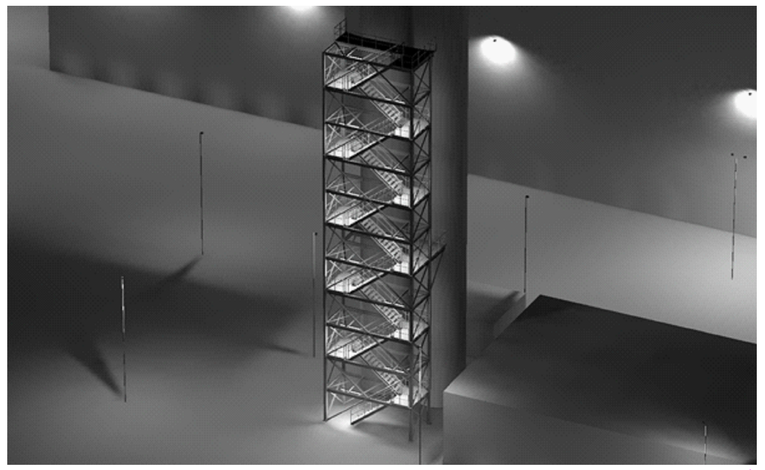
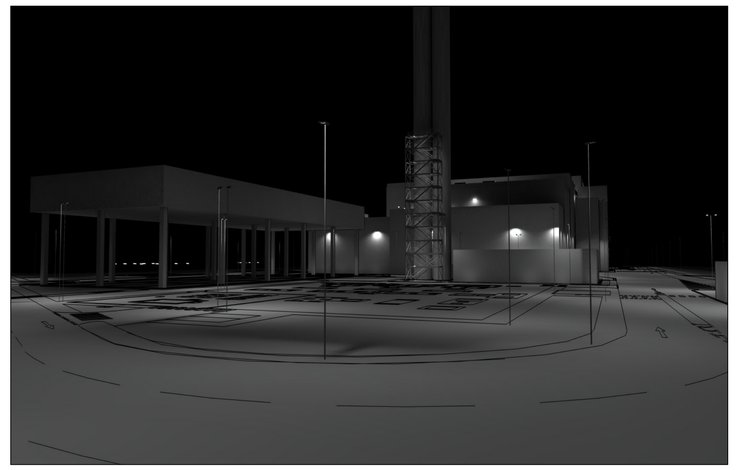
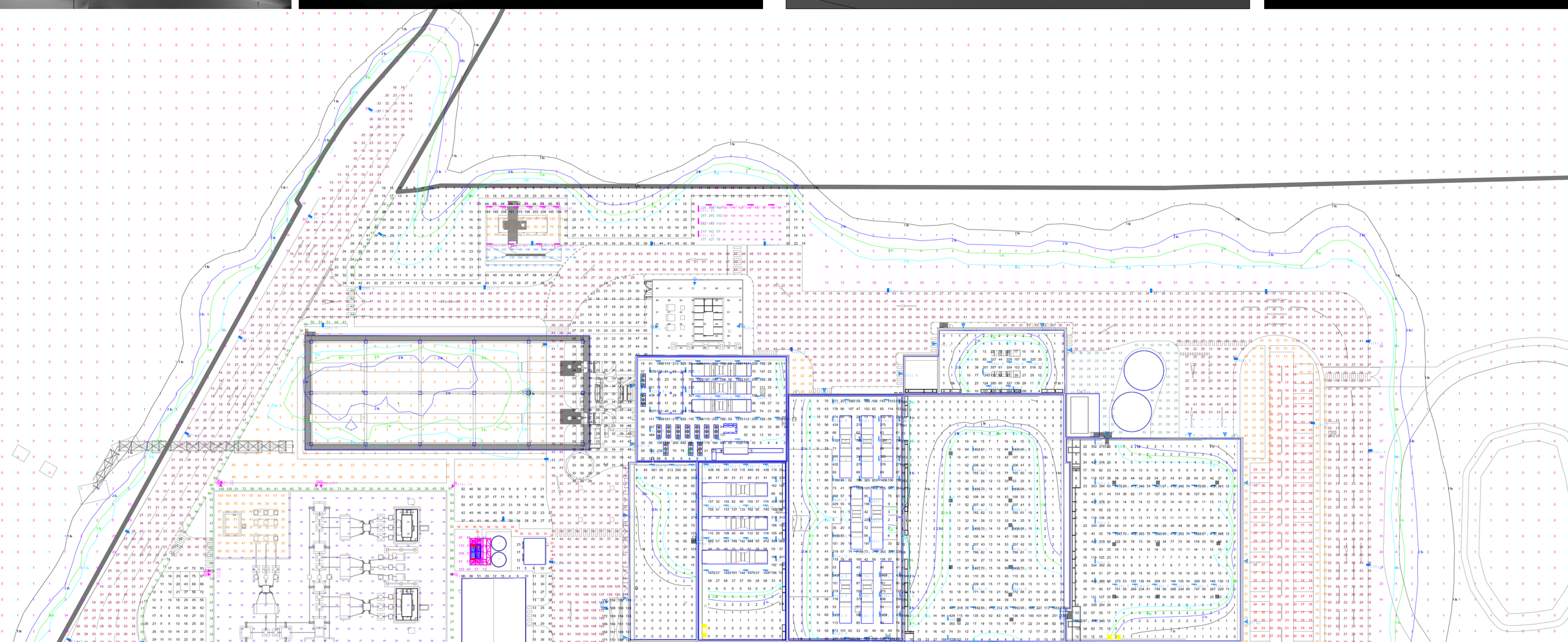




