

STERLING INNOVATIONS LLC

8950 West Olympic Blvd., #420

Beverly Hills, CA 90211

PHONE/FAX: 310-274-6433

E-MAIL: RON@STERLINGINNOVATIONS.NET

WEB-SITE: WWW.STERLINGINNOVATIONS.NET

September 2, 2011

Skylight Illumination Transmission Overview

While a skylight on it's own, doesn't create illumination, it does transmit the light of the sun. For that reason, accepted IESNA (Illuminating Engineering Society of North America) methods for measuring the output of lighting fixtures can be applied for the purpose of comparative analysis between differing skylights.

By applying the same: illumination source, position and lumen rating, behind each skylight, the transmission of the illumination through the skylight and reaching a flat surface underneath (the floor) at a fixed distance away, can be measured in a grid. Those measurements can be used for comparison.

All of the measurements are based on foot-candle units. One foot-candle of light is the amount of light that a candle generates at one foot away.

For a skylight comparison, the pertinent foot-candle measurements are: **Average, Minimum, Maximum, and Uniformity.**

Following is a description of each:

Average (Avg)- is not calculated only based on the highest and lowest foot-candle ratings, it is an average of every single foot-candle reading included on the same grid. Usually, the higher the average the better, because higher means more illumination overall is being transmitted.

Minimum (Min)- is the lowest foot-candle reading on the grid. While the minimum reading is the dimmest spot on the grid, it doesn't necessarily identify a dark area(s). It is only the dimmest illuminated spot as compared with the other spots on the same grid. Usually the more minimum readings that are present, the better. That is because multiples of the same minimum reading is often a component of good uniformity.

Maximum (Max)- is the highest (brightest) foot-candle reading on a grid. The maximum reading alone does not provide much insight, however, it is an important element comprising the uniformity. Multiples of the same maximum reading is often a component of good uniformity.

Uniformity (Max/Min)- is the ratio between minimum and maximum foot-candle readings. The lower the uniformity number the better. A low number means that there is not a great difference between the minimum and maximum foot-candle readings on the same grid, thus the area is uniformly illuminated. The human eye can effectively adjust to very bright areas and vary dimly illuminated areas, however, the transition between the two can take some time. Thus, in a single area that contains both bright and dim portions, depending on the ratio between the two, the eye may remain in a state of adjustment as it views the illumination range, potentially making it difficult to see. The problem escalates when the lowest areas are substantially lower than the very brightest areas. A high uniformity figure depicts a greater range between darkest to brightest.

Ronald S. Bieber

Sterling Innovations LLC

"Putting the Power of Creation in the Palm of Your Hand"

STERLING INNOVATIONS LLC

8950 West Olympic Blvd., #420

Beverly Hills, CA 90211

PHONE/FAX: 310-274-6433

E-MAIL: RON@STERLINGINNOVATIONS.NET

WEB-SITE: WWW.STERLINGINNOVATIONS.NET

August 26, 2011

Comparative Illumination Transmission Analysis Between Quasar and A Competing Prismatic Skylight

Both the Quasar and competing prismatic skylight systems were submitted to Light Laboratories Inc. (an independent testing laboratory) for analysis. Light Laboratories Inc. performs illumination tests in accordance with the Illuminating Engineering Society of North America (IESNA) Standards.

Light Laboratories Inc. created an enclosure that was used for each system, that mimics the normal circumstance in which each skylight is typically installed, recessed 1' into a ceiling well. They then attached the same light source behind each skylight at respective angles of 45 and 90 degrees, as defined below, and then performed testing to IESNA standards. Each test resulted in photometric reports and an "absolute" photometric computer data model file, representing the illumination transmission characteristics of each skylight, called "IES" files.

Those "IES" files were then sent to an independent photometric analysis company, Sterling Innovations LLC, that specializes in photometric analysis based upon "IES" data files.

Sterling Innovations LLC used the provided "IES" files to create four different photometric reports that depict the different light transmission characteristics of each skylight system at 30' above the ground (or floor) with the following illumination transmission results measured on the floor:

The competing prismatic skylight -45 degrees, transmitted an average of 0.54 footcandles, with a minimum of 0.1 and a maximum of 1.1. The resulting uniformity (Maximum/Minimum) ratio was 11 to 1 (the lower the ratio the more uniform the illumination).

With the same light source, installation and testing procedures, the Quasar Prismatic Skylight -45 degree, transmitted an average of 0.85 footcandles, with a minimum of 0.2 and a maximum of 1.9. The resulting uniformity (Maximum/Minimum) ratio for it was 9.5 to 1.

