Proximity

No. 1 Castlefield

The Solar Glare Impact of the Proposed Development on Highways, Metro and Network Rail Infrastructure

Our Ref: 2306/TWK
July 2026

Introduction

As part of a Planning Application, there is a requirement for the assessment of Solar Glare.

The potential for Solare Gare has been assessed for the Metro and Network Rail lines where signals have been identified.

As part of this exercise, Proximity has also assessed potential for solar glare impacts on car drivers around the Site.

Proximity is a firm of Chartered Surveyors specialising in the assessment, management, and mitigation of the Proximity Risk™, including, amongst other things, solar glare impacts.

We have consulted directly with Network Rail and have agreed with them the relevant parameters for the undertaking of this solar glare impact assessment.

This document sets out our assessment parameters, methodology and findings.

Information Relied Upon

Site Inspections

A Photogrammetric Model of the Site / Surroundings by Accucities

A 3D Model of the Proposed Development by Denton Corker Marshall Architects

What is Solar Glare

In simple terms, solar glare (or dazzle) is reflected sunlight.

There are several factors that influence whether glare will be experienced:

- Receptor sensitivity in a direction of view;
- The suns position in the sky, which changes throughout both the course of the day and the seasons. For example, in the winter, sunlight hours are reduced, and the sun is lower in the sky. In the summer, sunlight hours are increased, and the sun is higher in the sky. Both will give rise to different solar glare patterns;
- The location and orientation of the Proposed Development; and

- The reflective quality / characteristics of the Proposed Development. All building materials will reflect sunlight to some degree, however, a predominantly brick elevation / façade will reflect less sunlight than, say, a heavily glazed façade.

There are two types of glare problem that can occur. Discomfort glare causes visual discomfort without necessarily affecting the ability to see. Disability glare happens when a bright source of light (such as the reflected sun) impairs the vision of other objects.

The design guidance (see the subsequent section of this Report) identifies that disability glare creates the more serious problem as it can affect motorists' ability to drive safely. It is especially important at locations where a driver has to make a key decision, for example approaching a road junction, traffic signal or pedestrian crossing. It can also affect train drivers, particularly if they are looking at illuminated signals.

Design Guidance

Solar glare design guidance is limited to the following publications:

- Building Research Establishment's Digest 209 - Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice.
- BRE IP3 / 87 - Solar Dazzle Reflected from Sloping Glazed Facades.
- CIE Report 146: 2002 - Equations for Disability Glare.

The City of London Planning Advice Note *"Guidance and Best Practice for assessing Solar Glare ..."* is often cited as a reference in solar glare reports (even outside of London).

It does not, however, add anything that is not already covered in the other guidance (and in fact borrows from them heavily). It is acknowledged for the avoidance of doubt.

The Design Guidance confirms (between them):

- That solar glare can occur when sunlight is reflected from a glazed façade or area of metal cladding. In our opinion, this can be extended to any reflective building material.
- If it is considered likely that a building may cause solar glare the exact scale of the problem should be evaluated. This is done by identifying key locations such as road junctions and railway signals and working out the number of hours of the year that sunlight can be reflected to these points. BRE IP3/87 gives details.
- Where solar glare would be created, the next step is to calculate the angle between the driver's line of view and the reflected sun. For building elements in a vertical plane, for a driver on a level road (or track), solar glare could be a significant issue if this angle is less than 10°. That would see glare experienced in the central vision.
- If the solar glare would be experienced close to the driver's line of sight, i.e. central vision, then further assessments and/or mitigation would likely be required.

The Human Field of Vision

The solar glare design guidance is clear that solar glare could become an issue if it is experienced in a particular part of the human field of vision.

The field of vision is the area that can be seen without moving the eyes or head. It is measured as degrees visible with both eyes while looking straight ahead. A wide field of vision reduces unnecessary head and eye movement.

The field of vision is generally defined as follows:

- Central vision 0-3° from focal point;
- Paracentral 3-10° from focal point;
- Near periphery 10-30° from focal point; and
- Mid-periphery >30° from focal point.

Generally, solar glare has potential to cause visibility issues if experienced at an angle of less than 10°, i.e. within the central vision. Less so, in the mid / outer periphery (>30°).

The Receptors ...

The Meto and Network Rail receptors are signals identified using Google Earth and our Site inspections.

Highways locations for assessment have been selected using professional judgement following Site inspection.



Technical Assessment

We have undertaken a solar glare technical analysis. We have built a topographically accurate 3D model of the Proposed Development, acknowledging its elevational treatments and window positions, and have measured the potential for its windows to create solar glare that might distract train drivers and car drivers in the vicinity of the Site.

The glare impact assessment measures the glare that might be created by the Proposed Development at the established or confirmed viewpoints only.

The assessment is not a cumulative assessment that acknowledges the reflectivity or solar glare potential of any other structures or surfaces in the vicinity of the Site.

The assessment does not measure glare intensity. It will measure glare potential by assuming that the Proposed Development (or relevant parts thereof – in this case the façade) operate as a mirror. On this basis, a “worst case” position is established.

The assessment has evaluated the glare impact by reference to where any glare is experienced in the human field of vision at the viewpoints and with reference to when the glare is experienced in terms of time of day (including duration) and time of year.

Glare has been assessed at a height of 2.75m above track level for both Metro and Network Rail Lines.

Glare has been assessed at a height of 1.5m above road level (which reflects a typical position of a driver’s eyes level).

Position 1

Located to the south of the Proposed Development, and 2m from the Signals.

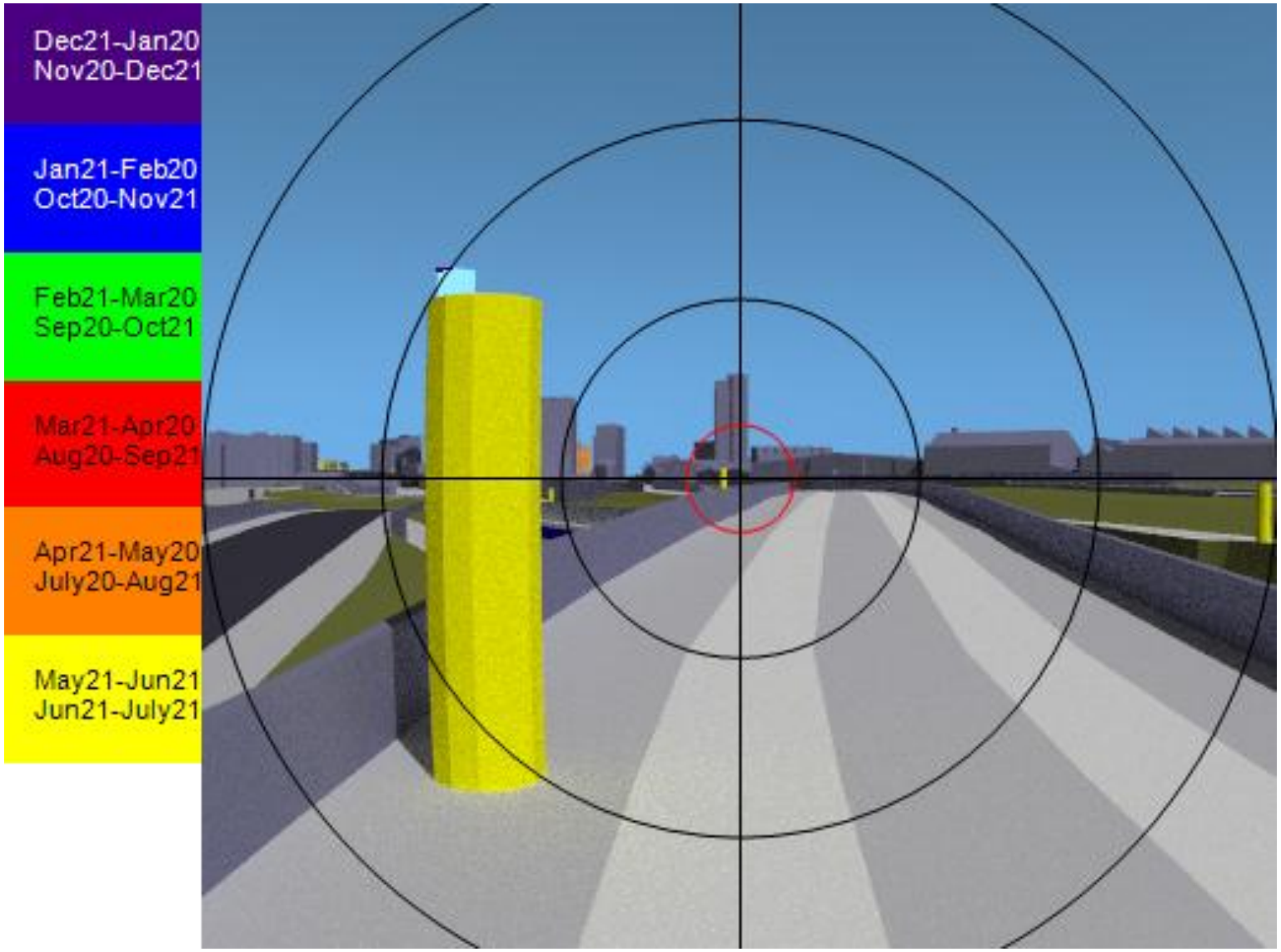
The Proposed Development will be visible to a tram driver at this point.

