



Skanska Technology Ltd

UK0041847.0811 – TATA STEEL, EXTERNAL LIGHTING

Scrap Yard Feasibility Options Report





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OPTIONS REPORT (REVISION P01) CONFIDENTIAL

PROJECT NO. UK0041847.0811

OUR REF. NO. UK0041847.0811

DATE: APRIL 2026

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QUALITY CONTROL

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Remarks	First Issue	Second Issue	
Date	06/05/2026	29/05/2026	
Prepared by	Ken Packham	Ken Packham	
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Signature	<i>Paul Donegan</i>		
Project number	UK0041847.0811	UK0041847.0811	
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Amendments / additions are denoted by a line to the left of the text as shown adjacent.



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1. INTRODUCTION

1.1. SCOPE

The scope for this scheme is to review the feasibility of illuminating scrap yard areas of new development at the TATA Steel facility at Port Talbot. There are alternative options to illuminate the operational areas of the scrap yard with either high mast lighting (25m) or columns (12m)

Option 1 – 25m high mast

Option 2 – Combination of 25m high mast and 12m columns

Option 3 – 12m columns

Any proposal for the scheme shall consider the local surroundings and environment.

A light pollution study was carried out in October 2024 and highlighted three areas of sensitive receptors to light pollution due to sensitive wildlife, particularly bats:

Areas 1: Eglwys Nunydd Reservoir.

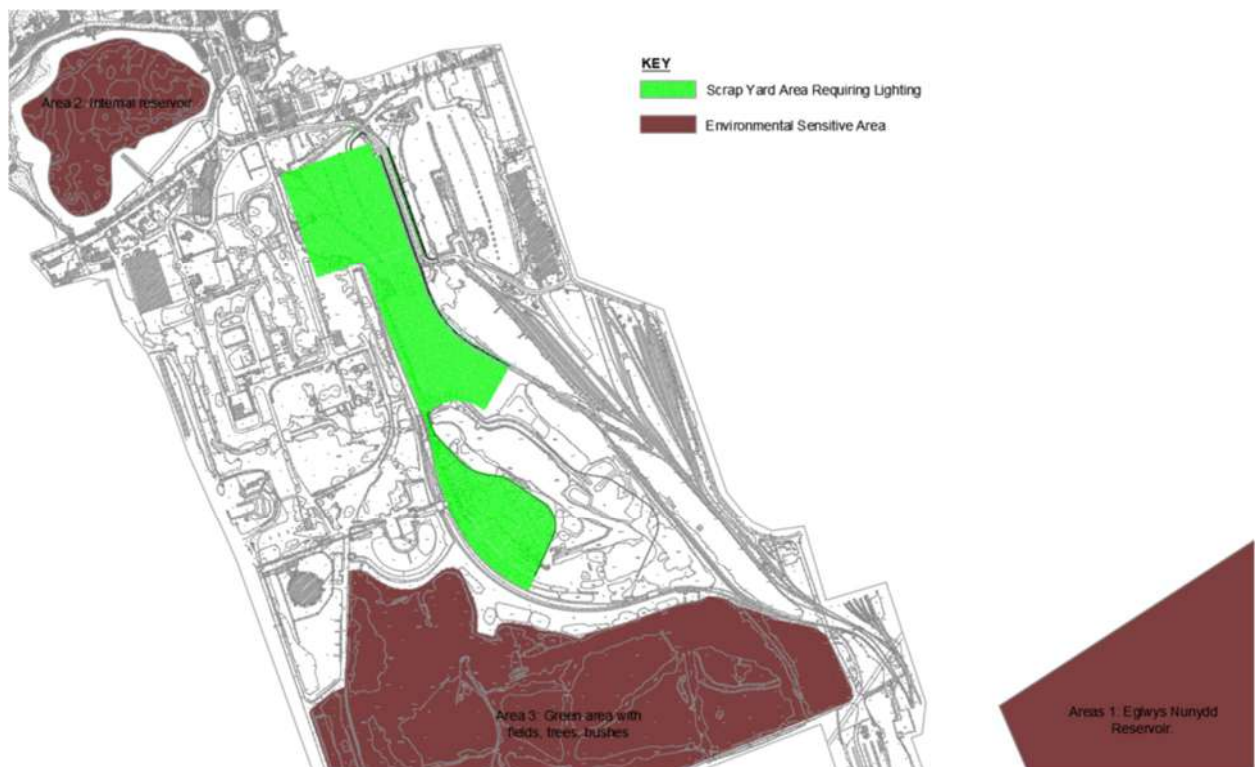
Area 2: Internal reservoir (300 x 400m), operational lagoon.

Area 3: Green area with fields, trees, bushes, an access road (Heolcae'r Bont') and a path (Lower Mother).

This review also showed that all residential areas in the area are too far from the site to be significantly adversely affected by light spillage.

Figure 1.1 displays the area requiring illumination at for the TATA Steel development.

Figure 1-1 – TATA Steel Areas of new lighting



1.2. PURPOSE OF THE OPTIONS REPORT

The purpose of this report is to summarise the findings from desk top calculations to determine the most suitable method to illuminate the scrap yard area with consideration to the environmental surroundings and provide a recommendation that, following approval from the client, will be taken through to detail stage.

The area was assessed as requiring illumination in accordance with BS EN 12464-2:2024 Table 7, Ref. no. 7.4 “Mixed traffic areas, vehicle turning, stationary loading and unloading points”, see Table 1 below.

Table 1 – TATA Steel lighting requirements

EN 12464-2:2024 (E)

6.4 Lighting requirements for areas, tasks and activities

Table 7 — General requirements for traffic zones outside buildings and for cleaning at outdoor work places

Ref. no.	Type of area, task or activity	$\hat{E}_m$ lx		U_o	R_{GL}	R_a	Specific requirements
		required ^a	modified ^b				
7.1	Walkways exclusively for pedestrians	5	—	0,20	50	70	
7.2	Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators	10	—	0,40	50	70	
7.3	Regular vehicle traffic (max. 40 km/h)	20	—	0,20	45	70	At shipyards and in docks, R_{GL} may be 50.
7.4	Mixed traffic areas, vehicle turning, stationary loading and unloading points	50	—	0,40	50	70	When the area is non-occupied $\hat{E}_m$ required may be reduced to 5 lx. Pay attention to the illuminance levels of the surrounding and adjacent areas.
7.5	Cleaning and servicing	50	—	0,25	50	70	At all relevant surfaces
7.6	Recycling centers - areas with rubbish bins and sorting of waste	30	—	0,25	50	70	
^a Required: minimum value.							
^b Modified: considers common context modifiers in 5.3.3.							

Due to environmental concerns, the northern section is to be illuminated using a colour temperature of 3000k (warm white) and the southern section ideally to be illuminated using a colour temperature of 2700k (warm white).

1.3. SCHEME CONTACT DETAILS

Table 2 – Scheme Contacts

Role	Contact Name
Skanska Technology Ltd Project Manager	Jason Prosser
Technical Lead	John Sutcliffe
Scheme Lead	Ken Packham
Lead Engineer	Jaydrath Raulji
WSP Project Manager	Andy Fullarton

1.4. SCHEME DELIVERABLES

The deliverables for each package at detailed design stage in the outlined price list will include: -

- 1300 – proposed road lighting calculations
- 1400 – Electrical & Ducting routes
- Electrical cable for lighting Calculations in accordance with BS7671
- Production of an 2D electrical layout detailing proposed electrical infrastructure, including proposed feeder pillar location and ducting & chamber plans.
- Production of an of typical details for project; feeder pillar general arrangement, lighting column terminations and earth electrode details.
- Input into specification appendices 0000, 0100 & 0500
- Lighting calculations in accordance with BS5489
- Production of quantities for costing purposes only
- Liaison with External companies
- Production of specifications
- Production of Design Stage Risk Assessment
- Production of Design Decision Registers
- Liaison with other WSP disciplines
- Project Management in accordance with WSP BMS.
- Input into project wide CDM Designers Risk Assessment.

1.5. ASSUMPTION, EXCLUSIONS AND LIMITATIONS

- Conservation Area consultation is excluded.
- BIM/3D Modelling is excluded.
- The lighting design will be completed on the final alignment drawing being received.
- Illuminated sign locations & designs to be undertaken by others.
- Environmental Impact Assessment (EIA) scoping report shall be provided by an environmental specialist and input regarding the lighting impact on the environment will not form part of this submission.
- No foundations for lighting equipment will be designed as part of this submission, these will be designed by the contractor.
- TOPO to be provided.
- Any third-party costs for lighting approvals are excluded and to be paid for by others.
- Site assistance is excluded. This includes material approval forms and TQ's.- however if required this can be carried out on a hourly rate basis with expenses if required.
- Production of as-built drawings and maintenance manuals is excluded.
- All meetings via Teams
- Existing inventory asset information shall be provided by Local Authority for all lighting assets in the vicinity of the works, including as built drawings and test certificates.
- Any CCTV design is excluded
- Site surveys are excluded but can be costed for.