The concern on glare from the floodlights on the north elevation can be cleared as floodlights in question are 0° tilt (flat to ground).



Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Min/Avg	Min/Max	Lighting Standard
AC Compound	Illuminance	Lux	46.58	54	37	0.79	0.69	CIBSE LG6
ACC Area	Illuminance	Lux	10.78	92	0	0.00	0.00	BS EN 13201
ACC Walkway	Illuminance	Lux	47.05	153	20	0.43	0.13	CIBSE LG6
Access Road	Illuminance	Lux	33.84	172	11	0.33	0.06	BS EN 12464
Area Around Double Tanks	Illuminance	Lux	20.27	41	9	0.44	0.22	BS EN 12464
Area infront of Boiler Building	Illuminance	Lux	27.67	42	17	0.61	0.40	
Footpaths	Illuminance	Lux	39.82	109	11	0.28	0.10	
Fuel Tank	Illuminance	Lux	106.32	208	45	0.42	0.22	BS EN 12464
TWH Pit	Illuminance	Lux	79.88	179	38	0.48	0.21	BS EN 12464
Loading & Unloading	Illuminance	Lux	51.56	61	36	0.70	0.59	BS EN 12464
Loading & Unloading 2	Illuminance	Lux	152.42	174	119	0.78	0.68	BS EN 12464
Open Areas	Illuminance	Lux	27.28	215	1	0.04	0.00	
Pumps & Panels	Illuminance	Lux	180.27	258	78	0.43	0.30	BS EN 12464
Re-fueling	Illuminance	Lux	92.90	150	45	0.48	0.30	CIBSE LG6
Roof 1	Illuminance	Lux	23.96	614	0	0.00	0.00	
Roof 2	Illuminance	Lux	43.42	170	3	0.07	0.02	
Roof 3	Illuminance	Lux	65.82	1543	0	0.00	0.00	
Roof 4	Illuminance	Lux	72.12	1547	0	0.00	0.00	
Roof 5	Illuminance	Lux	233.65	1577	0	0.00	0.00	
Roof 6	Illuminance	Lux	157.15	1824	1	0.01	0.00	
Roof 7	Illuminance	Lux	69.84	1589	0	0.00	0.00	
Roof 8	Illuminance	Lux	125.32	1073	0	0.00	0.00	
Stack Stair Levels	Illuminance	Lux	55.60	267	13	0.17	0.05	BS EN 12464
Top Left Of ACC Area	Illuminance	Lux	46.43	100	23	0.50	0.23	BS EN 12464
Weighbridges	Illuminance	Lux	97.58	147	48	0.49	0.33	BS EN 12464
Bottom Left Open Area	Illuminance	Lux	31.46	103	14	0.45	0.14	CIBSE LG6
Car Park	Illuminance	Lux	29.88	55	13	0.44	0.24	BS 5489
GR 1	Illuminance	Lux	23.34	392.9	0.0	0.00	0.00	
GR 1	Glare Rating	N.A.	33.98	51.7	10.0	0.29	0.19	
GR 1	Glare Rating	N.A.	34.85	56.1	10.0	0.29	0.18	
GR 1	Glare Rating	N.A.	36.03	55.1	13.7	0.38	0.25	
GR 1	Glare Rating	N.A.	34.26	44.3	10.0	0.29	0.23	
GR 1	Glare Rating	N.A.	33.62	48.2	10.0	0.30	0.21	
GR 1	Glare Rating	N.A.	35.39	53.7	10.0	0.28	0.19	
GR 1	Glare Rating	N.A.	36.16	58.6	13.7	0.38	0.23	
Lorry Loading & Unloading	Illuminance	Lux	54.05	59	46	0.85	0.78	BS EN 12464
Movement Around Car Parking	Illuminance	Lux	26.90	56	11	0.41	0.20	CIBSE LG6
Movement Around South Building	Illuminance	Lux	51.17	137	18	0.35	0.13	CIBSE LG6
Small Open Area	Illuminance	Lux	44.44	72	19	0.43	0.26	CIBSE LG6

