GLINT AND GLARE ASSESSMENT

macroworks

Proposed Warehouse/Logistics, Office & Café Development at Calmount Road, Ballymount Industrial Estate, Dublin 12

Registered Landscape Architect

November 2022

1 INTRODUCTION

Macro Works Ltd. undertook a glint and glare assessment for a number of roof-mounted photovoltaic (PV) panel installations on the roofs of the proposed new buildings at Calmount Road, Ballymount, Dublin 12 (Figure 1 and Figure 2 refer). This report was commissioned by Blackwin Limited in response to the Planning Application Reference SD22A/0099, more specifically to address Item 3(h) - 12.1.4 - Solar Photovoltaic of the CDP 2022-2028 of the Clarification on the Additional Information and specifically to address the requirement to assess the potential for glint and glare near airports associated with 'Solar Photovoltaic' on proposed 'buildings'. The design and location of the PV panels has been proposed by TOTA Architects in consultation with the design team and are considered appropriate for the subject units in the context of the requirements of Section 12.1.4 of the Development Plan. The PV panels will remain in a fixed position throughout the day and year (i.e. they will not rotate to track the movement of the sun).

Figure 1: Aerial view indicating the approximate location of the proposed PV panels (red pin).

Figure 2: Extract from drawing *'18-42-CFI-171-Proposed Site Plan'* indicating the location of the proposed PV panels.

2 STATEMENT OF AUTHORITY

Macro Works' relevant experience includes twenty years of analysing the visual effects of a wide range of infrastructural and commercial development types. This experience includes numerous domestic and international wind and solar energy developments. Macro Works has assessed the effects of glint and glare for many solar development sites throughout Ireland to date.

3 METHODOLOGY

The process for dealing with aviation receptors is as follows:

1. The Federal Aviation Administration (FAA) approved Solar Glare Hazard Analysis Tool (SGHAT) is used to determine if any of these aviation receptors has the potential to theoretically experience glint or glare. This tool also calculates the intensity of such reflectance and whether it is acceptable by FAA standards.
2. SGHAT does not account for terrain screening or screening provided by surface elements such as existing vegetation or buildings, therefore the results of the SGHAT may need to be considered, in conjunction with an assessment of existing intervening screening that may be present, to establish if reflectance can actually be experienced at the receptors.
3. Finally, if necessary, additional assessment is undertaken using Macro Works' bespoke model which would into account any screening provided by any proposed mitigation measures.

4 GUIDANCE

Guidance has been prepared by the Federal Aviation Authority[1] to address the potential hazards that solar developments may pose to aviation activities, and this has been adopted for use by the Irish Aviation Authority. SGHAT was developed in conjunction with the FAA in harmony with this guidance and is commonly regarded as the accepted industry standard by aviation authorities internationally when considering the glint and glare effects upon aviation related receptors.

4.1 FEDERAL AVIATION AUTHORITY

Within the FAA's interim policy, a 'Review of Solar Energy System Projects on Federally Obligated Airports'[2] it states:

"To obtain FAA approval to revise an airport layout plan to depict a solar installation and/or a "no objection" to a Notice of Proposed Construction Form 7460–1, the airport sponsor will be required to demonstrate that the proposed solar energy system meets the following standards:

- *No potential for glint or glare in the existing or planned Airport Traffic Control Tower (ATCT) cab, and*
- *No potential for glare or "low potential for after-image" (shown in green in Figure 1* [Figure 3 refers]*) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The*

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[1] Harris, Miller, Miller & Hanson Inc.. (November 2010). Technical Guidance for Evaluating Selected Solar Technologies on Airports; 3.1.2 Reflectivity. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. Available at: https://www.faa.gov/airports/environmental/policy_guidance/media/airport-solar-guide.pdf

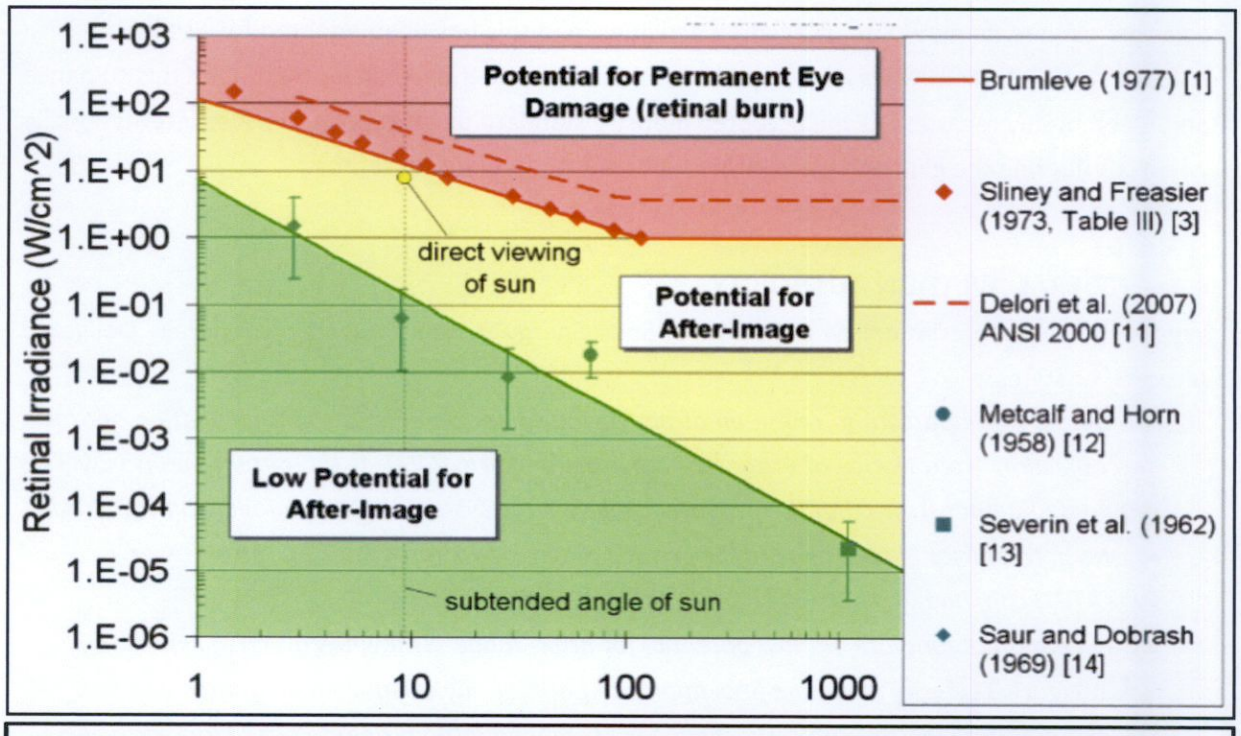
[2] Federal Aviation Administration (FAA). (2013). Department of Transportation - Federal Aviation Administration. *Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports*. Vol 78 (No 205), 63276-63279.

final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath."

In summary, glare at an ATCT is not acceptable but glare with a *"low potential for after-image"* is acceptable along final approach paths to runways.

4.2 SOLAR GLARE HAZARD ANALYSIS TOOL

The SGHAT was designed to determine whether a proposed solar energy project would result in the potential for ocular impact as depicted on the Solar Glare Hazard Analysis Plot (Figure 3 refers). SGHAT analyses ocular impact over the entire calendar year in one minute intervals from when the sun rises above the horizon until the sun sets below the horizon. One of the principal outputs from the SGHAT report is a glare plot per receptor that indicates the time of day and days per year that glare has the potential to occur. SGHAT plot classifies the intensity of ocular impact as either Green Glare, Yellow Glare or Red Glare. These colour classifications are equivalent to the FAA's definitions regarding the level of ocular impact e.g. 'Green Glare' in the SGHAT is synonymous to the FAA's *"low potential for after-image','* and so forth. The various correlations are illustrated on the Solar Glare Hazard Analysis Plot.



Solar Glare Ocular Hazard Plot: The potential ocular hazard from solar glare is a function of retinal irradiance and the subtended angle (size/distance) of the glare source. It should be noted that the ratio of spectrally weighted solar illuminance to solar irradiance at the earth's surface yields a conversion factor of ~100 lumens/W. Plot adapted from Ho et al., 2011.

Chart References: Ho, C.K., C.M. Ghanbari, and R.B. Diver, 2011, Methodology to Assess Potential Glint and Glare Hazards from Concentrating Solar Power Plants: Analytical Models and Experimental Validation, J. Solar Energy Engineering, August 2011, Vol. 133, 031021-1 – 031021-9.

Figure 3: Figure 1 from the FAA Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports

5 IDENTIFICATION OF RELEVANT RECEPTORS

5.1 RUNWAYS

5.1.1 Dublin Airport

Dublin Airport is an international airport operated by the Dublin Airport Authority. Dublin Airport currently hosts 3 operational runways 10/28 and 16/34 and 10L/28R, the latter of which was recently constructed and commenced operations in August 2022. 10L/28R was constructed to the north of the Airport to help accommodate increasing passenger numbers and runs parallel to runway 10/28, to the south. It is envisaged that this will eventually render the 16/34 runway as a purely taxiing runway (Figure 4 refers). All 6 runway approaches will be assessed.

Figure 4: Aerial view (Google Earth Pro) showing 2 mile approach lines to runways at Dublin Airport (at ¼ mile intervals) as assessed by SGHAT. Includes the newly opened northern runway (10L and 28R).

5.1.2 Casement Aerodrome

Casement Aerodrome, also known as Baldonnel Aerodrome is a military airbase to the southwest of Dublin, situated off the N7 main road route to the south and south west. It is the headquarters and the sole airfield of the Irish Air Corps, and is also used for other government purposes. Casement Aerodrome currently hosts 2 operational runways 04/22 and 10/28 (Figure 5 refers).

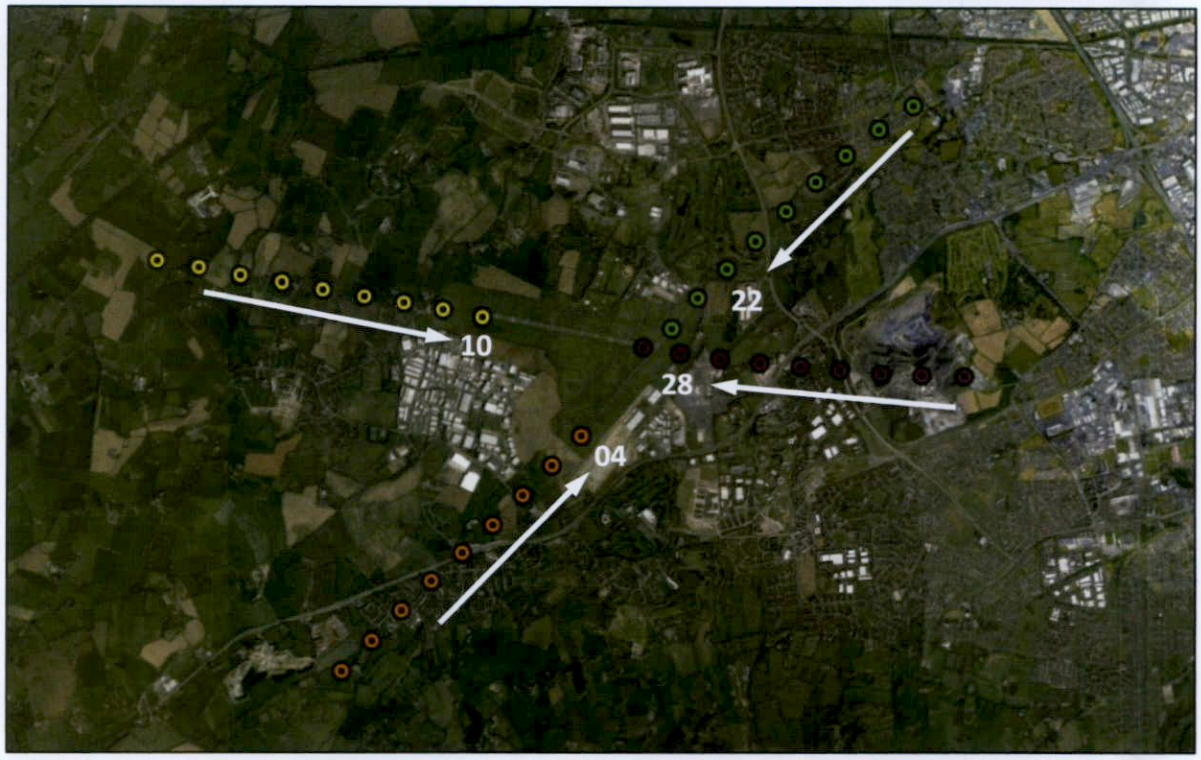


Figure 5: Aerial view (Google Earth Pro) showing 2 mile approach lines to runways at Casement Aerodrome (at ¼ mile intervals) as assessed by SGHAT.