2. FINDINGS

2.1. METHODOLOGY

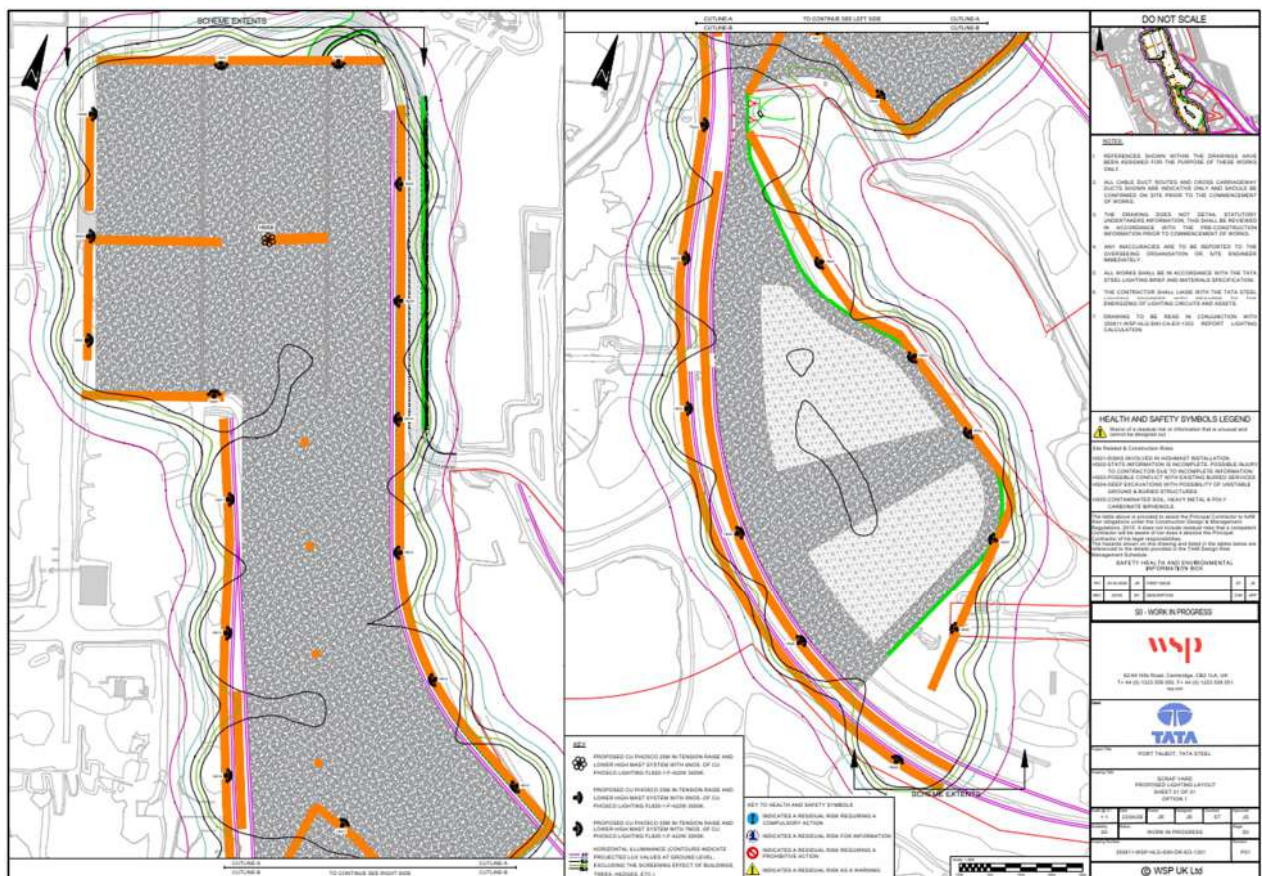
A desktop design has been carried out using the client supplied preferred equipment for each option. This includes achievement of desired lighting levels, environmental impacts, quantities of equipment and energy consumption.

2.2. DATA ANALYSIS

Option 1 - High mast lighting (25m)

This option requires 29 No. 25m high mast columns with 194 luminaires and consumes 81.868 Watts.

The scheme achieves required levels of illumination, and light spill is successfully limited to minimise impact on environmentally sensitive adjacent areas.



The preferred luminaire choice suggested by the client was Abacus challenger luminaires, however due to limited optical distribution options, we couldn't attain uniformity requirements without placing columns in the middle of operational areas, which is not viable due to safety and practical issues. Therefore we looked at other manufacturers data and achieved a compliant design using CU Phosco FL820 luminaires, unfortunately photometrics for 2700k are unavailable, however this can be investigated further at detail design stage.

2.3. DATA ANALYSIS SUMMARY

Following the data analysis, the below key findings will help inform the proposed options;

- Only Option 1 achieves the required lighting levels.
- All options satisfactorily minimised environmental impact from lighting on adjacent sensitive areas

2.4. STAKEHOLDER FEEDBACK

Feedback shall be requested from the following stakeholders to establish any concerns around the proposals following completion of this report;

- Skanska Technology Ltd
- TATA Steel

2.5. RISKS AND OPPORTUNITIES

Risks:

- Not achieving required lighting levels and uniformity.
- Environmental impacts.

Opportunities:

- Achieving required lighting levels and uniformity through Option 1.
- Alleviated environment concerns through all options.

3. RECOMMENDATIONS

3.1. RECOMMENDED SOLUTION

Option 1 - 25m high mast. It is recommended that the scrap yard area at TATA Steel, Port Talbot be illuminated using this option as this is the only compliant design in achieving the required levels of illumination and uniformity and this option be carried through to detail design.

The proposed lighting scheme will have no environmental impact on Eglwys Nunydd Reservoir (Area 1). Area 2 is significantly lit at present, so the proposed lights will only be relevant on the northern edge of the lagoon. Area 3 currently sees low levels of light at night, mostly within the range of 0.2 to 1.0 lux. The northern corner of this area may see a noticeable but limited increment due to the proposed lights.

Option 2 - Combination of 25m high mast and 12m columns. It is not recommended that the scrap yard area at TATA Steel, Port Talbot be illuminated using this option as it is not a compliant design in terms of achieving the required levels of illumination and uniformity.

Option 3 - 12m columns. It is not recommended that the scrap yard area at TATA Steel, Port Talbot be illuminated using this option as it is not a compliant design in terms of achieving the required levels of illumination and uniformity.

3.2. CLIENT REVIEW

Due to the planning and environment constraints option 1 is the only option and after client review this is now confirmed and recommended.

Appendix A

LIGHTING CALCULATIONS



DATE: 4 May 2026
DESIGNER: Jaydrathsinh Raulji
PROJECT No: 350811
PROJECT NAME: TATA Steel CE1 Slab



Document Reference No. - 350811-WSP-HLG-SWI-CA-EO-1303
Lighting Calculation in accordance with BS EN 12464-2:2014

Scrap Yard Lighting-Required Lighting Levels as per Table 5.7 —
Industrial sites and storage area-5.7.2
Eav (lux) = 50Lux, Uo = 0.40

Based upon LLMF & LSF values received from the manufacturer
and LMF value based upon 72 months clean and inspect cycle in
accordance with BS5489 (Table C.1) Environmental zone E3/E4.
This gives a calculation of $0.92 \times 1 \times 0.92 = 0.85$

All the grids have been compiled with results. Grid 1, Grid
2, Grid 3 are with CU Phosco Lanterns.

Outdoor Lighting Report

Designer:

Checker:

Approver:

PREPARED BY: Unit 9, The Chase
John Tate Road
Foxholes Business Park
Hertford
SG13 7NN

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	277534.49	186101.41	375.00	375.00	1.50	1.50
2	Grid 2	277646.94	185755.65	375.00	375.00	1.50	1.50
3	Grid 3	277810.28	185422.88	375.00	375.00	1.50	1.50

Luminaires



Luminaire A Data

Supplier	C U Phosco
Type	FL820-1-F-S2-730-SD-1200-422W
Lamp(s)	730SA
Lamp Flux (klm)	56.08
File Name	FL820-1-F-S2-730-SD-1200-422W.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	3273.1, 503.3, 4.8
No. in Project	84



Luminaire B Data

Supplier	C U Phosco
Type	FL820-1-F-W2-730-SD-1200-422W
Lamp(s)	730SA
Lamp Flux (klm)	56.81
File Name	FL820-1-F-W2-730-SD-1200-422W.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	662.5, 284.3, 7.6
No. in Project	62



Luminaire C Data

Supplier	C U Phosco
Type	FL820-1-F-M2-730-SD-1200-422W
Lamp(s)	730SA
Lamp Flux (klm)	57.31
File Name	FL820-1-F-M2-730-SD-1200-422W.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	1268.0, 423.8, 6.4
No. in Project	48

Layout

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
1/HM-03	A	277528.46	186247.87	25.00	36.99	0.00	0.00	0.00	277573.31	186281.66	0.00
2/HM-03	A	277528.46	186247.87	25.00	19.78	0.00	0.00	0.00	277581.29	186266.87	0.00
3/HM-03	A	277528.46	186247.87	25.00	2.91	0.00	0.00	0.00	277584.53	186250.72	0.00
4/HM-03	B	277528.46	186247.87	25.00	83.87	0.00	0.00	0.00	277531.64	186277.50	0.00
5/HM-03	B	277528.46	186247.87	25.00	316.81	0.00	0.00	0.00	277550.18	186227.48	0.00
6/HM-03	C	277528.46	186247.87	25.00	54.55	0.00	0.00	0.00	277559.55	186291.55	0.00
7/HM-03	C	277528.46	186247.87	25.00	345.98	0.00	0.00	0.00	277580.47	186234.88	0.00
8/HM-02	A	277549.92	186183.03	25.00	36.99	0.00	0.00	0.00	277594.77	186216.82	0.00

