LIGHTING CALCULATIONS FOR APRONS, TAXIWAYS, CONTROL TOWERS

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.2	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0,6	0.5
4	0,4	0,4	-0,5	0,5	0,6	0.8	0,5	0,5	0,7	0,8	0.7	0,4	0,5	0,7	0.8	0,8	0,8	0,8	0.8	0,8	0,7	0.7
.5	0.6	0.6	0.7	0.8	-0.9	1.0	0.7	0.7	0.7	1.0	0.5	0.6	0.6	1.1	1.2	1.2	1.2	1.2	1.1	1.1	1.0	0.9
.8	0,9	1,0	1,1	1,2	1,4	1,5	-1,0	R	1.0	9.7	9.0	7.0	1.1	4.6	1,8	4,8	1.8	1,8	1,6	1,5	1,4	1,2
2	1.	1.5	1.7	1.9	2.1	2.2	2.0	1.5	M		1.3	1.5	1.9	2.5	2.6	2.7	2.7	2.6	2,4	2.2	1.9	1.6
,8	2.1	2,4	2,5	2,8	3,1	3,1	3,1	2,3	2.1	MA	2.0	2,3	2,6	3,8	3,9	4.0	4.0	з.	3,5	3,2	2,7	2,3
17	3.1	8.5	3.7	.2	4.4	4.5	4.6	3.4	з.	2.6	10.9	3.4	3.9	1.3	1.9	4.8	4.8	5.	4.9	4.4	3.8	3.3
.9	4.5	4.	5,3	52	5,4	1,0	1,4	3,5	4.	3.5	10	0.3	0,1	5.7	6,0	7.5	7.2	6.6	6.4	5,7	5,0	4,5
2	5.9	8.6	7.1	7.5	7.8	6.7	6.4	0.3	0.3	-0.4	87	0.3	6.7	7.4	9.9	J 9.7	9.2	85	7.9	7.1	6.3	6.0
7	7.5	8,4	.0	9.	100	10.8	10.0	7,1	6.1	04	0.	7.16	8.3	120	12.1	11.8	1.2	10.4	9,5	8.6	7.9	7.6
,1	9,1	10,1	100	11.	12.	12,1	11:8-	10,0	7,5	न्णू 7.3	9.9	8,6	8.5	13,9	14.0	13,8	1.1	2,2	11,2	10,2	9,6	9,1
15	10.5	11.7	12.7	13.4	13,8	13,7	13,4	12.5	8.5	-ad	9, 14.9	9.2	N/T	5.2	200	15,4	147	3.8	2.9	12.0	11.3	10.
0,8	11,9	13,2	14,2	4.8	14,9	15,0	14.9	14,6	9,5	8,8	5,1	9,7	10,6	16,1	15,9	152	14,4	14.2	14.g	3.6	13,1	12
2.0	13.3	14.3	14.6	1.3	14.1	14.5	15.0	5.5	102	-0.0		10.6	11.4	14.6	14.7	14.0	13.8	13.7	13 6	13.5	13.1	12.
3,5	14.6	14.6	14.0	13,9	14,3	14,5	14.7	1.0	/ <u>.</u>	1	MA	111/1	1 AN	X ₇	14,3	14,5	14,5	14,5	14.1	13,5	12,9	12.
20	11.2	13	14.2	14.9	15.1	15.4	15.9	15.8	9.4		7.5	10.8	10.1	14.2	14.6	14.6	14.9	15.3	15.2	1.6	13.7	12
A	12.9	13,7	14.6	15,2	15,8	16,4	16,6	16,3	15,5	8 1	2.1	0.0	10.6	13,9	14,8	15,9	16,9	17.2	16,6	15,3	13.8	12.
1.3	23	18.5	14.6	16.1	17.6	18.2	17.9	16.7	14.7	12.8	1	h2.3	12.4	13.5	15.4	17.4	18.7	19.1	16.0	15.9	13.6	11.
	11.0	12.7	16.0	7.3	19.3	20.1	19.0	16.6	13.9	11	10.4	10.3	11.3	13.3	15.7	18.4	20.6	2013	17.7	14.6	11.9	9.7
		11.5	14.2	7.0	3.01	20.2	185	14.8	11.9		9.1	9.0	10.1	12.0	14.1	10.5	18.5	16.8	13.5	11.2	9.6	43
-*	Ţ	0.4	11.6	12.2		140	10.0	10.7		8.1	7.6	7.4	8.1	0.3	10.3	10.0	10.0	[[]	5.2	6.9	6.7	e.1
.0	1	3,4	0.5	13.2	13.6	VI/	14.1	10.7	1	6.7	7.0	8.4	0.1	3,3	6.2	10.5		1.0	1.0	0.0	0,4	0.1
19	5,4	7,0	6.D	2.0	0,4	F	3	4,7	9,4	0,7	-115	5ft	0,0	6,9	6,3	4,0		1.0	1,9	4.1	2,4	a,2
.0	5,3	5.0	2.5	3.0	2.5	1.0	1.0	1.7	2.0	2.8	3,5	3.8	4.2	3.0	2.2	1/0	1.3	0.0	1.2	1.1	1.3	1,0

