Mr Paul Todhunter
Project Manager
Hansen Yuncken Pty Ltd
Building 1, L3, 75-85 O'Riordan Street
Alexandria NSW 2015 NSW 2000

By email: Ptodhunter@hansenyuncken.com.au

Our ref: 064301-02

Dear Paul

Re: Solar Power System installation at proposed new primary school in Googong– Solar Glare Analysis

Please find in this correspondence the results of a solar glare analysis in relation to potential impact to Canberra Airport for the solar power system that is proposed at the new primary school in Googong that is the subject of an application for a State Significant Development (SSD-10326042) (the Project).

Aviation Projects has previously prepared an Aviation Impact Assessment in support of an Environmental Impact Statement (EIS) for the Project. An analysis of the potential for solar glare to impact on aircraft operations at Canberra Airport was not included in that assessment.

1.1. Project background

The Project includes the installation of a 70 kW solar power system on the roof of Building D within the Project Area. The roof slopes at 8° towards the north and south from a central ridge at approximately 7.1 m above ground level (AGL). The panels will be installed on a fixed mount and tilted opposite to the roof angle.

1.2. Scope of Works

The following items form the scope of works:

1. outline the planning context from an aviation perspective (included previously in the Aviation Impact Assessment; solar glare impact specifically addressed in this report)
2. conduct an assessment of the solar panel layout using the ForgeSolar Solar Glare Hazard Analysis Tool
3. conduct an analysis of all hazards presented by the proposed layout in relation to existing approach paths, runway thresholds and the air traffic control (ATC) tower at Canberra Airport
4. provide a written letter report that documents the findings of the analysis.

1.3. Methodology

The engagement was delivered as outlined below:

1. review client material
2. review and outline the planning context
3. prepare a solar glare analysis using the ForgeSolar software
4. prepare a final letter report for client acceptance.

1.4. References

References used or consulted in the preparation of this report include:

- Airservices Australia, Aeronautical Information Package; including AIP Book, Departure and Approach Procedures, and En Route Supplement Australia effective 17 June 2021
- Civil Aviation Safety Authority, Part 139 (Aerodromes) Manual of Standards 2019, dated 5 September 2019
- Civil Aviation Safety Authority, *Civil Aviation Safety Regulations 1998* (CASR)
- Department of Infrastructure and Regional Development, Australian Government, National Airport Safeguarding Framework, Guideline E *Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports*
- Federal Aviation Administration, Interim Policy, *FAA Review of Solar Energy System Projects on Federally Obligated Airports* 78 FR 63276, Federal Register, vol. 78, No. 205, dated October 2013
- Canberra Airport 2020 Master Plan (January 2020)
- Queanbeyan Local Environmental Plan 2012 (version 1 February 2021)
- State Environmental Planning Policy (Infrastructure) 2007 (version 22 January 2021).

1.5. Client material

Hansen Yuncken Pty Ltd provided the following materials for the purposes of this assessment:

- Drawing No. GOOG-ARC-DD-DWG-04_021 Rev C – Building D – Roof Plan
- Drawing No. GOOG-ARC-DD-DWG-04_101 Rev D – Building D – Elevations
- Drawing No. GOOG-ARC-DD-DWG-04_201 Rev C – Building D – Sections

1.6. Site overview

The Project site is located along Aprasia Avenue, approximately 13.5 km (7.3 nm) southeast of Canberra Airport's Aerodrome Reference Point (ARP). The 70 kW solar system is proposed to be installed on the roof of Building D within the Project Area.

Figure 1 shows the location of Building D within the Project Area (source: Hansen Yuncken).