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
9/HM-02	A	277549.92	186183.03	25.00	19.78	0.00	0.00	0.00	277602.76	186202.04	0.00
10/HM-02	A	277549.92	186183.03	25.00	2.91	0.00	0.00	0.00	277606.00	186185.88	0.00
11/HM-02	B	277549.92	186183.03	25.00	83.87	0.00	0.00	0.00	277553.10	186212.66	0.00
12/HM-02	B	277549.92	186183.03	25.00	316.81	0.00	0.00	0.00	277571.64	186162.64	0.00
13/HM-02	C	277549.92	186183.03	25.00	54.55	0.00	0.00	0.00	277581.02	186226.71	0.00
14/HM-02	C	277549.92	186183.03	25.00	345.98	0.00	0.00	0.00	277601.94	186170.05	0.00
15/HM-09	A	277734.31	186275.53	25.00	216.99	0.00	0.00	0.00	277689.46	186241.74	0.00
16/HM-09	A	277734.31	186275.53	25.00	199.78	0.00	0.00	0.00	277681.47	186256.53	0.00
17/HM-09	A	277734.31	186275.53	25.00	182.91	0.00	0.00	0.00	277678.23	186272.68	0.00
18/HM-09	B	277734.31	186275.53	25.00	263.87	0.00	0.00	0.00	277731.13	186245.90	0.00
19/HM-09	B	277734.31	186275.53	25.00	136.81	0.00	0.00	0.00	277712.59	186295.92	0.00
20/HM-09	C	277734.31	186275.53	25.00	234.55	0.00	0.00	0.00	277703.21	186231.85	0.00
21/HM-09	C	277734.31	186275.53	25.00	165.98	0.00	0.00	0.00	277682.29	186288.52	0.00
22/HM-10	A	277759.76	186203.08	25.00	216.99	0.00	0.00	0.00	277714.91	186169.29	0.00
23/HM-10	A	277759.76	186203.08	25.00	199.78	0.00	0.00	0.00	277706.92	186184.07	0.00
24/HM-10	A	277759.76	186203.08	25.00	182.91	0.00	0.00	0.00	277703.68	186200.23	0.00
25/HM-10	B	277759.76	186203.08	25.00	263.87	0.00	0.00	0.00	277756.58	186173.45	0.00
26/HM-10	B	277759.76	186203.08	25.00	136.81	0.00	0.00	0.00	277738.04	186223.47	0.00
27/HM-10	C	277759.76	186203.08	25.00	234.55	-0.00	0.00	0.00	277728.67	186159.40	0.00
28/HM-10	C	277759.76	186203.08	25.00	165.98	0.00	0.00	0.00	277707.75	186216.06	0.00
29/HM-06	A	277644.02	186408.62	25.00	306.99	0.00	0.00	0.00	277677.80	186363.77	0.00
30/HM-06	A	277644.02	186408.62	25.00	289.78	0.00	0.00	0.00	277663.02	186355.78	0.00
31/HM-06	A	277644.02	186408.62	25.00	272.91	0.00	0.00	0.00	277646.87	186352.54	0.00
32/HM-06	B	277644.02	186408.62	25.00	353.87	0.00	0.00	0.00	277673.64	186405.44	0.00
33/HM-06	B	277644.02	186408.62	25.00	226.81	0.00	0.00	0.00	277623.62	186386.90	0.00
34/HM-06	C	277644.02	186408.62	25.00	324.55	0.00	0.00	0.00	277687.69	186377.52	0.00
35/HM-06	C	277644.02	186408.62	25.00	255.98	0.00	0.00	0.00	277631.03	186356.60	0.00
36/HM-05	A	277572.55	186382.57	25.00	306.99	0.00	0.00	0.00	277606.34	186337.72	0.00
37/HM-05	A	277572.55	186382.57	25.00	289.78	0.00	0.00	0.00	277591.56	186329.74	0.00
38/HM-05	A	277572.55	186382.57	25.00	272.91	0.00	0.00	0.00	277575.40	186326.50	0.00
39/HM-05	B	277572.55	186382.57	25.00	353.87	0.00	0.00	0.00	277599.68	186379.66	0.00
40/HM-05	B	277572.55	186382.57	25.00	226.81	0.00	0.00	0.00	277553.88	186362.68	0.00
41/HM-05	C	277572.55	186382.57	25.00	324.55	0.00	0.00	0.00	277616.23	186351.48	0.00
42/HM-05	C	277572.55	186382.57	25.00	255.98	0.00	0.00	0.00	277559.57	186330.56	0.00
43/HM-11	A	277670.48	186116.55	25.00	36.99	0.00	0.00	0.00	277715.33	186150.34	0.00
44/HM-11	A	277670.48	186116.55	25.00	19.78	0.00	0.00	0.00	277723.31	186135.55	0.00

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
45/HM-11	A	277670.48	186116.55	25.00	2.91	0.00	0.00	0.00	277726.55	186119.40	0.00
46/HM-11	B	277670.48	186116.55	25.00	83.87	0.00	0.00	0.00	277673.66	186146.17	0.00
47/HM-11	B	277670.48	186116.55	25.00	316.81	0.00	0.00	0.00	277692.20	186096.16	0.00
48/HM-11	C	277670.48	186116.55	25.00	54.55	0.00	0.00	0.00	277701.57	186160.22	0.00
49/HM-11	C	277670.48	186116.55	25.00	345.98	0.00	0.00	0.00	277722.49	186103.56	0.00
50/HM-04	A	277503.46	186322.68	25.00	38.07	0.00	0.00	0.00	277547.66	186357.30	0.00
51/HM-04	A	277503.46	186322.68	25.00	19.78	0.00	0.00	0.00	277556.30	186341.68	0.00
52/HM-04	A	277503.46	186322.68	25.00	2.91	0.00	0.00	0.00	277559.54	186325.53	0.00
53/HM-04	B	277503.46	186322.68	25.00	80.16	0.00	0.00	0.00	277508.55	186352.03	0.00
54/HM-04	B	277503.46	186322.68	25.00	316.15	0.00	0.00	0.00	277524.94	186302.04	0.00
55/HM-04	C	277503.46	186322.68	25.00	56.78	-0.00	0.00	0.00	277532.83	186367.53	0.00
56/HM-04	C	277503.46	186322.68	25.00	345.98	0.00	0.00	0.00	277555.47	186309.69	0.00
57/HM-01	A	277640.68	186176.14	25.00	126.99	0.00	0.00	0.00	277606.90	186220.99	0.00
58/HM-01	A	277640.68	186176.14	25.00	109.78	0.00	0.00	0.00	277621.68	186228.98	0.00
59/HM-01	A	277640.68	186176.14	25.00	92.91	0.00	0.00	0.00	277637.83	186232.22	0.00
60/HM-01	B	277640.68	186176.14	25.00	173.87	0.00	0.00	0.00	277611.06	186179.32	0.00
61/HM-01	B	277640.68	186176.14	25.00	46.81	0.00	0.00	0.00	277661.07	186197.86	0.00
62/HM-01	C	277640.68	186176.14	25.00	144.55	-0.00	0.00	0.00	277597.01	186207.23	0.00
63/HM-01	C	277640.68	186176.14	25.00	75.98	0.00	0.00	0.00	277653.67	186228.15	0.00
64/HM-16	A	277862.21	185915.73	25.00	83.35	0.00	0.00	0.00	277868.72	185971.50	0.00
65/HM-16	A	277862.21	185915.73	25.00	63.26	0.00	0.00	0.00	277887.48	185965.87	0.00
66/HM-16	A	277862.21	185915.73	25.00	44.72	0.00	0.00	0.00	277902.11	185955.24	0.00
67/HM-16	B	277862.21	185915.73	25.00	115.57	0.00	0.00	0.00	277849.35	185942.60	0.00
68/HM-16	B	277862.21	185915.73	25.00	12.55	0.00	0.00	0.00	277891.30	185922.20	0.00
69/HM-22	A	277940.63	185765.44	25.00	251.99	0.00	0.00	0.00	277923.27	185712.04	0.00
70/HM-22	A	277940.63	185765.44	25.00	234.78	0.00	0.00	0.00	277908.25	185719.57	0.00
71/HM-22	A	277940.63	185765.44	25.00	217.91	0.00	0.00	0.00	277896.33	185730.94	0.00
72/HM-22	B	277940.63	185765.44	25.00	298.87	0.00	0.00	0.00	277955.01	185739.35	0.00
73/HM-22	B	277940.63	185765.44	25.00	171.81	0.00	0.00	0.00	277911.14	185769.69	0.00
74/HM-22	C	277940.63	185765.44	25.00	269.55	0.00	0.00	0.00	277940.21	185711.83	0.00
75/HM-22	C	277940.63	185765.44	25.00	200.98	0.00	0.00	0.00	277890.57	185746.25	0.00
76/HM-23	A	277811.61	185683.61	25.00	36.99	0.00	0.00	0.00	277856.46	185717.40	0.00
77/HM-23	A	277811.61	185683.61	25.00	19.78	0.00	0.00	0.00	277864.44	185702.62	0.00
78/HM-23	A	277811.61	185683.61	25.00	2.91	0.00	0.00	0.00	277867.68	185686.46	0.00
79/HM-23	B	277811.61	185683.61	25.00	83.87	0.00	0.00	0.00	277814.79	185713.24	0.00
80/HM-23	B	277811.61	185683.61	25.00	316.81	0.00	0.00	0.00	277833.33	185663.22	0.00

