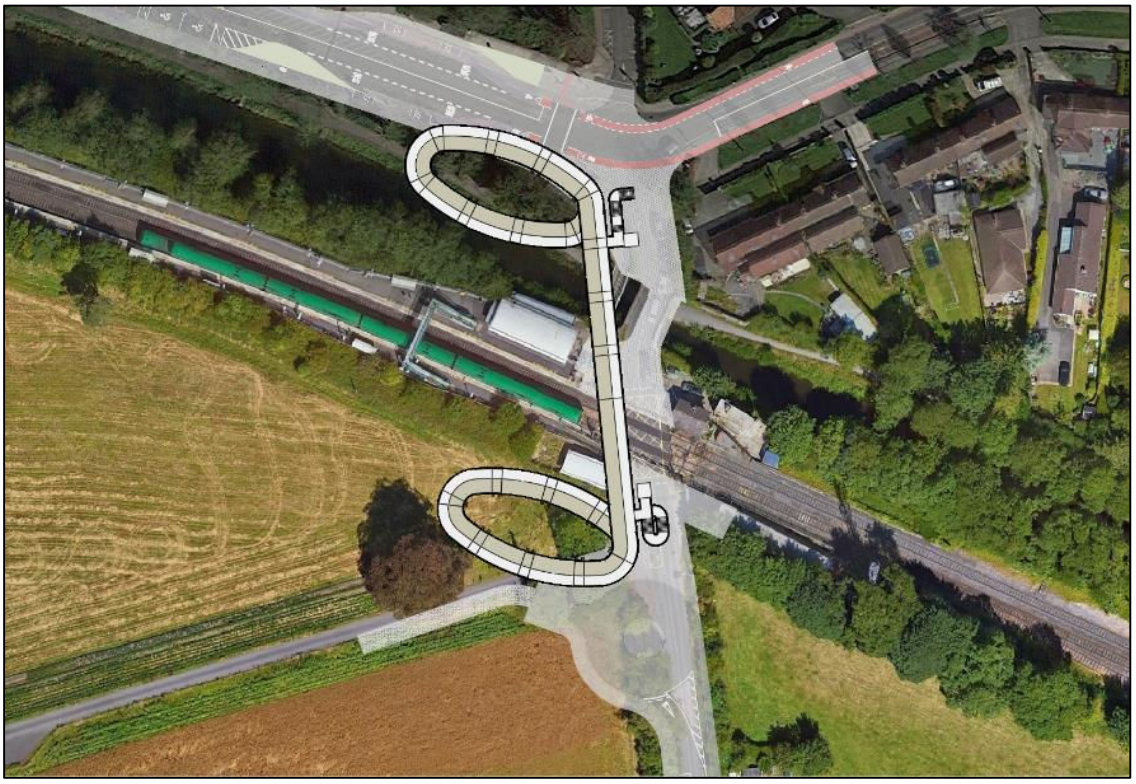


Figure 2 - Clonsilla Pedestrian/Cycle Bridge Location Diagram

4 Design Flexibility

The design intent arrangements included in the Railway Order provide flexibility for further refinement as the scheme develops. These include further optimisation of the northern ramp arrangement and pier positioning in response to towpath and canal-side constraints, confirmation of whether the current integral articulation strategy can be maintained or whether movement joints and bearings will ultimately be required, and refinement of the foundation solutions where spread footings may be feasible in lieu of piling at some locations. There is also flexibility to develop the towpath retaining wall and reinforced earth arrangements, drainage detailing, lighting, finishes and overall architectural treatment so that the bridge integrates successfully with its surroundings while still meeting structural, access and maintenance requirements. As such, the current design provides a robust preliminary concept, with flexibility for adjustments and refinement.

The final bridge design will be developed and refined during the detailed design phase by the C&S D&B Contractor. Ongoing consultation is taking place between Fingal County Council, Irish Rail and Waterways Ireland during the development of the scheme, and stakeholder requirements will continue to be incorporated as the design progresses. The Works Requirements for the D&B Contract will include provisions to ensure that the final bridge design maintains access, clearance, and operational requirements for all users.