

# FORGESOLAR GLARE ANALYSIS

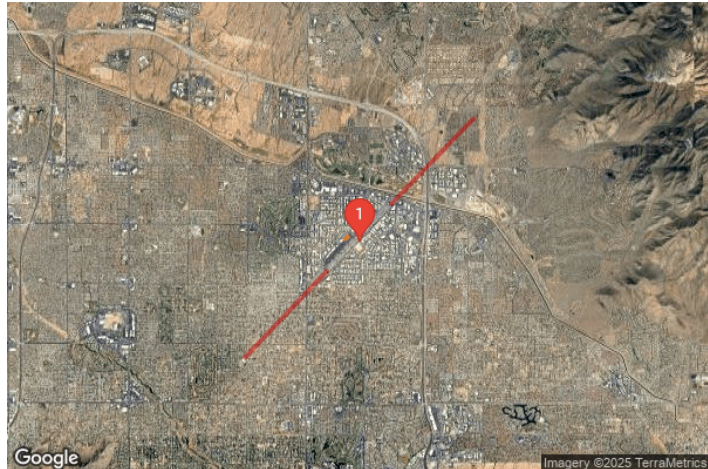
## Project: FlexJet Scottsdale Solar Prelim Design

A proposed ~85 kW rooftop solar project adjacent to Scottsdale Airpark.

Site configuration: **FlexJet Scottsdale Solar Rev 2**

Created 26 Feb, 2025  
 Updated 26 Feb, 2025  
 Time-step 1 minute  
 Timezone offset UTC-8  
 Minimum sun altitude 0.0 deg  
 DNI peaks at 1,000.0 W/m<sup>2</sup>  
 Category 10 to 100 kW  
 (1,000 kW / 8 acre limit)  
 Site ID 142457.24047

Ocular transmission coefficient 0.5  
 Pupil diameter 0.002 m  
 Eye focal length 0.017 m  
 Sun subtended angle 9.3 mrad  
 PV analysis methodology V2



## Summary of Results No glare predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
NW-facing array - north roof	5.0	315.0	0	0.0	0	0.0	-
NW-facing array - South Roof	5.0	315.0	0	0.0	0	0.0	-

*Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.*

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
FP 21	0	0.0	0	0.0
FP 3	0	0.0	0	0.0
1-ATCT	0	0.0	0	0.0

# Component Data

## PV Arrays

**Name:** NW-facing array - north roof  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 5.0°  
**Orientation:** 315.0°  
**Rated power:** -  
**Panel material:** Smooth glass with AR coating  
**Reflectivity:** Vary with sun  
**Slope error:** correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	33.623186	-111.914684	1468.00	38.50	1506.50
2	33.623352	-111.914477	1468.00	36.66	1504.66
3	33.623047	-111.914089	1468.00	36.66	1504.66
4	33.622874	-111.914316	1468.00	38.50	1506.50

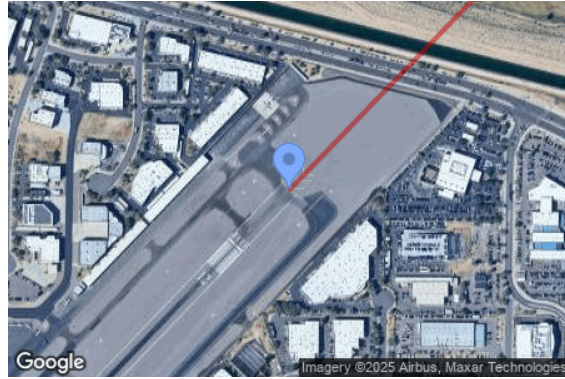
**Name:** NW-facing array - South Roof  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 5.0°  
**Orientation:** 315.0°  
**Rated power:** -  
**Panel material:** Smooth glass with AR coating  
**Reflectivity:** Vary with sun  
**Slope error:** correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	33.623183	-111.914685	1468.00	38.50	1506.50
2	33.622874	-111.914318	1468.00	38.50	1506.50
3	33.622704	-111.914537	1468.00	36.66	1504.66
4	33.622999	-111.914913	1468.00	36.66	1504.66

