



Doc. Ref.	23620_CALC_0201
Sheet	1 of 12
Engineer	Nathan Allen
Date	23.11.2023
Revision	-

DESIGN CALCULATIONS FRONT SHEET

SCHEME	Trent Furniture, Regent Street, Narborough
CLIENT	Trent Furniture Ltd
ASPECTS OF SCHEME TO BE DESIGNED	Commercial Lighting Design
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	BS 5489-1:2020 & BS EN 12464-2-2014
DESIGN CONSIDERATION NOTES	<p>Ensure the area is safe and secure and works for CCTV</p> <ul style="list-style-type: none"> • Lighting colour 3K • Lighting to class Eav 20lux for delivery entrance and 5 lux for adjacent walkways. • Utilise DW WINDSOR lanterns across the site. • (0degree tilt,) • Street lighting layout shown on engineering drawing ref. 23620_02_100_01 • Using Lighting Reality design software

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Pages	Calculations	Checked by	Date
2-10	Lighting Reality Design Calculation – Area	AW	23.11.23
11-12	Design Risk Assessment	AW	23.11.23

DATE: 23 November 2023
DESIGNER: Nathan Allen
PROJECT No: 23620
PROJECT NAME: Trent Furniture, Regent Street



SCHEME DESIGNED IN ACCORDANCE WITH BS5489-1:2020 &
BS EN 12464-2:2014

Trent Furniture, Regent Street

Private Lighting Layout

Delivery Entrance lit to Eav 20lux Emin/Eav 0.25

Walkways lit to Eav 5Lux Emin/Eav 0.25

Outdoor Lighting Report

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	454463.16	297434.44	55.38	56.92	1.50	1.50
2	Grid 2	454468.16	297421.36	101.81	75.00	1.50	1.50
3	Grid 3	454519.95	297437.86	10.48	17.98	1.50	1.50

Luminaires



Luminaire A Data

Supplier	D W Windsor
Type	Sabre 32LED 3k C2 550mA UMSUG 42 00 56 0000 100
Lamp(s)	32 x 3k LED
Lamp Flux (klm)	6.42
File Name	Sabre 32LED 3k C2 550mA UMSUG 42 00 56 0000 100.ies
Maintenance Factor	0.96
Imax70,80,90(cd/klm)	794.0, 43.8, 0.0
No. in Project	1

Luminaire B Data

Supplier	
Type	Sephora Bulkhead-16LED-3k-300mA-12W-Clear-Narrow
Lamp(s)	16x3k LED
Lamp Flux (klm)	1.69
File Name	Sephora Bulkhead-16LED-3k-300mA-12W-Clear-Narrow.ies
Maintenance Factor	0.96
Imax70,80,90(cd/klm)	908.6, 184.8, 0.0
No. in Project	2



Luminaire C Data

Supplier	D W Windsor
Type	PHA WW B
Lamp(s)	4 x LUXEON Tx 3K LED
Lamp Flux (klm)	0.43
File Name	PHA 010 WW B.IES
Maintenance Factor	0.96
Imax70,80,90(cd/klm)	487.1, 397.2, 254.5
No. in Project	2

Luminaire D Data

Supplier	
Type	D-CO R LED MINI 1L35 840 CL
Lamp(s)	LED_D-CO_56 1W
LampFlux(klm)/Colour	0.06 0/0
File Name	96257227_(STD)4.LDT
Maintenance Factor	0.96
Imax70,80,90(cd/klm)	0.0, 0.0, 0.0
No. in Project	6

Layout

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	454505.01	297455.30	6.00	159.00	0.00	0.00	0.00			
2	B	454512.63	297442.63	4.00	249.00	0.00	0.00	0.00			
3	B	454521.08	297456.71	6.50	70.00	0.00	0.00	0.00			
4	C	454537.61	297452.48	1.20	155.00	0.00	0.00	0.00			
5	C	454529.10	297441.83	1.20	74.00	0.00	0.00	0.00			
6	D	454522.19	297440.37	8.50	347.00	0.00	180.00	0.00			
7	D	454526.36	297450.08	8.50	344.00	180.00	0.00	0.00			
8	D	454527.35	297452.33	8.50	340.00	180.00	0.00	0.00			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
9	D	454525.66	297447.99	8.50	344.00	180.00	0.00	0.00			
10	D	454523.52	297443.40	8.50	344.00	180.00	0.00	0.00			
11	D	454524.63	297445.72	8.50	344.00	180.00	0.00	0.00			