A second set of the same tests were conducted with the same light source, installation and testing procedures, for the competing prismatic skylight -90 degree, which transmitted an average of 0.47 footcandles, with a minimum of 0.1 and a maximum of 1.0, Resulting in a uniformity (Maximum/Minimum) ratio of 10 to 1.

With the same light source, installation and testing procedures, the Quasar Prismatic Skylight -90 degree, transmitted an average of 0.73 footcandles, with a minimum of 0.2 and a maximum of 1.9. The resulting uniformity (Maximum/Minimum) ratio for it was 9.5 to 1.

Thus, with all results based on the photometric testing and analysis parameters defined herein, it is determined for the first set of skylights that the Quasar Prismatic Skylight -45 degrees, transmits over 1.57 times the average illumination, twice the minimum, and over 1.72 times the maximum as compared to the competing prismatic skylight -45 degree system. Additionally, the Quasar Prismatic Skylight -45 degree, transmitted illumination over 15% more uniformly than the competing prismatic skylight system.

For the second set of skylights tested, the Quasar Prismatic Skylight -90 degree, transmitted over 1.55 times the average illumination, twice the minimum, and 1.90 times the maximum as compared to the competing prismatic skylight -90 degree system. Additionally, the Quasar Prismatic Skylight -90 degree, transmitted illumination over 5% more uniformly than the competing prismatic skylight system.

Ronald S. Bieber

Sterling Innovations LLC

"Putting the Power of Creation in the Palm of Your Hand"



STERLING INNOVATIONS
 8950 W. OLYMPIC BLVD., #420
 BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

QUASAR PRISMATIC
 SKYLIGHT- 45 DEG-1'
 @30'AG-1A

DWG.NO

SI072811R-1A

SCALE

SHEET

SIZE

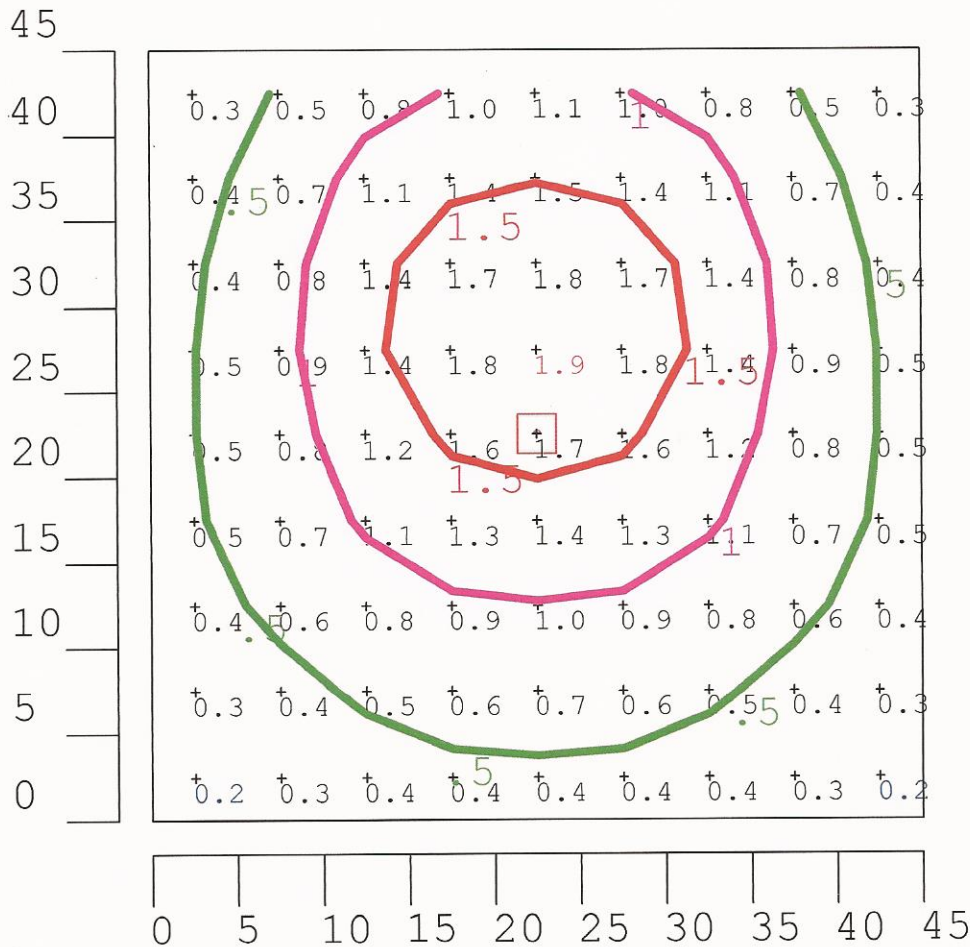
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule			
Symbol	Label	Description	Filename
A	A	QUASAR PRISMATIC SKYLIGHT-45 DEG-1'@30'AG	L06110105.IES