# Flight Path Receptors

**Name:** FP 21  
**Description:**  
**Threshold height:** 40 ft  
**Direction:** 224.0°  
**Glide slope:** 4.0°  
**Pilot view restricted?** Yes  
**Vertical view:** 30.0°  
**Azimuthal view:** 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	33.631044	-111.901129	1509.80	40.00	1549.80
Two-mile	33.651835	-111.876970	1651.71	636.53	2288.23

**Name:** FP 3  
**Description:**  
**Threshold height:** 59 ft  
**Direction:** 43.5°  
**Glide slope:** 4.0°  
**Pilot view restricted?** Yes  
**Vertical view:** 30.0°  
**Azimuthal view:** 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	33.614730	-111.919954	1443.44	59.00	1502.44
Two-mile	33.593761	-111.943885	1378.99	861.88	2240.87

## Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
1-ATCT	1	33.621666	-111.910133	1466.97	85.00

Map image of 1-ATCT



## Obstruction Components

**Name:** Parapet Wall  
**Top height:** 40.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	33.622703	-111.914536	1468.00
2	33.623045	-111.914086	1468.00
3	33.623046	-111.914083	1468.00

# Glare Analysis Results

## Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
NW-facing array - north roof	5.0	315.0	0	0.0	0	0.0	-
NW-facing array - South Roof	5.0	315.0	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
FP 21	0	0.0	0	0.0
FP 3	0	0.0	0	0.0
1-ATCT	0	0.0	0	0.0

## PV: NW-facing array - north roof no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
FP 21	0	0.0	0	0.0
FP 3	0	0.0	0	0.0
1-ATCT	0	0.0	0	0.0

### NW-facing array - north roof and FP: FP 21

No glare found

### NW-facing array - north roof and FP: FP 3

No glare found

### NW-facing array - north roof and 1-ATCT

No glare found

## PV: NW-facing array - South Roof no glare found

*Receptor results ordered by category of glare*

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
FP 21	0	0.0	0	0.0
FP 3	0	0.0	0	0.0
1-ATCT	0	0.0	0	0.0

### NW-facing array - South Roof and FP: FP 21

No glare found

### NW-facing array - South Roof and FP: FP 3

No glare found

### NW-facing array - South Roof and 1-ATCT

No glare found

# Assumptions

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"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.

The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.

Several V1 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. This primarily affects V1 analyses of path receptors.

Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.

The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.

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.)

The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.

The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.

The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.

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.

Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.

Refer to the Help page at [www.forgesolar.com/help/](http://www.forgesolar.com/help/) for assumptions and limitations not listed here.

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

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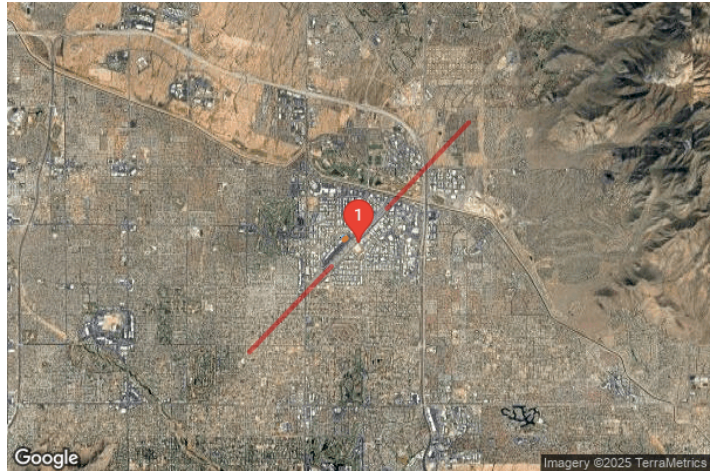
**Project: FlexJet Scottsdale Solar Prelim Design**

A proposed ~85 kW rooftop solar project adjacent to Scottsdale Airpark.

Site configuration: **FlexJet Scottsdale Solar Rev 1-temp-0**

Created 24 Feb, 2025  
 Updated 26 Feb, 2025  
 Time-step 1 minute  
 Timezone offset UTC-8  
 Minimum sun altitude 0.0 deg  
 DNI peaks at 1,000.0 W/m<sup>2</sup>  
 Site ID 142101.24047

Ocular transmission coefficient 0.5  
 Pupil diameter 0.002 m  
 Eye focal length 0.017 m  
 Sun subtended angle 9.3 mrad  
 PV analysis methodology V2



## Glare Policy Adherence

The following table estimates the policy adherence of this glare analysis according to the 2021 U.S. Federal Aviation Administration Policy:

### Review of Solar Energy System Projects on Federally-Obligated Airports

This policy may require the following criteria be met for solar energy systems on airport property:

- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics, including 1-minute time step.