Glare could be experienced between 13:21hrs - 13:26hrs on 14-27 December. It would be experienced in the mid-periphery of the field of vision.

This is a fleeting incidence of glare of no more than between 1-4 minutes on any one occasion and will not be experienced in the central vision.

Accordingly, this glare should not cause any distraction to the tram driver.

Glare impacts at Position 1 are minor adverse.



Position 2

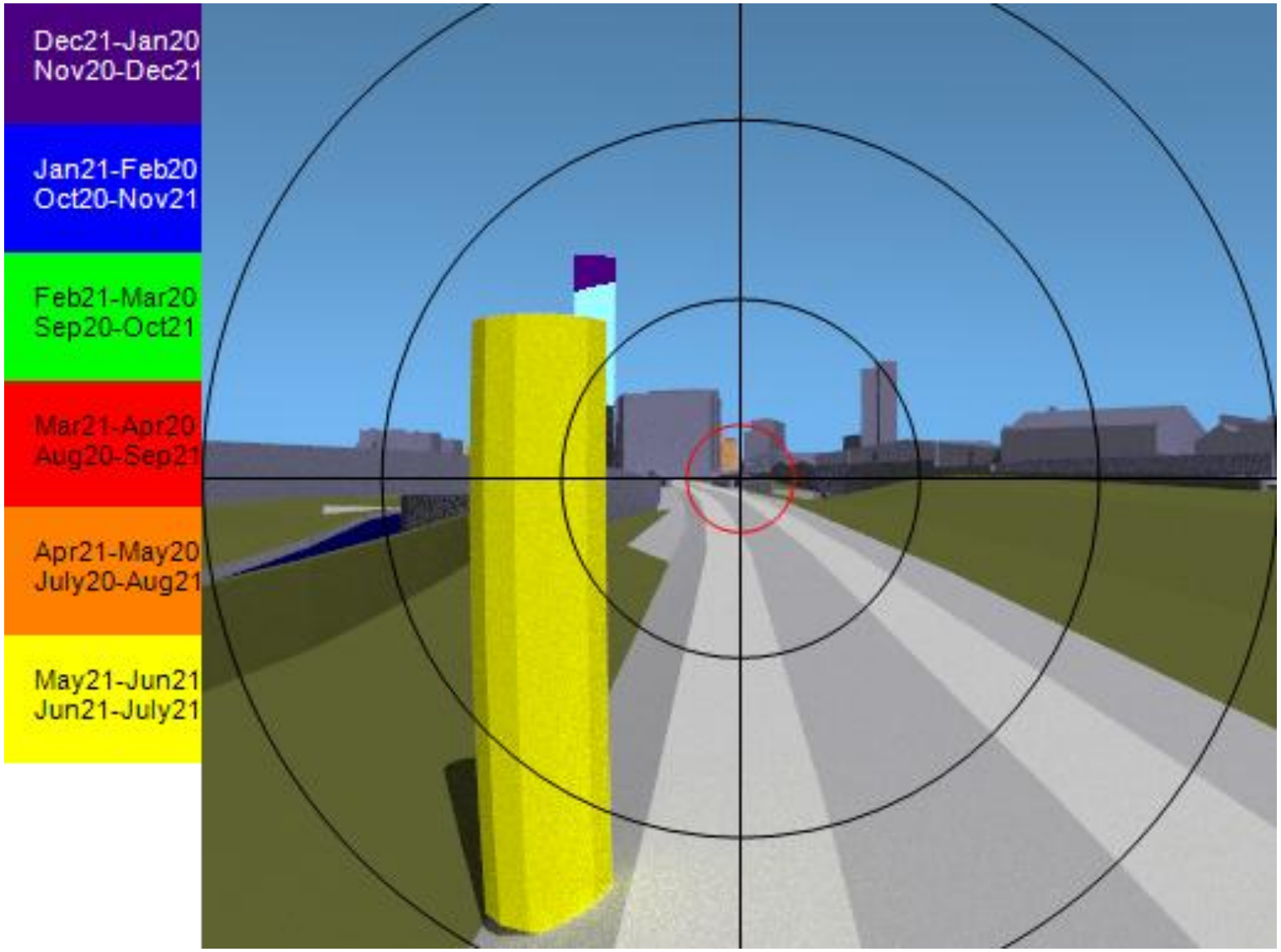
Located to the south of the Proposed Development, and 2m from the Signals.

The Proposed Development will be visible to a tram driver at this point.

Glare could be experienced between 13:33hrs - 13:50hrs on 28 November – 12 January. It would be experienced in the near-periphery of the field of vision and sits within the 5o visor cut off zone that could be obscured by the visor.

This incidence of glare of no more than between 2-10 minutes on any one occasion and will not be experienced in the central vision.

Glare impacts at Position 2 are moderate adverse.



Position 3

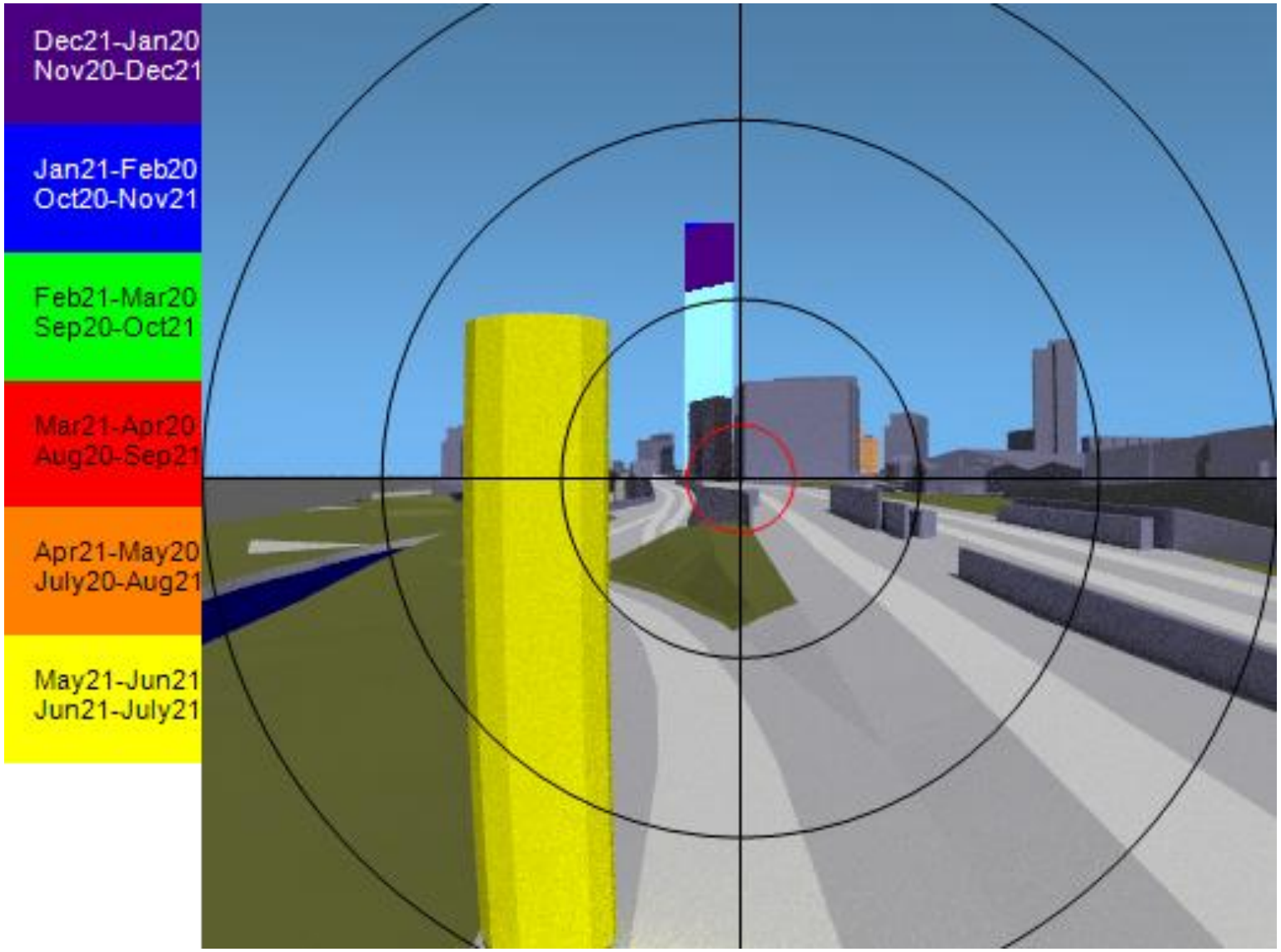
Located to the south of the Proposed Development, and 2m from the Signal.