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
81/HM-23	C	277811.61	185683.61	25.00	54.55	0.00	0.00	0.00	277842.70	185727.29	0.00
82/HM-23	C	277811.61	185683.61	25.00	345.98	0.00	0.00	0.00	277863.62	185670.63	0.00
83/HM-14	A	277837.19	186051.31	25.00	235.49	0.00	0.00	0.00	277805.38	186005.04	0.00
84/HM-14	A	277837.19	186051.31	25.00	218.29	0.00	0.00	0.00	277793.11	186016.52	0.00
85/HM-14	A	277837.19	186051.31	25.00	200.22	0.00	0.00	0.00	277784.50	186031.90	0.00
86/HM-14	B	277837.19	186051.31	25.00	278.50	0.00	0.00	0.00	277841.59	186021.84	0.00
87/HM-14	B	277837.19	186051.31	25.00	151.65	0.00	0.00	0.00	277810.96	186065.46	0.00
88/HM-14	C	277837.19	186051.31	25.00	251.23	-0.00	0.00	0.00	277819.93	186000.55	0.00
89/HM-14	C	277837.19	186051.31	25.00	180.75	-0.00	0.00	0.00	277783.58	186050.61	0.00
90/HM-12	A	277788.59	186121.73	25.00	216.99	0.00	0.00	0.00	277743.74	186087.94	0.00
91/HM-12	A	277788.59	186121.73	25.00	199.78	0.00	0.00	0.00	277735.75	186102.72	0.00
92/HM-12	A	277788.59	186121.73	25.00	182.91	0.00	0.00	0.00	277732.51	186118.88	0.00
93/HM-12	B	277788.59	186121.73	25.00	263.87	0.00	0.00	0.00	277785.41	186092.10	0.00
94/HM-12	B	277788.59	186121.73	25.00	136.81	0.00	0.00	0.00	277766.87	186142.12	0.00
95/HM-12	C	277788.59	186121.73	25.00	234.55	0.00	0.00	0.00	277757.49	186078.05	0.00
96/HM-12	C	277788.59	186121.73	25.00	165.98	0.00	0.00	0.00	277736.57	186134.72	0.00
97/HM-18	A	277728.95	185947.17	25.00	31.99	0.00	0.00	0.00	277776.58	185976.91	0.00
98/HM-18	A	277728.95	185947.17	25.00	14.78	0.00	0.00	0.00	277783.25	185961.49	0.00
99/HM-18	A	277728.95	185947.17	25.00	357.91	0.00	0.00	0.00	277785.07	185945.12	0.00
100/HM-18	B	277728.95	185947.17	25.00	78.87	0.00	0.00	0.00	277734.71	185976.40	0.00
101/HM-18	B	277728.95	185947.17	25.00	311.81	-0.00	0.00	0.00	277748.82	185924.96	0.00
102/HM-18	C	277728.95	185947.17	25.00	49.55	0.00	0.00	0.00	277763.74	185987.96	0.00
103/HM-18	C	277728.95	185947.17	25.00	340.98	0.00	0.00	0.00	277779.64	185929.69	0.00
104/HM-19	A	277760.11	185861.07	25.00	31.99	0.00	0.00	0.00	277807.74	185890.81	0.00
105/HM-19	A	277760.11	185861.07	25.00	14.78	0.00	0.00	0.00	277814.40	185875.39	0.00
106/HM-19	A	277760.11	185861.07	25.00	357.91	0.00	0.00	0.00	277816.23	185859.02	0.00
107/HM-19	B	277760.11	185861.07	25.00	78.87	0.00	0.00	0.00	277765.86	185890.30	0.00
108/HM-19	B	277760.11	185861.07	25.00	311.81	0.00	0.00	0.00	277779.97	185838.86	0.00
109/HM-19	C	277760.11	185861.07	25.00	49.55	-0.00	0.00	0.00	277794.89	185901.86	0.00
110/HM-19	C	277760.11	185861.07	25.00	340.98	-0.00	0.00	0.00	277810.80	185843.59	0.00
111/HM-20	A	277777.40	185775.80	25.00	31.99	0.00	0.00	0.00	277825.02	185805.55	0.00
112/HM-20	A	277777.40	185775.80	25.00	14.78	0.00	0.00	0.00	277831.69	185790.13	0.00
113/HM-20	A	277777.40	185775.80	25.00	357.91	0.00	0.00	0.00	277833.51	185773.75	0.00
114/HM-20	B	277777.40	185775.80	25.00	78.87	0.00	0.00	0.00	277783.15	185805.03	0.00
115/HM-20	B	277777.40	185775.80	25.00	311.81	0.00	0.00	0.00	277797.26	185753.59	0.00
116/HM-20	C	277777.40	185775.80	25.00	49.55	-0.00	0.00	0.00	277812.18	185816.60	0.00

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
117/HM-20	C	277777.40	185775.80	25.00	340.98	-0.00	0.00	0.00	277828.08	185758.33	0.00
118/HM-13	A	277698.05	186033.99	25.00	31.99	0.00	0.00	0.00	277745.68	186063.74	0.00
119/HM-13	A	277698.05	186033.99	25.00	14.78	0.00	0.00	0.00	277752.35	186048.31	0.00
120/HM-13	A	277698.05	186033.99	25.00	357.91	0.00	0.00	0.00	277754.17	186031.94	0.00
121/HM-13	B	277698.05	186033.99	25.00	78.87	0.00	0.00	0.00	277703.81	186063.22	0.00
122/HM-13	B	277698.05	186033.99	25.00	311.81	0.00	0.00	0.00	277717.92	186011.78	0.00
123/HM-13	C	277698.05	186033.99	25.00	49.55	0.00	0.00	0.00	277732.84	186074.79	0.00
124/HM-13	C	277698.05	186033.99	25.00	340.98	0.00	0.00	0.00	277748.74	186016.52	0.00
125/HM-15	A	277910.25	186004.37	25.00	246.99	0.00	0.00	0.00	277888.30	185952.68	0.00
126/HM-15	A	277910.25	186004.37	25.00	229.78	0.00	0.00	0.00	277873.99	185961.49	0.00
127/HM-15	A	277910.25	186004.37	25.00	212.91	0.00	0.00	0.00	277863.11	185973.86	0.00
128/HM-15	B	277910.25	186004.37	25.00	293.87	0.00	0.00	0.00	277922.31	185977.12	0.00
129/HM-15	B	277910.25	186004.37	25.00	166.81	0.00	0.00	0.00	277881.24	186011.17	0.00
130/HM-15	C	277910.25	186004.37	25.00	264.55	0.00	0.00	0.00	277905.16	185951.00	0.00
131/HM-15	C	277910.25	186004.37	25.00	195.98	0.00	0.00	0.00	277858.71	185989.61	0.00
132/HM-07	A	277709.71	186347.60	25.00	216.99	0.00	0.00	0.00	277664.86	186313.81	0.00
133/HM-07	A	277709.71	186347.60	25.00	199.78	0.00	0.00	0.00	277656.87	186328.59	0.00
134/HM-07	A	277709.71	186347.60	25.00	182.91	0.00	0.00	0.00	277653.63	186344.75	0.00
135/HM-07	B	277709.71	186347.60	25.00	263.87	0.00	0.00	0.00	277706.53	186317.97	0.00
136/HM-07	B	277709.71	186347.60	25.00	136.81	0.00	0.00	0.00	277687.99	186367.99	0.00
137/HM-07	C	277709.71	186347.60	25.00	234.55	0.00	0.00	0.00	277678.61	186303.92	0.00
138/HM-07	C	277709.71	186347.60	25.00	165.98	0.00	0.00	0.00	277657.69	186360.58	0.00
139/HM-21	A	277863.35	185803.77	25.00	246.99	0.00	0.00	0.00	277841.40	185752.08	0.00
140/HM-21	A	277863.35	185803.77	25.00	229.78	0.00	0.00	0.00	277827.09	185760.89	0.00
141/HM-21	A	277863.35	185803.77	25.00	212.91	0.00	0.00	0.00	277816.21	185773.26	0.00
142/HM-21	B	277863.35	185803.77	25.00	293.87	0.00	0.00	0.00	277875.41	185776.52	0.00
143/HM-21	B	277863.35	185803.77	25.00	166.81	0.00	0.00	0.00	277834.34	185810.56	0.00
144/HM-21	C	277863.35	185803.77	25.00	264.55	0.00	0.00	0.00	277858.26	185750.40	0.00
145/HM-21	C	277863.35	185803.77	25.00	195.98	0.00	0.00	0.00	277811.81	185789.01	0.00
146/HM-24	A	277991.29	185731.39	25.00	251.99	0.00	0.00	0.00	277973.93	185677.99	0.00
147/HM-24	A	277991.29	185731.39	25.00	234.78	0.00	0.00	0.00	277958.90	185685.52	0.00
148/HM-24	A	277991.29	185731.39	25.00	217.91	0.00	0.00	0.00	277946.99	185696.89	0.00
149/HM-24	B	277991.29	185731.39	25.00	298.87	-0.00	0.00	0.00	278005.67	185705.30	0.00
150/HM-24	B	277991.29	185731.39	25.00	171.81	0.00	0.00	0.00	277961.80	185735.64	0.00
151/HM-24	C	277991.29	185731.39	25.00	269.55	0.00	0.00	0.00	277990.87	185677.78	0.00
152/HM-24	C	277991.29	185731.39	25.00	200.98	0.00	0.00	0.00	277941.23	185712.20	0.00

Layout Continued

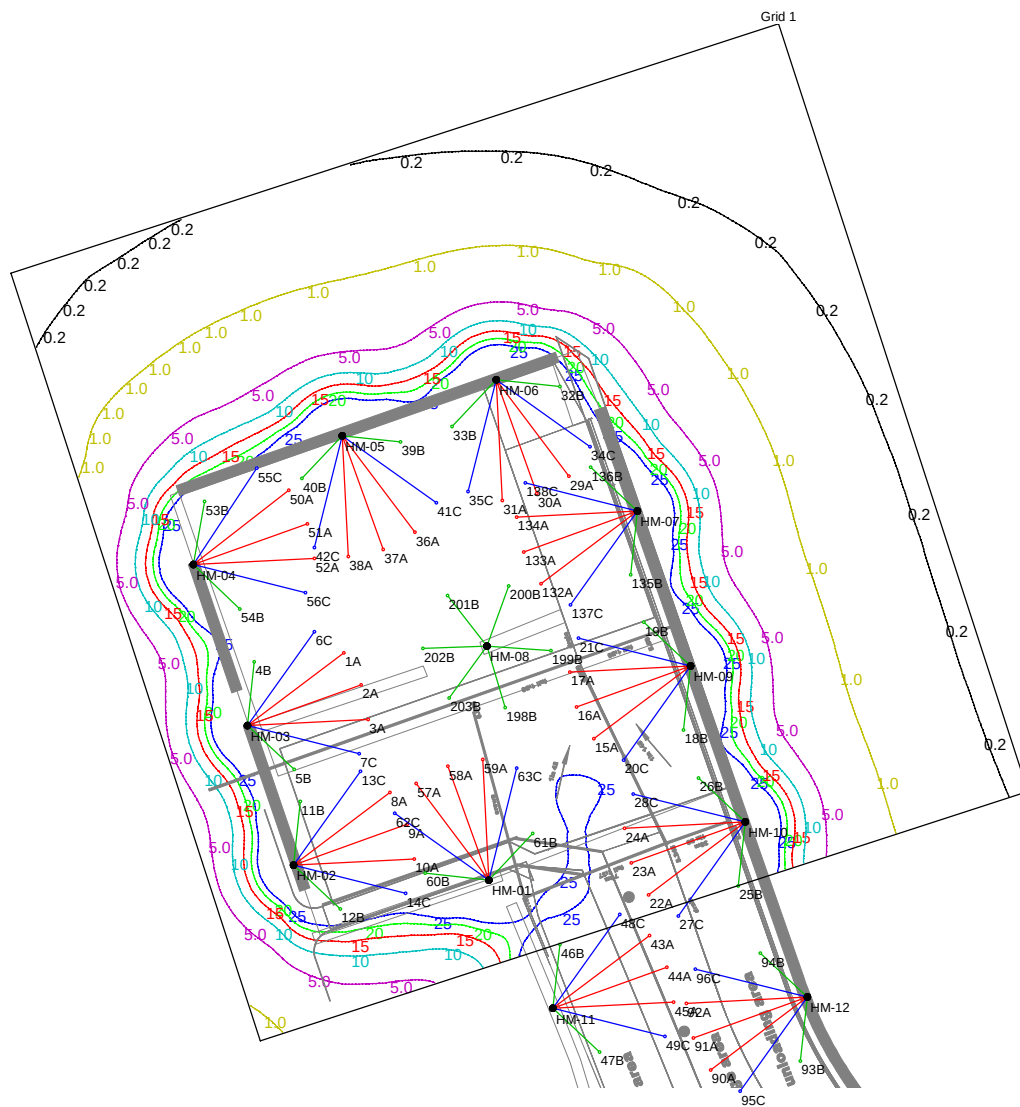
ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
153/HM-27	A	278029.98	185670.45	25.00	179.53	0.00	0.00	0.00	277973.83	185670.91	0.00
154/HM-27	A	278029.98	185670.45	25.00	160.49	0.00	0.00	0.00	277977.05	185689.21	0.00
155/HM-27	A	278029.98	185670.45	25.00	198.85	0.00	0.00	0.00	277976.84	185652.31	0.00
156/HM-27	B	278029.98	185670.45	25.00	227.15	0.00	0.00	0.00	278011.42	185650.45	0.00
157/HM-27	B	278029.98	185670.45	25.00	130.28	0.00	0.00	0.00	278012.34	185691.27	0.00
158/HM-17	A	277811.41	185941.67	25.00	71.29	0.00	0.00	0.00	277829.42	185994.85	0.00
159/HM-17	A	277811.41	185941.67	25.00	50.88	0.00	0.00	0.00	277846.84	185985.23	0.00
160/HM-17	A	277811.41	185941.67	25.00	93.98	0.00	0.00	0.00	277807.52	185997.68	0.00
161/HM-17	B	277811.41	185941.67	25.00	115.11	0.00	0.00	0.00	277798.77	185968.65	0.00
162/HM-17	B	277811.41	185941.67	25.00	26.57	0.00	0.00	0.00	277838.06	185954.99	0.00
163/HM-28	A	278025.87	185607.12	25.00	179.53	0.00	0.00	0.00	277969.72	185607.58	0.00
164/HM-28	A	278025.87	185607.12	25.00	160.49	0.00	0.00	0.00	277972.94	185625.87	0.00
165/HM-28	A	278025.87	185607.12	25.00	198.85	0.00	0.00	0.00	277972.73	185588.98	0.00
166/HM-28	B	278025.87	185607.12	25.00	227.15	-0.00	0.00	0.00	278007.31	185587.12	0.00
167/HM-28	B	278025.87	185607.12	25.00	130.28	0.00	0.00	0.00	278008.23	185627.93	0.00
168/HM-25	A	277870.13	185618.38	25.00	59.99	0.00	0.00	0.00	277898.22	185667.01	0.00
169/HM-25	A	277870.13	185618.38	25.00	43.78	0.00	0.00	0.00	277910.67	185657.23	0.00
170/HM-25	A	277870.13	185618.38	25.00	26.91	0.00	0.00	0.00	277920.20	185643.80	0.00
171/HM-25	B	277870.13	185618.38	25.00	107.87	0.00	0.00	0.00	277860.99	185646.74	0.00
172/HM-25	B	277870.13	185618.38	25.00	340.81	-0.00	0.00	0.00	277898.27	185608.59	0.00
173/HM-25	C	277870.13	185618.38	25.00	78.55	0.00	0.00	0.00	277880.77	185670.93	0.00
174/HM-25	C	277870.13	185618.38	25.00	9.98	0.00	0.00	0.00	277922.93	185627.67	0.00
175/HM-26	A	277931.76	185564.69	25.00	74.99	0.00	0.00	0.00	277946.30	185618.92	0.00
176/HM-26	A	277931.76	185564.69	25.00	58.78	0.00	0.00	0.00	277960.87	185612.71	0.00
177/HM-26	A	277931.76	185564.69	25.00	41.91	0.00	0.00	0.00	277973.55	185602.19	0.00
178/HM-26	B	277931.76	185564.69	25.00	122.87	0.00	0.00	0.00	277915.59	185589.71	0.00
179/HM-26	B	277931.76	185564.69	25.00	355.81	0.00	0.00	0.00	277961.47	185562.51	0.00
180/HM-26	C	277931.76	185564.69	25.00	93.55	0.00	0.00	0.00	277928.44	185618.20	0.00
181/HM-26	C	277931.76	185564.69	25.00	24.98	0.00	0.00	0.00	277980.36	185587.33	0.00
182/HM-29	A	278017.00	185512.72	25.00	97.37	0.00	0.00	0.00	278009.80	185568.41	0.00
183/HM-29	A	278017.00	185512.72	25.00	78.05	0.00	0.00	0.00	278028.63	185567.65	0.00
184/HM-29	A	278017.00	185512.72	25.00	57.86	0.00	0.00	0.00	278046.87	185560.27	0.00
185/HM-29	B	278017.00	185512.72	25.00	140.40	0.00	0.00	0.00	277994.04	185531.71	0.00
186/HM-29	B	278017.00	185512.72	25.00	16.32	0.00	0.00	0.00	278045.59	185521.09	0.00
187/HM-29	C	278017.00	185512.72	25.00	116.09	0.00	0.00	0.00	277993.43	185560.87	0.00
188/HM-29	C	278017.00	185512.72	25.00	41.80	0.00	0.00	0.00	278056.97	185548.45	0.00

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Target X	Target Y	Target Z
189/HM-08	B	277639.78	186284.74	25.00	286.58	0.00	0.00	0.00	277648.28	186256.19	0.00
190/HM-08	B	277639.78	186284.74	25.00	356.05	0.00	0.00	0.00	277669.50	186282.69	0.00
191/HM-08	B	277639.78	186284.74	25.00	70.08	0.00	0.00	0.00	277649.93	186312.75	0.00
192/HM-08	B	277639.78	186284.74	25.00	127.72	-0.00	0.00	0.00	277621.55	186308.31	0.00
193/HM-08	B	277639.78	186284.74	25.00	181.77	-0.00	0.00	0.00	277610.00	186283.82	0.00
194/HM-08	B	277639.78	186284.74	25.00	233.97	-0.00	0.00	0.00	277622.25	186260.65	0.00

Horizontal Illuminance (lux)