ForgeSolar is not affiliated with the U.S. FAA and does not represent or speak officially for the U.S. FAA. ForgeSolar cannot approve or deny projects - results are informational only. Contact the relevant airport and FAA district office for information on policy and requirements.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
ATCT(s)	FAIL	Receptor(s) marked as ATCT receive green and/or yellow glare

The referenced policy can be read at <https://www.federalregister.gov/d/2021-09862>

# Component Data

This report includes results for PV arrays and Observation Point ("OP") receptors marked as ATCTs. Components that are not pertinent to the policy, such as routes, flight paths, and vertical surfaces, are excluded.

## PV Arrays

**Name:** NE-facing array  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 3.0°  
**Orientation:** 45.0°  
**Rated power:** -  
**Panel material:** Smooth glass with AR coating  
**Reflectivity:** Vary with sun  
**Slope error:** correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	33.623186	-111.914684	1466.60	38.16	1504.76
2	33.623352	-111.914477	1467.14	34.33	1501.47
3	33.623047	-111.914089	1470.14	34.33	1504.47
4	33.622874	-111.914316	1468.28	38.16	1506.44

**Name:** SW-facing array  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 3.0°  
**Orientation:** 225.0°  
**Rated power:** -  
**Panel material:** Smooth glass with AR coating  
**Reflectivity:** Vary with sun  
**Slope error:** correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	33.623183	-111.914685	1466.57	38.16	1504.73
2	33.622874	-111.914318	1468.28	38.16	1506.44
3	33.622704	-111.914537	1466.95	34.33	1501.28
4	33.622999	-111.914913	1466.38	34.33	1500.71

## Observation Point ATCT Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
1-ATCT	1	33.621666	-111.910133	1466.97	85.00

Map image of 1-ATCT



## Obstruction Components

**Name:** Parapet Wall  
**Top height:** 40.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	33.622703	-111.914536	1466.95
2	33.623045	-111.914086	1470.14
3	33.623046	-111.914083	1470.15

# Glare Analysis Results

## Summary of Results Glare with low potential for temporary after-image predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
NE-facing array	3.0	45.0	2,352	39.2	0	0.0	-
SW-facing array	3.0	225.0	524	8.7	0	0.0	-

Total annual glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
1-ATCT	2,876	47.9	0	0.0

## PV: NE-facing array

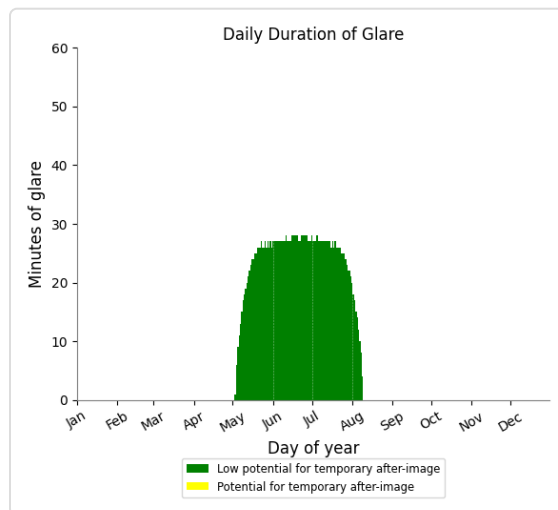
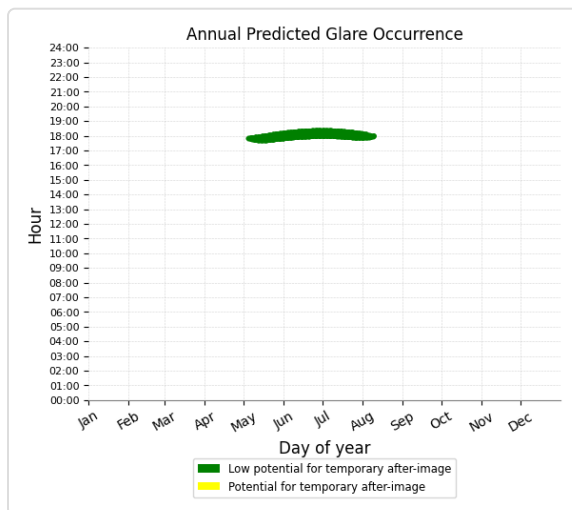
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
1-ATCT	2,352	39.2	0	0.0