The Proposed Development will be visible to a tram driver at this point.

Glare could be experienced between 13:32hrs - 13:52hrs on 18 November to 22 January. It would be experienced in the near-periphery of the field of vision and sits within the 5o visor cut off zone that could be obscured by the visor.

This incidence of glare of no more than between 2-13 minutes on any one occasion and will not be experienced in the central vision.

Glare impacts at Position 3 are moderate adverse.



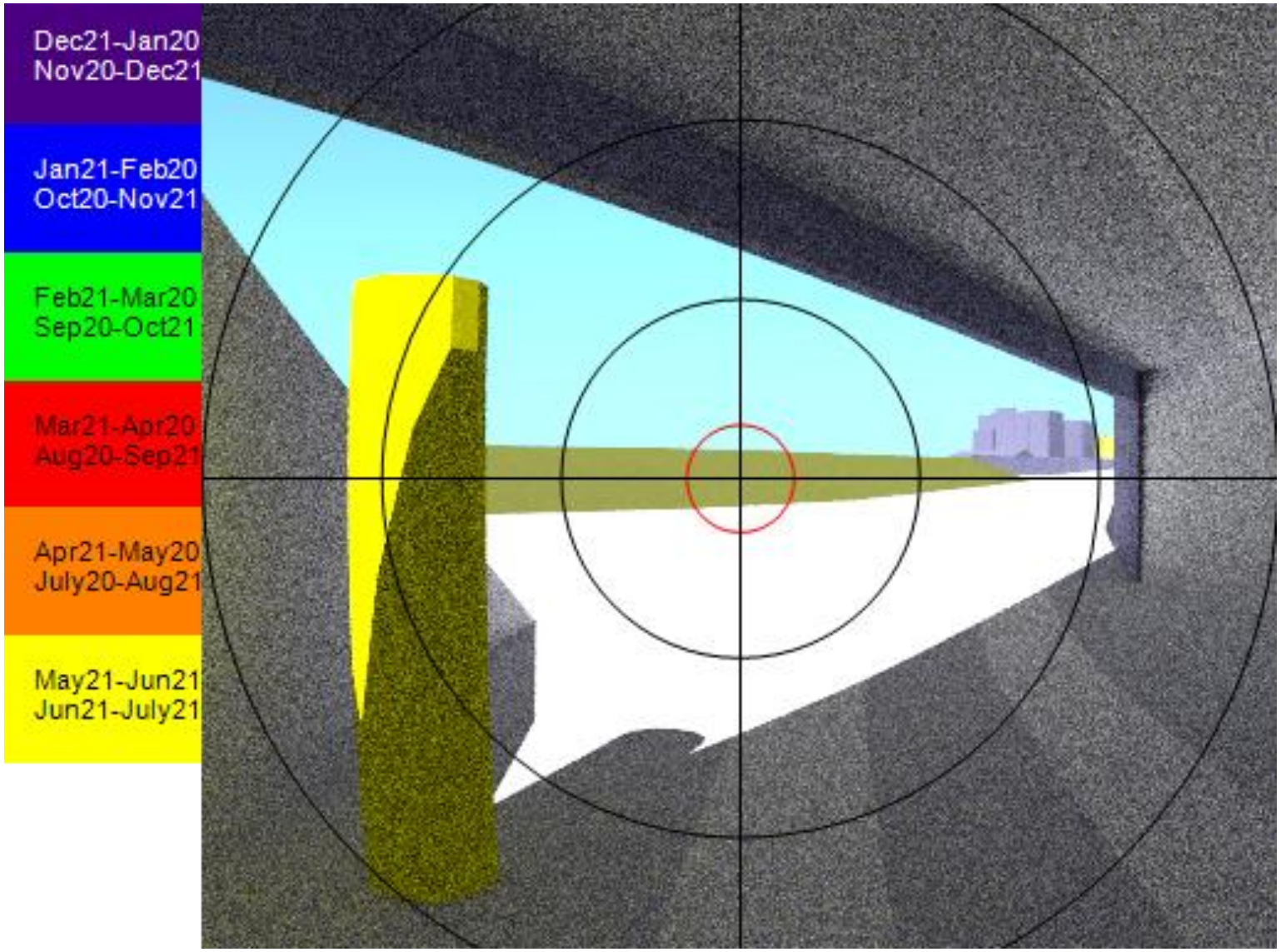
Position 4

Located to the south of the Proposed Development, and 2m from the Signals.

The Proposed Development will not be visible to a tram driver at this point.

No glare would be experienced at any point at this location.

Glare impacts at Position 4 are therefore Not Significant



Position 5

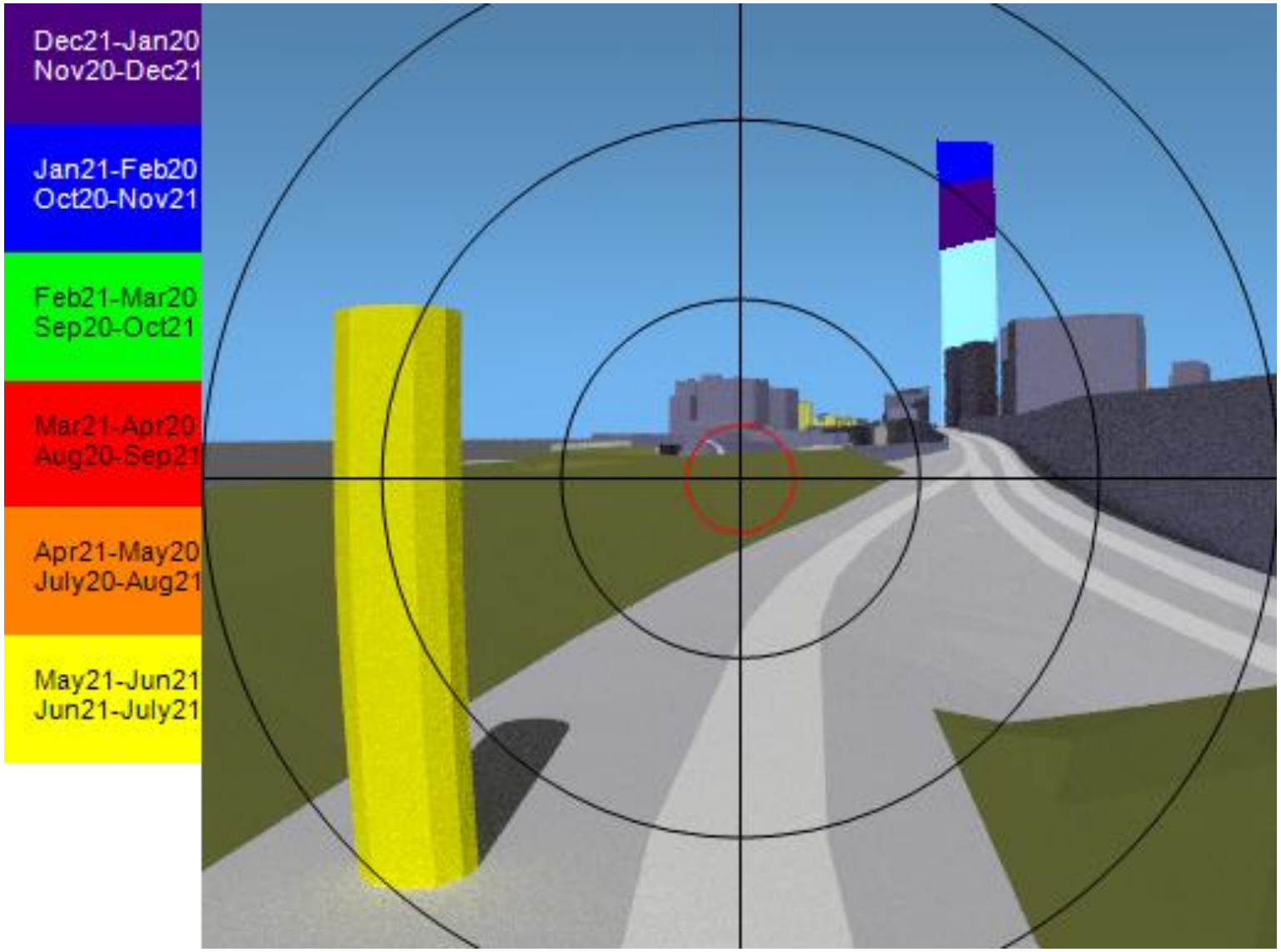
Located to the south of the Proposed Development.