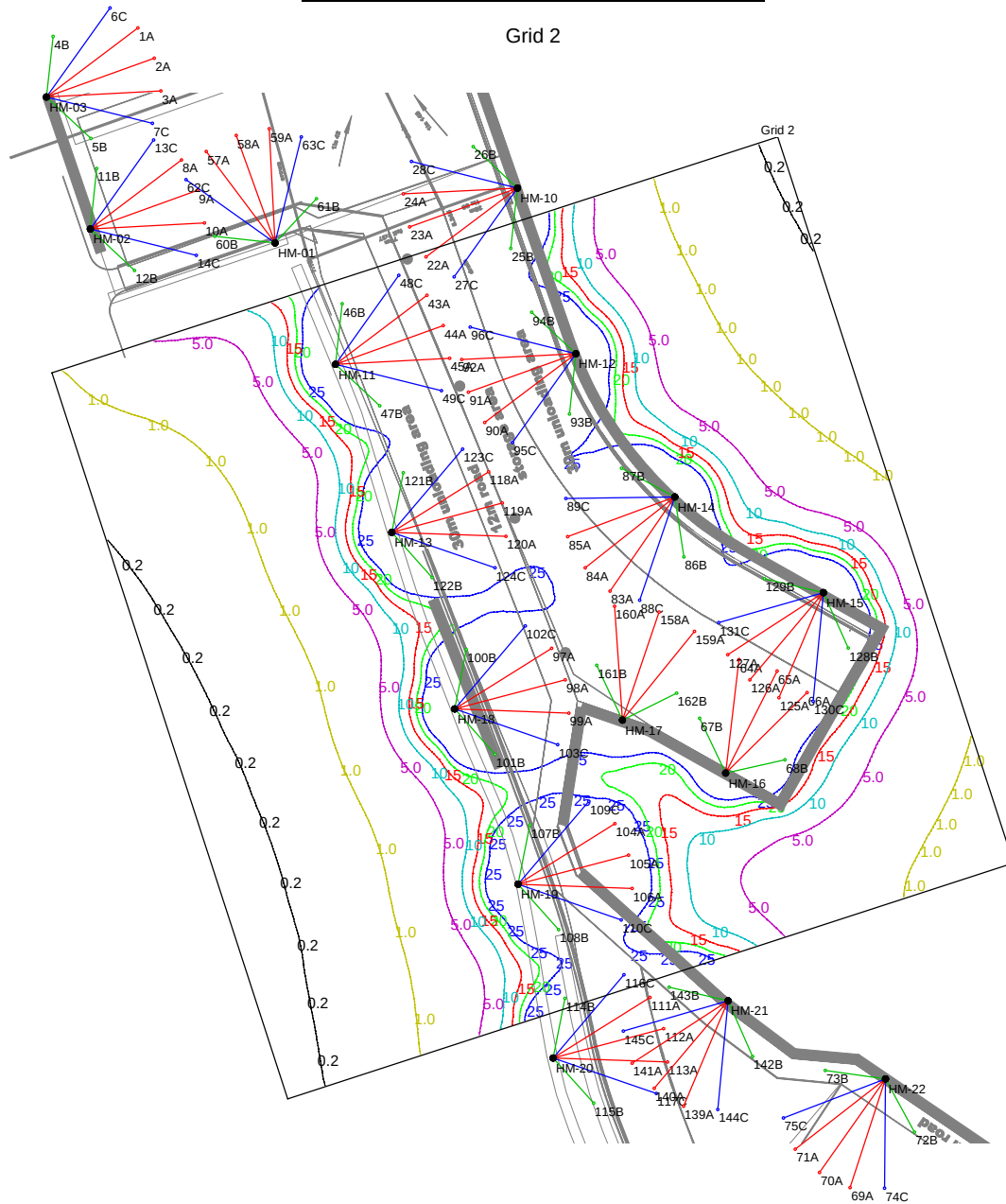
Grid 1



Results

Eav	56.66
Emin	22.43
Emax	100.46
Emin/Emax	0.22
Emin/Eav	0.40

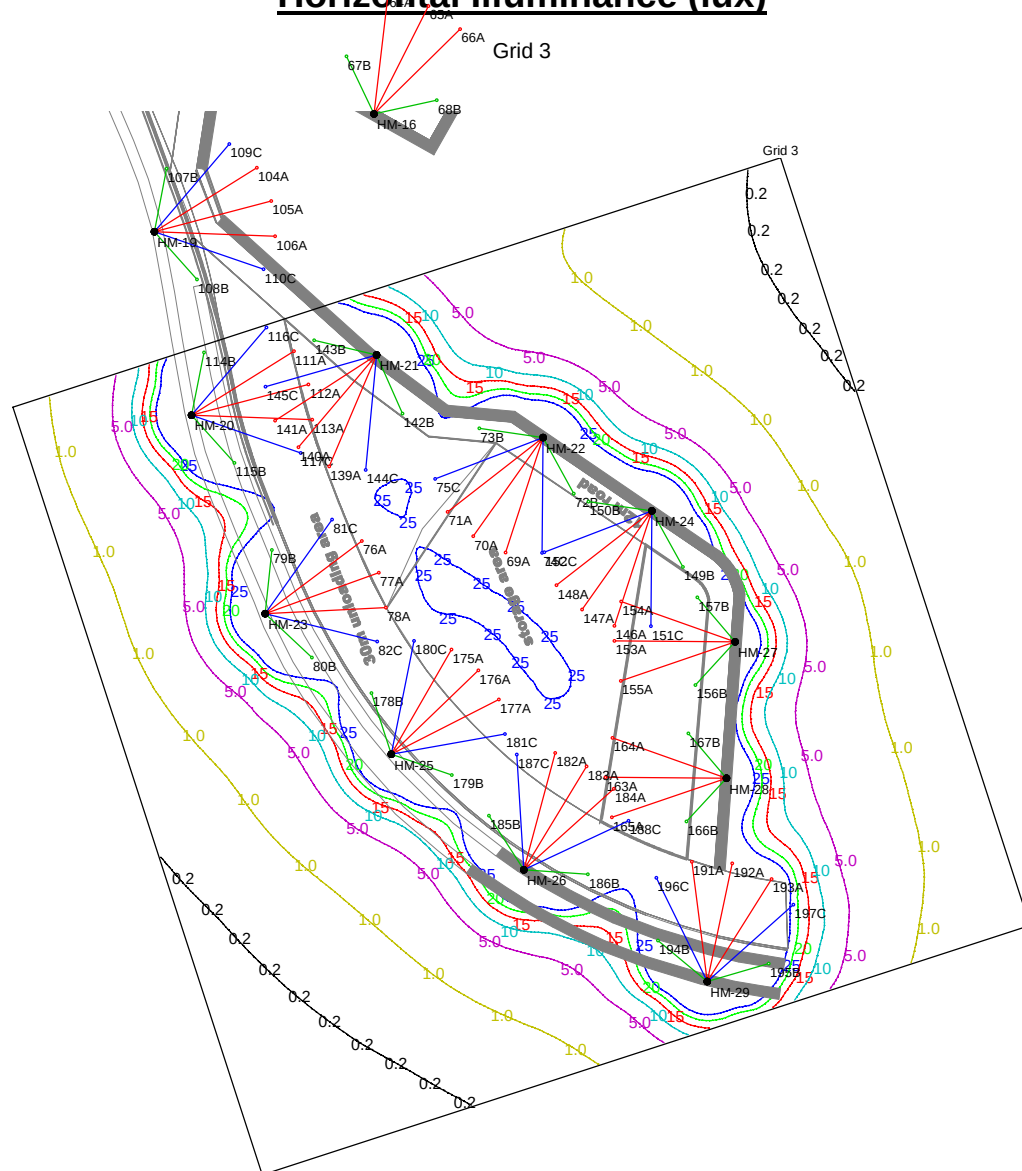
Horizontal Illuminance (lux)



Results

Eav	52.97
Emin	21.22
Emax	98.41
Emin/Emax	0.22
Emin/Eav	0.40

Horizontal Illuminance (lux)



Results

Eav	54.70
Emin	21.62
Emax	112.74
Emin/Emax	0.19
Emin/Eav	0.40

DATE: 4 May 2026
DESIGNER: Jaydrathsinh Raulji
PROJECT No: 350811
PROJECT NAME: TATA Steel CE1 Slab



Document Reference No. - 350811-WSP-HLG-SWI-CA-EO-1303
Lighting Calculation in accordance with BS EN 12464-2:2014

Scrap Yard Lighting-Required Lighting Levels as per Table 5.7 —
Industrial sites and storage area-5.7.2
Eav (lux) = 50Lux, Uo = 0.40

Based upon LLMF & LSF values received from the manufacturer
and LMF value based upon 72 months clean and inspect cycle in
accordance with BS5489 (Table C.1) Environmental zone E3/E4.
This gives a calculation of $0.92 \times 1 \times 0.92 = 0.85$

All the grids have not compiled with results. For all grids, a 12 m
high lighting column has been used, with a 25 m high mast at the
centre. Grid 1, Grid 2 & Grid 3 are with TRT Lanterns.