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	0.85	1.9	0.2	4.25	9.50

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
 8950 W. OLYMPIC BLVD., #420
 BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

COMPETING PRISMATIC
 SKYLIGHT-45 DEG-1'
 @30'AG-2B

DWG.NO

SI082611R-2B

SCALE

SHEET

SIZE

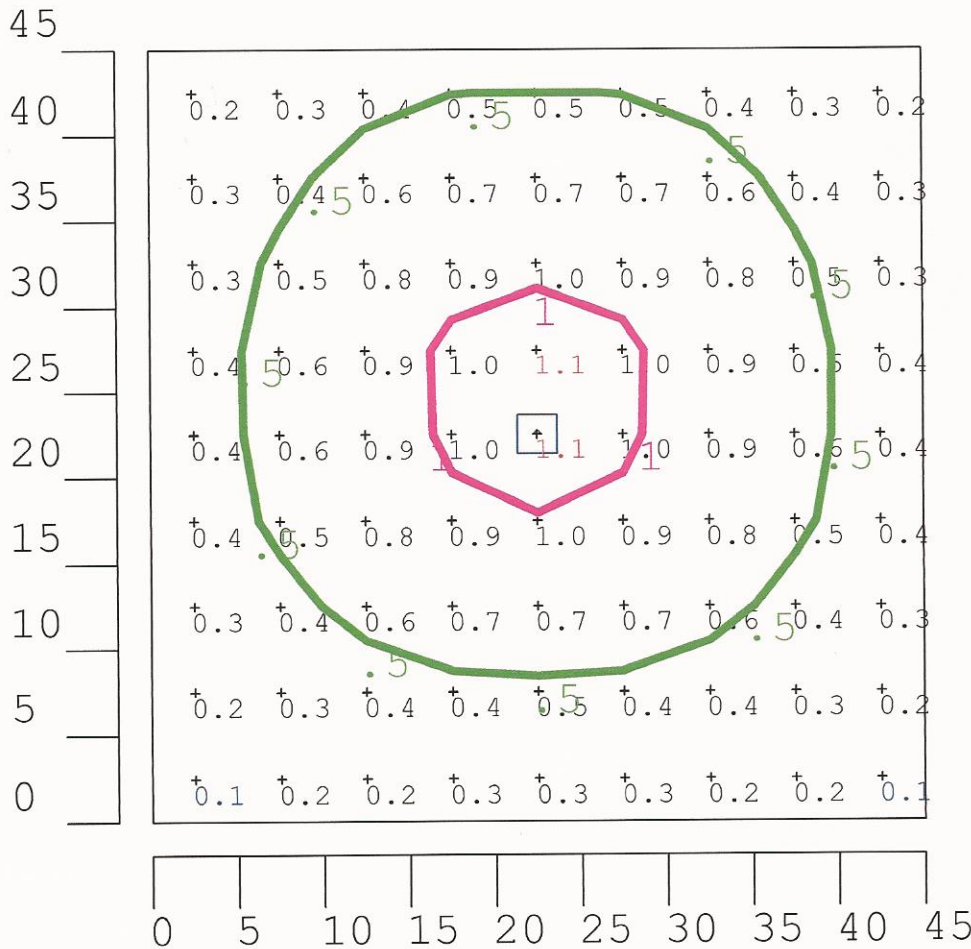
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule			
Symbol	Label	Description	Filename
F	F	COMPETING PRISMATIC SKYLIGHT-45 DEG-1'@30'AG	L06110111.IES

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	0.54	1.1	0.1	5.40	11.00

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
8950 W. OLYMPIC BLVD., #420
BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