The Proposed Development will be visible to the tram driver at this point.

Glare could be experienced between 13.26-13.48 on 09 November – 31 January. It would be experienced in the mid and outer periphery of the field of vision.

This is a fleeting incidence of glare of no more than between 1-14 minutes on any one occasion and will not be experienced in the central vision.

Glare impacts at Position 5 are minor adverse to negligible.



Position 6

Located to the south west of the Proposed Development, facing north east. The Proposed Development will be visible to a car driver at this point.

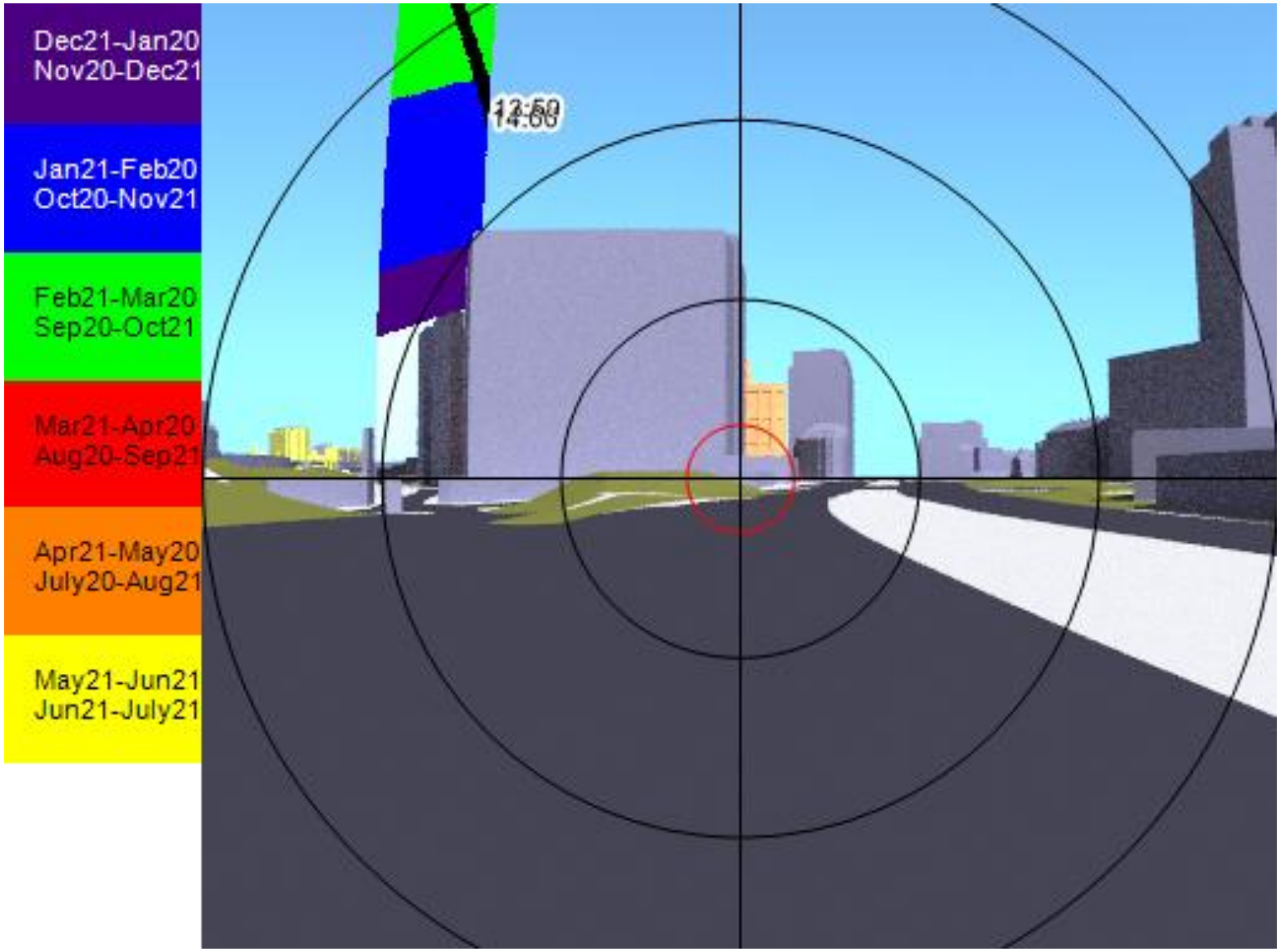
Glare could be experienced between 01 January – 11 March and 01 October – 31 December, between 13.50-14.30. This glare would be predominantly experienced in the outer periphery.

This is relatively brief instance of glare, of no more than 26 minutes (on the 24 - 25 January & 15 -16 November) on any one occasion and will not be experienced in the mid periphery.

Between 21 February and 20 March glare occurs at the edge of the mid periphery. As above, this is relatively brief and up to 23 minutes.

On the basis that this glare occurs in the mid and outer periphery, this glare should not cause distraction to drivers.

Glare impacts at Position 6 are minor adverse to negligible.



Position 7

Located to the south of the Proposed Development, facing north.

The Proposed Development will be visible to a car driver at this point.

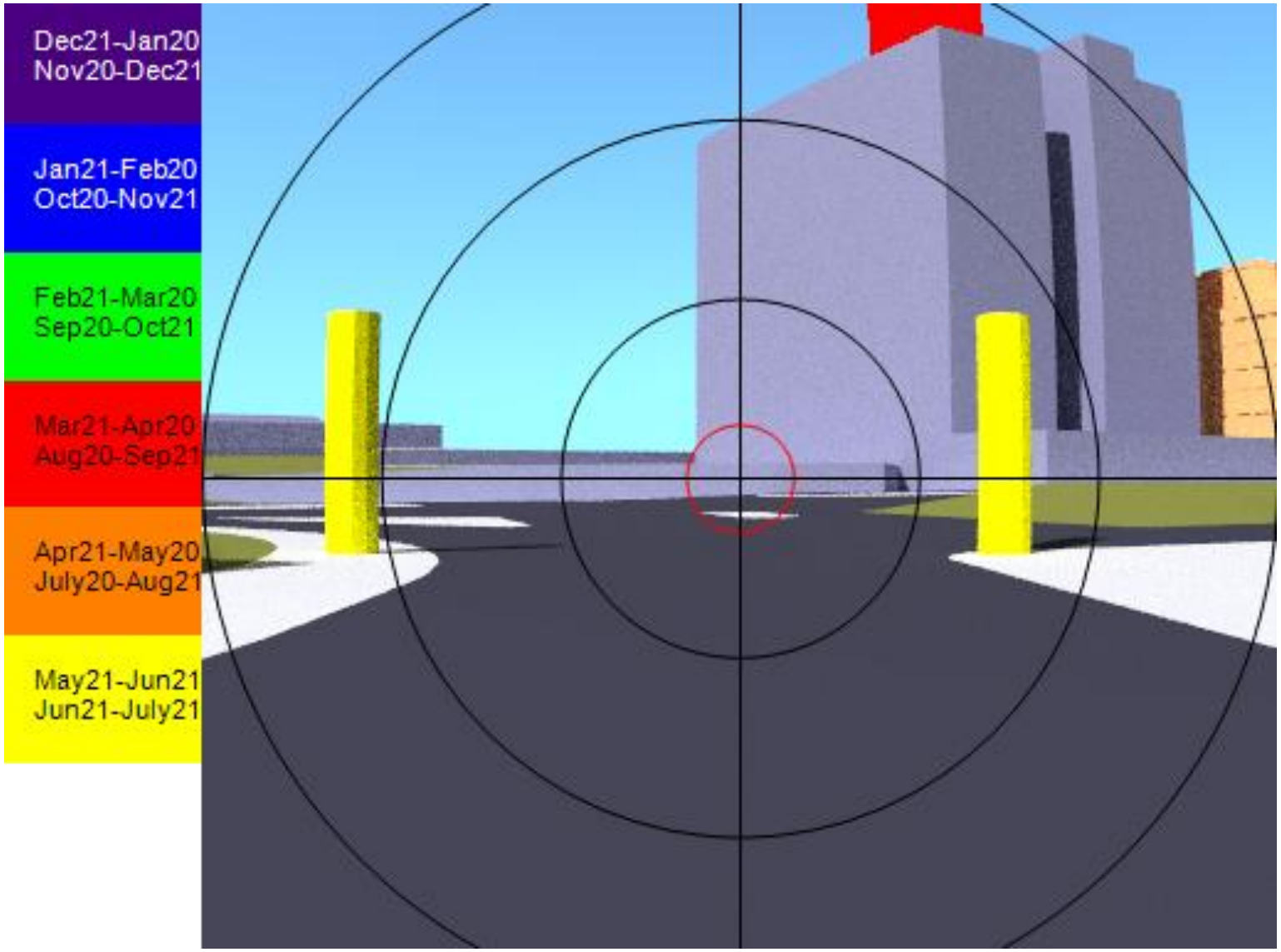
Glare could be experienced between 15.21-15.55 on 27 March - 16 April and 26 August - 15 September.