Luminaire Schedule					
Symbol	Qty	Label	Arrangement	LLF	Description
	46	EX1	SINGLE	0.900	102w (4 module) 700mA Italo 1 with STE-M Optic column mounted at 10m
	28	EX2	SINGLE	0.900	150w LED Carina Symmetrical Floodlight wall mounted at 12m
	11	EX3	SINGLE	0.900	150w LED Carina Symmetrical Floodlight column mounted at 10m
	11	EX3 Hinged	SINGLE	0.900	150w LED Carina Symmetrical Floodlight hinged column mounted at 10m
	2	EX3 (Twin)	TWIN 20 DEGREE	0.900	150w LED Carina Symmetrical Floodlight column mounted at 10m
	17	EX6	SINGLE	0.900	48w LED Climate Extra Twin Array - LCL150668540
	11	EX6E (SC)	SINGLE	0.900	48w LED Climate Extra Twin Array mounted on stair case - LCL15066E40
	179	EX6E (Roof)	SINGLE	0.900	48w LED Climate Extra Twin Array mounted on roof - LCL15066E40

Rev	Date	Drawn	Checked	Approved	Modifications
H	18/07/2018	JH	RP	RP	KINGFISHER DESIGN UPDATED. COMMENTS CIV 1282, 3839, 3840 & 3841 INCORPORATED
G	21/03/2018	JH	RP	RP	KINGFISHER DESIGN UPDATED
F	26/09/2017	JH	JH	RP	MODS TO LOADING AREAS
E	12/09/2017	JH	JH	RP	COMMENTS INCORPORATED
D	23/03/2017	CH	CW	RP	COMMENTS INCORPORATED
C	13/03/2017	CH	CW	RP	COMMENTS INCORPORATED
B	22/02/2017	JP	CW	RP	COMMENTS INCORPORATED
A	13/12/2016	JP	CW	RP	FIRST ISSUE

PROJECT:

K3 CHP Facility

Kemsley Mill, Sittingbourne, Kent

K3 CHP Powering the future

CUSTOMER:

Wheelabrator TECHNOLOGIES

EPC CONTRACTOR:

ENIM CONSTRUCTIONS INDUSTRIELLES DE LA MÉDITERRANÉE

SUBCONTRACTOR:

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ISSUED AT 90%

Doc Number: Clugston or Supplier

SUBCONTRACTOR DRAWING TITLE:

DRAWING TITLE:

EXTERNAL LIGHTING DRAWING

Dpt : Format: A0 Scale :1/500

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DRAWING N° 502520_02_01_17_/_LX_G_0907 (502520_02_01_17_/_LX_G_0907_H)

AAK	04	20 02 01 17 _ LX G 0907	H
Project N°	Type	Doc N°	Rev

Kingfisher Lighting

BREEAM

D26989W - Energy From Waste - Kemsley Sustainable Energy Plant

Qty	Range	Light Source	Lamp Lumens	Circuit Watts	Lm/W	LOR	Luminaire Lumens	ULOR	Upward Lms	RA	ART Hour Per Day	CO² Calculation for year: CO² (Tonnes)	Kwhour
46	Italo 1	STE-M - 700mA 4 Module	11270	102	110.49	100.0%	11302	0.0%	0	70	12	12.20	35530.96
54	Carina LED	150w LED (SY)	15661	150	104.41	100.0%	845656	0.0%	0	60	12	19.34	35678.00
207	Climate Extra	48w LED	6600	48	114.13	83.0%	1133040	8.0%	90716	60	12	22.73	43029.68