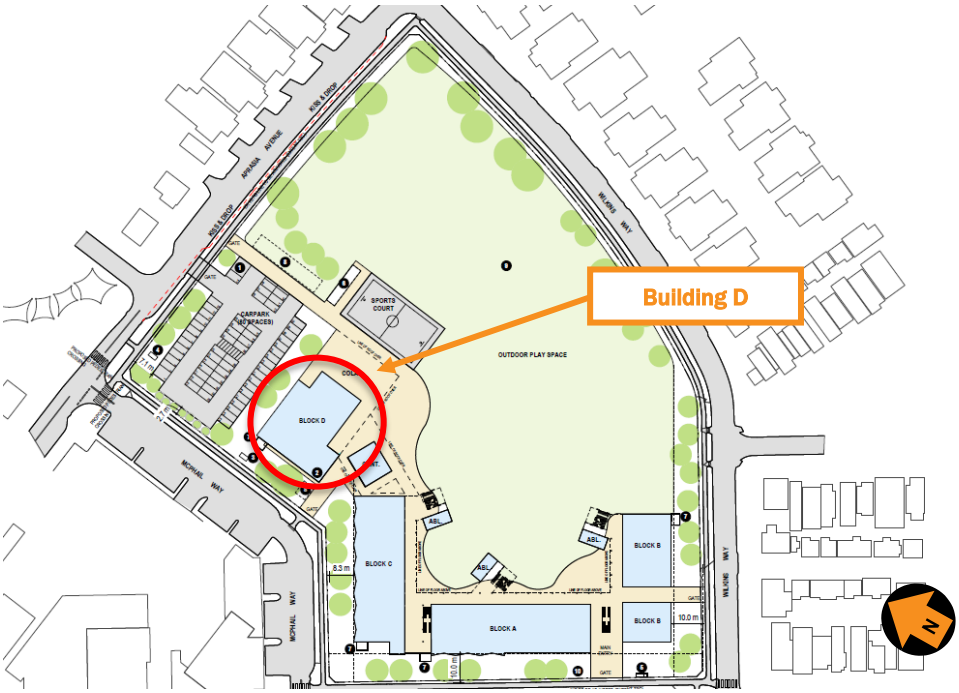


Figure 1 Location of Building D (Solar Installation) in Project Area

Figure 2 shows the location of the Project Area relative to Canberra Airport (source: Google Earth).

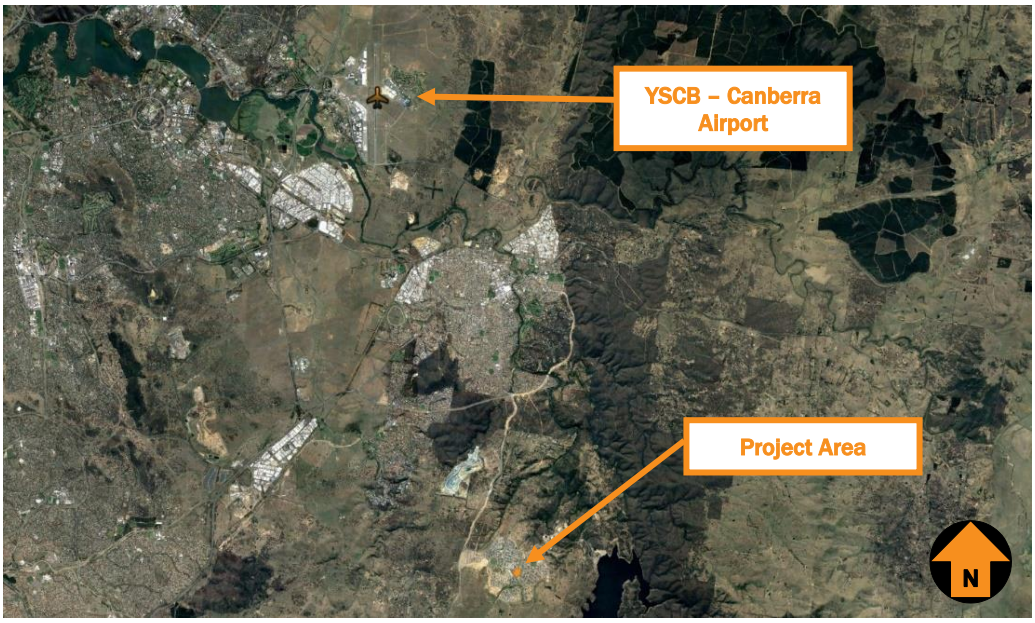


Figure 2 Project site relative to Canberra Airport

Building D is proposed to be constructed on level ground (RL 744.30) with the elevation of the ridge of the roof 7.097 m AGL.