## NE-facing array and 1-ATCT

Receptor type: ATCT Observation Point

0 minutes of yellow glare

2,352 minutes of green glare



## PV: SW-facing array

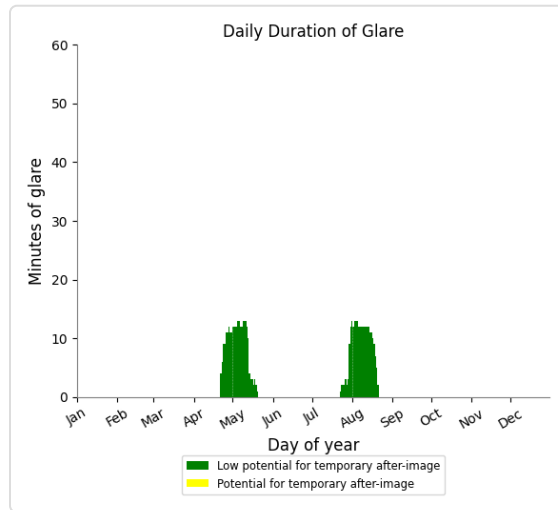
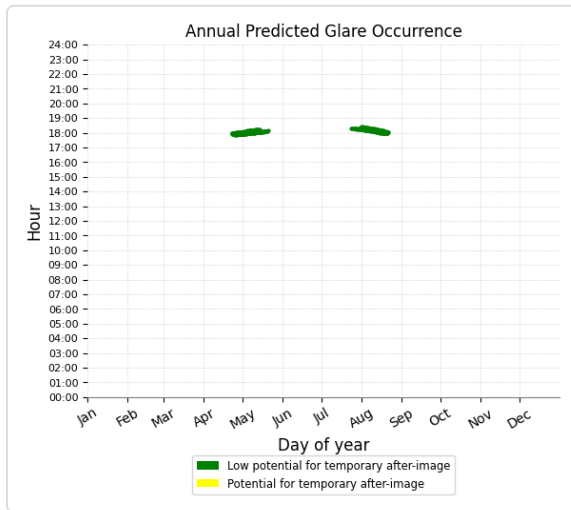
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
1-ATCT	524	8.7	0	0.0

### SW-facing array and 1-ATCT

Receptor type: ATCT Observation Point

0 minutes of yellow glare

524 minutes of green glare



# Assumptions

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"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.

The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.

Several V1 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. This primarily affects V1 analyses of path receptors.

Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.

The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.

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.)

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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.

Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.

Refer to the Help page at [www.forgesolar.com/help/](http://www.forgesolar.com/help/) for assumptions and limitations not listed here.

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

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# FORGESOLAR GLARE ANALYSIS

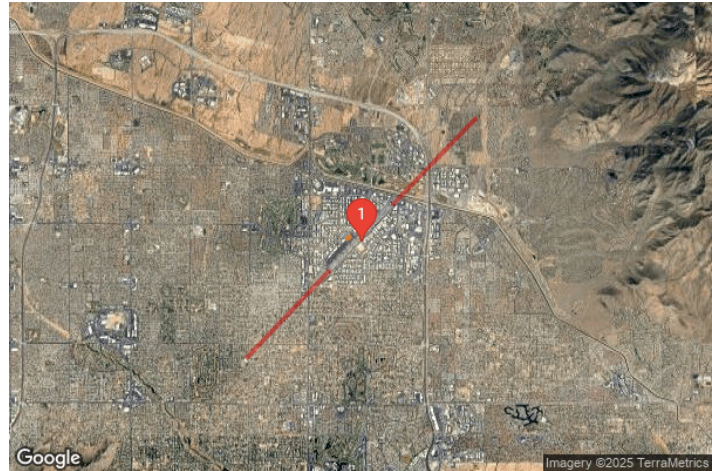
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A proposed ~85 kW rooftop solar project adjacent to Scottsdale Airpark.