It would be experienced in the outer periphery of the field of vision.

This incidence of glare of no more than 30 minutes on any one occasion and will not be experienced in the central vision.

Accordingly, this glare should not cause any distraction to a car driver.

Glare impacts at Position 7 are negligible are therefore Not Significant.



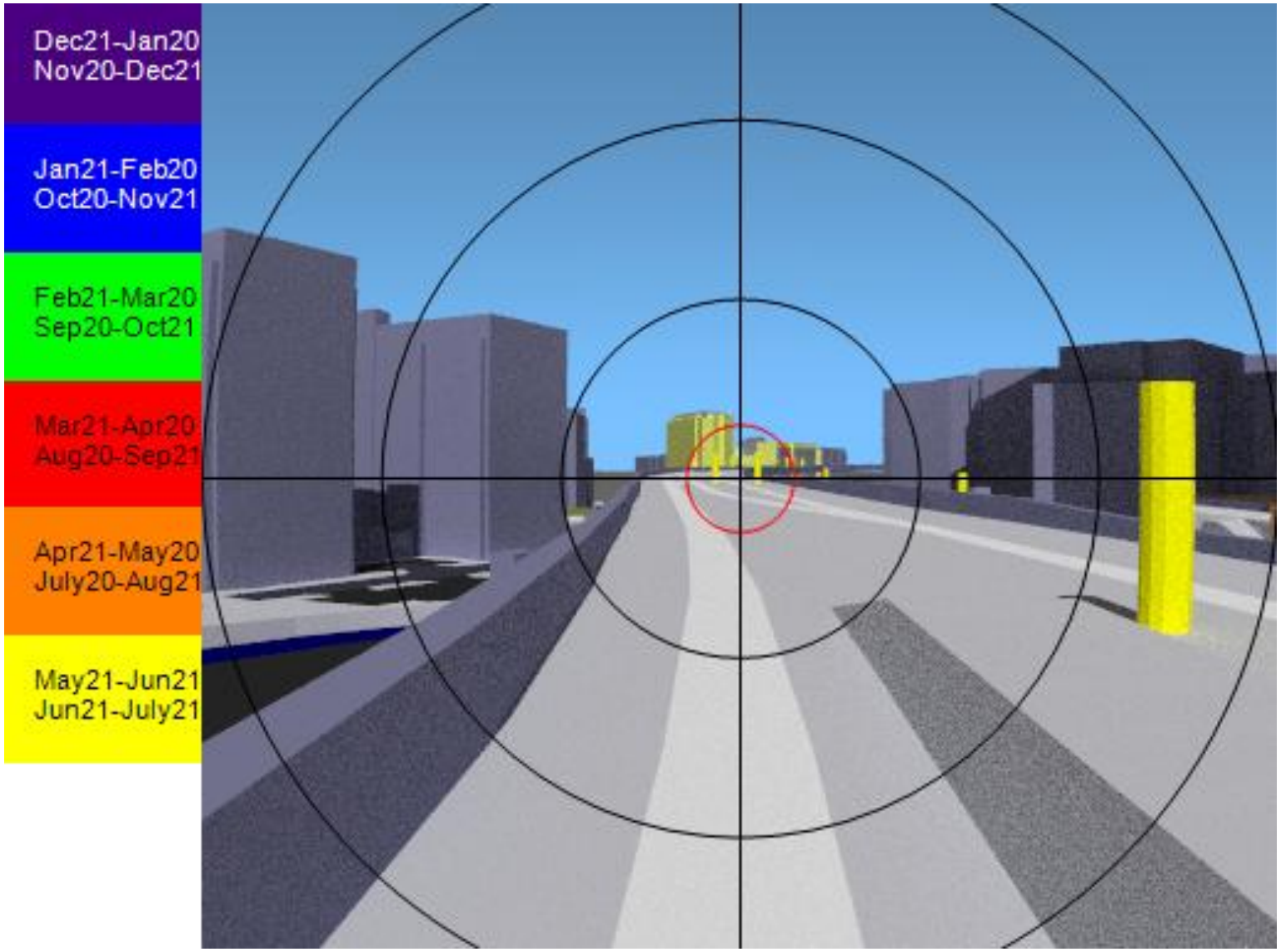
Position 8

Located to the west of the Proposed Development facing north, and 2m from the Signals.

The Proposed Development will not be visible to a tram driver at this point.

No glare would be experienced at any point at this location.

Glare impacts at Position 8 are therefore Not Significant.



Position 9

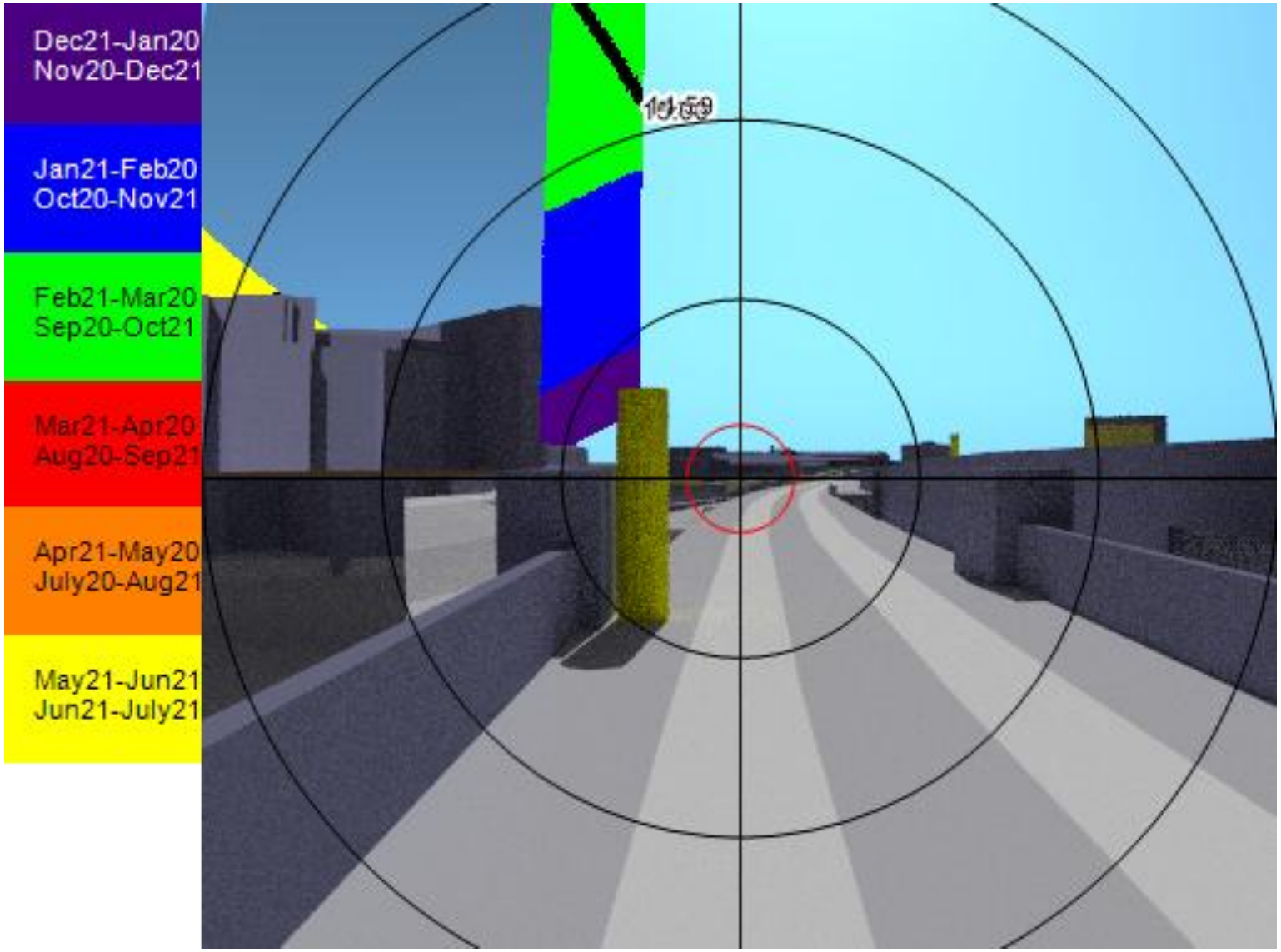
Located to the immediate west of the Proposed Development, and facing south.