QUASAR PRISMATIC
SKYLIGHT- 45 DEG-1'
@30'AG-4A

DWG.NO

SI072811R-4A

SCALE

SHEET

SIZE

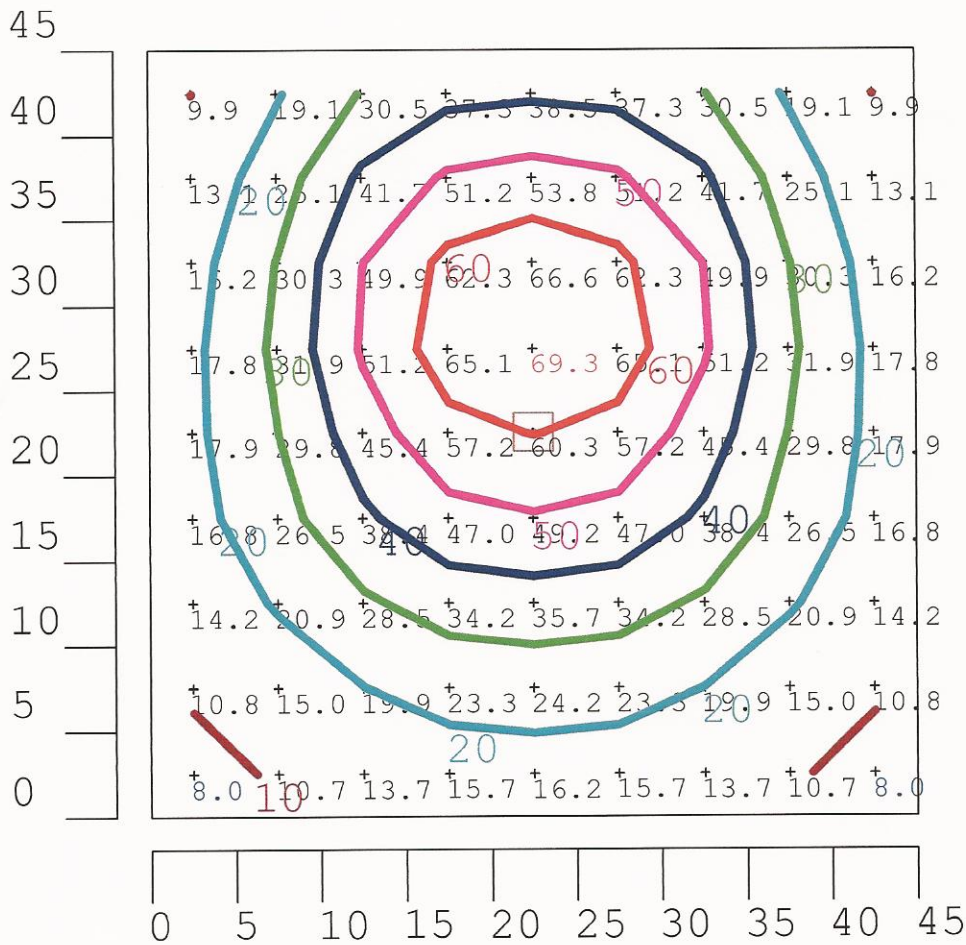
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule			
Symbol	Label	Description	Filename
*	G	QUASAR PRISMATIC SKYLIGHT-45 DEG-1'@30'AG	L06110105R01.IES

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	30.95	69.3	8.0	3.87	8.66

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
 8950 W. OLYMPIC BLVD., #420
 BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