Site configuration: **FlexJet Scottsdale Solar Rev 2**

Created 26 Feb, 2025  
 Updated 26 Feb, 2025  
 Time-step 1 minute  
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 Minimum sun altitude 0.0 deg  
 DNI peaks at 1,000.0 W/m<sup>2</sup>  
 Site ID 142457.24047

Ocular transmission coefficient 0.5  
 Pupil diameter 0.002 m  
 Eye focal length 0.017 m  
 Sun subtended angle 9.3 mrad  
 PV analysis methodology V2



## Glare Policy Adherence

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COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
ATCT(s)	PASS	Receptor(s) marked as ATCT do not receive glare

The referenced policy can be read at <https://www.federalregister.gov/d/2021-09862>

# Component Data

This report includes results for PV arrays and Observation Point ("OP") receptors marked as ATCTs. Components that are not pertinent to the policy, such as routes, flight paths, and vertical surfaces, are excluded.

## PV Arrays

**Name:** NW-facing array - north roof  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 5.0°  
**Orientation:** 315.0°  
**Rated power:** -  
**Panel material:** Smooth glass with AR coating  
**Reflectivity:** Vary with sun  
**Slope error:** correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	33.623186	-111.914684	1468.00	38.50	1506.50
2	33.623352	-111.914477	1468.00	36.66	1504.66
3	33.623047	-111.914089	1468.00	36.66	1504.66
4	33.622874	-111.914316	1468.00	38.50	1506.50

**Name:** NW-facing array - South Roof  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 5.0°  
**Orientation:** 315.0°  
**Rated power:** -  
**Panel material:** Smooth glass with AR coating  
**Reflectivity:** Vary with sun  
**Slope error:** correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	33.623183	-111.914685	1468.00	38.50	1506.50
2	33.622874	-111.914318	1468.00	38.50	1506.50
3	33.622704	-111.914537	1468.00	36.66	1504.66
4	33.622999	-111.914913	1468.00	36.66	1504.66

## Observation Point ATCT Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
1-ATCT	1	33.621666	-111.910133	1466.97	85.00

Map image of 1-ATCT



## Obstruction Components

**Name:** Parapet Wall  
**Top height:** 40.0 ft



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)
1	33.622703	-111.914536	1468.00
2	33.623045	-111.914086	1468.00
3	33.623046	-111.914083	1468.00

# Glare Analysis Results

## Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
NW-facing array - north roof	5.0	315.0	0	0.0	0	0.0	-
NW-facing array - South Roof	5.0	315.0	0	0.0	0	0.0	-

Total annual glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
1-ATCT	0	0.0	0	0.0

## PV: NW-facing array - north roof

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
1-ATCT	0	0.0	0	0.0

## NW-facing array - north roof and 1-ATCT

Receptor type: ATCT Observation Point  
No glare found

## PV: NW-facing array - South Roof

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
1-ATCT	0	0.0	0	0.0

## NW-facing array - South Roof and 1-ATCT

Receptor type: ATCT Observation Point  
No glare found

# 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.

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The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.

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.)

The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.

The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.

The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.

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.