Building D elevation from the east is demonstrated in Figure 3. (Source Hansen Yuncken)

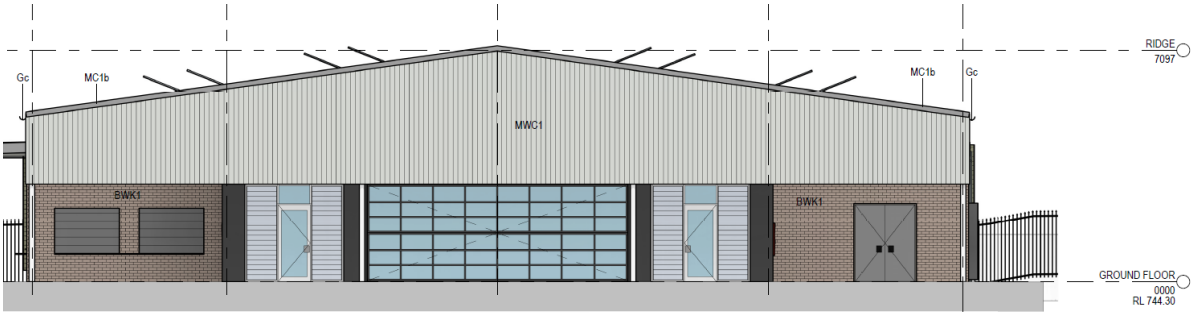


Figure 3 East elevation Building D

The proposed solar panel layout on the roof of building D is demonstrated in Figure 4. (Source Hansen Yuncken)

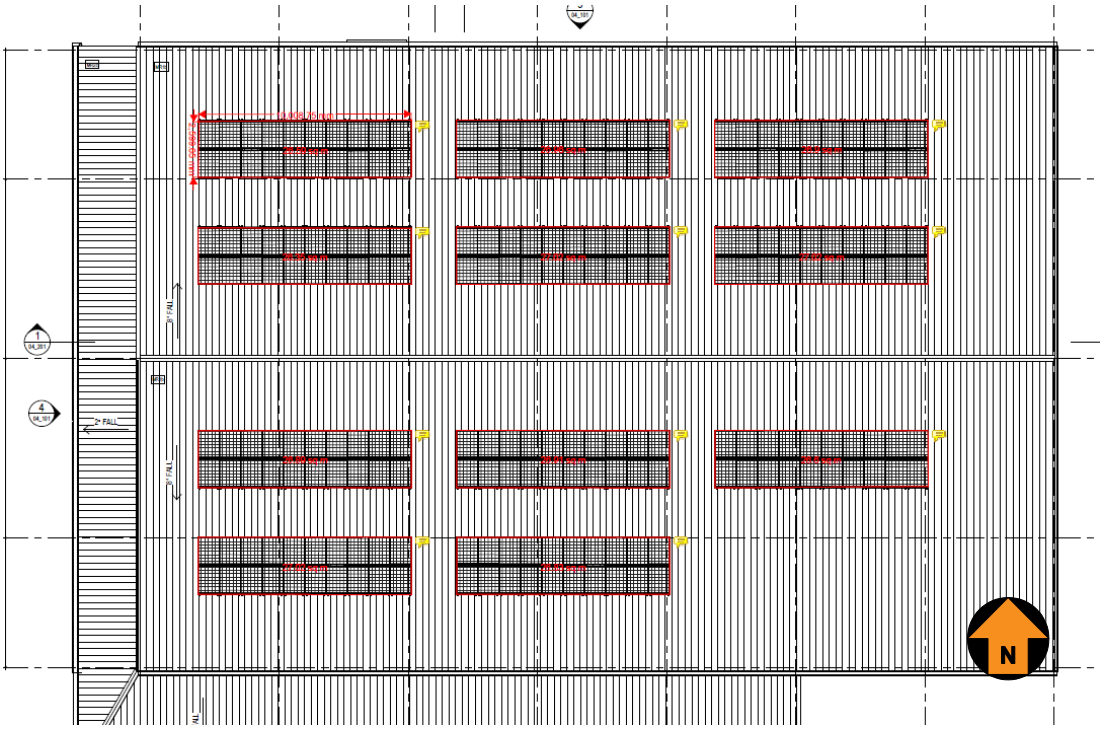


Figure 4 Configuration of solar installation

1.7. Planning context summary – glare analysis

Solar photovoltaic (PV) panels can produce glint (a momentary flash of bright light) and glare (a continuous source of bright light), which could result in an ocular impact to pilots or air traffic controllers.