The Proposed Development will be visible to a train driver at this point.

Glare could be experienced between 15.22 and 15.48 on 20 November – 20 January. It would be experienced in the near periphery and paracentral field of vision.

The greatest duration of glare in this period would be present for 27 minutes. Between 20 November – 09 December and 01 January – 20 January glare could be experienced for a duration of 10-27 minutes, with an average of 22 minutes. Between 10 December – 31 December glare could be experienced for a duration of 3-17 minutes, with an average of 7 minutes.

Glare could also be experienced in the near and mid peripheral field of vision between 21 January – 20 February and 20 October – 19 November between 15.08 – 15.47.



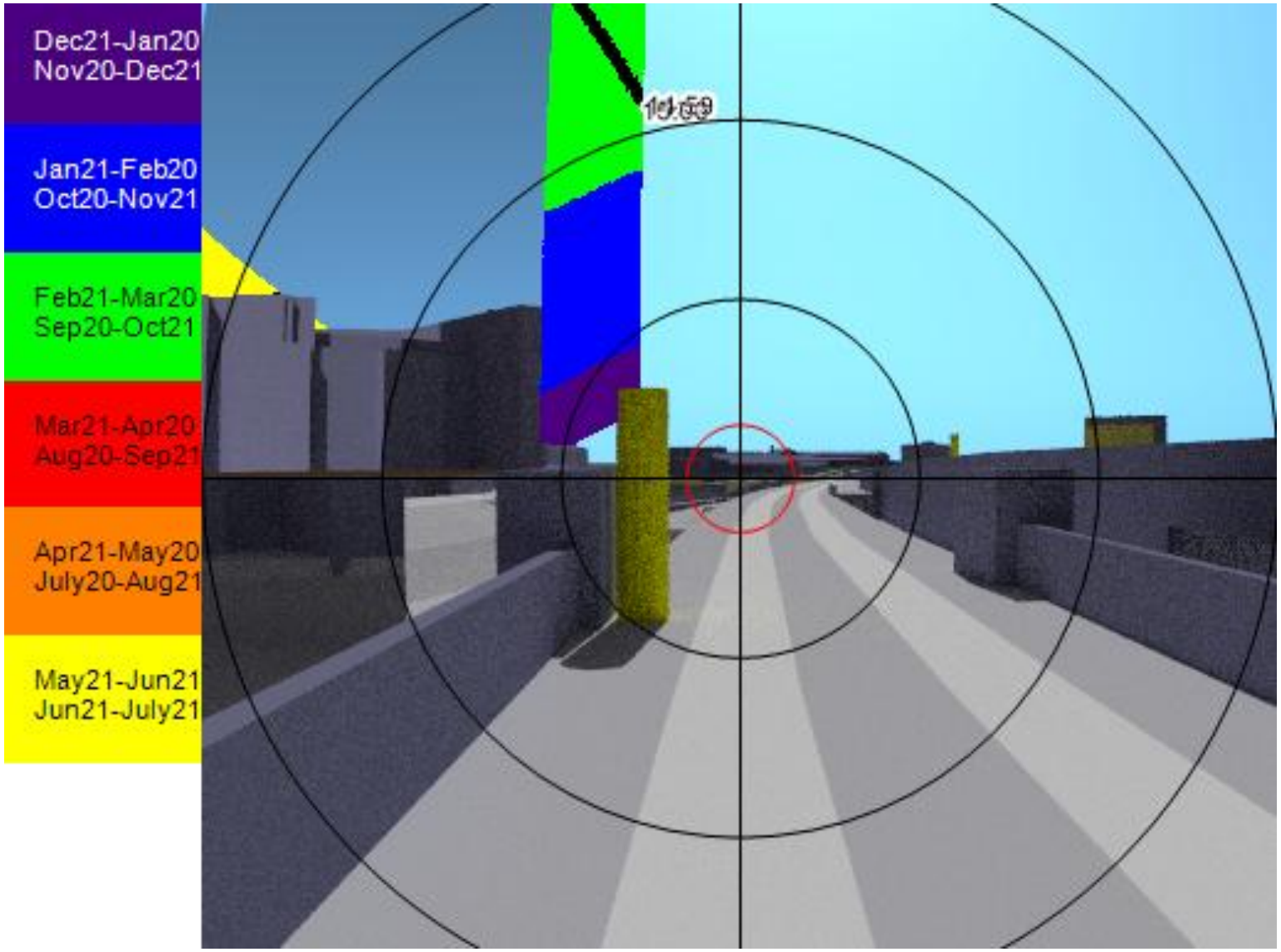
Position 9 cont...

The duration of glare in this period would be present for between 25 to 27 minutes.

Glare could also occur in the peripheral field of vision between 21 February – 20 March and 22 September – 19 October between 14.42 – 15.31.

On the basis that a portion of this glare will occur in the outer portion of the paracentral field of vision there is the potential that this glare could cause distraction to a train driver.

Glare impacts at Position 9 are Major adverse.



Position 10

Located to the immediate west of the Proposed Development, and facing south.