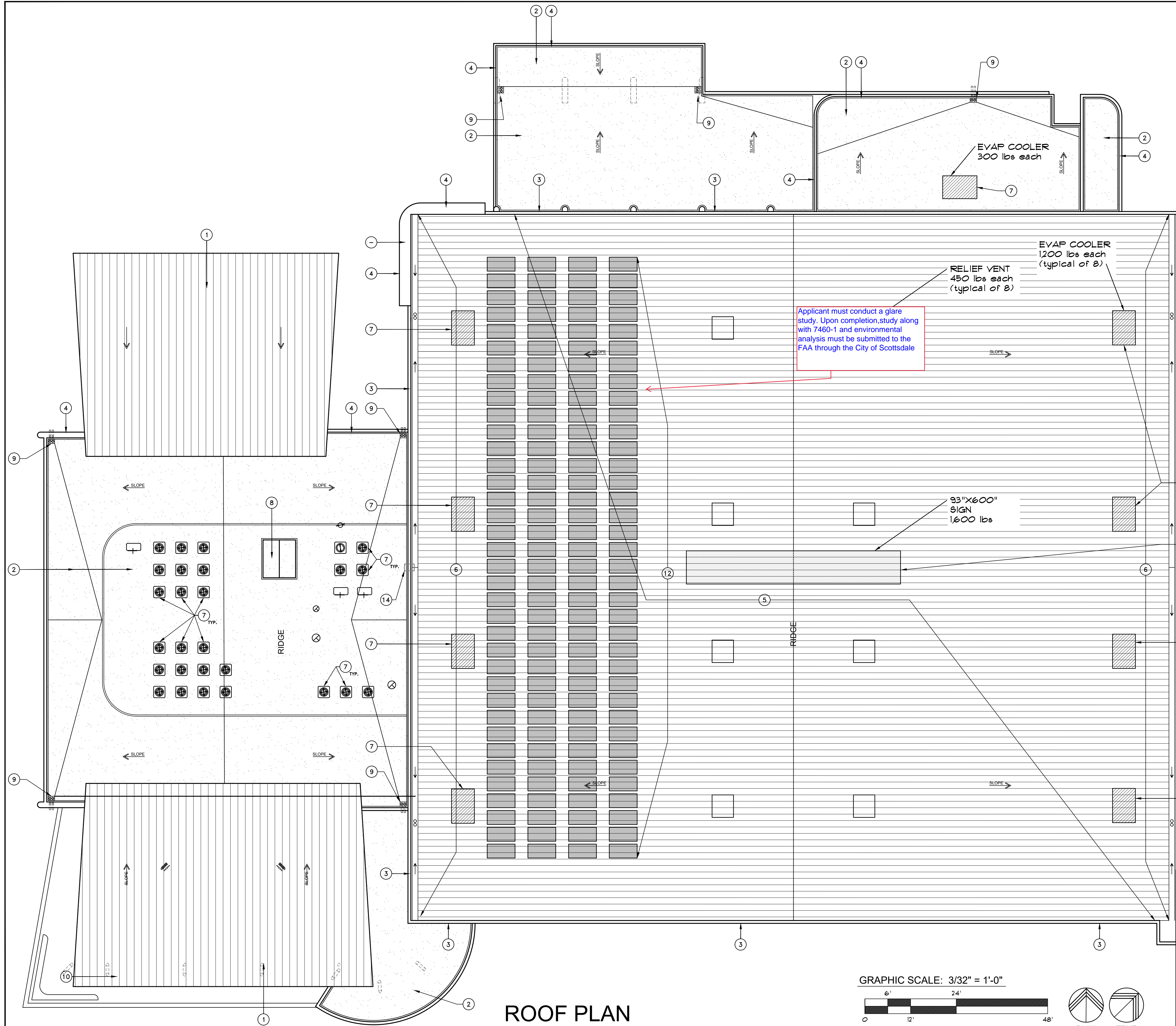
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.

Refer to the Help page at [www.forgesolar.com/help/](http://www.forgesolar.com/help/) for assumptions and limitations not listed here.

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

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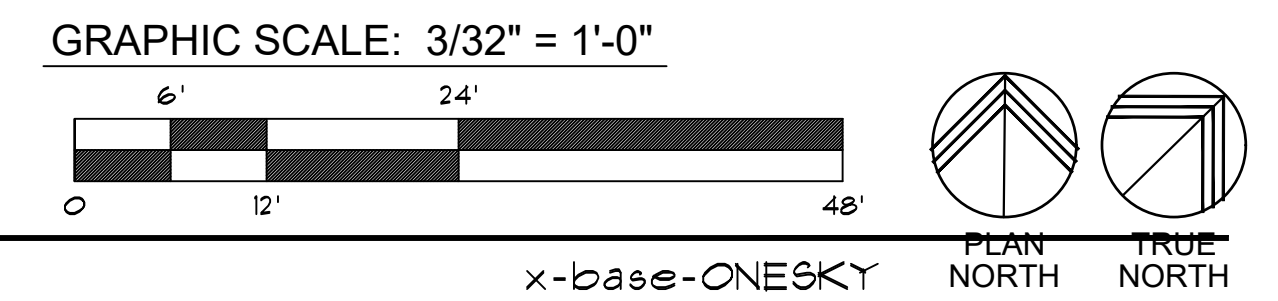