5.2 AIR TRAFFIC CONTROL TOWERS

5.2.1 Casement

Casement Aerodrome has one Air Traffic Control Tower (ATCT) (Ref: '2-ATCT' in SGHAT) located to the east of the main terminal buildings, with a viewing height of 9m Above Ground Level (AGL) (Figure 6 refers).

Figure 6: Location of the Air Traffic Control Towers at Casement Aerodrome (red centre icon).

5.2.2 Dublin

Dublin Airport has a new Air Traffic Control Tower (ATCT) (Ref: '1-ATCT' in SGHAT) located to the west of the main terminal buildings. With a viewing height of 75.6m Above Ground Level (AGL) (Figure 7 refers), the new Air Traffic Control Tower (ATCT) (Ref: '1-ATCT' in SGHAT) is considerably taller than the older ATCT, which has not been included in the SGHAT due to its relatively low height at just 21.9m AGL.

Figure 7: Location of the Air Traffic Control Tower at Dublin Airport (red centre icon).

5.3 HELICOPTER RECEPTORS

The site falls within the Tallaght University Hospital Solar Safeguarding Zone, relating to a helipad at Tallaght University Hospital. The helipad is situated approximately 3km to the southwest (heading 220 degrees) of the proposed PV panels (**Error! Reference source not found.** refers). There is no category for helipads within the FAA guidance and only recently have these been included as a standard aviation receptor in Ireland.

Figure 8: Aerial view (Google Earth Pro) showing the approximate location of the proposed development (red pin) relative to the identified aviation receptor (yellow pin).

6 RESULTS

6.1 RUNWAY APPROACHES

6.1.1 Casement

The SGHAT results are contained in Appendix A and show that of the four runway approaches analysed, runway approach 04 at Casement Aerodrome is the only approach which has the theoretical potential to receive glare. In this instance, SGHAT calculated the potential glare to be '*Green Glare*'. SGHATs '*Green Glare*' classification regarding the intensity of the potential glare is synonymous with FAA's *'low potential for temporary after image'*. *'Green Glare' /* glare with a *'low potential for temporary after image,'* regardless of the number of minutes per year, is considered by the FAA to be an **acceptable level of reflectance effect for runway approaches.**

6.1.2 Dublin

The SGHAT results are contained in Appendix A and show that of the six runway approaches analysed, three runways – Runway 28R, Runway 28 and Runway 34 at Dublin Airport have the theoretical potential to receive glare. In this instance, SGHAT calculated the potential glare at the runways to be '*Green Glare*'. SGHATs '*Green Glare*' classification regarding the intensity of the

potential glare is synonymous with FAA's *'low potential for temporary after image'*. *'Green Glare'* / glare with a *'low potential for temporary after image,'* regardless of the number of minutes per year, is considered by the FAA to be an **acceptable level of reflectance effect for runway approaches**.

6.2 AIR TRAFFIC CONTROL TOWERS

6.2.1 Casement

The SGHAT results contained in Appendix A also assessed the theoretical potential for impacts at the ATCT in Casement Aerodrome (2-ATCT). SGHAT calculated that there is no potential for glare at the Casement Aerodrome ATCT.

6.2.2 Dublin

The SGHAT results contained in Appendix A also assessed the theoretical potential for impacts at the taller ATCT in Dublin Airport (1-ATCT). SGHAT calculated that there is no potential for glare at the Dublin Airport ATCT.

7 HELICOPTER RECEPTORS

In the absence of specific flight path information for the helicopters that land at Tallaght University Hospital, and given the potential random trajectory of helicopter destination and arrival flights, it was deemed appropriate to analyse receptor points at multiple height intervals above the helipad. It is intended that these will serve for the evaluation of a wide variety of flight scenarios to and from the hospital.

The SGHAT software was utilised to undertake this analysis. Using the SGHAT software, Observation Points (OP) were placed at a representative selection of thirteen different heights (OP3 to OP15), starting at 1.7m then increasing to 25m, thereafter increasing by 25m intervals above the helipad surface; 1.7m, 25m, 50m, 75m, 100m, 125m, 150m, 175m, 200m, 225m, 250m, 275m and 300m.

While the use of Observation Points for assessing a helipad are not included for in the FAA guidance, for the purpose of this assessment, it was assumed, as a worst-case scenario, that a similar hazard intensity classification would apply to helicopters at these Observation Points as would apply to passenger aircraft approaching a runway.

7.1 HELICOPTER ANALYSIS RESULTS

The SGHAT results for the Observation Points above the helipad at the Tallaght University Hospital are contained in Appendix A and show that none of the thirteen Observation Points (OP3-OP15) have the theoretical potential to receive glare as a result of the proposed development.

8 OVERALL CONCLUSION

From the analysis and discussions contained herein, it is considered that there will not be any hazardous glint and glare effects upon the identified aviation receptors - Casement Aerodrome, Dublin Airport or Tallaght University Hospital helicopter landing/take-off point, as a result of the proposed roof-mounted solar PV panels.

APPENDIX A:

SGHAT RESULTS

RUNWAYS APPROACHES, AIR TRAFFIC CONTROL TOWERS (ATCT) AND HELIPADS.

FORGESOLAR GLARE ANALYSIS

Project: **Dublin Casement**
Site configuration: **Calmount Road**
Analysis conducted by Luis Dominguez (luis@macroworks.ie) at 12:24 on 09 Nov, 2022.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	PASS	Flight path receptor(s) do not receive yellow glare
ATCT(s)	PASS	Receptor(s) marked as ATCT do not receive glare

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 79007.13297
Methodology: V2

PV Array(s)

Name: Unit1_1
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 65.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312290	-6.352995	64.40	15.97	80.37
2	53.312302	-6.352948	64.40	15.69	80.09
3	53.312265	-6.352919	64.40	15.69	80.09
4	53.312253	-6.352965	64.40	15.97	80.37
5	53.312207	-6.352930	64.40	15.97	80.37
6	53.312219	-6.352884	64.40	15.69	80.09
7	53.312173	-6.352848	64.40	15.69	80.09
8	53.312160	-6.352894	64.40	15.97	80.37
9	53.312109	-6.352855	64.40	15.97	80.37
10	53.312122	-6.352809	64.40	15.69	80.09
11	53.312085	-6.352780	64.40	15.69	80.09
12	53.312072	-6.352826	64.40	15.97	80.37
13	53.312022	-6.352786	64.40	15.96	80.36
14	53.312034	-6.352741	64.40	15.69	80.09
15	53.311988	-6.352705	64.40	15.69	80.09
16	53.311975	-6.352751	64.40	15.96	80.36
17	53.311929	-6.352716	64.40	15.97	80.37
18	53.311941	-6.352670	64.40	15.70	80.10
19	53.311904	-6.352642	64.40	15.70	80.10
20	53.311891	-6.352688	64.40	15.97	80.37
21	53.311891	-6.352689	64.40	15.97	80.37
22	53.312290	-6.352995	64.40	15.97	80.37

Name: Unit1_2
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 65.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312381	-6.352662	64.40	16.02	80.42
2	53.312394	-6.352616	64.40	15.74	80.14
3	53.312357	-6.352587	64.40	15.74	80.14
4	53.312344	-6.352633	64.40	16.01	80.41
5	53.312298	-6.352597	64.40	16.01	80.41
6	53.312311	-6.352552	64.40	15.74	80.14
7	53.312264	-6.352516	64.40	15.74	80.14
8	53.312252	-6.352562	64.40	16.01	80.41
9	53.312201	-6.352522	64.40	16.01	80.41
10	53.312213	-6.352476	64.40	15.74	80.14
11	53.312176	-6.352448	64.40	15.74	80.14
12	53.312164	-6.352494	64.40	16.01	80.41
13	53.312113	-6.352454	64.40	16.00	80.40
14	53.312126	-6.352409	64.40	15.74	80.14
15	53.312079	-6.352373	64.40	15.74	80.14
16	53.312066	-6.352419	64.40	16.01	80.41
17	53.312020	-6.352384	64.40	16.01	80.41
18	53.312033	-6.352338	64.40	15.74	80.14
19	53.311995	-6.352310	64.40	15.74	80.14
20	53.311983	-6.352355	64.40	16.01	80.41
21	53.311983	-6.352356	64.40	16.01	80.41
22	53.312381	-6.352662	64.40	16.02	80.42

Name: Unit2_1
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 65.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312849	-6.353761	62.50	16.02	78.52
2	53.312862	-6.353715	62.50	15.71	78.21
3	53.312816	-6.353680	62.50	15.71	78.21
4	53.312803	-6.353726	62.50	16.02	78.52
5	53.312757	-6.353690	62.50	16.02	78.52
6	53.312770	-6.353645	62.50	15.71	78.21
7	53.312723	-6.353609	62.50	15.71	78.21
8	53.312711	-6.353655	62.50	16.02	78.52
9	53.312665	-6.353620	62.50	16.02	78.52
10	53.312678	-6.353574	62.50	15.71	78.21
11	53.312632	-6.353538	62.50	15.71	78.21
12	53.312619	-6.353584	62.50	16.02	78.52
13	53.312576	-6.353550	62.50	16.01	78.51
14	53.312588	-6.353504	62.50	15.71	78.21
15	53.312542	-6.353469	62.50	15.71	78.21
16	53.312529	-6.353515	62.50	16.02	78.52
17	53.312483	-6.353479	62.50	16.02	78.52
18	53.312495	-6.353434	62.50	15.72	78.22
19	53.312449	-6.353398	62.50	15.72	78.22
20	53.312436	-6.353444	62.50	16.02	78.52
21	53.312436	-6.353445	62.50	16.03	78.53
22	53.312849	-6.353761	62.50	16.02	78.52

Name: Unit2_2
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 65.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312944	-6.353415	62.50	16.06	78.56
2	53.312957	-6.353368	62.50	15.76	78.26
3	53.312911	-6.353333	62.50	15.76	78.26
4	53.312898	-6.353379	62.50	16.05	78.55
5	53.312852	-6.353344	62.50	16.05	78.55
6	53.312865	-6.353298	62.50	15.76	78.26
7	53.312818	-6.353262	62.50	15.76	78.26
8	53.312806	-6.353308	62.50	16.05	78.55
9	53.312761	-6.353274	62.50	16.05	78.55
10	53.312773	-6.353228	62.50	15.76	78.26
11	53.312727	-6.353192	62.50	15.76	78.26
12	53.312714	-6.353238	62.50	16.05	78.55
13	53.312671	-6.353203	62.50	16.05	78.55
14	53.312683	-6.353158	62.50	15.76	78.26
15	53.312637	-6.353122	62.50	15.76	78.26
16	53.312624	-6.353168	62.50	16.05	78.55
17	53.312578	-6.353133	62.50	16.05	78.55
18	53.312590	-6.353087	62.50	15.76	78.26
19	53.312544	-6.353052	62.50	15.76	78.26
20	53.312531	-6.353098	62.50	16.05	78.55
21	53.312531	-6.353099	62.50	16.06	78.56
22	53.312944	-6.353415	62.50	16.06	78.56

Name: Unit3_1
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312852	-6.352442	61.00	16.03	77.03
2	53.313041	-6.351754	61.00	16.02	77.02
3	53.313013	-6.351733	61.00	15.74	76.74
4	53.312991	-6.351810	61.00	15.74	76.74
5	53.313019	-6.351831	61.00	16.02	77.02
6	53.312997	-6.351906	61.00	16.01	77.01
7	53.312971	-6.351885	61.00	15.74	76.74
8	53.312949	-6.351963	61.00	15.74	76.74
9	53.312977	-6.351984	61.00	16.02	77.02
10	53.312956	-6.352059	61.00	16.02	77.02
11	53.312929	-6.352038	61.00	15.74	76.74
12	53.312907	-6.352116	61.00	15.74	76.74
13	53.312934	-6.352136	61.00	16.02	77.02
14	53.312914	-6.352212	61.00	16.02	77.02
15	53.312887	-6.352191	61.00	15.75	76.75
16	53.312866	-6.352268	61.00	15.75	76.75
17	53.312893	-6.352289	61.00	16.02	77.02
18	53.312872	-6.352364	61.00	16.02	77.02
19	53.312845	-6.352343	61.00	15.75	76.75
20	53.312824	-6.352421	61.00	15.75	76.75
21	53.312852	-6.352442	61.00	16.03	77.03

Name: Unit3_2
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312631	-6.352274	61.00	16.02	77.02
2	53.312820	-6.351586	61.00	16.02	77.02
3	53.312792	-6.351564	61.00	15.74	76.74
4	53.312770	-6.351642	61.00	15.74	76.74
5	53.312798	-6.351663	61.00	16.01	77.01
6	53.312777	-6.351738	61.00	16.00	77.00
7	53.312750	-6.351717	61.00	15.74	76.74
8	53.312729	-6.351795	61.00	15.74	76.74
9	53.312756	-6.351816	61.00	16.01	77.01
10	53.312735	-6.351891	61.00	16.01	77.01
11	53.312708	-6.351870	61.00	15.74	76.74
12	53.312687	-6.351947	61.00	15.74	76.74
13	53.312714	-6.351968	61.00	16.01	77.01
14	53.312693	-6.352043	61.00	16.01	77.01
15	53.312666	-6.352022	61.00	15.74	76.74
16	53.312645	-6.352100	61.00	15.74	76.74
17	53.312672	-6.352121	61.00	16.01	77.01
18	53.312651	-6.352196	61.00	16.01	77.01
19	53.312624	-6.352175	61.00	15.74	76.74
20	53.312603	-6.352253	61.00	15.74	76.74
21	53.312631	-6.352274	61.00	16.02	77.02

Name: Unit4_1
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.313154	-6.351346	61.00	16.38	77.38
2	53.313330	-6.350707	61.00	16.38	77.38
3	53.313302	-6.350685	61.00	15.84	76.84
4	53.313281	-6.350763	61.00	15.84	76.84
5	53.313308	-6.350784	61.00	16.37	77.37
6	53.313291	-6.350847	61.00	16.37	77.37
7	53.313264	-6.350825	61.00	15.84	76.84
8	53.313242	-6.350903	61.00	15.84	76.84
9	53.313269	-6.350924	61.00	16.36	77.36
10	53.313252	-6.350987	61.00	16.37	77.37
11	53.313225	-6.350966	61.00	15.84	76.84
12	53.313199	-6.351059	61.00	15.84	76.84
13	53.313226	-6.351080	61.00	16.36	77.36
14	53.313213	-6.351127	61.00	16.36	77.36
15	53.313186	-6.351106	61.00	15.84	76.84
16	53.313164	-6.351184	61.00	15.84	76.84
17	53.313192	-6.351205	61.00	16.37	77.37
18	53.313174	-6.351267	61.00	16.36	77.36
19	53.313147	-6.351246	61.00	15.84	76.84
20	53.313126	-6.351324	61.00	15.84	76.84
21	53.313154	-6.351346	61.00	16.38	77.38

Name: Unit4_2
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312935	-6.351177	61.00	16.39	77.39
2	53.313111	-6.350537	61.00	16.39	77.39
3	53.313083	-6.350516	61.00	15.86	76.86
4	53.313062	-6.350594	61.00	15.86	76.86
5	53.313089	-6.350615	61.00	16.37	77.37
6	53.313072	-6.350677	61.00	16.38	77.38
7	53.313044	-6.350656	61.00	15.86	76.86
8	53.313023	-6.350734	61.00	15.86	76.86
9	53.313050	-6.350755	61.00	16.37	77.37
10	53.313033	-6.350818	61.00	16.37	77.37
11	53.313006	-6.350797	61.00	15.86	76.86
12	53.312980	-6.350890	61.00	15.86	76.86
13	53.313007	-6.350911	61.00	16.37	77.37
14	53.312994	-6.350958	61.00	16.37	77.37
15	53.312967	-6.350937	61.00	15.86	76.86
16	53.312945	-6.351015	61.00	15.86	76.86
17	53.312972	-6.351035	61.00	16.37	77.37
18	53.312955	-6.351098	61.00	16.37	77.37
19	53.312928	-6.351077	61.00	15.86	76.86
20	53.312906	-6.351155	61.00	15.86	76.86
21	53.312935	-6.351177	61.00	16.39	77.39

Name: Unit 5A
Axis tracking: Fixed (no rotation)
Tilt: 5.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312745	-6.349990	61.75	12.00	73.75
2	53.312731	-6.349979	61.75	12.00	73.75
3	53.312705	-6.350071	61.75	12.00	73.75
4	53.312634	-6.350015	61.75	12.00	73.75
5	53.312659	-6.349924	61.75	12.00	73.75
6	53.312645	-6.349913	61.75	12.00	73.75
7	53.312620	-6.350004	61.75	12.00	73.75
8	53.312521	-6.349929	61.75	12.00	73.75
9	53.312539	-6.349865	61.75	12.00	73.75
10	53.312525	-6.349854	61.75	12.00	73.75
11	53.312500	-6.349945	61.75	12.00	73.75
12	53.312428	-6.349890	61.75	12.00	73.75
13	53.312454	-6.349799	61.75	12.00	73.75
14	53.312440	-6.349788	61.75	12.00	73.75
15	53.312414	-6.349881	61.75	12.00	73.75
16	53.312513	-6.349958	61.75	12.00	73.75
17	53.312521	-6.349930	61.75	12.00	73.75
18	53.312619	-6.350007	61.75	12.00	73.75
19	53.312719	-6.350083	61.75	12.00	73.75
20	53.312719	-6.350083	61.75	12.00	73.75

Name: Unit 5B
Axis tracking: Fixed (no rotation)
Tilt: 5.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.311923	-6.350242	63.50	10.25	73.75
2	53.311949	-6.350149	63.50	10.25	73.75
3	53.311935	-6.350138	63.50	10.25	73.75
4	53.311983	-6.350090	63.50	10.25	73.75
5	53.311997	-6.350100	63.50	10.25	73.75
6	53.312023	-6.350007	63.50	10.25	73.75
7	53.312009	-6.349997	63.50	10.25	73.75
8	53.312058	-6.349945	63.50	10.25	73.75
9	53.312072	-6.349955	63.50	10.25	73.75
10	53.312097	-6.349862	63.50	10.25	73.75
11	53.312084	-6.349852	63.50	10.25	73.75
12	53.312132	-6.349803	63.50	10.25	73.75
13	53.312145	-6.349814	63.50	10.25	73.75
14	53.312171	-6.349721	63.50	10.25	73.75
15	53.312157	-6.349710	63.50	10.25	73.75
16	53.312131	-6.349803	63.50	10.25	73.75
17	53.312083	-6.349851	63.50	10.25	73.75
18	53.312058	-6.349944	63.50	10.25	73.75
19	53.312009	-6.349996	63.50	10.25	73.75
20	53.311983	-6.350090	63.50	10.25	73.75
21	53.311935	-6.350138	63.50	10.25	73.75
22	53.311909	-6.350231	63.50	10.25	73.75
23	53.311923	-6.350242	63.50	10.25	73.75

Name: Unit 5C
Axis tracking: Fixed (no rotation)
Tilt: 5.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.312555	-6.350702	62.50	11.25	73.75
2	53.312581	-6.350609	62.50	11.25	73.75
3	53.312567	-6.350598	62.50	11.25	73.75
4	53.312542	-6.350690	62.50	11.25	73.75
5	53.312458	-6.350626	62.50	11.25	73.75
6	53.312483	-6.350533	62.50	11.25	73.75
7	53.312469	-6.350522	62.50	11.25	73.75
8	53.312444	-6.350615	62.50	11.25	73.75
9	53.312358	-6.350548	62.50	11.25	73.75
10	53.312383	-6.350456	62.50	11.25	73.75
11	53.312369	-6.350445	62.50	11.25	73.75
12	53.312344	-6.350537	62.50	11.25	73.75
13	53.312260	-6.350473	62.50	11.25	73.75
14	53.312285	-6.350381	62.50	11.25	73.75
15	53.312271	-6.350370	62.50	11.25	73.75
16	53.312245	-6.350463	62.50	11.25	73.75
17	53.312555	-6.350702	62.50	11.25	73.75

Name: Unit6_1
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.311898	-6.351352	64.50	16.37	80.87
2	53.312057	-6.350780	64.50	16.36	80.86
3	53.312011	-6.350744	64.50	15.88	80.38
4	53.311998	-6.350791	64.50	15.88	80.38
5	53.312043	-6.350826	64.50	16.36	80.86
6	53.312008	-6.350954	64.50	16.36	80.86
7	53.311962	-6.350919	64.50	15.88	80.38
8	53.311949	-6.350966	64.50	15.88	80.38
9	53.311994	-6.351001	64.50	16.36	80.86
10	53.311959	-6.351129	64.50	16.36	80.86
11	53.311913	-6.351094	64.50	15.88	80.38
12	53.311900	-6.351141	64.50	15.88	80.38
13	53.311946	-6.351176	64.50	16.36	80.86
14	53.311910	-6.351304	64.50	16.36	80.86
15	53.311865	-6.351269	64.50	15.88	80.38
16	53.311852	-6.351316	64.50	15.88	80.38
17	53.311898	-6.351352	64.50	16.37	80.87

Name: Unit6_2
Axis tracking: Fixed (no rotation)
Tilt: 4.0°
Orientation: 155.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	53.311724	-6.351217	64.50	16.37	80.87
2	53.311883	-6.350645	64.50	16.37	80.87
3	53.311836	-6.350609	64.50	15.88	80.38
4	53.311823	-6.350656	64.50	15.88	80.38
5	53.311869	-6.350691	64.50	16.36	80.86
6	53.311833	-6.350819	64.50	16.36	80.86
7	53.311788	-6.350784	64.50	15.88	80.38
8	53.311775	-6.350831	64.50	15.88	80.38
9	53.311820	-6.350866	64.50	16.36	80.86
10	53.311785	-6.350994	64.50	16.36	80.86
11	53.311739	-6.350959	64.50	15.88	80.38
12	53.311726	-6.351006	64.50	15.88	80.38
13	53.311772	-6.351041	64.50	16.36	80.86
14	53.311736	-6.351169	64.50	16.36	80.86
15	53.311690	-6.351134	64.50	15.88	80.38
16	53.311677	-6.351181	64.50	15.88	80.38
17	53.311724	-6.351217	64.50	16.37	80.87

Flight Path Receptor(s)

Name: 10L Runway
Description: None
Threshold height: 15 m
Direction: 95.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 120.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.436880	-6.280253	71.90	15.20	87.10
Two-mile	53.439822	-6.328592	74.90	180.90	255.80

Name: 10 Runway
Description: None
Threshold height: 15 m
Direction: 95.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 120.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.422405	-6.289520	74.00	15.30	89.30
Two-mile	53.425327	-6.337846	80.30	177.60	257.90

Name: 16 Runway
Description: None
Threshold height: 15 m
Direction: 156.1°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 120.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.436699	-6.261764	66.50	15.20	81.70
Two-mile	53.463138	-6.281428	69.70	180.70	250.40

Name: 28R Runway
Description: None
Threshold height: 15 m
Direction: 275.9°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 120.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.435084	-6.240975	65.50	15.30	80.80
Two-mile	53.432097	-6.192645	34.00	215.50	249.50

Name: 28 Runway
Description: None
Threshold height: 15 m
Direction: 275.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 120.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.420299	-6.251111	62.00	15.20	77.20
Two-mile	53.417517	-6.202763	41.90	204.00	245.90

Name: 34 Runway
Description: None
Threshold height: 15 m
Direction: 336.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 120.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.420211	-6.249810	62.20	15.30	77.50
Two-mile	53.393680	-6.230504	49.00	197.10	246.10

Name: Casement 04 Runway
Description: None
Threshold height: 15 m
Direction: 41.3°
Glide slope: 4.3°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.293830	-6.453465	98.30	15.20	113.50
Two-mile	53.272113	-6.485435	154.40	127.80	282.20

Name: Casement 10 Runway
Description: None
Threshold height: 15 m
Direction: 101.8°
Glide slope: 3.42°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.304622	-6.468287	86.30	15.30	101.60
Two-mile	53.310549	-6.515700	73.60	196.60	270.20

Name: Casement 22 Runway
Description: None
Threshold height: 15 m
Direction: 220.9°
Glide slope: 4.3°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.303267	-6.439788	93.40	15.20	108.60
Two-mile	53.325107	-6.408047	62.50	214.80	277.30

Name: Casement 28 Runway
Description: None
Threshold height: 15 m
Direction: 281.8°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	53.301696	-6.445153	96.10	15.20	111.30
Two-mile	53.295759	-6.397747	106.20	173.80	280.00

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
1-ATCT	1	53.428937	-6.264259	65.60	75.60
2-ATCT	2	53.305496	-6.441790	93.50	9.00
OP 3	3	53.289501	-6.376776	104.60	1.70
OP 4	4	53.289501	-6.376776	104.60	25.00
OP 5	5	53.289501	-6.376776	104.60	50.00
OP 6	6	53.289501	-6.376776	104.60	75.00
OP 7	7	53.289501	-6.376776	104.60	100.00
OP 8	8	53.289501	-6.376776	104.60	125.00
OP 9	9	53.289501	-6.376776	104.60	150.00
OP 10	10	53.289501	-6.376776	104.60	175.00
OP 11	11	53.289501	-6.376776	104.60	200.00
OP 12	12	53.289501	-6.376776	104.60	225.00
OP 13	13	53.289501	-6.376776	104.60	250.00
OP 14	14	53.289501	-6.376776	104.60	275.00
OP 15	15	53.289501	-6.376776	104.60	300.00

Map image of 1-ATCT

Map image of 2-ATCT

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt	Orient	"Green" Glare	"Yellow" Glare	Energy
	(°)	(°)	min	min	kWh
Unit1_1	4.0	65.0	8,644	0	-
Unit1_2	4.0	65.0	8,559	0	-
Unit2_1	4.0	65.0	8,825	0	-
Unit2_2	4.0	65.0	8,778	0	-
Unit3_1	4.0	155.0	826	0	-
Unit3_2	4.0	155.0	836	0	-
Unit4_1	4.0	155.0	723	0	-
Unit4_2	4.0	155.0	791	0	-
Unit 5A	5.0	155.0	909	0	-
Unit 5B	5.0	155.0	892	0	-
Unit 5C	5.0	155.0	922	0	-
Unit6_1	4.0	155.0	781	0	-
Unit6_2	4.0	155.0	709	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	11699	0
28 Runway	12917	0
34 Runway	10190	0
Casement 04 Runway	7389	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Results for: Unit1_1

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	2897	0
28 Runway	3222	0
34 Runway	2525	0
Casement 04 Runway	0	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

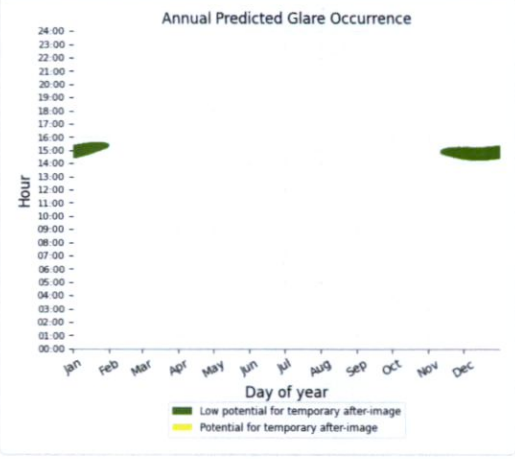
0 minutes of yellow glare
0 minutes of green glare

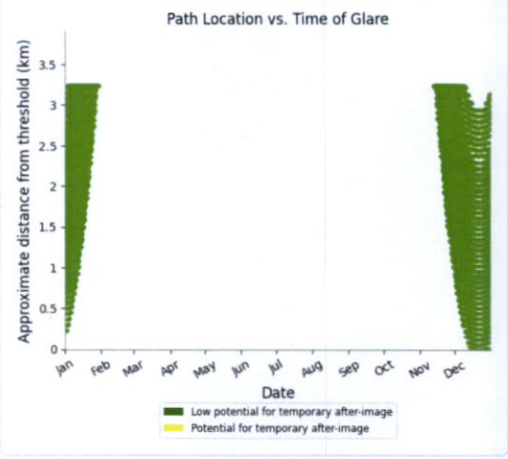
Flight Path: 16 Runway

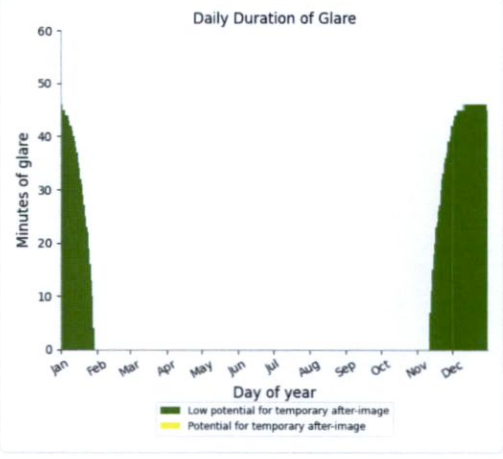
0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
2897 minutes of green glare



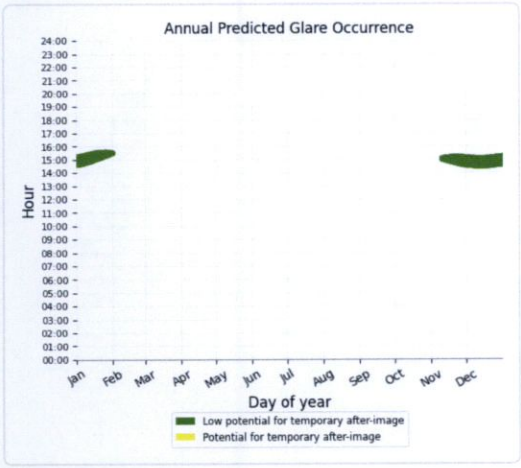


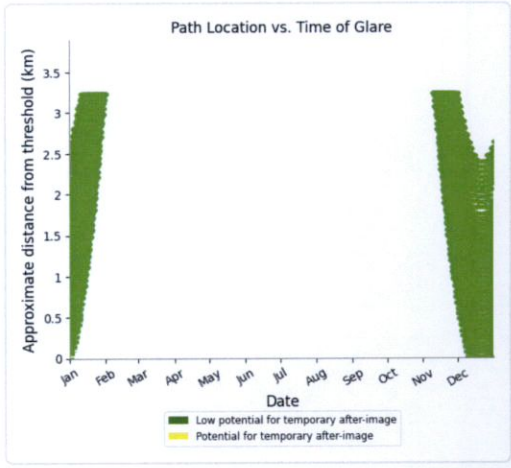


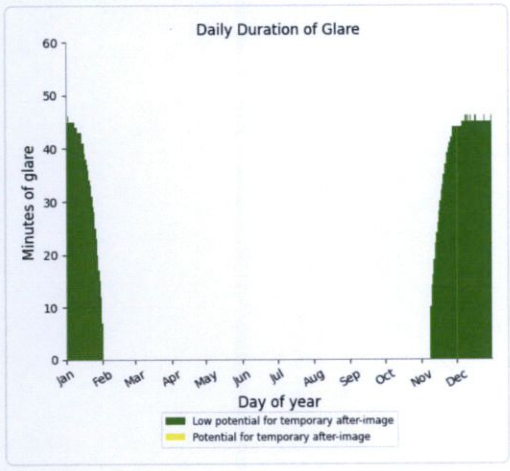
Flight Path: 28 Runway

0 minutes of yellow glare

3222 minutes of green glare

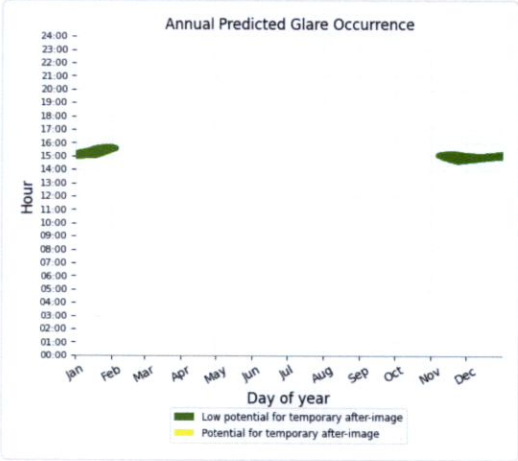


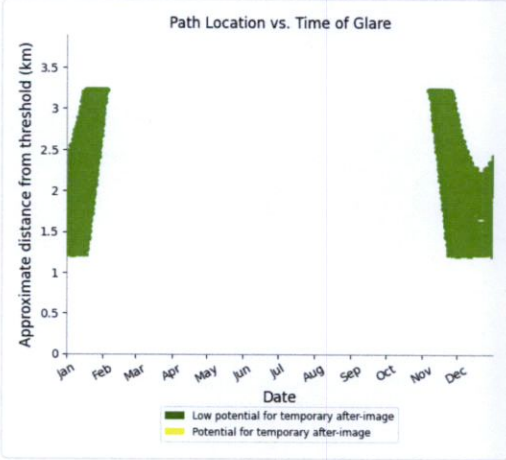


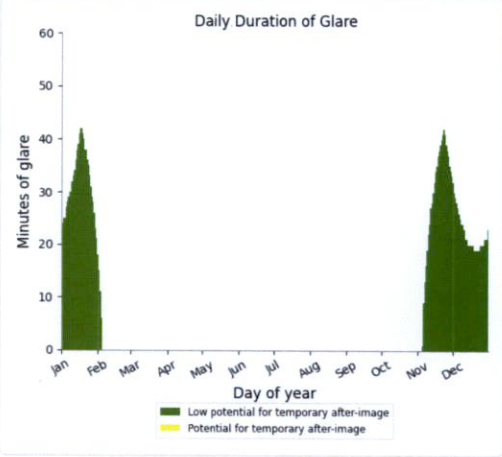


Flight Path: 34 Runway

0 minutes of yellow glare
2525 minutes of green glare







Flight Path: Casement 04 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit1_2

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	2874	0
28 Runway	3169	0
34 Runway	2516	0
Casement 04 Runway	0	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

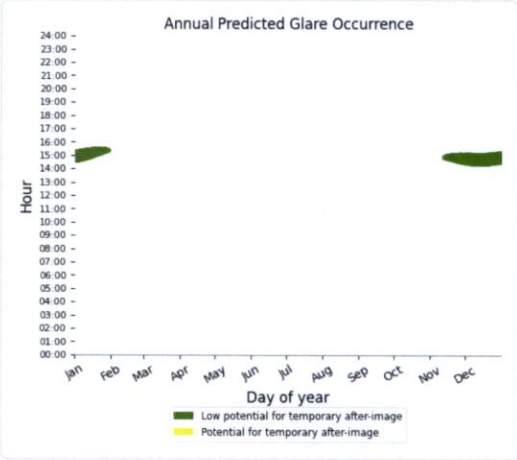
Flight Path: 16 Runway

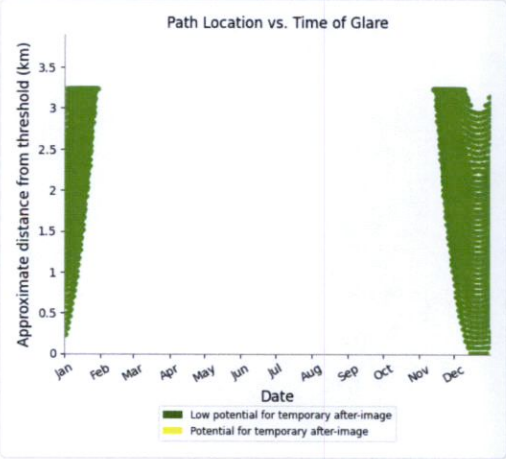
0 minutes of yellow glare
0 minutes of green glare

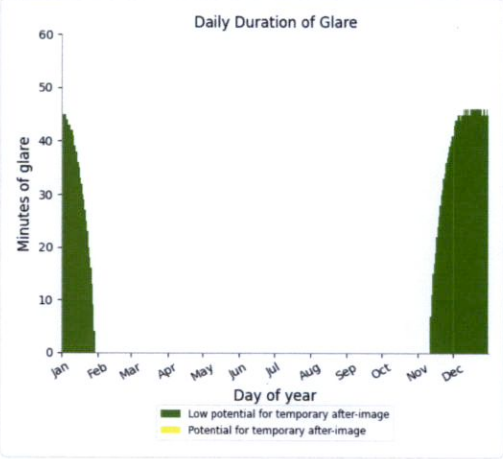
Flight Path: 28R Runway

0 minutes of yellow glare

2874 minutes of green glare



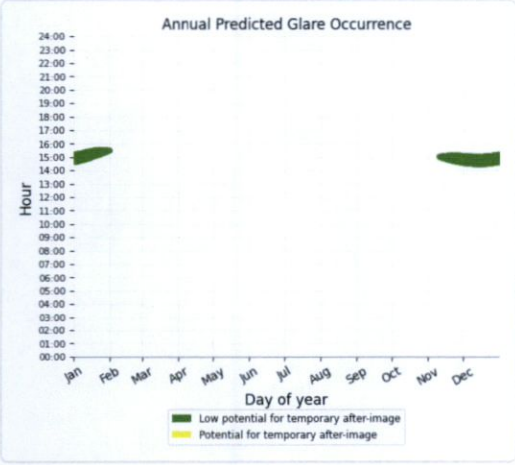


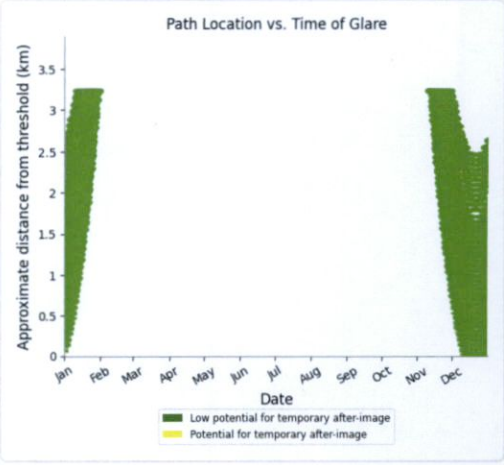


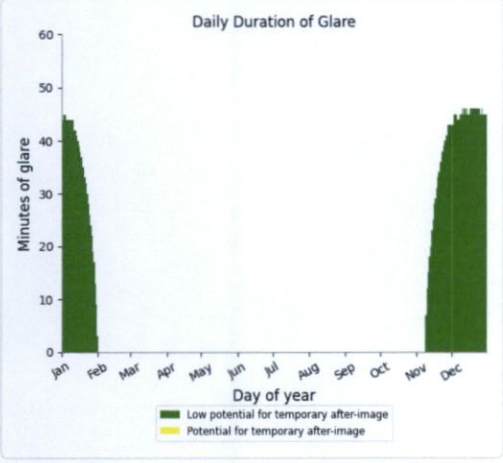
Flight Path: 28 Runway

0 minutes of yellow glare

3169 minutes of green glare



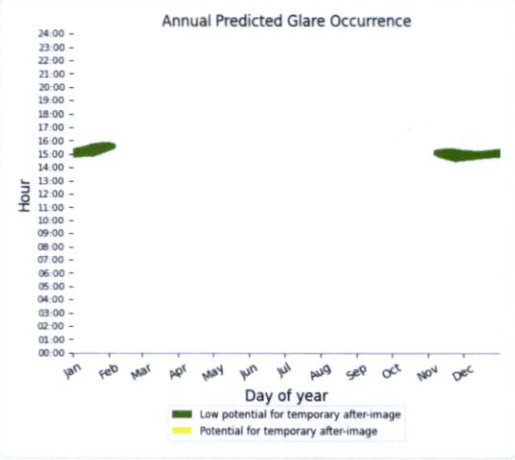


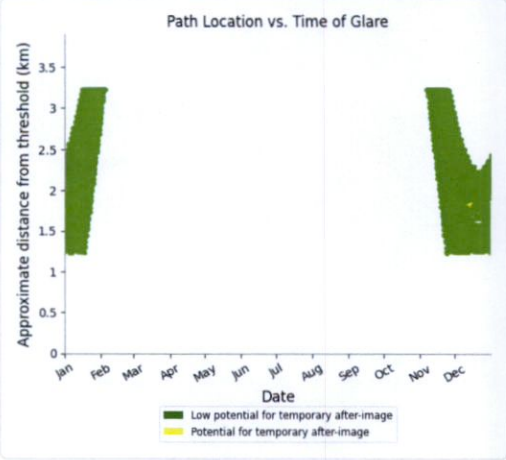


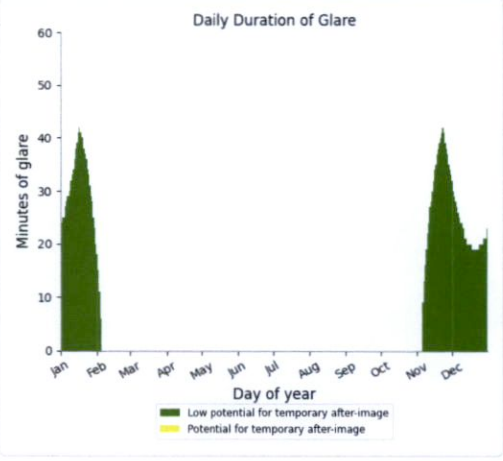
Flight Path: 34 Runway

0 minutes of yellow glare

2516 minutes of green glare







Flight Path: Casement 04 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 10 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit2_1

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	2973	0
28 Runway	3263	0
34 Runway	2589	0
Casement 04 Runway	0	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

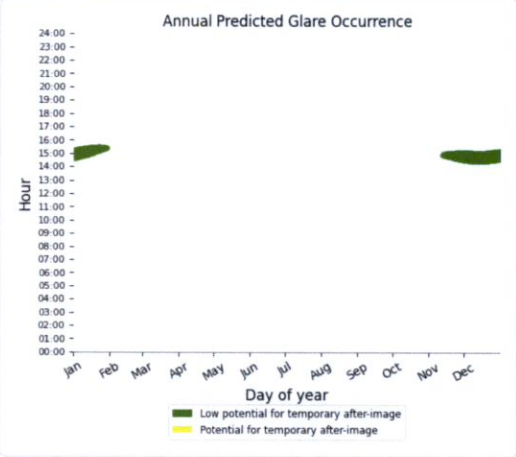
Flight Path: 16 Runway

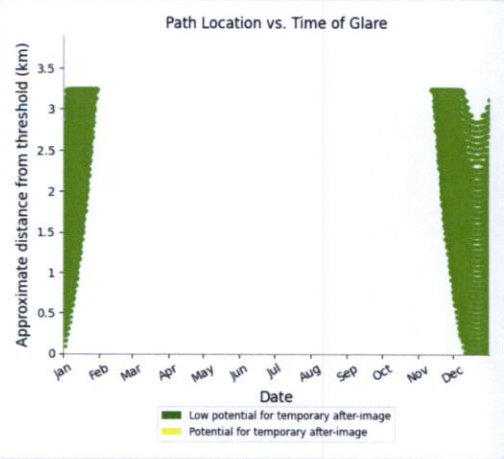
0 minutes of yellow glare
0 minutes of green glare

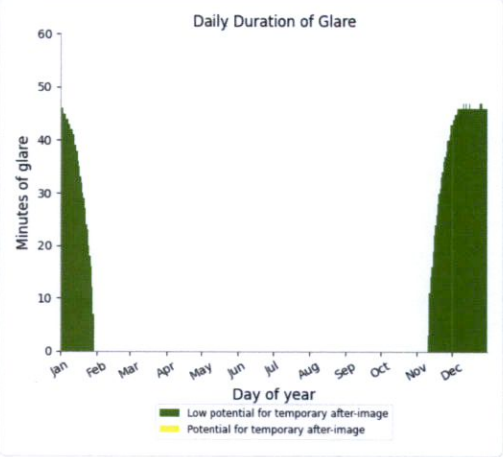
Flight Path: 28R Runway

0 minutes of yellow glare

2973 minutes of green glare



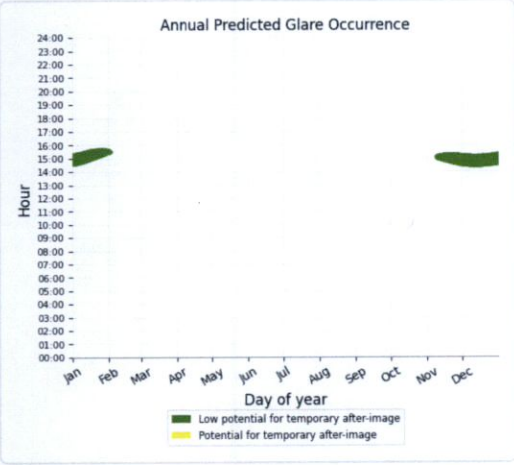


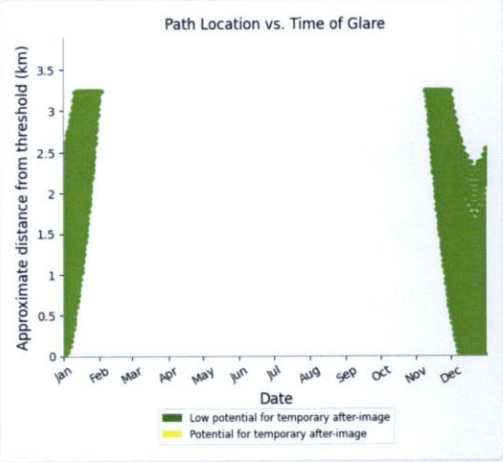


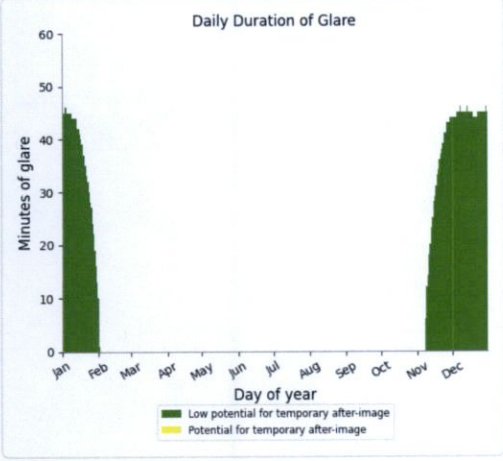
Flight Path: 28 Runway

0 minutes of yellow glare

3263 minutes of green glare



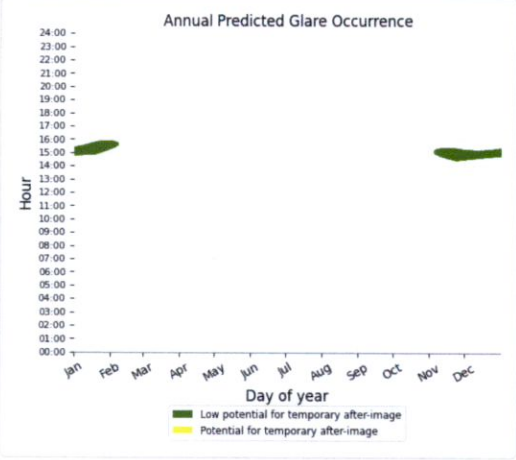


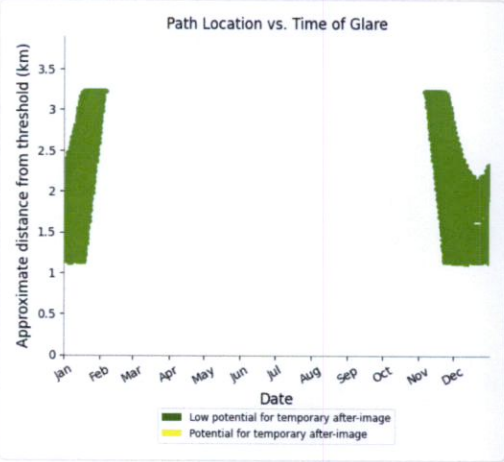


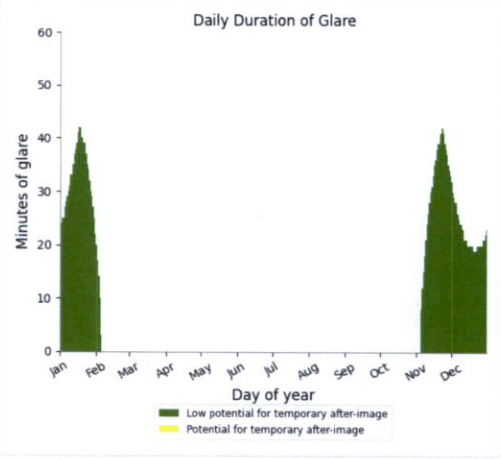
Flight Path: 34 Runway

0 minutes of yellow glare

2589 minutes of green glare







Flight Path: Casement 04 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 10 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit2_2

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	2955	0
28 Runway	3263	0
34 Runway	2560	0
Casement 04 Runway	0	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

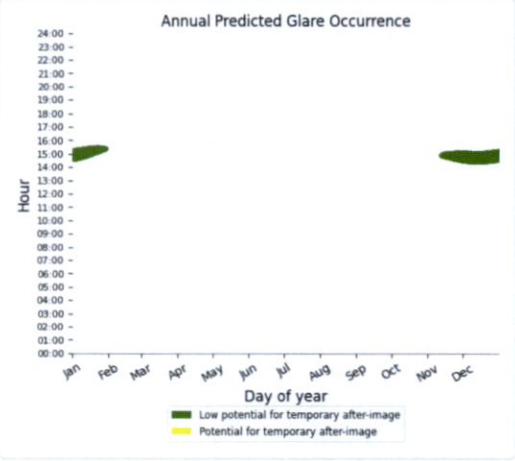
Flight Path: 16 Runway

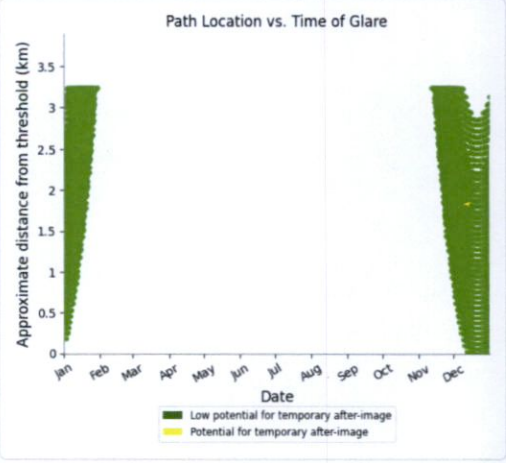
0 minutes of yellow glare
0 minutes of green glare

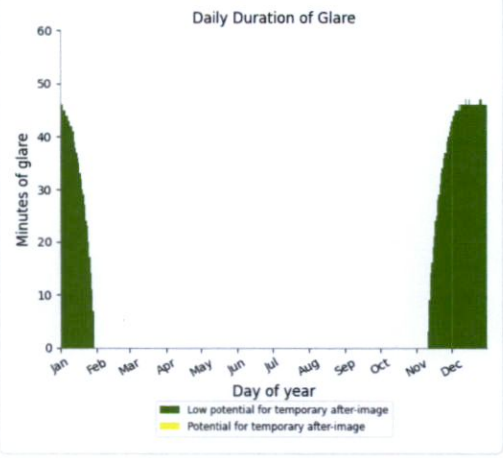
Flight Path: 28R Runway

0 minutes of yellow glare

2955 minutes of green glare



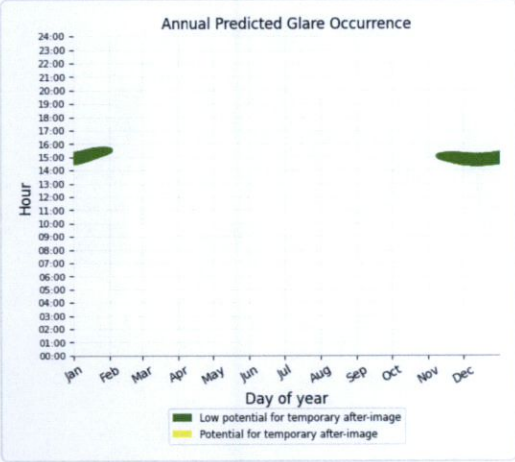


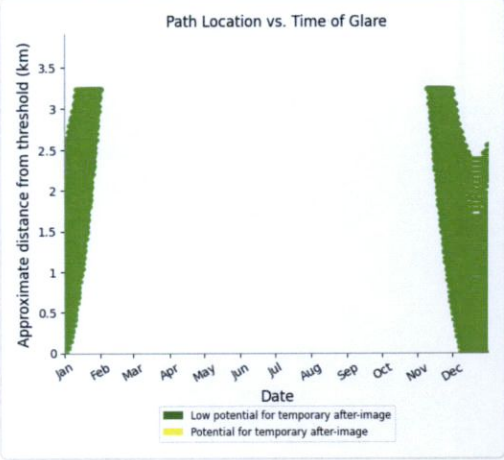


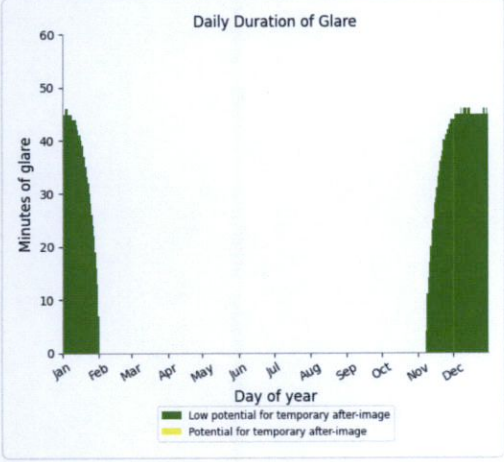
Flight Path: 28 Runway

0 minutes of yellow glare

3263 minutes of green glare



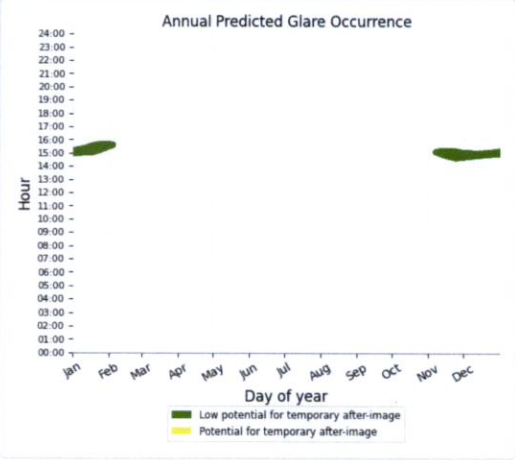


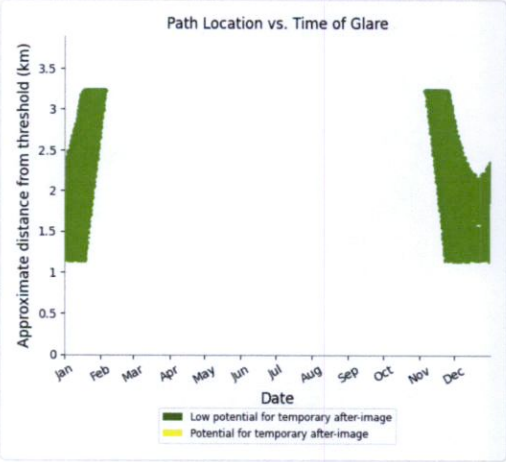


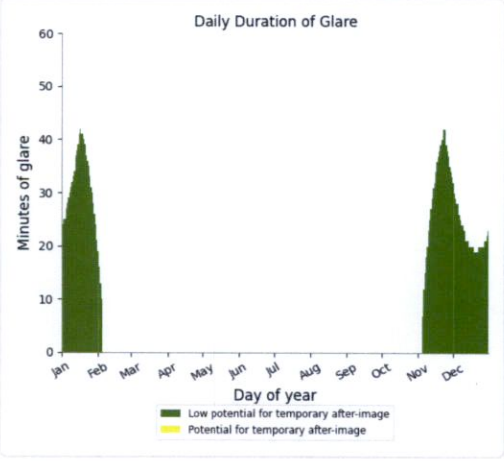
Flight Path: 34 Runway

0 minutes of yellow glare

2560 minutes of green glare







Flight Path: Casement 04 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 10 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare

0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit3_1

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	826	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

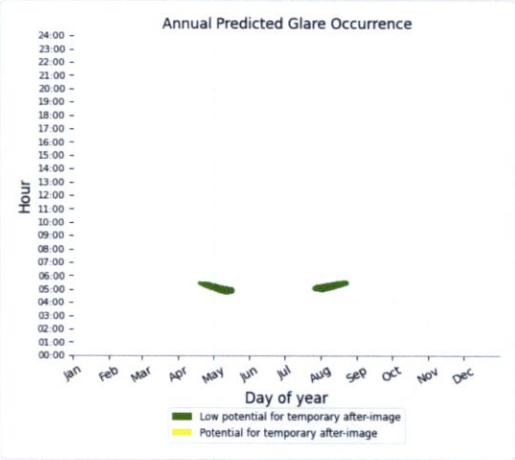
0 minutes of yellow glare
0 minutes of green glare

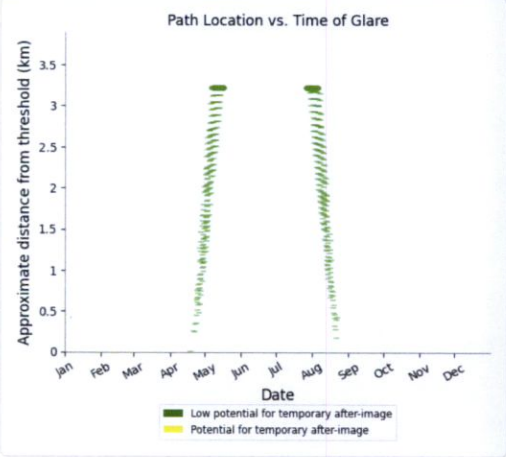
Flight Path: 34 Runway

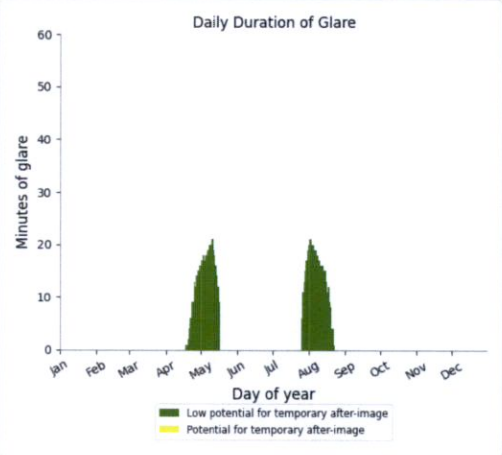
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
826 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit3_2

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	836	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

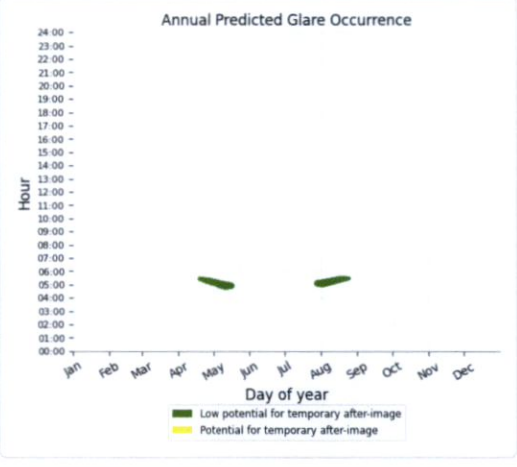
0 minutes of yellow glare
0 minutes of green glare

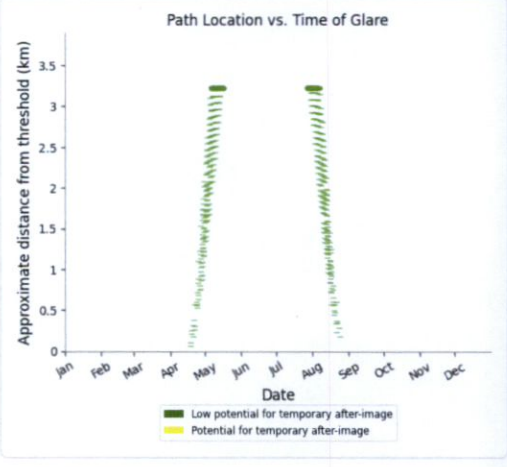
Flight Path: 34 Runway

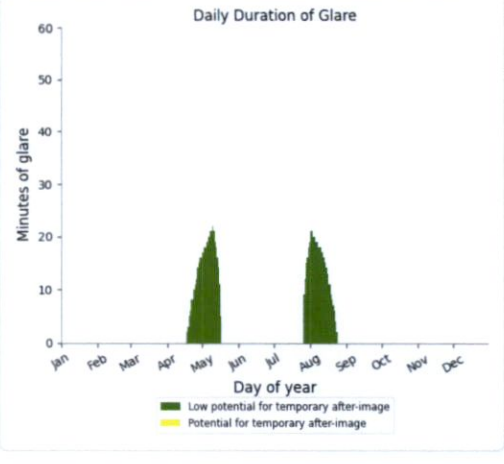
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
836 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit4_1

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	723	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

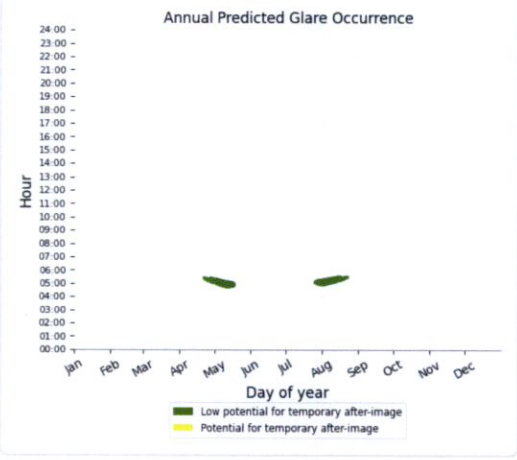
0 minutes of yellow glare
0 minutes of green glare

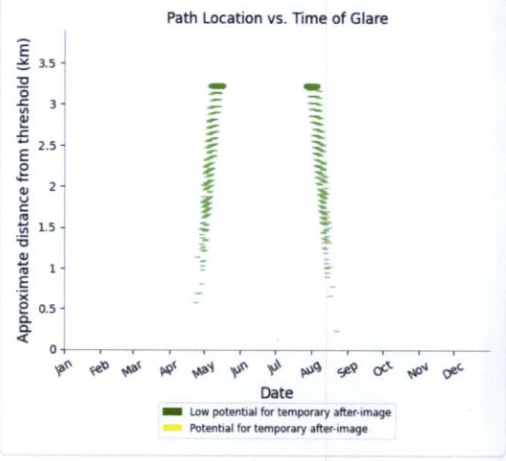
Flight Path: 34 Runway

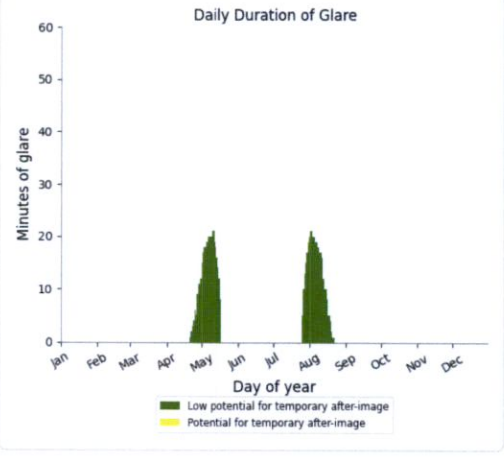
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
723 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit4_2

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	791	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

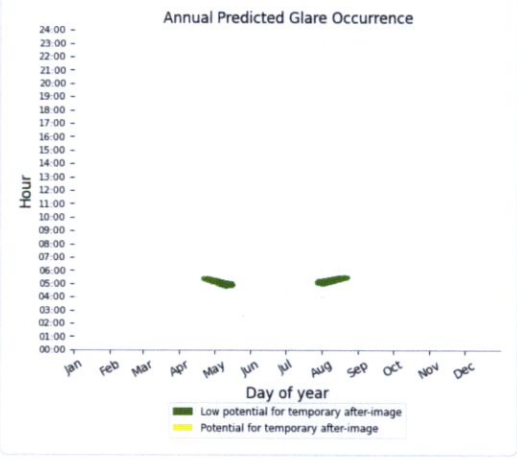
0 minutes of yellow glare
0 minutes of green glare

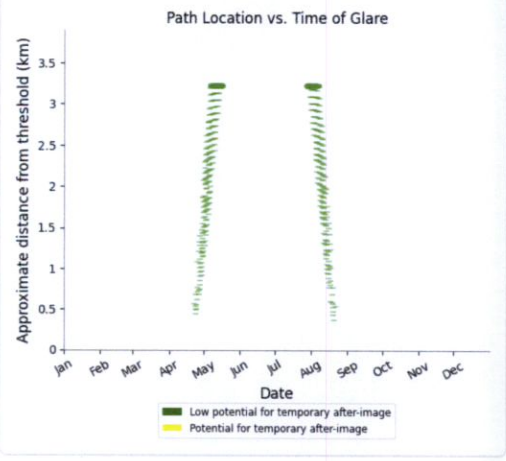
Flight Path: 34 Runway

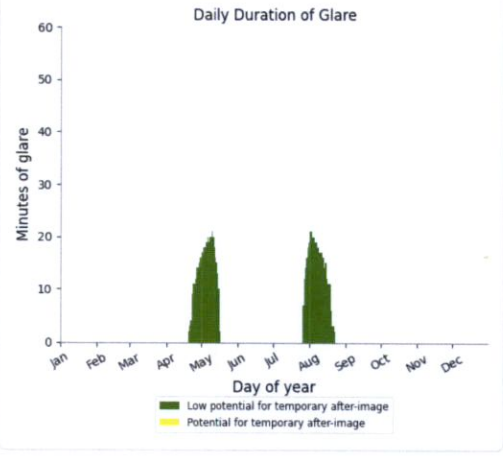
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
791 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit 5A

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	909	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

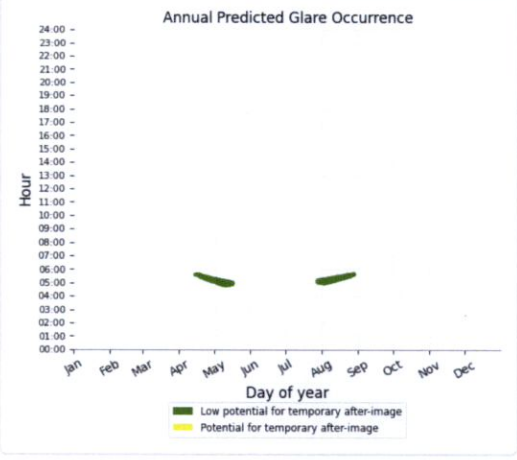
0 minutes of yellow glare
0 minutes of green glare