Horizontal Illuminance (lux)

Grid 1

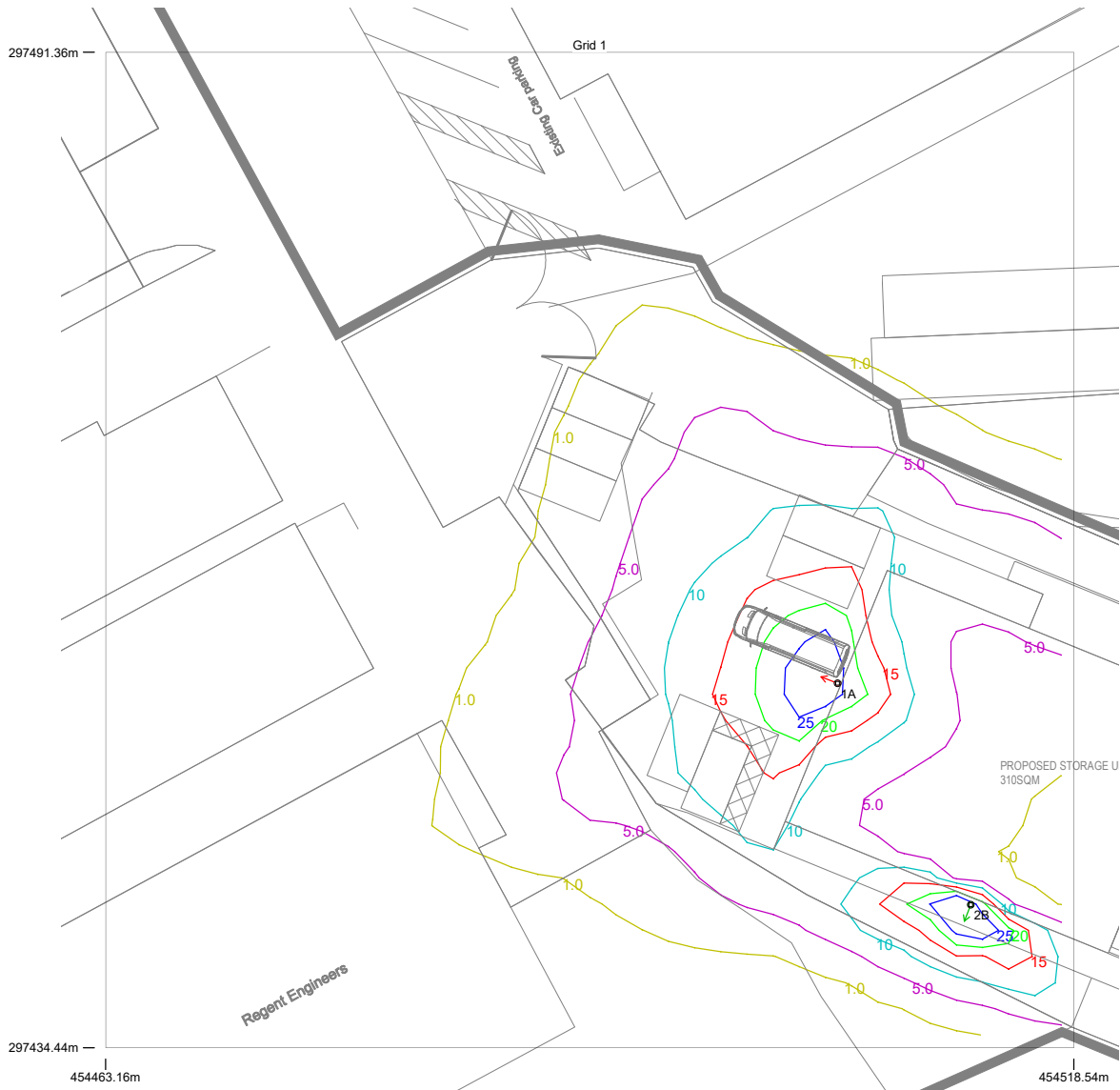


Results

Eav	20.07
Emin	12.24
E _{max}	33.88
E _{min} /E _{max}	0.36
E _{min} /E _{av}	0.61