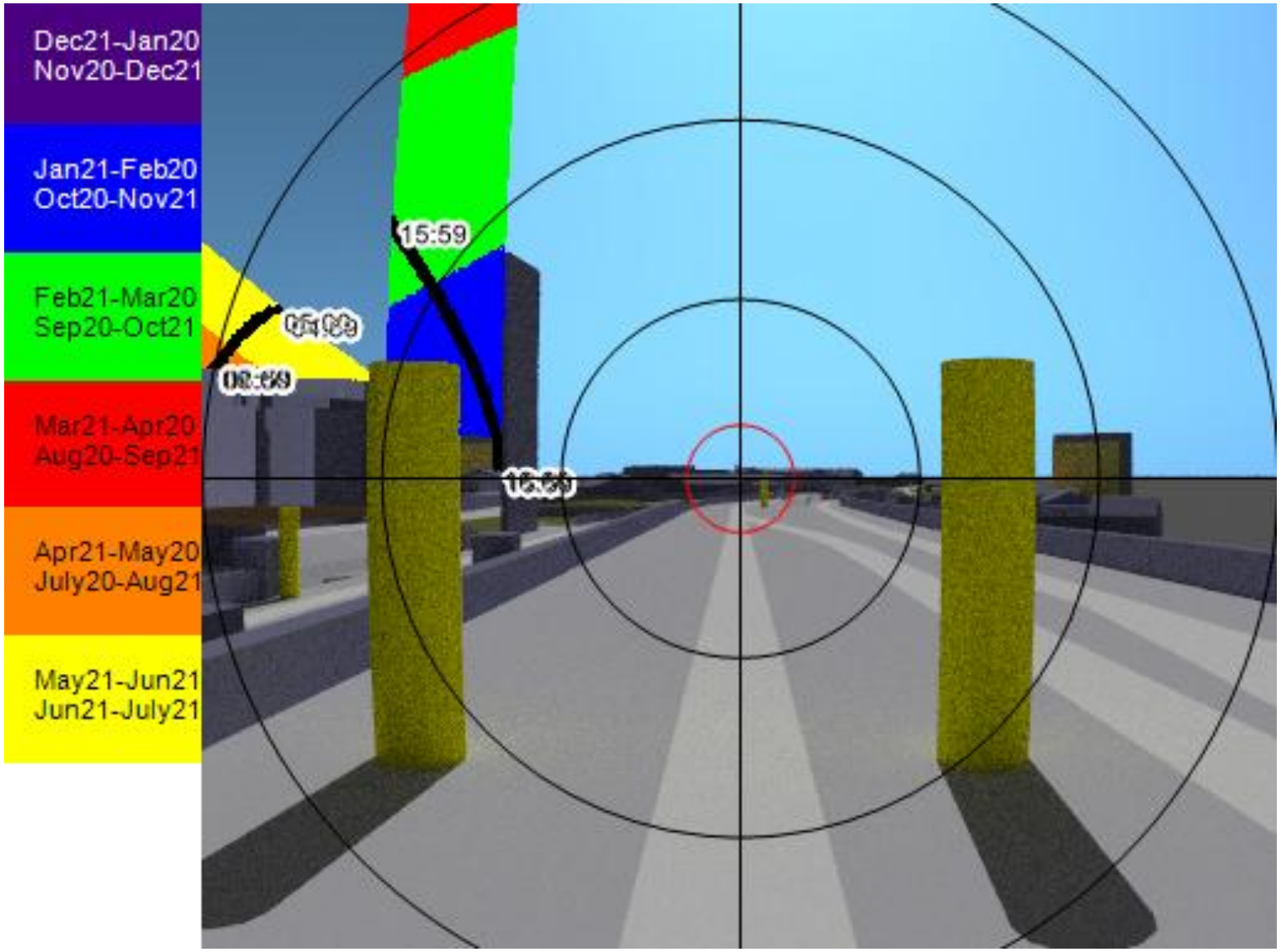
The Proposed Development will be visible to a train driver at this point.

Glare could be experienced between 15.08 and 15.47 on 21 January – 20 February. It would be experienced in the mid periphery field of vision.

The greatest duration of glare in this period would be present for 25 minutes.

Glare could also be experienced in the peripheral field of vision between 21 February – 20 March & 22 September – 19 October in the afternoon between 14.42 and 15.31. The maximum duration for glare on these dates and time is 25 minutes.

Peripheral glare could also be experienced between 21 March -27 March & 15 September – 21 September between 14.41 – 15.03 – 20 February and 20 October – 19 November between 15.08 – 15.47.

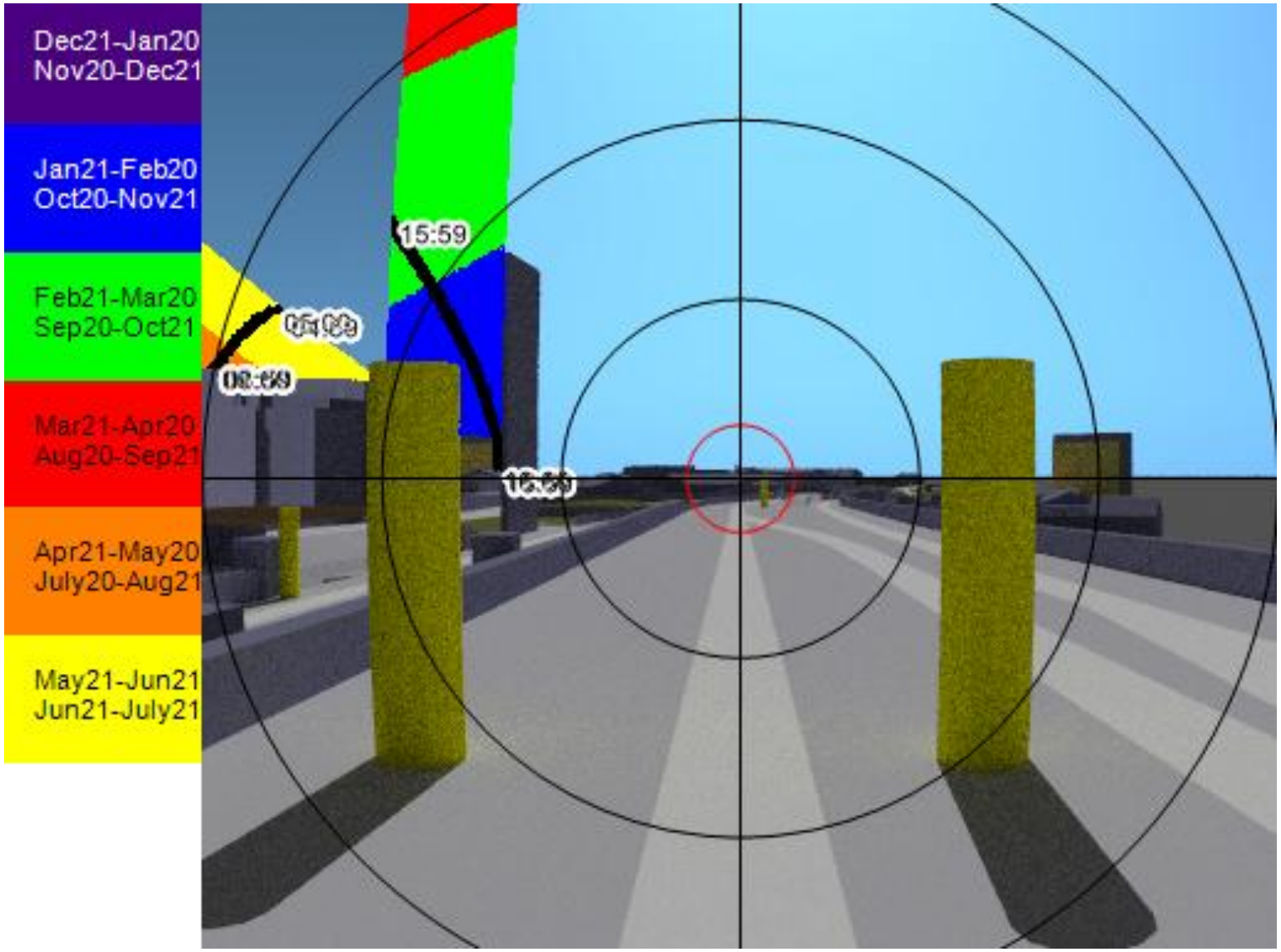


Position 10 cont...

In the early morning of 25 May – 18 July peripheral glare could be experienced between 04.07-05.25 for a duration of 5-17 minutes.

On the basis that glare may occur in the mid peripheral field of the train driver's vision we do not consider that there is the potential that this glare could cause distraction to a train driver.

Glare impacts at Position 10 are minor adverse. It would be experienced in the mid- and outer periphery of the field of vision.



Position 11

Located to the north of the Proposed Development, and facing south.

The Proposed Development will be visible to a train driver at this point.

Glare could be experienced between 14.57 and 15.04 on 01 January – 20 January, 20 November – 17 December and 24-31 December. It would be experienced in the near periphery field of vision.