- ### ROOF PLAN KEYED NOTES
- 1 PRE-FINISHED STANDING SEAM METAL ROOF
  - 2 TPO ROOF
  - 3 PARAPET CAP BY FEMB MANUFACTURER
  - 4 PRE-FINISHED METAL PARAPET CAP TO MATCH METAL WALL PANELS
  - 5 METAL BUILDING ROOF SYSTEM - PARAPET CLOSURE ATTACHMENTS AND FLASHING PER METAL BUILDING SHOP DRAWINGS - INSTALL CRICKETING AS REQUIRED - COORD. W/ MANUFACTURER DECK BELOW
  - 6 METAL BUILDING GUTTER SYSTEM WITH ROOF AND OVERFLOW DRAINS - LIP OF OVERFLOW DRAW TO BE MIN 2" ABV MAIN ROOF DRAIN
  - 7 ROOFTOP MECHANICAL UNITS INSTALLED PER MANUFACTURER STANDARDS - SEE MECHANICAL DRAWINGS - FEMB MANUFACTURER TO PROVIDE CURBS AND CRICKETING FOR UNITS AS REQUIRED
  - 8 ELEVATOR SHAFT
  - 9 ROOF DRAIN AND OVERFLOW WITH DOWNSPOUT THROUGH WALL
  - 10 DECK BELOW
  - 11 EXIT STAIR BELOW
  - 12 ROOF-MOUNTED PHOTOVOLTAIC SOLAR PANELS AS REQUIRED TO PROVIDE NOT LESS THAN 3% OF ANNUAL ESTIMATED ENERGY USED FOR BUILDING MECHANICAL SERVICE WATER HEATING AND LIGHTING OR NOT LESS THAN 2 WATTS PER SQ. FT. MULTIPLIED BY THE GROSS ROOF AREA, IN ACCORDANCE WITH IBC CODE AMENDED SECTION 1013.
  - 13 3' WIDE WALK PADS - PRODUCT AND INSTALLATION AS RECOMMENDED BY ROOFING MANUFACTURER TO MAINTAIN ROOF SYSTEM WARRANTY
  - 14 ROOF LADDER TO PROVIDE ACCESS FROM UPPER HANGAR ROOF TO LOWER TERMINAL ROOF - LADDER BY G.C. AND STRUCTURAL SUPPORT FOR LADDER BY FEMB MANUFACTURER
  - 15 POST-MOUNTED BUILDING SIGN BY DEFERRED SUBMITTAL: 93' X 600', 600LBS MAX. FEMB MANUFACTURER TO PROVIDE (4) POST MOUNTING POINTS. SIGN MANUFACTURER TO PROVIDE ADDITIONAL FRAMING AS REQUIRED TO SUPPORT SIGN
- CALCULATION:**  
 ROOF AREA = 42,458 G.S.F.  
 42,458 SQ. FT. X 2 WATTS/SQ. FT. = 84,916 WATTS REQUIRED  
 600 WATTS/PANEL  
 84,916 WATTS / 600 WATTS/PANEL = 141.53 PANELS REQUIRED  
 144 PANELS PROVIDED

Applicant must conduct a glare study. Upon completion, study along with 7460-1 and environmental analysis must be submitted to the FAA through the City of Scottsdale

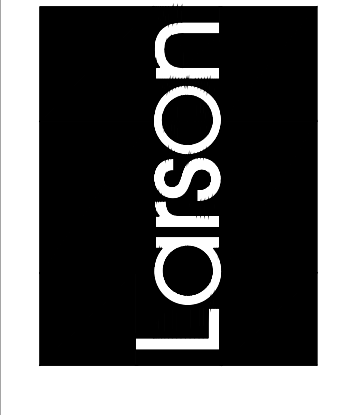
APPROVED PER ARTICLE 7 OF LEASE AGREEMENT 2010-166-COS  
 DATE: 12/2/2024 INITIALS: JPM

**ROOF PLAN**  
 SCALE: 3/32"=1'-0"

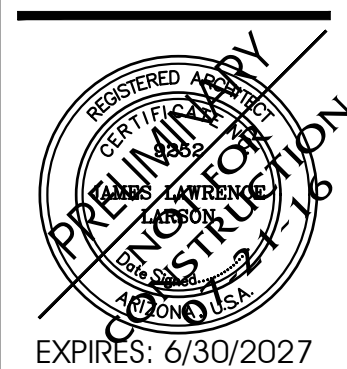


CITY OF SCOTTSDALE APPROVAL BLOCK

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 SCOTTSDALE, AZ 85260



EXPIRES: 6/30/2027  
 Drawing Name: ROOF PLAN

Revisions  
 11-22-24 AIRPORT APPROVAL DOCS. - RL

Date: 11/22/24

Project Number: 2021004

Drawing No: