

# CLASSROOMS & UNIVERSITIES

BRILLIANCE IN EDUCATION



# CLASSROOMS

## LIGHTING CONSIDERATIONS



Classroom lighting is a crucial element of educational design that must balance both functional requirements and aesthetic considerations. From illuminance levels to energy efficiency, designers must navigate a range of normative specifications, constructional conditions, and design aspects to create an effective lighting system that meets the needs of students and educators alike. Proper lighting in classrooms can have a significant impact on students' academic performance, behaviour, and overall well-being. In this application guide, we will explore the various factors to consider when lighting classrooms, from lighting levels to colour temperature, to create optimal learning environments for students

## LIGHTING CONSIDERATIONS

### SAFE SPACES & MOVEMENT

Quality lighting is equally important in educational settings, as it allows students and teachers to move around the classroom safely and efficiently. Proper lighting helps prevent accidents and provides adequate visibility for students to engage in activities such as reading, writing, and using electronic devices. Additionally, lighting can be used to create specific zones within the classroom, such as study areas or reading corners.

### MINIMISE GLARE

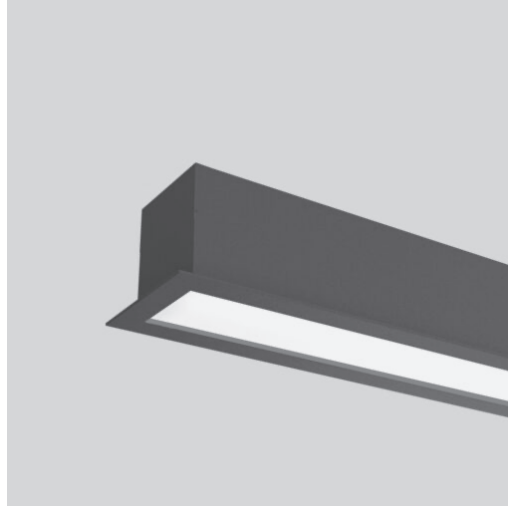
Glare is created when light reflects off surfaces causing visual discomfort and reducing visibility. This can be especially problematic in classrooms, where students may be required to read from whiteboards or digital displays for extended periods. To minimise glare, the placement of luminaires must be considered and their proximity to reflective surfaces, as well as selecting low-glare luminaires to reduce the amount of reflected light in the space.

### HUMAN-CENTRIC

Human-centric lighting is an emerging approach that considers the effects of lighting on the well-being and performance of individuals. It is particularly relevant in educational settings, where lighting can have a significant impact on students' academic performance and behaviour. By using cyan-enhanced LEDs such as Beyond Vision technology, designers can create environments that promote alertness, and concentration.



# RECOMMENDED PRODUCTS



## centauri CENTAURI MINOR RECESSED



LUMINAIRE LUMINOUS FLUX	1000lm - 4000lm
MOUNTING TYPE	Recessed
MATERIAL	Low Glare diffuser   Extruded aluminium profile
DIMMING	DALI
FINISH	Black, White or custom powder coat
WARRANTY	10 years



## CULTURA SOFT FLAT BEYOND VISION



LUMINAIRE LUMINOUS FLUX	2190lm - 3040lm
MOUNTING TYPE	Recessed   T-bar
MATERIAL	Sheet Steel body   Frosted Prismatic Diffuser
DIMMING	DALI   Bluetooth
FINISH	White Powder-coated
WARRANTY	10 years



## HALEN



LUMINAIRE LUMINOUS FLUX	2067lm - 4138lm
MOUNTING TYPE	Recessed   T-bar   Sureface Mounted
MATERIAL	Frosted prismatic PMMA diffuser   Aluminium body
DIMMING	DALI   Bluetooth
FINISH	White Powder-coated
WARRANTY	5 years