COMPETING PRISMATIC
 SKYLIGHT-45 DEG-1'
 @30'AG-4B

DWG.NO

SI082611R-4B

SCALE

SHEET

SIZE

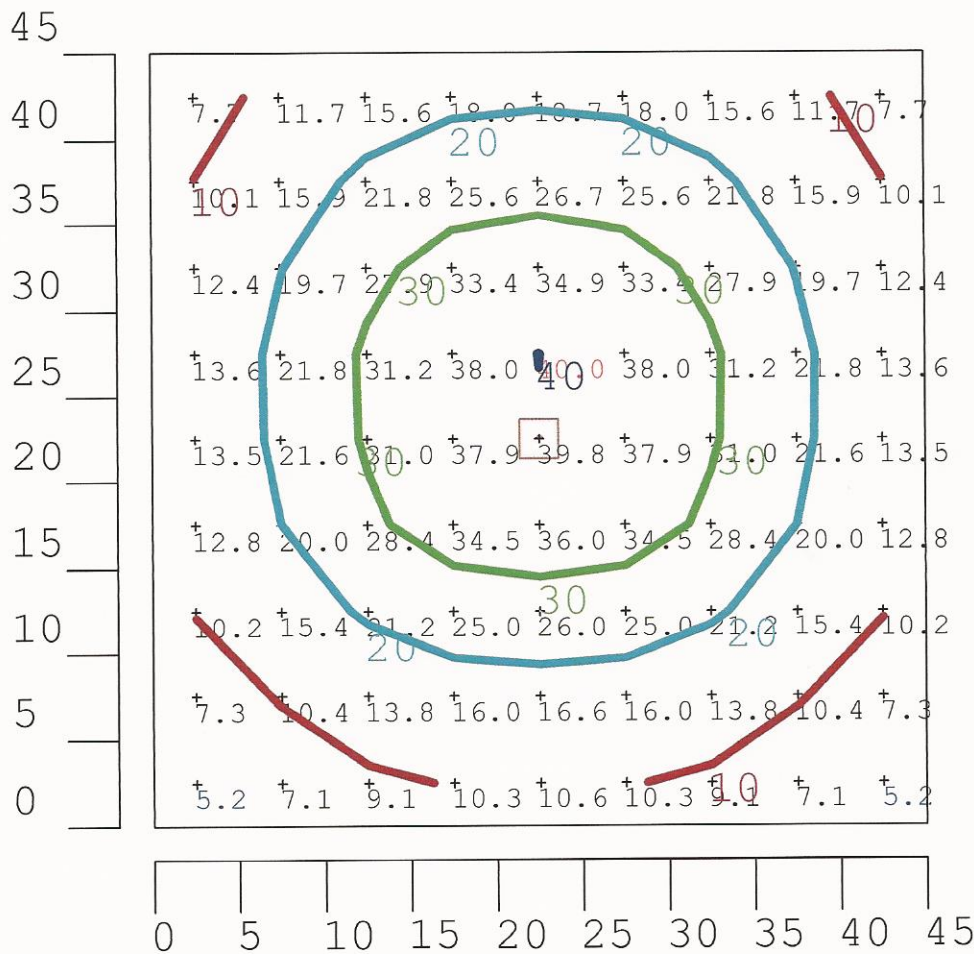
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule				
Symbol	Label	Description	Filename	Lumens
*	H	COMPETING PRISMATIC SKYLIGHT-45 DEG-1'@30'AG	L06110111R01.IES	400000

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	19.75	40.0	5.2	3.80	7.69

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
8950 W. OLYMPIC BLVD., #420
BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

QUASAR PRISMATIC SKYLIGHT-90 DEG-1'@30'AG-1C

DWG. NO

SI072811R-1C

SCALE

SHEET

SIZE

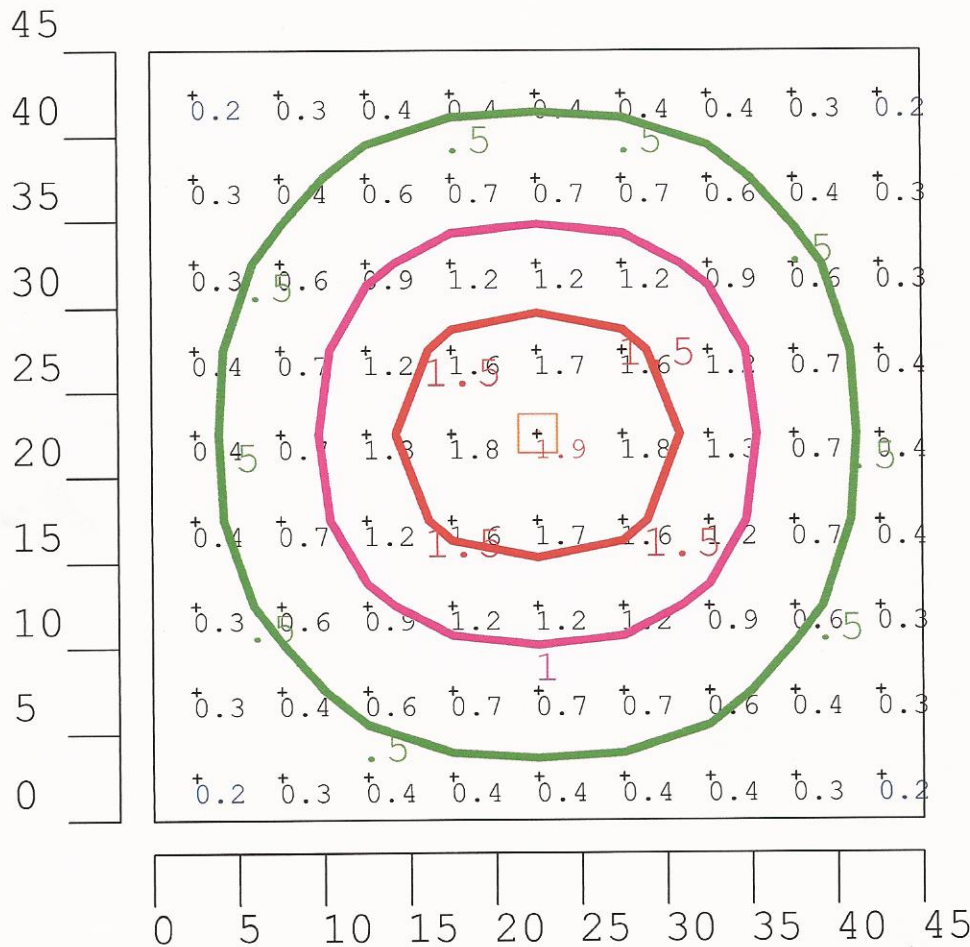
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule			
Symbol	Label	Description	Filename
□	C	QUASAR PRISMATIC SKYLIGHT-90 DEG-1'@30'AG	L06110102.IES

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	0.73	1.9	0.2	3.65	9.50

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
8950 W. OLYMPIC BLVD., #420
BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

COMPETING PRISMATIC
SKYLIGHT-90 DEG-1'
@30'AG-2D

DWG.NO

SI082611R-2D

SCALE

SHEET

SIZE

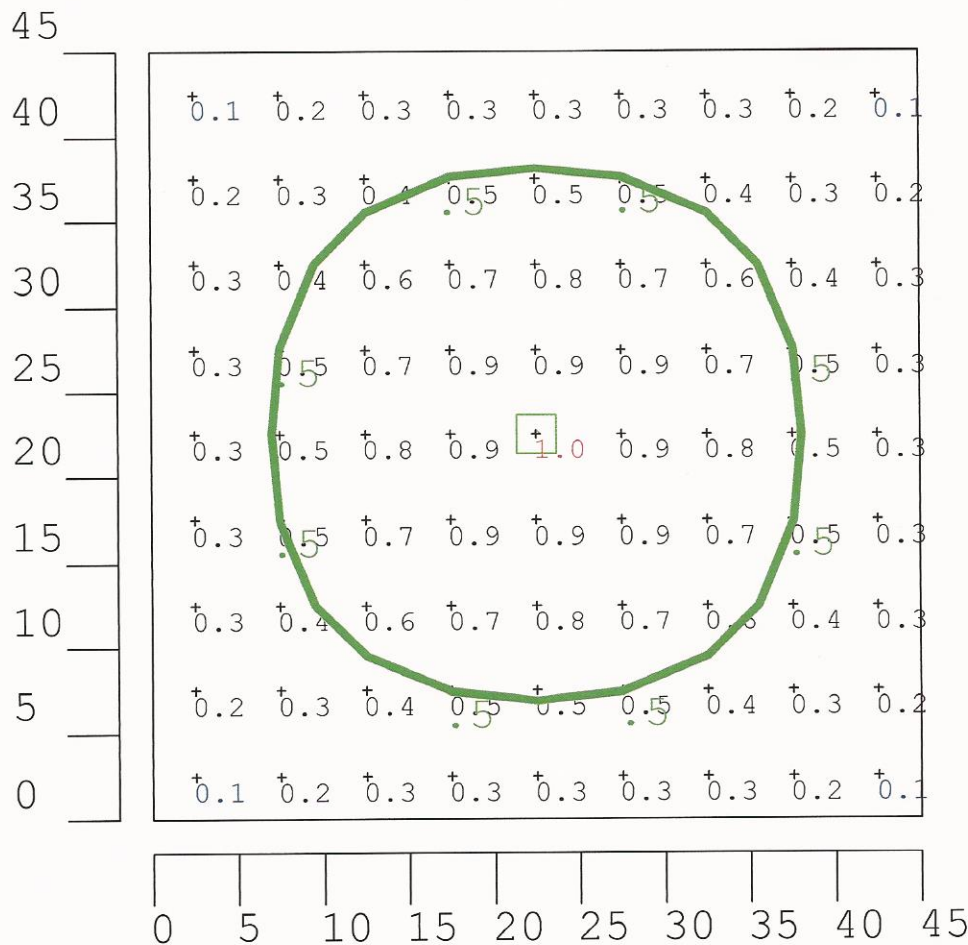
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule			
Symbol	Label	Description	Filename
E	E	COMPETING PRISMATIC SKYLIGHT-90 DEG-1'@30'AG	L06110108.IES

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	0.47	1.0	0.1	4.70	10.00

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
8950 W. OLYMPIC BLVD., #420
BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

QUASAR PRISMATIC SKYLIGHT-
90 DEG-1'@30'AG-4C

DWG.NO

SI072811R-4C

SCALE

SHEET

SIZE

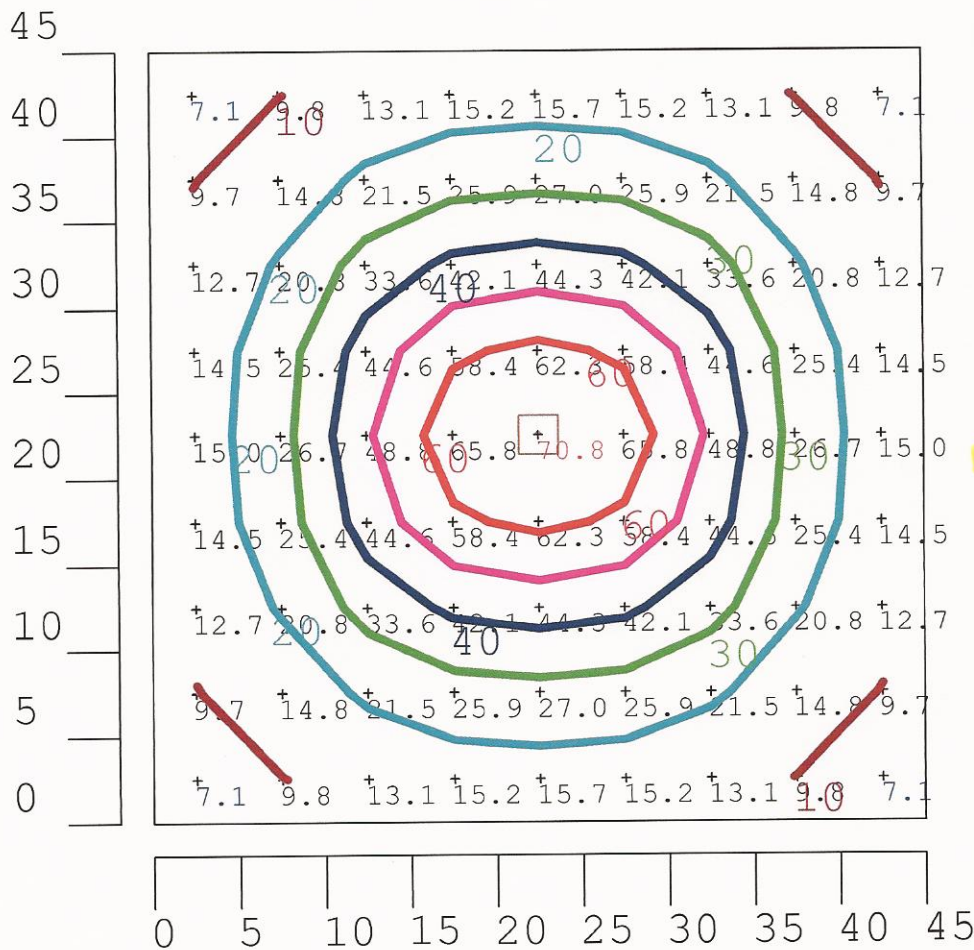
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule

Symbol	Label	Description	Filename	Lumens
I	I	QUASAR PRISMATIC SKYLIGHT-90 DEG-1'@30'AG	L06110102R01.IES	400000

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	26.65	70.8	7.1	3.75	9.97

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illuminations characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.