The Federal Aviation Administration (FAA) provided a free tool called So*lar Glare Hazard Analysis Tool* (SGHAT) and supporting Interim Policy 78 FR 63276 for the assessment of solar glare.

The assessment requirement specified:

> *No potential for glare or "low potential for after-image" along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.*

SGHAT was withdrawn from public access in 2017. The ForgeSolar glare analysis tool is recommended instead for non-military/government users and is used for the analysis of the new primary school in Googong solar installation.

The ocular impact of solar glare is quantified into three categories:

- Green - low potential to cause after-image (flash blindness)
- Yellow - potential to cause temporary after-image
- Red - potential to cause retinal burn (permanent eye damage)

The analysis should determine the level of adherence to the FAA policy for these components:

1. Analysis time interval and eye characteristics used are acceptable
2. No glare of any kind for Air Traffic Control Tower(s) (ATCT) at cab height
3. Flight path receptor(s) do not receive yellow glare.

1.8. Civil Aviation Safety Authority – Aerodromes

The Civil Aviation Safety Authority (CASA) regulates aviation activities in Australia. Standards for certified aerodromes are established in Part 139 MOS 2019. Chapter 9.143 of Part 139 MOS (Other lighting on the aerodrome) states in section (8) and (9):

> *(8) An aerodrome operator must immediately notify CASA in writing of any proposals for equipment or lighting installation within the aerodrome boundary which would reflect sunlight, including solar panels, mirrors or reflective building cladding,* and
>
> *(9) An aerodrome operator must not proceed with any proposal mentioned in subsection (8) unless CASA has determined, in writing, that it will not cause a hazard to aircraft operations.*

The proposed solar installation at the new primary school in Googong is not located within the boundary of any aerodrome.

1.9. National Airport Safeguarding Framework Guideline

The National Airport Safeguarding Framework Guideline E *Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports* provides guidance on the potential risk of distractions to pilots of aircraft from lighting and light fixtures near airports but does not specifically address solar glare.

NASF Guideline E provides advice for situations where lights are to be installed within a 6 km radius of a known aerodrome.

The proposed solar installation at the new primary school in Googong is not located within 6 km of Canberra Airport, or any other known aerodrome.

1.10. Airports (Protection of Airspace) Regulations 1996

Part 12 of the Airports Act 1996 and the Airports (Protection of Airspace) Regulations 1996 establish a framework for the protection of airspace at and around airports. The following summary of these requirements is provided on the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications website.

The Airports Act 1996 defines any activity resulting in an intrusion into an airport's protected airspace to be a "controlled activity", and requires that controlled activities cannot be carried out without approval.

The Regulations provide for the Department or the airport operator to approve applications to carry out controlled activities, and to impose conditions on an approval.

Carrying out a controlled activity without approval is an offence under Section 183 of the Airports Act 1996, and is punishable by a fine of up to 250 penalty units. It is an offence under Section 185 of the Act to contravene any conditions imposed on an approval. Under Section 186 of the Act it is an offence not to give information to the airport operator that is relevant to a proposed controlled activity.

Any activity that infringes an airport's protected airspace is called a controlled activity, and requires approval before it can be carried out. Controlled activities include the following:

- permanent structures, such as buildings, intruding into the protected airspace;
- temporary structures such as cranes intruding into the protected airspace; and
- any activities causing intrusions into the protected airspace through glare from artificial light or reflected sunlight, air turbulence from stacks or vents, smoke, dust, steam or other gases or particulate matter.