# TYPICAL DESIGN

## OPTION 1

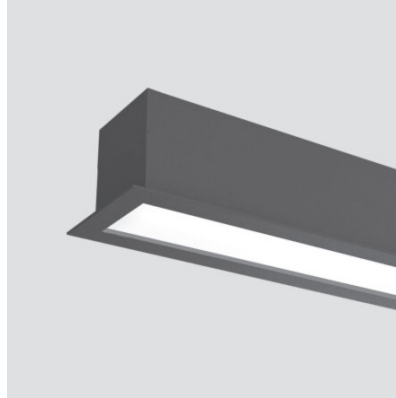
ROOM: 10.0M X 10.0M X 3.0M

## LUMINAIRE SELECTION

CENTAURI MINOR RECESSED  
CENTMI-RE-WH-7000MM-DT-LG-1000-940-IP20-DA



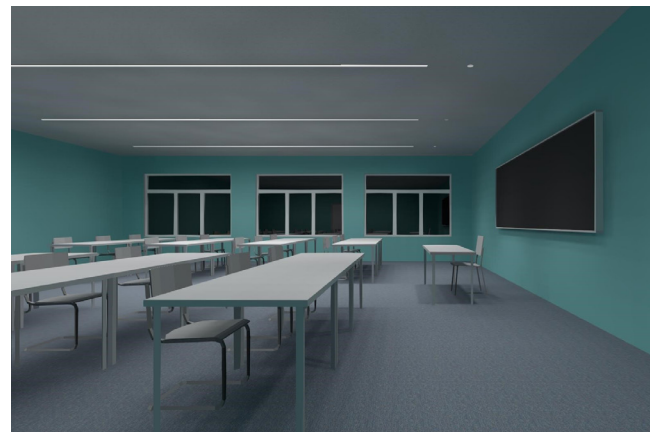
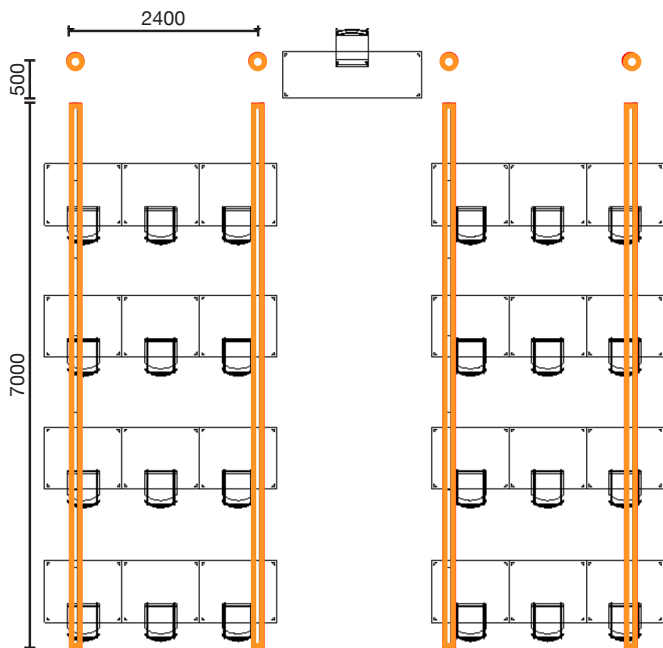
ROOM CALCULATIONS	
REFLECTANCE	Ceiling 70 Wall 50 Floor 20
MAINTENANCE FACTOR	0.8
CEILING HEIGHT	3.0m
ROOM DIMENSIONS	10m x 10m



POWER	14.5 W/m
LUMINOUS FLUX	1000 lm/m
IP RATING	IP20
CRI	90
CCT	4000K
MOUNTING TYPE	Recessed
WARRANTY	10 Years

ADDITIONAL LUMINAIRE: RECESSED TRILUX SONNOS  
White Finish, Ø 100MM, 60° Beam Angle, 4000 K,  
8W, 800 lm, 100 lm/W, DALI DIM, IP20.

ROOM CALCULATIONS						
	STANDARD REFERENCED	STANDARD REQUIREMENTS	DESK AREA (0.7m)	TEACHING AREA (0.7m)	WALLS	CEILING (3m)
AVG. ILLUMINANCE	AS 1680	General Desk/ Teaching >240 lx	377lx	331lx	90.5lx	69.8lx
UNIFORMITY	AS 1680	Table > 0.5	0.51	0.73	0.33	0.58
SEMI CYLINDRICAL ILLUMINANCE	prEN 12464-1:2009	150 lx @1.6 M HT - Teaching @ 1.2 M HT - Desk	151lx	152lx	-	-
MAX UGR @ 1.2 M HT	AS 1680	<= 19		19.5		
LIGHT POWER DENSITY	NCC Section J6	4.5		4.38 W/sq.m		
CYL. TO HOZ. ILLUMINANCE RATIO	prEN 12464-1:2009	0.3 - 0.6	0.40	0.46	-	-
CRI	AS 1680	80 <= Ra <= 90		90		