Total Installation Lumens: 2480660.00

90716.68

Total ULR: 3.65%

Table 1 compliance

Environmental zone: E3

Total CO² per year (Tonnes): 54.28

Total Electrical consumption (Kw): 22.73

Total Electrical consumption per year (Kwh): 99,546.64

Average luminaire lumens per circuit Watt: 109.91

Sky Glow

	Target	Achieved	Status
	5.00%	3.63%	Pass

Source Intensity (candelas)

Fix cutOne	10,000	0	Pass
Post cutOne	1,000	0	Pass

Note - we have not been able to calculate this as no housing is shown on the drawing
Note - we have assumed no fittings will be left on Post cutOne

Light Trespass into windows (Lux)

Pre cutOne	10	0	Pass
Post cutOne	2	0	Pass

Note - we have not been able to calculate this as no housing is shown on the drawing
Note - we have assumed no fittings will be left on Post cutOne

Building Luminance (cd/m²): 10

Compliance Status		
Ext 04	Reduction of night time light pollution	Pass
Ene 03	Energy efficient external lighting	Pass
Hea 01	Internal and external lighting levels	Pass

Note - HEA01 in this report only applies to exterior lighting

The criteria for a design to achieve the ENE 03 credit have now changed. Designs are now required to achieve an average of 80 luminaire lumens per circuit watt. average of 85 luminaire lumens per circuit watt. This affects the type of fitting and light source that can be used. Please ensure that this is considered when comparing this drawing to previous designs or designs by others. For more information contact our lighting design department or go to : http://goo.gl/GAjUAy (BREEAM's official website)

BREEAM

Kingfisher Lighting

Pol 04 Reduction of night time light pollution

No. of credits available: 1 Minimum Standards: No

Zone	Surrounding	Lighting Constraint	Examples
E1	Natural	Minimally Light	National parks or protected sites
E2	Rural	Low District Brightness	Industrial or residential rural areas
E3	Suburban	Medium district brightness	Industrial or residential suburban areas
E4	Urban	High district brightness	Town centres and commercial

Table 2 – Obtrusive Light Limitations for Exterior Lighting Installations – General

Obtrusive Light Limitations	Sky Glow ULR (Max %)[1]	Light Intrusion (into Windows) Ev (lux)[2]		Luminaire Intensity I (candelas) [3]		Building Luminance (cd/m²)[4]	
Environmental Zone		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Pre-curfew	Average, L (cd/m²)
E0	0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0	0
E2	2.5	5	1	7,500	500	5	1
E3	5.0	10	2	10,000	1,000	10	2
E4	15	25	5	25,000	2,500	25	5

ENE 03 - External lighting

No. of credits available: 1 Minimum Standards: No

Aim

To recognise and encourage the specification of energy efficient light fittings for external areas of the development.

Assessment Criteria

The following demonstrates compliance:

- The building has been designed to operate without the need for external lighting (which includes on the building, signs and at entrance). OR alternatively, where the building requires external lighting, the following criteria are achieved:
- The average initial luminous efficacy of the external light fittings within the construction zone is not less than 80 luminaire lumens per circuit Watt.
- All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian

Hea 01 Visual comfort

No. of credits available: 1 Minimum Standards: No

Aim

To ensure lighting has been designed in line with best practice for visual performance and comfort.

Assessment Criteria

The following demonstrates compliance:

- The lighting for the areas within the construction zone is designed to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during the night.
- To demonstrate this, external lighting provided is specified in accordance with:
  - BS 5489-1:2013 Lighting of roads and public amenity areas.
  - BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places.

The criteria for a design to achieve the ENE 03 credit have now changed. Designs are now required to achieve an average of 80 luminaire lumens per circuit watt. average of 85 luminaire lumens per circuit watt. This affects the type of fitting and light source that can be used. Please ensure that this is considered when comparing this drawing to previous designs or designs by others. For more information contact our lighting design department or go to : http://goo.gl/GAjUAy (BREEAM's official website)

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