Canberra Airport is subject to the Airports Act 1996 and the Airports (Protection of Airspace) Regulations 1996 as a Leased Federal Airport, and the infringement of its protected airspace through glare from artificial light or reflected sunlight would be considered a Controlled activity. The Project Area is located within the Outer Horizontal Area of Canberra Airport's Obstacle Limitation Surface. The natural ground elevation of the site and surrounding built-up area already infringes the Outer Horizontal Surface of Canberra Airport's OLS due to the high terrain of the area relative to the Aerodrome Reference Elevation Datum (ARED) used for Canberra Airport's OLS.

The solar installation is therefore considered to automatically project reflection into Canberra Airport's protected airspace. The analysis should confirm if the reflection causes glare to pilots approaching Canberra Airport with the potential for after-image, and no glare of any kind for air traffic controllers at Canberra Airport.

1.11. Canberra Airport Master Plan

The Canberra Airport Master Plan 2020, and in particular Chapter 11, addresses current and future requirements for a prescribed airspace. Specially it notes:

> *Airspace management and protection is an essential part of Canberra Airport's operations. So too is the safe movement of aircraft.*
>
> *....*
>
> *The purpose of the OLS is to define the volume of airspace at and around the Airport which should be kept free of obstacles in order to minimise danger to aircraft arriving or departing the Airport. Infringements of the OLS may be approved by the Secretary of the Department of Infrastructure, Transport, Regional Development and Communications [the Secretary], following assessments on the potential safety, regularity, and efficiency impacts of the proposed obstacle.*
>
> *The purpose of the PANS-OPS is to safeguard an aircraft from collision with obstacles when the pilot is flying on avionic instruments. The PANS-OPS establishes minimum clearances between approach and departure paths of aircraft and obstacles. A PANS-OPS surface cannot be infringed in any circumstances except for short term structures with the approval of the Secretary.*
>
> *Canberra Airport is responsible for the assessment of temporary or permanent structures for infringements of the OLS or PANS-OPS. In the event an infringement into the OLS is detected, Canberra Airport is responsible for ensuring this information is communicated to CASA, Airservices Australia and aircraft operations.*
>
> *CASA requires where facilities are constructed at or in the vicinity of the Airport that:*
>
> - *Sensible cladding and roofing materials are used to minimise the possibility of glare effects;*
> - *Solar Farms planned, designed and located in a manner so as not to cause reflection or glare to aircraft;*
> - *Glass for buildings is used in a manner to minimise reflection and glare; and*
> - *All external lighting will be lit downward from a horizontal level to minimise impact on aircraft operations at night.*
>
> *Regulation 5 of the Airports [Protection of Airspace] Regulations 1996 ultimately provides that the Secretary can declare specified airspace around Canberra Airport to be prescribed to safeguard future Airport operations. The future declared OLS and PANS-OPS surfaces are shown in Figure 5 and Figure 6.*
>
> *The future declared OLS and PANS-OPS surfaces allow for some future growth of the Airport, including development considered under this 2020 Master Plan. These surfaces may be changed, if necessary, when operations, facilities, or plans change. Other operation, policy, planning, or regulatory changes may also necessitate amendment to these surfaces by Canberra Airport at any*

time including in relation to developments which may interfere with the safety, efficiency, or regularity of existing development services or future air transport operations.

Canberra Airport's Obstacle Limitation Surface (OLS) is shown in Figure 5, with the Project Site identified.