LUMINAIRES MOUNTED AT 50'-0" A.F.G.

LUMINAIRES MOUNTED AT 70'-0" A.F.G.







110' Mounting Height, Super Jumbo Jets



150' Mounting Height, Super Jumbo







NOTE:

DO NOT EXPECT A DESIGNER OR MANUFACTURER TO RUN CALCULATIONS OVER A TERMINAL APRON CONTAINING SEVERAL 3D AIRPLANE MODELS! IT IS MUCH TOO TIME-CONSUMING, WOULD REQUIRE MONSTER COMPUTERS.

IT IS REASONABLE TO ASK FOR ONE TYPICAL STAND TO BE SHOWN WITH AND WITHOUT THE PLANE MODELED IN.

Airplane classes, in RP37. Pole height needed tbd

Airpiane Design Group (ADG)	Mad Wing Foot	mum gspan Neters	NBEG	
I. Small Regional	49	15	0,4	No. of Narrowbody Arcraft in witgssan of ADG1 Arcraft = 0.4
II. Medium Regional	79	24	6.7	No. of Narrowbody Arcraft in wingsaan of ADGIII Arcraft = 0,7
III. Narrowoody	118	30	1,0	Nus, of NarrowDody Alcount is whosean of ADG III Alcount = 1,0
Illa. 8757	135	41	1.1	No. of Narrowbody Averaft In whotsan of ADG IIIa Aircraft = 1,1
IV. Widebody	171	52	1.4	No. of Narrowbody Alcout h whoasan of ADGIV Alcout = 1.4
V. Jumbo	214	65	1.8	Ns. of Narrowbody Alcraft h wingspan of ADG V Alcraft = 1.8
VI. Super Jumbo	262	80	2.2	No. of Nantwoody Alcrant to viocepan of ADG VI Alcrant =2.2

Source: Hirsh Associates and Landnum & Brown

Figure 4.4 Identification of Aircraft Types.







Luminous Intensity at Taxiway



Luminous Intensity on Control Tower





Takeaway –

- 1. Adequate pole height is critical, recommendations for each class of plane will be in RP37
- 2. Pole placement is equally important at each corner
- 3. Proper equipment special optics that provide long throw, but not high vertical spill
- 1. Request typical calculations on one 3-d model of the largest plane at each terminal, to see lux levels on and around the plane
- 2. Then check that all locations are lighted similarly
- 3. Insist on glare calculations max luminous intensity at control tower and runways
- 4. Low-polygonal models are needed for the various classes in order for calcs to be done. A library of such needs to be made available for agi32 and other software programs

Many thanks to Dawn De Grazio of Lighting Analysts for providing the example airport glare calculations.