Horizontal Illuminance (lux)

Grid 1

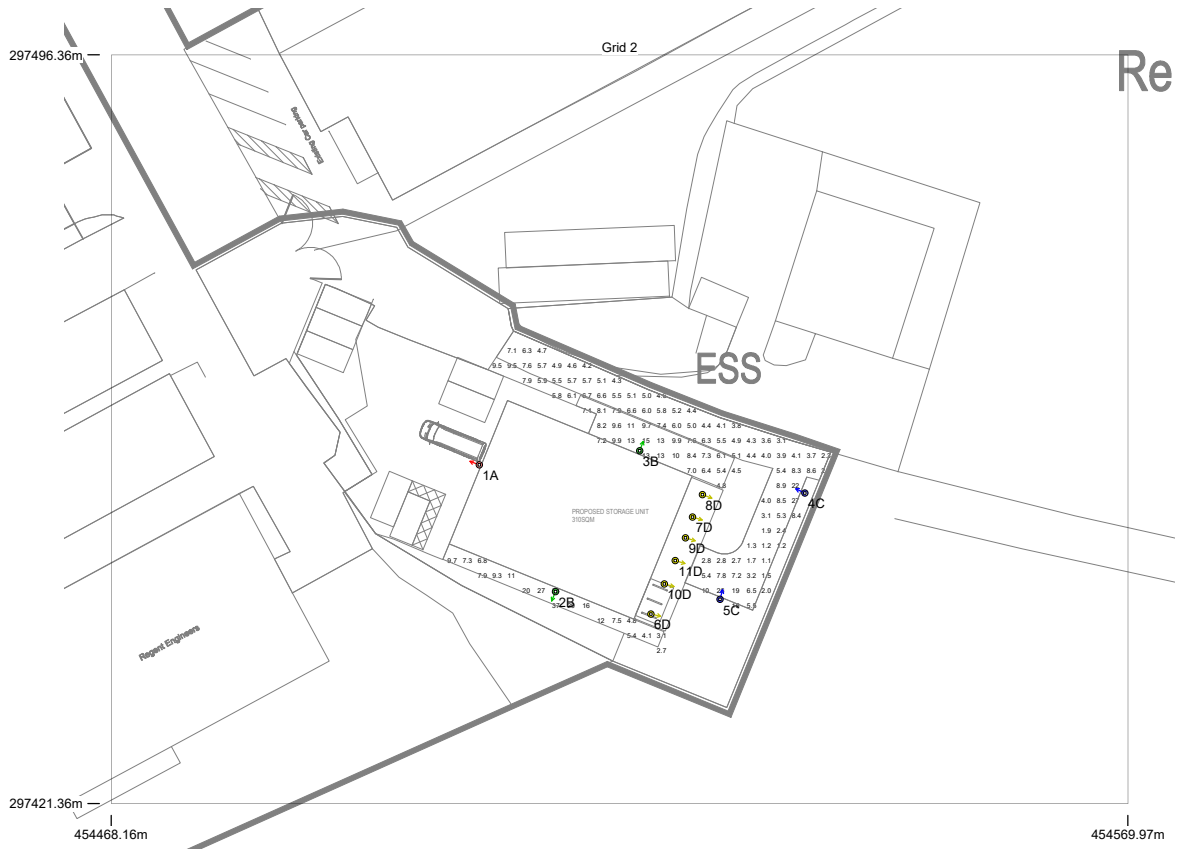


Results

Eav	20.07
Emin	12.24
E _{max}	33.88
E _{min} /E _{max}	0.36
E _{min} /E _{av}	0.61

Horizontal Illuminance (lux)