NOTE: DESIGN CAN BE ACHIEVED WITH EITHER RECESSED, SURFACE MOUNTED OR SUSPENDED CENTAURI MINOR

# TYPICAL DESIGN

## OPTION 2

ROOM: 10.0M X 10.0M X 3.0M

## LUMINAIRE SELECTION

- CULTURA SOFT FLAT BEYOND VISION ENABLED  
 1. CULTURA-SOFTFLATBV-1200-300-2500-840-ETD  
 2. CULTURA-SOFTFLATBV-1200-300-2820-840-ETD

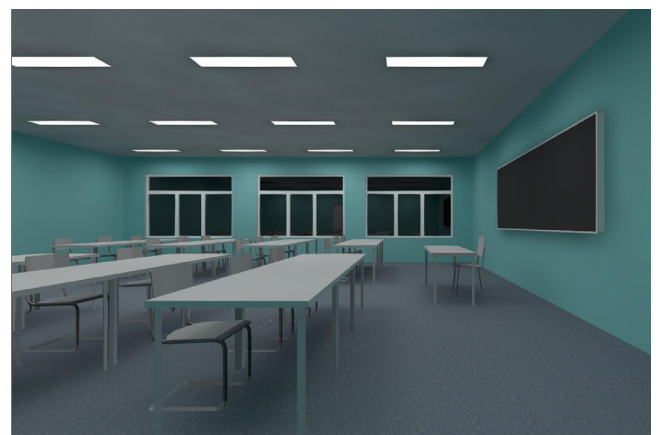
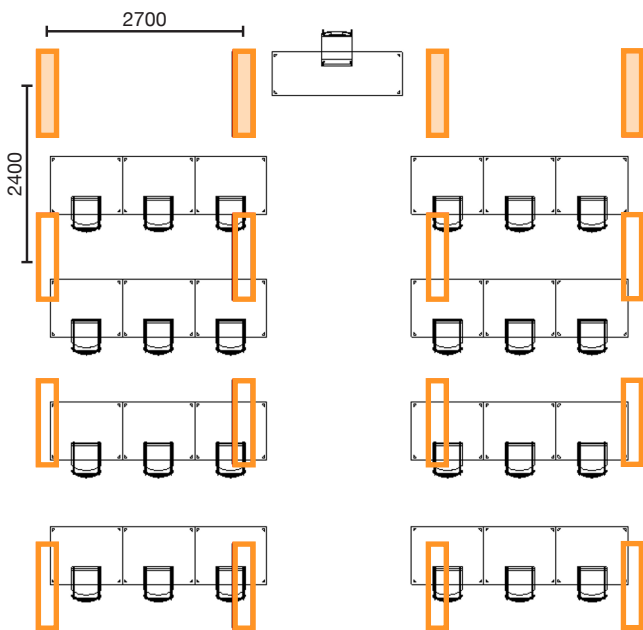


ROOM CALCULATIONS	
REFLECTANCE	Ceiling 70 Wall 50 Floor 20
MAINTENANCE FACTOR	0.8
CEILING HEIGHT	3.0m
ROOM DIMENSIONS	10m x 10m



POWER	25.3 W
LUMINOUS FLUX	2500 lm
IP RATING	IP20
CRI	80
CCT	Beyond Vision
MOUNTING TYPE	Recessed
WARRANTY	10 Years