STERLING INNOVATIONS
 8950 W. OLYMPIC BLVD., #420
 BEVERLY HILLS, CA. 90211

WWW.STERLINGINNOVATIONS.NET

PROJECT NAME:

COMPETING PRISMATIC
 SKYLIGHT-90 DEG-1'
 @30'AG-4D

DWG.NO

SI082611R-4D

SCALE

SHEET

SIZE

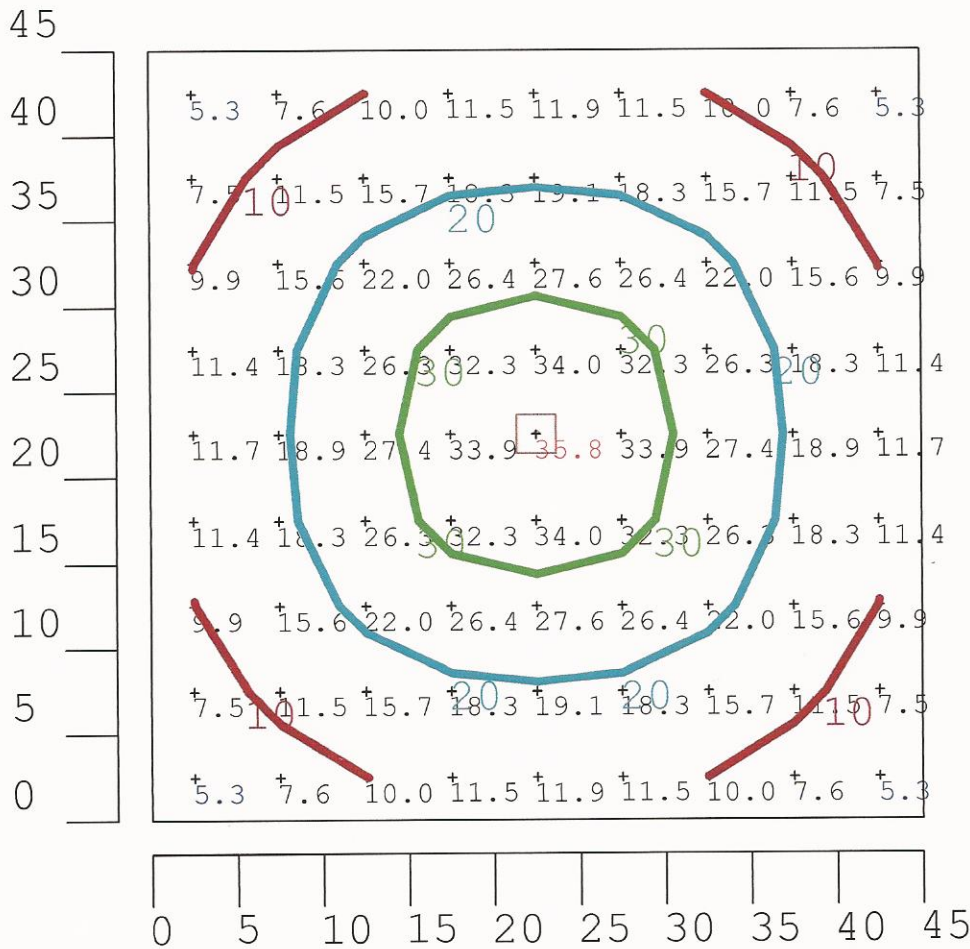
FSCM NO.

DRAWN BY:

RSB

REVISIONS

REV.	DATE	BY



Luminaire Schedule			Filename	Lumens
Symbol	Label	Description		
*	J	COMPETING PRISMATIC SKYLIGHT-90 DEG-1'@30'AG	L06110108R01.IES	400000

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
GRID	Illuminance	Fc	17.32	35.8	5.3	3.27	6.75

Based on the information provided, all dimensions and luminaire locations shown represent recommended pole placement and luminaire orientation. The engineer and/or architect must determine applicability of the layout to relevant field conditions. The depicted illumination results are based upon illumination measurements as calculated by an Independent Laboratory. The luminaire characteristic data (ies file) that was used in this analysis was measured under controlled conditions in accordance with approved Illuminating Engineering Society methods. Actual on-site performance of any manufacturer's luminaires may vary from laboratory test results due to variations in: electrical voltage, tolerance in lamps and other variable field conditions. This photometric analysis may be based on luminaire ies data files that were provided or recommended by the manufacturer or product reseller and thus it is beyond the control of the creator of this report to ensure that the ies file(s) utilized in this analysis represent the actual product provided. Due to this fact, the creator of this report makes no expressed or implied warranty that the results of this report will occur at the project site. If existing luminaires are included in this report, their illumination characteristics are based upon a combination of customer provided specifications and our best estimations. Due to this fact, the resulting footcandle accuracy may be compromised. If this plan is based on an original faxed drawing, by virtue of the fax process, the scale of the drawing will have been compromised and thus the resulting figures and calculations on this document will also be compromised.