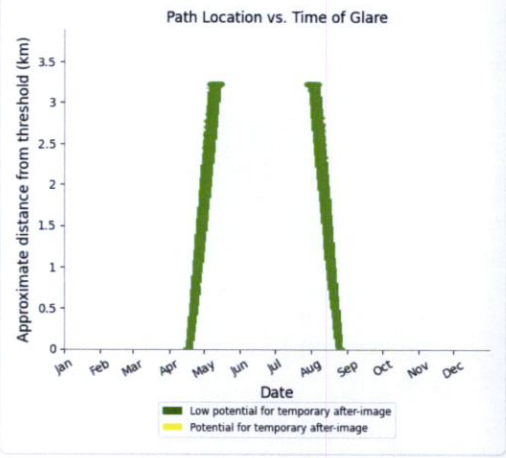
Flight Path: 34 Runway

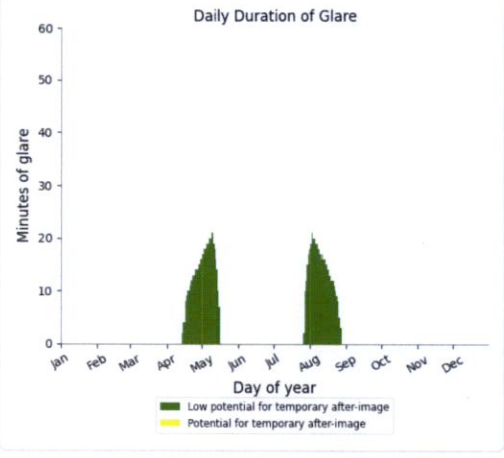
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
909 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit 5B

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	892	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

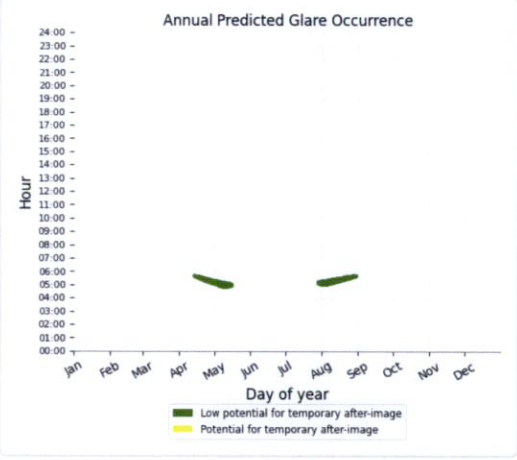
0 minutes of yellow glare
0 minutes of green glare

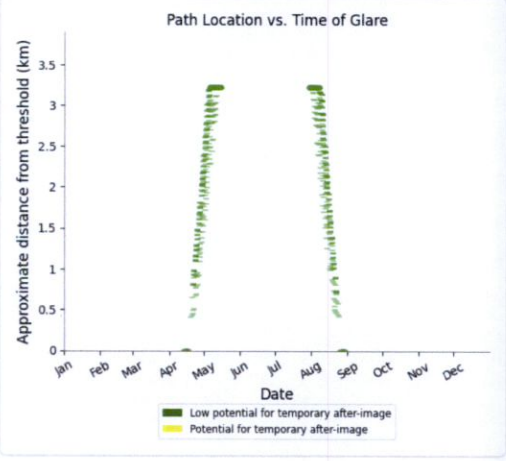
Flight Path: 34 Runway

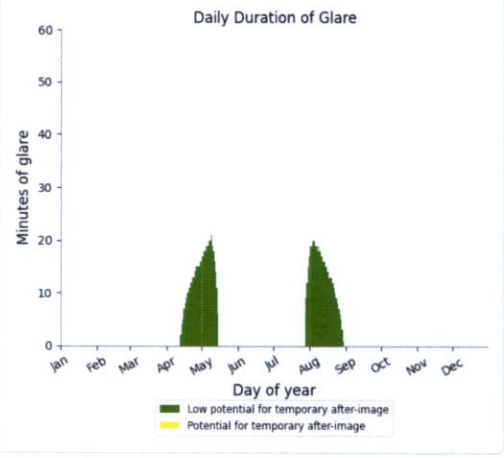
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
892 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit 5C

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	922	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

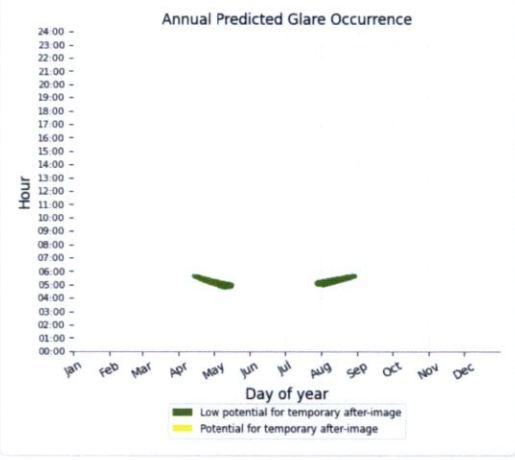
0 minutes of yellow glare
0 minutes of green glare

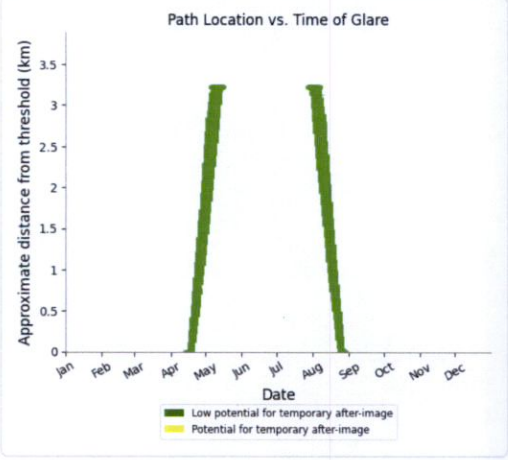
Flight Path: 34 Runway

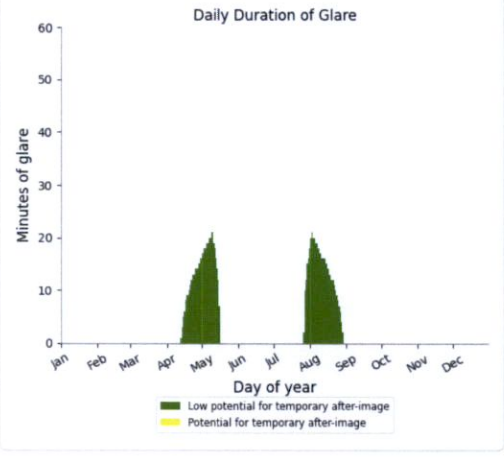
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
922 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit6_1

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	781	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

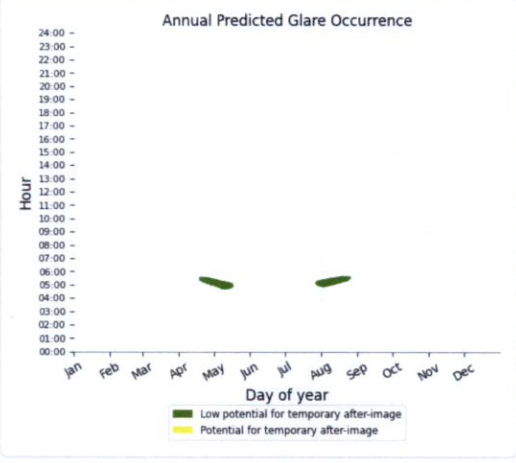
0 minutes of yellow glare
0 minutes of green glare

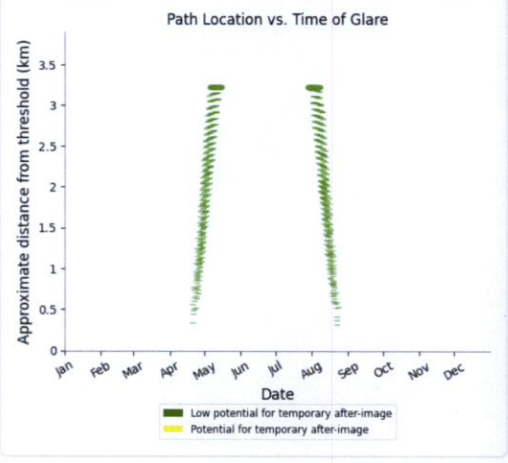
Flight Path: 34 Runway

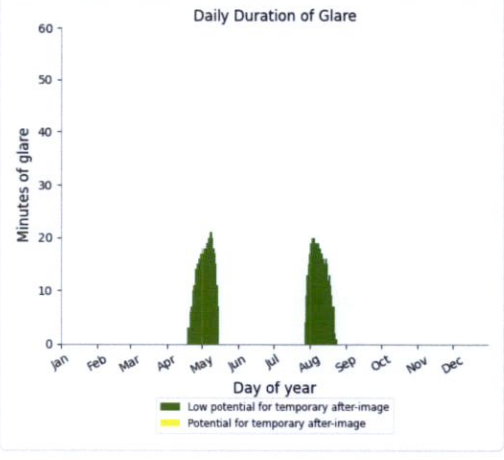
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
781 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Results for: Unit6_2

Receptor	Green Glare (min)	Yellow Glare (min)
10L Runway	0	0
10 Runway	0	0
16 Runway	0	0
28R Runway	0	0
28 Runway	0	0
34 Runway	0	0
Casement 04 Runway	709	0
Casement 10 Runway	0	0
Casement 22 Runway	0	0
Casement 28 Runway	0	0
1-ATCT	0	0
2-ATCT	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	0	0
OP 12	0	0
OP 13	0	0
OP 14	0	0
OP 15	0	0

Flight Path: 10L Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 16 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28R Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: 28 Runway

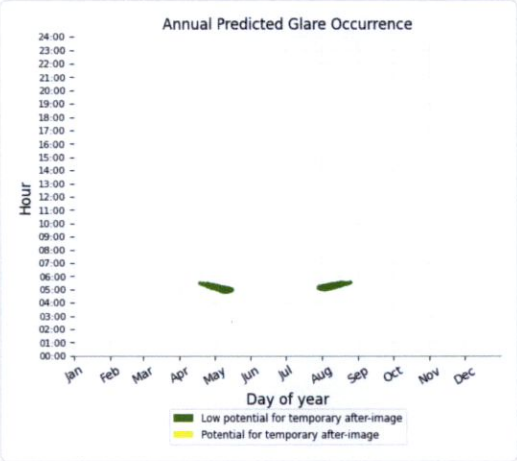
0 minutes of yellow glare
0 minutes of green glare

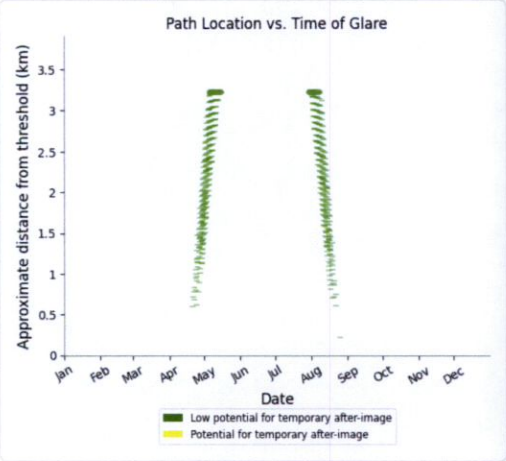
Flight Path: 34 Runway

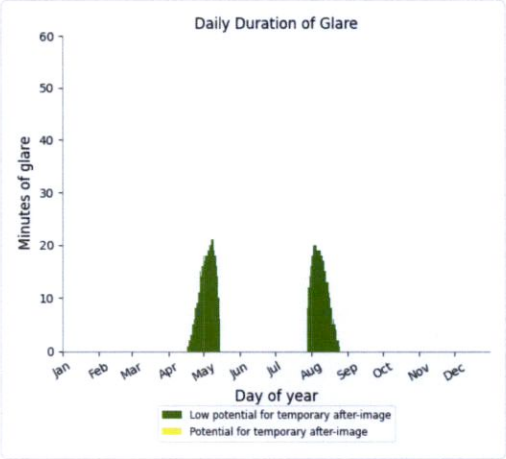
0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 04 Runway

0 minutes of yellow glare
709 minutes of green glare







Flight Path: Casement 10 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 22 Runway

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Casement 28 Runway

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 2-ATCT

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 13

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 14

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 15

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

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