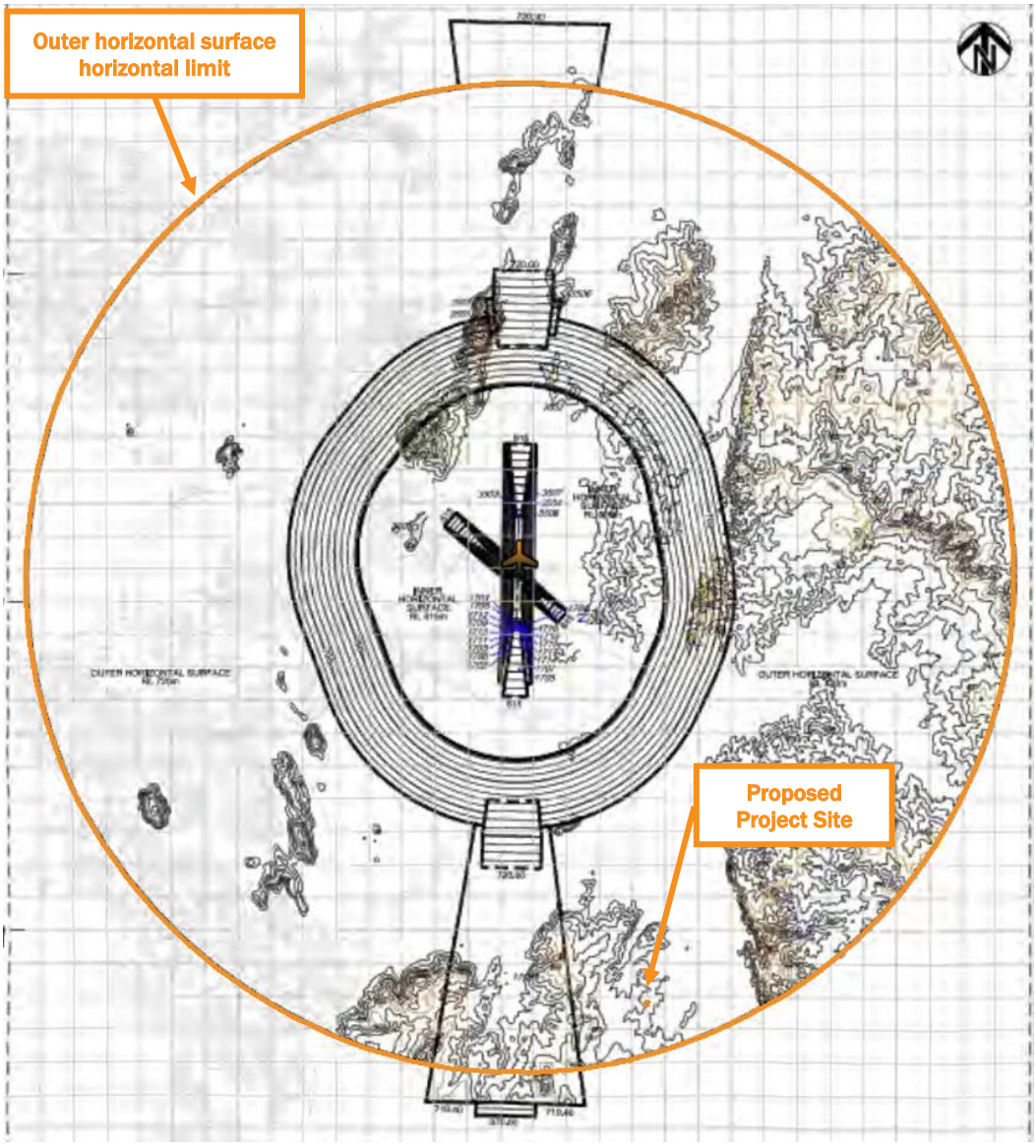


Figure 5 Project Site in relation to Canberra Airport OLS

1.12. Queanbeyan Local Environmental Plan 2012

The Project is subject to the Queanbeyan Local Environmental Plan 2012. The policy incorporates policies that aim to protect airspace operations and regulates developments in areas that are subject to aircraft noise. In terms of the projecting airspace operations, the policies can be found in section 7 clause 6:

7.6 Airspace operations

1) The objectives of this clause are as follows—

(a) to provide for the effective and ongoing operation of Canberra Airport by ensuring that such operation is not compromised by proposed development that penetrates the Limitation or Operations Surface for that airport,

(b) to protect the community from undue risk from that operation.

Solar Glare is not specifically addressed in the Queanbeyan Local Environmental Plan 2012.

1.13. ForgeSolar analysis

A glare analysis was prepared using the ForgeSolar application for the proposed Project layout with settings as per details provided in Table 1. Two separate PV arrays were established for the analysis in consideration of the panels located on the roof sloping towards the north, and panels on the roof sloping to the south. An orientation of 0° T and 180° T was used for the solar glare analysis. An estimated roof height of 7.1 m (at highest point, with 8° fall in north and south directions) was applied for the analysis.