Grid 2

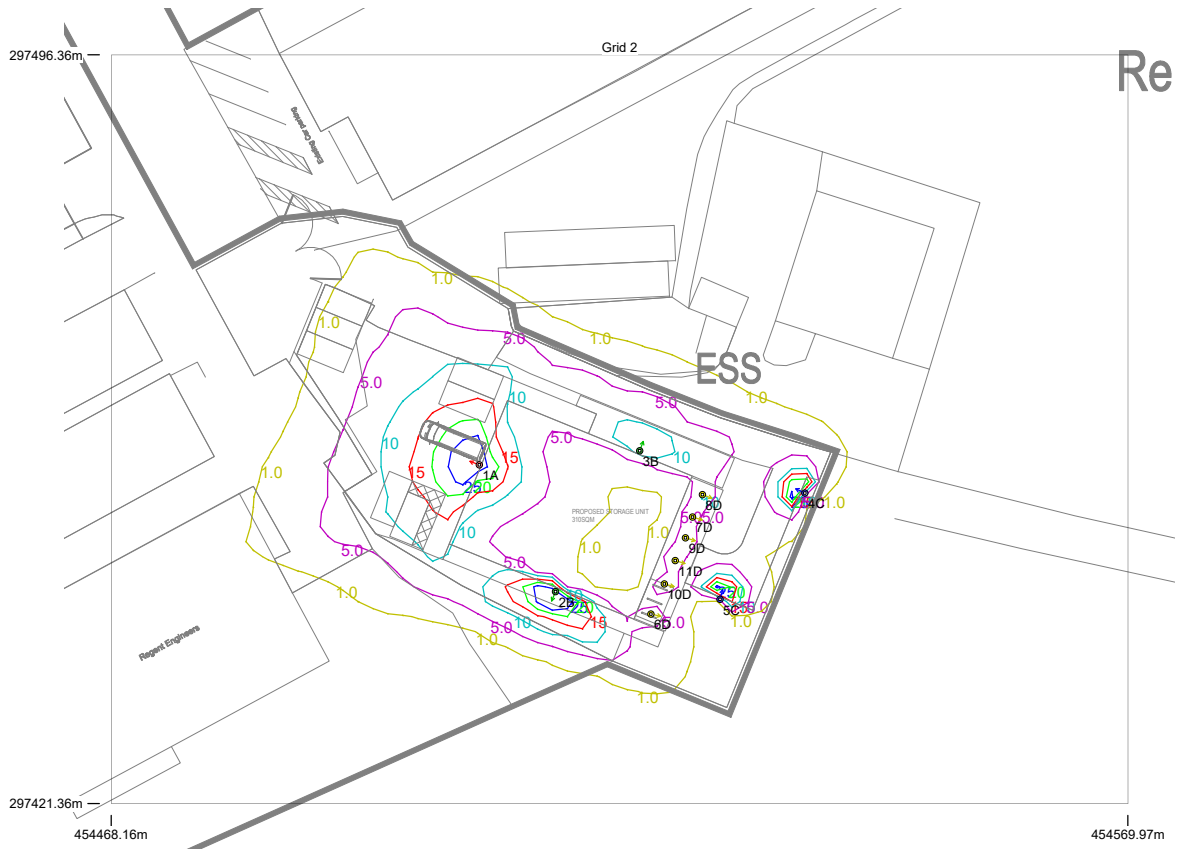


Results

Eav	7.65
Emin	1.08
Emax	36.63
Emin/Emax	0.03
Emin/Eav	0.14

Horizontal Illuminance (lux)

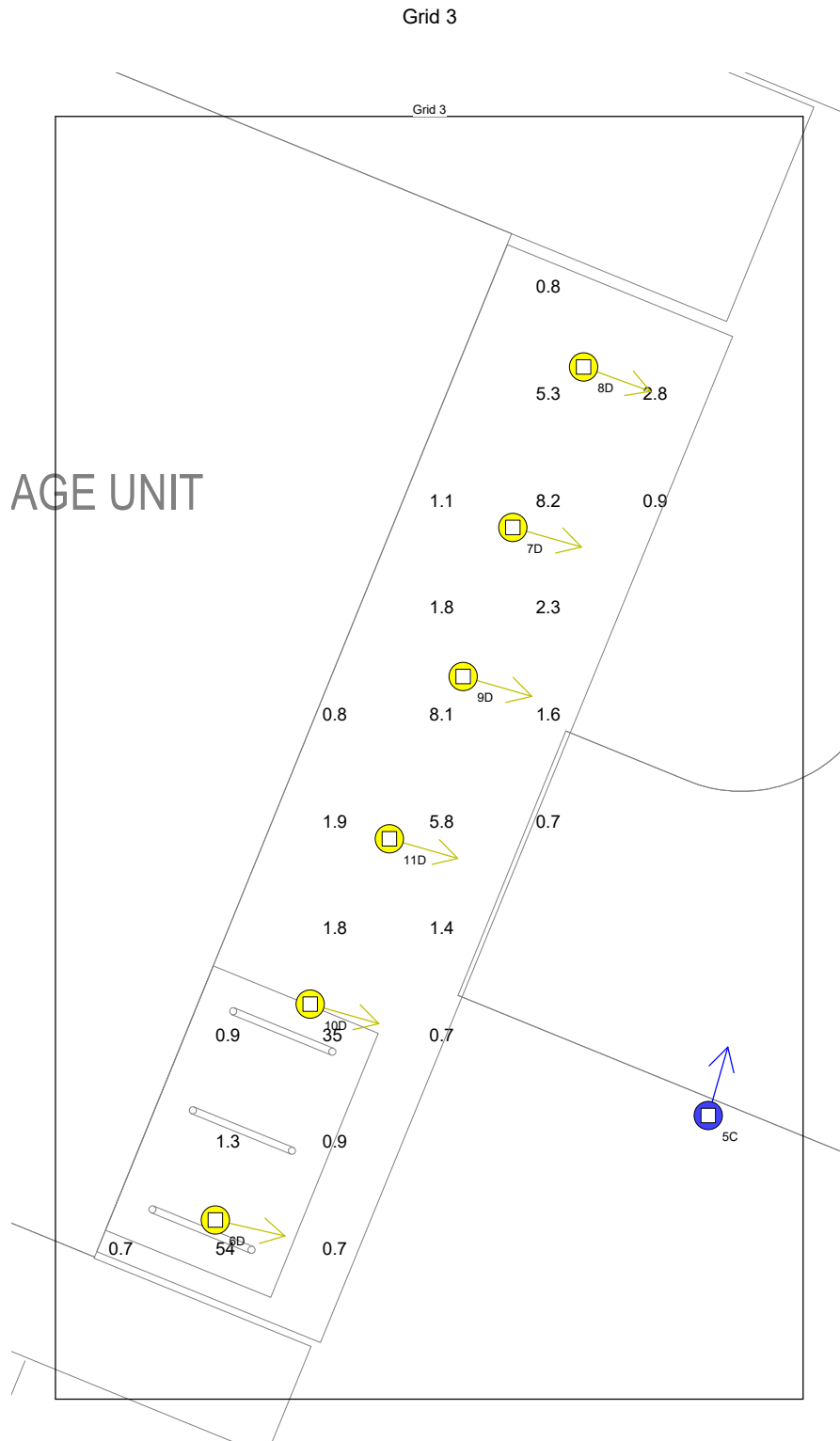
Grid 2



Results

Eav	7.65
Emin	1.08
Emax	36.63
Emin/Emax	0.03
Emin/Eav	0.14

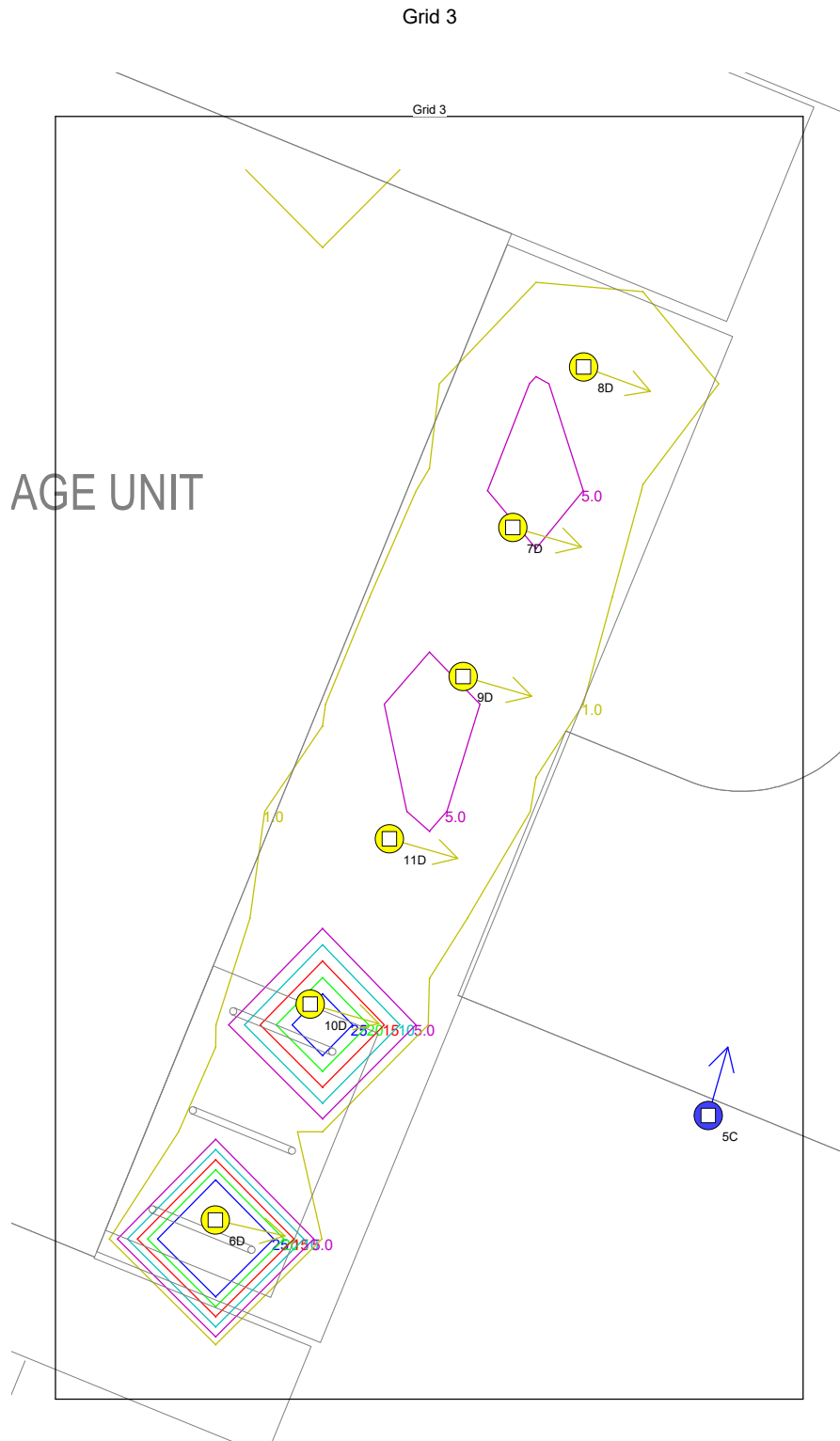
Horizontal Illuminance (lux)



Results

Eav	5.80
Emin	0.69
Emax	54.05
Emin/Emax	0.01
Emin/Eav	0.12

Horizontal Illuminance (lux)



Results

Eav	5.80
Emin	0.69
Emax	54.05
Emin/Emax	0.01
Emin/Eav	0.12

LIGHTING DESIGN RISK ASSESSMENT



MEC

Development Technical
Consultants

LIGHTING DESIGN RISK ASSESSMENT						
Project		Trent Furniture, Regent Street, Narborough				
Ref.	23620	Client		Trent Furniture Ltd		
Engineer	N. Allen		Date	23.11.2023		
Ref. No	Activity/Element	Potential Hazards	Those at Risk	Risk Rating LOW/ MED/ HIGH	Elimination Or Reduction Through Design	Possible Control Options (Contractors)
1.1	Installation and removal of lighting	Erection and removal of lighting columns and signs	Contractor Visitors Public	MED	Works cannot be eliminated through design. Number of required columns minimised to reduce extent of works, existing columns retained where possible.	Safety zone to be maintained between column erection and other site users/pedestrians. Comply with Well-maintained Highways Code of Practice and all requirements for manual handling of columns, refer to The Manual Handling Operations Regulations 1992. Reflective jackets and safety equipment to be worn at all times. Traffic management to be carried out in accordance with Chapter 8. When removing existing apparatus carry out appropriate safety checks to ensure supply is disconnected. Existing street lighting to be maintained in accordance with appropriate BS EN 13201:2015 (BS 5489) Code of practice or as specified by engineer, during construction process. Maintained minimum 0.5m safety zone from overhead lines at all times. The use of impact tools must be limited. For the installation of raise/lower columns, the contractor should consider the use of a carrying cradle. Due to the proximity of the bus route and nearby playground safe pedestrian routes around the works should be provided.
1.2	Excavation for the Installation and removal of lighting	Buried services may exist that have not been identified on the record and survey information resulting in risk of potential electrocution, damage to cables, damage to ducting system and damage to gas mains/water mains.	Site operatives and persons permitted within site. Public	MED	Lighting design has taken into account a combined services survey drawing to reduce this risk but risk cannot be eliminated through design. Utilities information to be provided to contractor	Collate service records from ALL major utility companies with equipment within the vicinity before starting work. All holes to be excavated by hand digging to minimise risks. CAT scan to locate buried obstructions. Safety zone to be maintained between other site users / pedestrians. Comply with HSG47 – Avoiding danger from underground services and all requirements for manual handling of equipment (Manual Handling Techniques). Reflective jackets and safety equipment to be worn at all times. Traffic management to be carried out in accordance with Chapter 8. When removing existing apparatus carry out appropriate safety checks to ensure supply is disconnected. The use of impact tools must be limited or appropriate road closure/diversions set up. All works involved with the removal and disconnection of column S15 should follow the HSE work near electricity guidelines.
1.3	Electrical Installation /Testing	Electrocution	Contractor	MED	Design has minimised the number of required connections.	All electrical work to be carried out in accordance with the latest BS 7671:2018 18th Edition, The electricity at work regulations, Health and safety at work Act and CDM. Reflective jackets and safety equipment to be worn at all times. Traffic management to be carried out in accordance with Chapter 8. Existing street lighting to be maintained in accordance with appropriate BS EN 13201:2015 (BS 5489) Code of practice or as specified by engineer, during construction process. When removing

						existing apparatus carry out appropriate safety checks to ensure supply is disconnected.
1.5	Working at heights	People falling and objects falling	Contractor Visitors Public	MED	Risk Reduced as lighting columns designed to be low as practically possible at 6m.	Avoid working at heights where it's reasonably practicable to do so. Minimise the distance and consequences of a fall, by using the right type of equipment where the risk cannot be eliminated. Keep loose materials and stacking or storing materials well back from edges. Contractor to comply with work place regulations and also the personal protective equipment at work regulations 1992
1.6	Lifting operations near live carriageway	Objects falling	Contractor Visitors Public	MED	Works cannot be eliminated through design; however, the height of columns has been minimised.	Contractor to provide method statements and detailed risk assessment to cover this operation. Ensure clear working area is provided by using barriers to prevent public being in close proximity to the works.
1.7	Working in the vicinity of LV or HV overhead power lines	Coming into contact with live power lines	Contractor Visitors Public	HIGH	Risk has been reduced as lighting columns have been designed with the combined services survey drawing in mind.	Operative to be G39 trained and have knowledge of identification of overhead line voltage cables. Work in accordance with the ILP document GP10 – safety during the installation and removal of lighting columns and similar street furniture in the proximity of overhead lines.
1.8	Removal of DNO fuse carriers	Electrocution	Contractor	MED	Works cannot be eliminated through design, however the number of required connections have been minimised.	Only electricians holding a G39 certificate allowed to perform this task