Outdoor Lighting Report

Designer:

Checker:

Approver:

PREPARED BY: Unit 9, The Chase
John Tate Road
Foxholes Business Park
Hertford
SG13 7NN

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	277534.49	186101.41	375.00	375.00	1.50	1.50
2	Grid 2	277646.94	185755.65	375.00	375.00	1.50	1.50
3	Grid 3	277810.28	185422.88	375.00	375.00	1.50	1.50

Luminaires

Luminaire A Data



Supplier	TRT Lighting
Type	ASF96_LED-V1_290W_F08_SYM_2700K_FG
Lamp(s)	42 0290 0000 100
Lamp Flux (klm)	32.73
File Name	ASF96_LED-V1_290W_F08_SYM_2700K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	476.0, 31.6, 0.0
No. in Project	12

Luminaire B Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_307W_GA1_(Pink)_G0_3000K_FG
Lamp(s)	42 0307 0000 100
Lamp Flux (klm)	41.10
File Name	A128_GEN2_LED_307W_GA1_(Pink)_G0_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	753.3, 402.1, 0.0
No. in Project	30

Luminaire C Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_3000K_FG
Lamp(s)	42 0307 0000 100
Lamp Flux (klm)	41.08
File Name	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	635.2, 122.4, 0.0
No. in Project	56

Luminaire D Data



Supplier	TRT Lighting
Type	ASF96_LED-V1_290W_F08_SYM_3000K_FG
Lamp(s)	42 0290 0000 100
Lamp Flux (klm)	36.81
File Name	ASF96_LED-V1_290W_F08_SYM_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	476.0, 31.6, 0.0
No. in Project	12

Luminaire E Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_2700K_FG
Lamp(s)	42 0307 0000 100
Lamp Flux (klm)	38.12
File Name	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_2700K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	635.2, 122.4, 0.0
No. in Project	70

Luminaire F Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_236W_GA2_(Yellow)_G2_EBS_3000K_FG
Lamp(s)	42 0236 0000 100
Lamp Flux (klm)	33.19
File Name	A128_GEN2_LED_236W_GA2_(Yellow)_G2_EBS_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	635.2, 122.4, 0.0
No. in Project	77