Table 1 Solar glare analysis settings

Parameter	*Setting*
Axis tracking	Fixed (no rotation)
Panel Orientation	0° T for north-facing panels 180° T for south-facing panels
Tilt	30° (Final tilt yet to be confirmed)
Panel material	Smooth glass without AR coating
Reflectivity	Vary with sun
Slope error	Correlate with material
ATC line of sight	720.5 m AHD

2-Mile Flight Path Receptors were established for all 4 runway ends as well as a discrete observation receptor for the Air Traffic Control tower located at Canberra Airport.

The receptors utilised for the solar glare analysis are demonstrated in Figure 6 (source: ForgeSolar analysis 02 August 2021).

Figure 6 Receptor configurations, Canberra Airport

Figure 7 and Figure 8 demonstrate the PV array configuration. (ForgeSolar analysis 02 August 2021).

Name: PV array 1
Description: Northern side of roof
Axis tracking: Fixed (no rotation)
Tilt: 30.0°
Orientation: 180.0°
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	-35.422577	149.237701	744.17	7.10	751.27
2	-35.422575	149.238098	743.18	7.10	750.28
3	-35.422682	149.238106	743.92	6.00	749.92
4	-35.422686	149.237701	744.00	6.00	750.00

Figure 7 PV array 1 configuration

Name: PV array 2
Axis tracking: Fixed (no rotation)
Tilt: 30.0°
Orientation: 0.0°
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	-35.422697	149.237701	743.88	7.10	750.98
2	-35.422693	149.238106	744.00	7.10	751.10
3	-35.422736	149.238103	744.26	7.10	751.36
4	-35.422736	149.237969	744.29	7.10	751.39
5	-35.422791	149.237972	744.15	6.00	750.15
6	-35.422795	149.237717	743.20	6.00	749.20

Figure 8 PV array 2 configuration

The analysis determined that, for Canberra Airport:

- The approach to runway 17 is not exposed to any glare.
- The approach to runway 35 is not exposed to any glare.
- The approach to runway 12 is not exposed to any glare.
- The approach to runway 30 is not exposed to any glare.
- The ATC tower is not exposed to any glare.

There is no yellow glare predicted.

FAA Interim Policy 78 FR 63276 does not require or recommend an additional analysis of solar glare for flight paths within the circuit area, and so this was not considered necessary for the purposes of demonstrating that there will be no adverse effect on aviation safety, as a result of solar glare.

A copy of the glare analysis report is provided at **Enclosure 1**.

1.14. Summary

Aviation Projects has conducted the solar glare analysis utilizing the ForgeSolar application tool and in terms of adherence to the FAA policy, it was found that each component of the analysis accorded with the applicable policy aspect:

1. Analysis time interval and eye characteristics used are acceptable
2. Flight path receptor(s) are not exposed to any glare
3. The ATC tower is not exposed to any glare.

It is recommended that Hansen Yuncken provide these results to the Canberra Airport operator (Canberra Airport Pty Ltd).

If you wish to clarify or discuss the contents of this correspondence, please contact me on 0417 631 681.

Kind regards

Keith Tonkin

Managing Director

04 August 2021

Enclosure:

1. Forge Solar Analysis report – 064301-02_Googong_School_YSCB_Forge_Solar_Report_v0.1_210803

FORGESOLAR GLARE ANALYSIS

Project: **New Googong Primary School - Building D Solar Installation**
Proposed 75kW solar installation on the roof of Building D for the Googong Primary School

Site configuration: **Googong Primary School - Building D Solar Inst**
Analysis conducted by Keith Tonkin (ktonkin@aviationprojects.com.au) at 07:01 on 02 Aug, 2021.