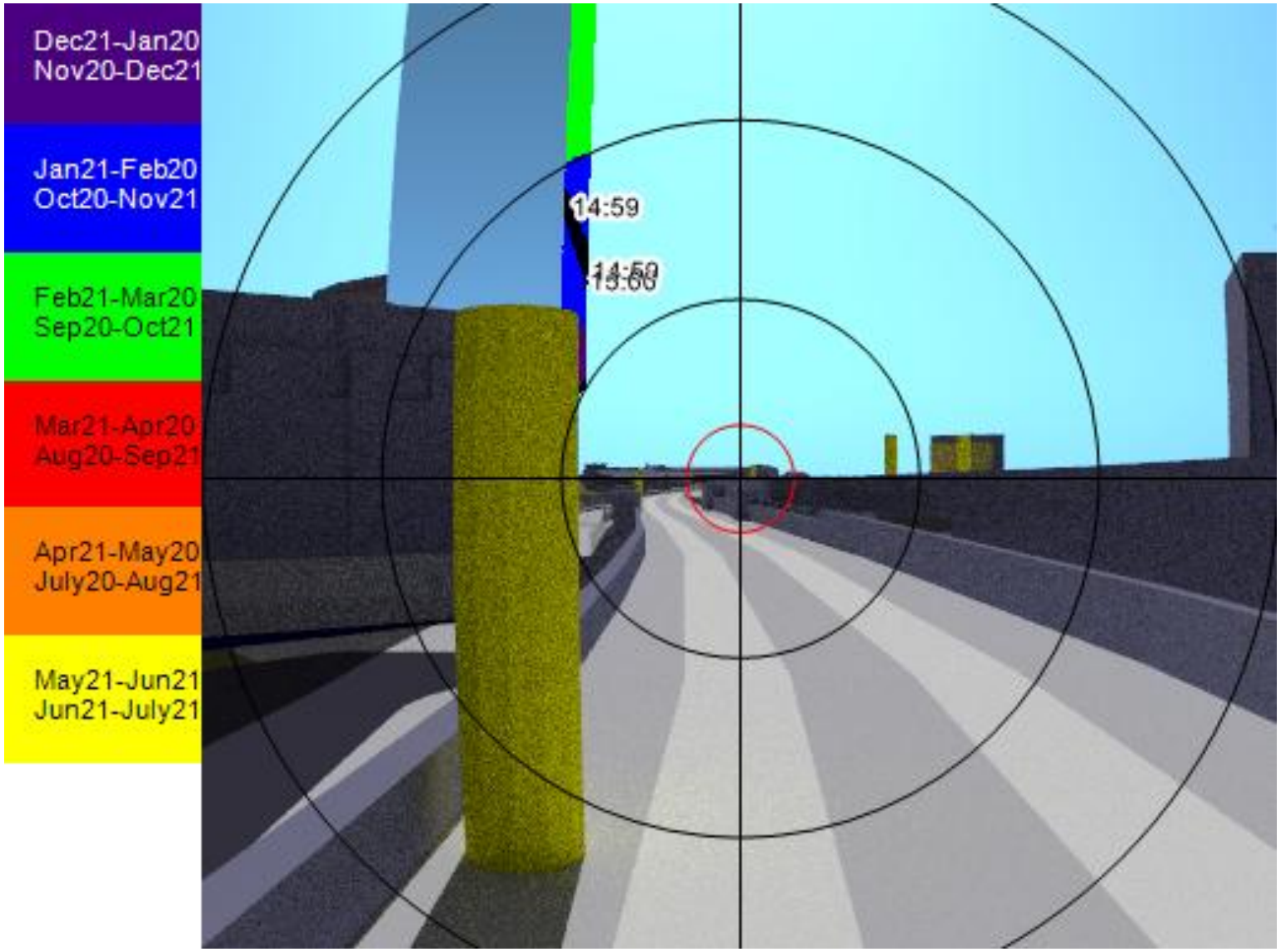
The greatest duration of glare in this period would be present for 2 minutes.

Glare could also be experienced in the mid peripheral field of vision between 21 January – 20 February 20 October – 19 November in the afternoon between 14.57 and 15.08. The duration for glare on these dates is between 2-7 minutes.

Peripheral glare could also be experienced between 21 February - 20 March & 22 September – 19 October between 14.27 – 14.56. The duration of glare in this period is 6-7 minutes.

On the basis that glare may occur in the near and mid peripheral field of the train driver's vision, we do not consider that there is the potential that this glare could cause distraction to a train driver.

Glare impacts at Position 11 are moderate adverse.



Position 12

Located to the north of the Proposed Development, and facing south.

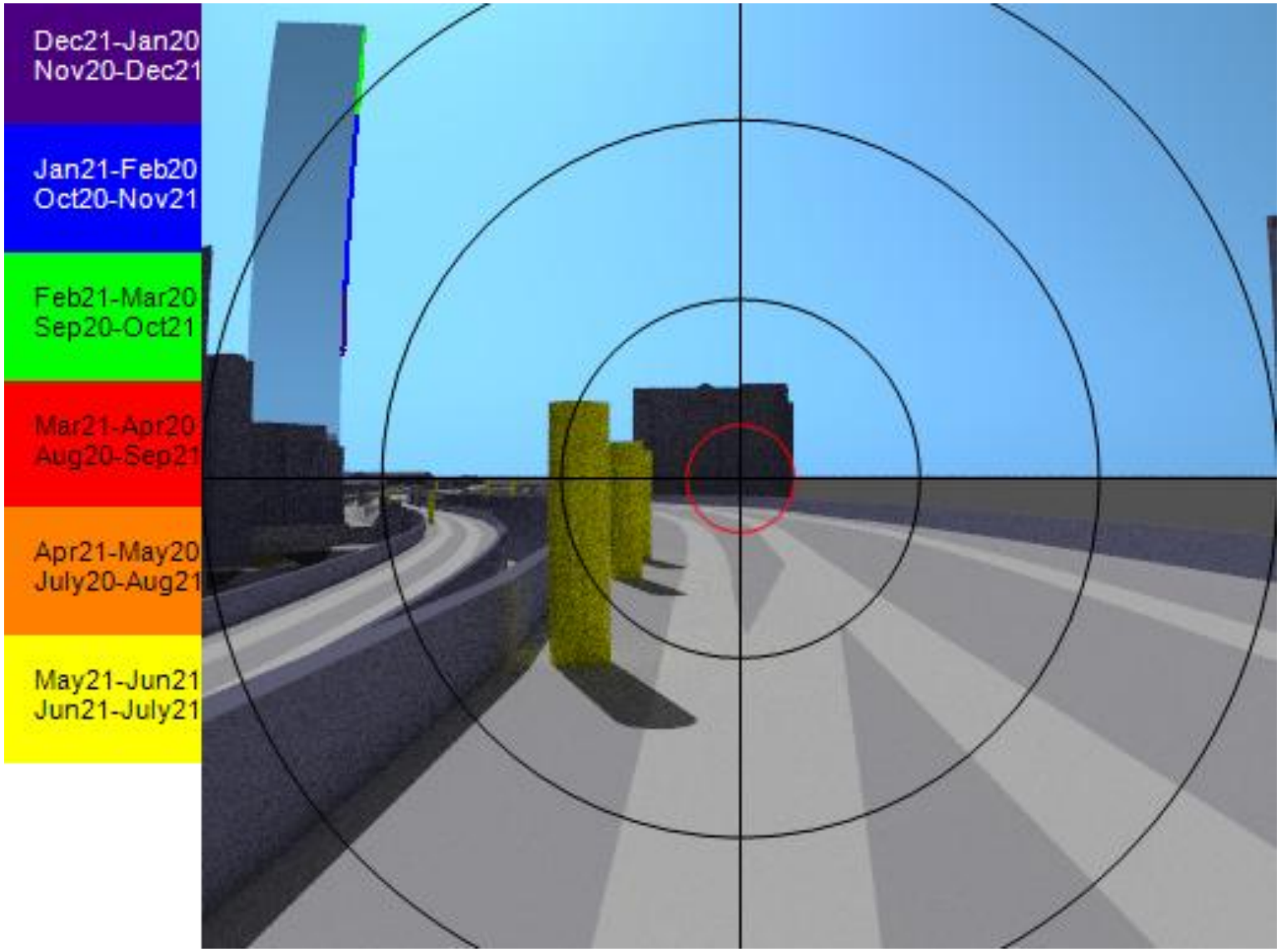
The Proposed Development will be visible to a tram driver at this point.

Glare could be experienced between 14.24 and 14.56 on 01 January – 05 March & 07 October – 18 December. It would be experienced in the peripheral field of vision.

The greatest duration of glare in this period would be present for 2 minutes.

On the basis that glare may occur in the peripheral field of the train driver's vision we do not consider that there is the potential that this glare could cause distraction to a tram driver.

Glare impacts at Position 12 are negligible with very low duration and are therefore Not Significant.



Proximity

Report Prepared by:



Tom Kibblewhite
Director
tom@weareproximity.co.uk
07983 455937

Altrincham
3 Barrington Road
Altrincham
WA14 1GY

Birmingham
Arca
Temple Row
Birmingham
B2 5AF

0345 257 5535
info@weareproximity.co.uk
weareproximity.co.uk