ROOM CALCULATIONS						
	STANDARD REFERENCED	STANDARD REQUIREMENTS	DESK AREA (0.7m)	TEACHING AREA (0.7m)	WALLS	CEILING (3m)
AVG. ILLUMINANCE	AS 1680	General Desk/ Teaching >240 lx	301lx	289lx	163.8lx	70.2lx
UNIFORMITY	AS 1680	Table > 0.5	0.79	0.88	0.50	0.80
SEMI CYLINDRICAL ILLUMINANCE	prEN 12464-1:2009	150 lx @1.6 M HT - Teaching @ 1.2 M HT - Desk	155lx	165lx	-	-
MAX UGR @ 1.2 M HT	AS 1680	<= 19		19.3		
LIGHT POWER DENSITY	NCC Section J6	4.5		4.17 W/sq.m		
CYL. TO HOZ. ILLUMINANCE RATIO	prEN 12464-1:2009	0.3 - 0.6	0.51	0.57	-	-
CRI	AS 1680	80 <= Ra <= 90		80		



NOTE: HIGHER OUTPUT LUMINAIRE USED AT THE FRONT OF THE CLASSROOM TO HELP CREATE FOCUS.

# TYPICAL DESIGN

## OPTION 1

ROOM: 10.0M X 10.0M X 3.0M

## LUMINAIRE SELECTION

RECESSED HALEN TROFFER

HALEN-300-1200-2830-940-ETD | HALEN-300-1200-3048-940-ETD

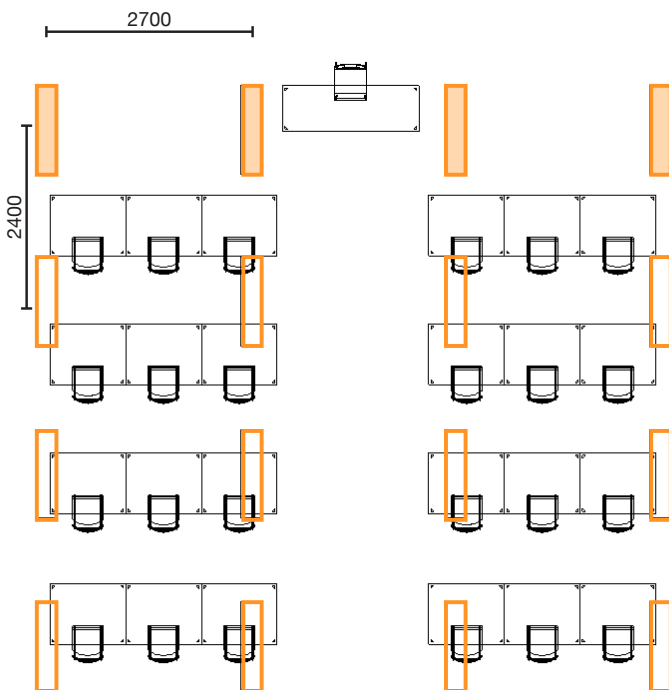


ROOM CALCULATIONS	
REFLECTANCE	Ceiling 70 Wall 50 Floor 20
MAINTENANCE FACTOR	0.8
CEILING HEIGHT	3.0m
ROOM DIMENSIONS	10m x 10m



POWER	26.6W   28.6W
LUMINOUS FLUX	2830lm   3048lm
IP RATING	IP20
CRI	90+
CCT	4000K
MOUNTING TYPE	Recessed
WARRANTY	5 Years

ROOM CALCULATIONS						
	STANDARD REFERENCED	STANDARD REQUIREMENTS	DESK AREA (0.7m)	TEACHING AREA (0.7m)	WALLS	CEILING (3m)
AVG. ILLUMINANCE	AS 1680	General Desk/ Teaching >240 lx	356 lx	341 lx	159.8 lx	78.2 lx
UNIFORMITY	AS 1680	Table > 0.5	0.83	0.88	0.51	0.78
SEMI CYLINDRICAL ILLUMINANCE	prEN 12464-1:2009	150 lx @1.6 M HT - Teaching @ 1.2 M HT - Desk	155 lx	159 lx	-	-
MAX UGR @ 1.2 M HT	AS 1680	<= 19		17.0		
LIGHT POWER DENSITY	NCC Section J6	4.5		4.34 W/sq.m		
CYL. TO HOZ. ILLUMINANCE RATIO	prEN 12464-1:2009	0.3 - 0.6	0.44	0.47	-	-
CRI	AS 1680	80 <= Ra <= 90		90		



NOTE: HIGHER OUTPUT LUMINAIRES USED AT THE FRONT OF THE CLASSROOM TO HELP CREATE FOCUS.