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: 56882.10163

PV Array(s)

Name: PV array 1
Description: Northern side of roof
Axis tracking: Fixed (no rotation)
Tilt: 30.0°
Orientation: 180.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

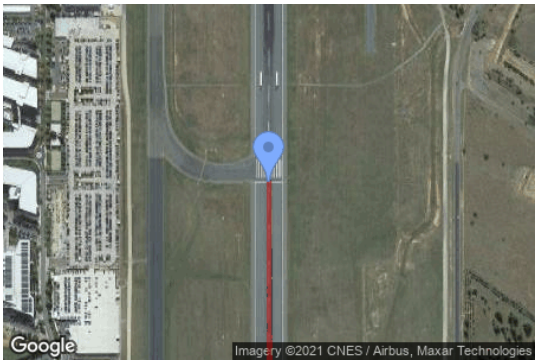
Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-35.422577	149.237701	744.17	7.10	751.27
2	-35.422575	149.238098	743.18	7.10	750.28
3	-35.422682	149.238106	743.92	6.00	749.92
4	-35.422686	149.237701	744.00	6.00	750.00

Name: PV array 2
Axis tracking: Fixed (no rotation)
Tilt: 30.0°
Orientation: 0.0°
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	-35.422697	149.237701	743.88	7.10	750.98
2	-35.422693	149.238106	744.00	7.10	751.10
3	-35.422736	149.238103	744.26	7.10	751.36
4	-35.422736	149.237969	744.29	7.10	751.39
5	-35.422791	149.237972	744.15	6.00	750.15
6	-35.422795	149.237717	743.20	6.00	749.20

Flight Path Receptor(s)

Name: FP 1 RWY 35 THR
Description:
Threshold height: 15 m
Direction: 360.0°
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	-35.314804	149.194462	568.83	15.24	584.07
Two-mile	-35.343717	149.194487	570.15	182.61	752.76

Name: FP 2 RWY 17 THR
Description:
Threshold height: 15 m
Direction: 179.8°
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	-35.290636	149.194459	570.37	15.24	585.61
Two-mile	-35.261724	149.194335	586.67	167.62	754.29

Name: FP 3 RWY 30 THR
Description:
Threshold height: 15 m
Direction: 311.0°
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	-35.309992	149.198777	573.69	15.24	588.93
Two-mile	-35.328972	149.225536	593.02	164.59	757.62

Name: FP 4 RWY 12 THR
Description:
Threshold height: 15 m
Direction: 130.5°
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	-35.300687	149.185176	562.65	15.24	577.89
Two-mile	-35.281902	149.158214	625.99	120.58	746.57

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
1-ATCT	1	-35.301641	149.197428	573.45	18.50

Map image of 1-ATCT

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	30.0	180.0	0	0	-
PV array 2	30.0	0.0	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
FP 1 RWY 35 THR	0	0
FP 2 RWY 17 THR	0	0
FP 3 RWY 30 THR	0	0
FP 4 RWY 12 THR	0	0
1-ATCT	0	0

Results for: PV array 1

FP 1 RWY 35 THR	0	0

Receptor	Green Glare (min)	Yellow Glare (min)
FP 2 RWY 17 THR	0	0
FP 3 RWY 30 THR	0	0
FP 4 RWY 12 THR	0	0
1-ATCT	0	0

Flight Path: FP 1 RWY 35 THR

0 minutes of yellow glare
0 minutes of green glare

Flight Path: FP 2 RWY 17 THR

0 minutes of yellow glare
0 minutes of green glare

Flight Path: FP 3 RWY 30 THR

0 minutes of yellow glare
0 minutes of green glare

Flight Path: FP 4 RWY 12 THR

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 2

Receptor	Green Glare (min)	Yellow Glare (min)
FP 1 RWY 35 THR	0	0
FP 2 RWY 17 THR	0	0
FP 3 RWY 30 THR	0	0
FP 4 RWY 12 THR	0	0
1-ATCT	0	0

Flight Path: FP 1 RWY 35 THR

0 minutes of yellow glare
0 minutes of green glare

Flight Path: FP 2 RWY 17 THR

0 minutes of yellow glare
0 minutes of green glare

Flight Path: FP 3 RWY 30 THR

0 minutes of yellow glare
0 minutes of green glare

Flight Path: FP 4 RWY 12 THR

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: 1-ATCT

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 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.