Layout

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
1	E	278035.79	185525.68	12.00	79.00	0.00	0.00	1.48	100%			
2	E	278014.47	185530.82	12.00	75.00	0.00	0.00	1.48	100%			
3	E	277993.32	185537.12	12.00	73.00	0.00	0.00	1.48	100%			
4	E	277972.84	185545.01	12.00	63.00	0.00	0.00	1.48	100%			
5	E	277953.05	185554.75	12.00	61.00	0.00	0.00	1.48	100%			
6	E	277933.82	185566.15	12.00	58.00	0.00	0.00	1.48	100%			
7	E	277915.44	185579.33	12.00	56.00	0.00	0.00	1.48	100%			
8	E	277898.26	185593.28	12.00	45.00	0.00	0.00	1.48	100%			
9	E	277881.73	185609.31	12.00	47.00	0.00	0.00	1.48	100%			
10	E	277866.27	185626.54	12.00	40.00	0.00	0.00	1.48	100%			
11	E	277852.28	185645.50	12.00	36.00	0.00	0.00	1.48	100%			
12	E	277839.44	185665.97	12.00	35.00	0.00	0.00	1.48	100%			
13	E	277828.12	185687.23	12.00	30.00	0.00	0.00	1.48	100%			
14	E	277818.52	185710.22	12.00	21.00	0.00	0.00	1.48	100%			
15	E	277809.45	185732.69	12.00	23.00	0.00	0.00	1.48	100%			
16	E	277800.87	185755.59	12.00	21.00	0.00	0.00	1.48	100%			
17	E	277794.08	185779.83	12.00	11.00	0.00	0.00	1.48	100%			
18	E	277788.84	185804.74	12.00	8.00	0.00	0.00	1.48	100%			
19	E	278021.46	185573.82	12.00	174.00	0.00	0.00	1.48	100%			
20	E	278023.06	185595.70	12.00	176.00	0.00	0.00	1.48	100%			
21	E	278024.64	185617.68	12.00	178.00	0.00	0.00	1.48	100%			
22	E	278026.20	185639.60	12.00	174.00	0.00	0.00	1.48	100%			
23	E	278027.79	185661.46	12.00	177.00	0.00	0.00	1.48	100%			
24	E	278029.41	185683.40	12.00	176.00	0.00	0.00	1.48	100%			
25	E	278019.33	185709.63	12.00	237.00	0.00	0.00	1.48	100%			
26	E	278001.21	185721.97	12.00	239.00	0.00	0.00	1.48	100%			
27	E	277983.03	185734.40	12.00	237.00	0.00	0.00	1.48	100%			
28	E	277964.73	185746.86	12.00	238.00	0.00	0.00	1.48	100%			
29	E	277946.67	185759.19	12.00	238.00	0.00	0.00	1.48	100%			
30	E	277928.36	185771.50	12.00	237.00	0.00	0.00	1.48	100%			
31	E	277905.23	185775.12	12.00	264.00	0.00	0.00	1.48	100%			
32	E	277884.36	185783.78	12.00	236.00	0.00	0.00	1.48	100%			
33	E	277866.64	185797.08	12.00	241.00	0.00	0.00	1.48	100%			
34	E	277849.39	185811.50	12.00	235.00	0.00	0.00	1.48	100%			
35	E	277832.77	185826.53	12.00	234.00	0.00	0.00	1.48	100%			
36	E	277788.97	185803.99	12.00	6.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
37	E	277794.28	185779.02	12.00	11.00	0.00	0.00	1.48	100%			
38	E	277801.16	185754.82	12.00	19.00	0.00	0.00	1.48	100%			
39	E	277809.75	185731.95	12.00	23.00	0.00	0.00	1.48	100%			
40	E	277818.86	185709.40	12.00	21.00	0.00	0.00	1.48	100%			
41	E	277828.49	185686.43	12.00	26.00	0.00	0.00	1.48	100%			
42	E	277839.97	185665.04	12.00	34.00	0.00	0.00	1.48	100%			
43	E	277852.84	185644.62	12.00	36.00	0.00	0.00	1.48	100%			
44	E	277866.92	185625.84	12.00	39.00	0.00	0.00	1.48	100%			
45	E	277882.47	185608.57	12.00	46.00	0.00	0.00	1.48	100%			
46	E	277899.03	185592.47	12.00	45.00	0.00	0.00	1.48	100%			
47	E	277916.18	185578.72	12.00	53.00	0.00	0.00	1.48	100%			
48	E	277934.74	185565.51	12.00	59.00	0.00	0.00	1.48	100%			
49	E	277954.02	185554.23	12.00	59.00	0.00	0.00	1.48	100%			
50	E	277973.57	185544.61	12.00	62.00	0.00	0.00	1.48	100%			
51	E	277994.22	185536.76	12.00	69.00	0.00	0.00	1.48	100%			
52	E	278015.33	185530.57	12.00	73.00	0.00	0.00	1.48	100%			
53	E	278036.69	185525.50	12.00	78.00	0.00	0.00	1.48	100%			
54	E	278021.49	185574.62	12.00	173.00	0.00	0.00	1.48	100%			
55	E	278023.08	185596.55	12.00	175.00	0.00	0.00	1.48	100%			
56	E	278024.69	185618.52	12.00	175.00	0.00	0.00	1.48	100%			
57	E	278027.91	185662.39	12.00	174.00	0.00	0.00	1.48	100%			
58	E	278029.43	185684.23	12.00	174.00	0.00	0.00	1.48	100%			
59	E	278018.73	185710.05	12.00	233.00	0.00	0.00	1.48	100%			
60	E	278000.52	185722.42	12.00	236.00	0.00	0.00	1.48	100%			
61	E	277982.24	185734.90	12.00	237.00	0.00	0.00	1.48	100%			
62	E	277963.91	185747.31	12.00	236.00	0.00	0.00	1.48	100%			
63	E	277945.97	185759.67	12.00	235.00	0.00	0.00	1.48	100%			
64	E	277927.70	185771.98	12.00	233.00	0.00	0.00	1.48	100%			
65	E	277904.50	185775.15	12.00	264.00	0.00	0.00	1.48	100%			
66	E	277883.73	185784.28	12.00	233.00	0.00	0.00	1.48	100%			
67	E	277865.91	185797.65	12.00	237.00	0.00	0.00	1.48	100%			
68	E	277848.71	185812.10	12.00	231.00	0.00	0.00	1.48	100%			
69	E	277831.89	185827.31	12.00	233.00	0.00	0.00	1.48	100%			
70	E	278026.28	185640.47	12.00	173.00	0.00	0.00	1.48	100%			
71	F	277784.71	185826.42	12.00	10.00	0.00	0.00	1.48	100%			
72	F	277784.61	185827.15	12.00	13.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
73	F	277767.02	185843.01	12.00	8.00	0.00	0.00	1.48	100%			
74	F	277766.87	185843.78	12.00	14.00	0.00	0.00	1.48	100%			
75	F	277762.64	185865.70	12.00	18.00	0.00	0.00	1.48	100%			
76	F	277762.36	185866.55	12.00	20.00	0.00	0.00	1.48	100%			
77	F	277756.38	185886.87	12.00	22.00	0.00	0.00	1.48	100%			
78	F	277756.05	185887.65	12.00	22.00	0.00	0.00	1.48	100%			
79	F	277748.28	185907.32	12.00	21.00	0.00	0.00	1.48	100%			
80	F	277747.90	185908.02	12.00	21.00	0.00	0.00	1.48	100%			
81	F	277748.36	185930.68	12.00	22.00	0.00	0.00	1.48	100%			
82	F	277748.05	185931.42	12.00	23.00	0.00	0.00	1.48	100%			
83	F	277740.26	185951.15	12.00	19.00	0.00	0.00	1.48	100%			
84	F	277739.91	185951.86	12.00	19.00	0.00	0.00	1.48	100%			
85	F	277732.17	185971.58	12.00	18.00	0.00	0.00	1.48	100%			
86	F	277731.87	185972.36	12.00	21.00	0.00	0.00	1.48	100%			
87	F	277724.04	185992.22	12.00	19.00	0.00	0.00	1.48	100%			
88	F	277723.73	185993.07	12.00	21.00	0.00	0.00	1.48	100%			
89	F	277708.26	186009.84	12.00	21.00	0.00	0.00	1.48	100%			
90	F	277707.97	186010.67	12.00	20.00	0.00	0.00	1.48	100%			
91	F	277701.54	186030.85	12.00	21.00	0.00	0.00	1.48	100%			
92	F	277701.34	186031.60	12.00	18.00	0.00	0.00	1.48	100%			
93	F	277695.14	186051.92	12.00	19.00	0.00	0.00	1.48	100%			
94	F	277694.89	186052.60	12.00	19.00	0.00	0.00	1.48	100%			
95	F	277688.77	186073.03	12.00	20.00	0.00	0.00	1.48	100%			
96	F	277688.53	186073.74	12.00	18.00	0.00	0.00	1.48	100%			
97	F	277682.27	186094.07	12.00	20.00	0.00	0.00	1.48	100%			
98	F	277681.99	186094.74	12.00	21.00	0.00	0.00	1.48	100%			
99	F	277674.11	186114.54	12.00	21.00	0.00	0.00	1.48	100%			
100	F	277673.76	186115.30	12.00	19.00	0.00	0.00	1.48	100%			
101	F	277665.64	186134.86	12.00	20.00	0.00	0.00	1.48	100%			
102	F	277665.35	186135.64	12.00	22.00	0.00	0.00	1.48	100%			
103	C	277657.31	186155.26	12.00	20.00	0.00	0.00	1.48	100%			
104	C	277656.98	186156.02	12.00	25.00	0.00	0.00	1.48	100%			
105	F	277815.71	185841.80	12.00	231.00	0.00	0.00	1.48	100%			
106	F	277814.97	185842.54	12.00	227.00	0.00	0.00	1.48	100%			
107	F	277799.52	185856.62	12.00	229.00	0.00	0.00	1.48	1%			
108	F	277798.72	185857.32	12.00	227.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
109	F	277780.72	185893.18	12.00	172.00	0.00	0.00	1.48	100%			
110	F	277780.90	185894.09	12.00	170.00	0.00	0.00	1.48	100%			
111	F	277786.23	185928.14	12.00	172.00	0.00	0.00	1.48	100%			
112	F	277786.38	185928.94	12.00	171.00	0.00	0.00	1.48	100%			
113	F	277792.67	185949.54	12.00	72.00	0.00	0.00	1.48	100%			
114	F	277793.68	185949.23	12.00	70.00	0.00	0.00	1.48	100%			
115	F	277814.11	185942.09	12.00	73.00	0.00	0.00	1.48	100%			
116	F	277815.01	185941.69	12.00	75.00	0.00	0.00	1.48	100%			
117	F	277834.35	185933.17	12.00	63.00	0.00	0.00	1.48	100%			
118	F	277835.13	185932.70	12.00	64.00	0.00	0.00	1.48	100%			
119	F	277853.81	185922.24	12.00	65.00	0.00	0.00	1.48	100%			
120	F	277854.73	185921.67	12.00	66.00	0.00	0.00	1.48	100%			
121	F	277873.11	185911.29	12.00	65.00	0.00	0.00	1.48	100%			
122	F	277898.86	185921.40	12.00	150.00	0.00	0.00	1.48	100%			
123	F	277899.30	185922.11	12.00	150.00	0.00	0.00	1.48	100%			
124	F	277910.06	185941.31	12.00	152.00	0.00	0.00	1.48	100%			
125	F	277910.51	185941.97	12.00	149.00	0.00	0.00	1.48	100%			
126	F	277921.08	185960.41	12.00	152.00	0.00	0.00	1.48	100%			
127	F	277921.49	185961.11	12.00	147.00	0.00	0.00	1.48	100%			
128	F	277911.76	185999.71	12.00	247.00	0.00	0.00	1.48	100%			
129	F	277910.89	186000.20	12.00	243.00	0.00	0.00	1.48	100%			
130	F	277891.85	186011.00	12.00	243.00	0.00	0.00	1.48	100%			
131	F	277891.03	186011.39	12.00	240.00	0.00	0.00	1.48	100%			
132	F	277872.65	186021.78	12.00	242.00	0.00	0.00	1.48	100%			
133	F	277871.81	186022.23	12.00	242.00	0.00	0.00	1.48	100%			
134	F	277854.03	186033.49	12.00	240.00	0.00	0.00	1.48	100%			
135	F	277853.19	186034.04	12.00	238.00	0.00	0.00	1.48	100%			
136	F	277836.52	186047.45	12.00	235.00	0.00	0.00	1.48	100%			
137	F	277835.84	186048.13	12.00	233.00	0.00	0.00	1.48	100%			
138	F	277820.67	186063.49	12.00	227.00	0.00	0.00	1.48	100%			
139	F	277820.10	186064.17	12.00	227.00	0.00	0.00	1.48	100%			
140	F	277806.64	186081.60	12.00	218.00	0.00	0.00	1.48	100%			
141	F	277806.08	186082.31	12.00	219.00	0.00	0.00	1.48	100%			
142	F	277794.53	186101.73	12.00	212.00	0.00	0.00	1.48	100%			
143	F	277794.10	186102.53	12.00	209.00	0.00	0.00	1.48	100%			
144	F	277784.76	186123.88	12.00	198.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
145	F	277784.45	186124.71	12.00	197.00	0.00	0.00	1.48	100%			
146	F	277776.77	186146.75	12.00	199.00	0.00	0.00	1.48	100%			
147	F	277776.51	186147.58	12.00	198.00	0.00	0.00	1.48	100%			
148	F	277768.97	186169.15	12.00	201.00	0.00	0.00	1.48	100%			
149	F	277768.70	186169.95	12.00	196.00	0.00	0.00	1.48	100%			
150	C	277761.35	186190.98	12.00	200.00	0.00	0.00	1.48	100%			
151	C	277761.04	186191.84	12.00	196.00	0.00	0.00	1.48	100%			
152/1	B	277705.71	186168.18	25.00	0.00	0.00	0.00	1.48	100%			
153/1	B	277705.71	186168.18	25.00	60.00	0.00	0.00	1.48	100%			
154/1	B	277705.71	186168.18	25.00	120.00	0.00	0.00	1.48	100%			
155/1	B	277705.71	186168.18	25.00	180.00	0.00	0.00	1.48	100%			
156/2	D	277731.55	186105.72	25.00	0.00	0.00	0.00	1.48	100%			
157/2	D	277731.55	186105.72	25.00	90.00	0.00	0.00	1.48	100%			
158/2	D	277731.55	186105.72	25.00	180.00	0.00	0.00	1.48	100%			
159/2	D	277731.55	186105.72	25.00	270.00	0.00	0.00	1.48	100%			
160/3	D	277758.68	186040.95	25.00	0.00	0.00	0.00	1.48	100%			
161/3	D	277758.68	186040.95	25.00	90.00	0.00	0.00	1.48	100%			
162/3	D	277758.68	186040.95	25.00	180.00	0.00	0.00	1.48	100%			
163/3	D	277758.68	186040.95	25.00	270.00	0.00	0.00	1.48	100%			
164/4	D	277783.43	185974.88	25.00	0.00	0.00	0.00	1.48	100%			
165/4	D	277783.43	185974.88	25.00	90.00	0.00	0.00	1.48	100%			
166/4	D	277783.43	185974.88	25.00	180.00	0.00	0.00	1.48	100%			
167/4	D	277783.43	185974.88	25.00	270.00	0.00	0.00	1.48	100%			
168	C	277753.46	186213.56	12.00	201.00	0.00	0.00	1.48	100%			
169	C	277753.13	186214.43	12.00	198.00	0.00	0.00	1.48	100%			
170	C	277745.82	186235.21	12.00	200.00	0.00	0.00	1.48	100%			
171	C	277745.47	186236.11	12.00	196.00	0.00	0.00	1.48	100%			
172	C	277738.39	186256.82	12.00	201.00	0.00	0.00	1.48	100%			
173	C	277738.07	186257.63	12.00	198.00	0.00	0.00	1.48	100%			
174	C	277730.64	186278.70	12.00	200.00	0.00	0.00	1.48	100%			
175	C	277730.34	186279.45	12.00	197.00	0.00	0.00	1.48	100%			
176	C	277723.08	186300.47	12.00	200.00	0.00	0.00	1.48	100%			
177	C	277722.69	186301.45	12.00	197.00	0.00	0.00	1.48	100%			
178	C	277717.59	186316.34	12.00	199.00	0.00	0.00	1.48	100%			
179	C	277717.36	186317.34	12.00	194.00	0.00	0.00	1.48	100%			
180	C	277707.96	186343.84	12.00	200.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
181	C	277707.66	186344.65	12.00	199.00	0.00	0.00	1.48	100%			
182	C	277700.26	186365.73	12.00	199.00	0.00	0.00	1.48	100%			
183	C	277699.92	186366.67	12.00	196.00	0.00	0.00	1.48	100%			
184	C	277692.59	186387.46	12.00	200.00	0.00	0.00	1.48	100%			
185	C	277692.36	186388.22	12.00	196.00	0.00	0.00	1.48	100%			
186	C	277654.34	186410.54	12.00	289.00	0.00	0.00	1.48	100%			
187	C	277653.50	186410.26	12.00	288.00	0.00	0.00	1.48	100%			
188	C	277518.16	186362.68	12.00	287.00	0.00	0.00	1.48	100%			
189	C	277519.01	186362.94	12.00	290.00	0.00	0.00	1.48	100%			
190	C	277540.67	186370.58	12.00	289.00	0.00	0.00	1.48	100%			
191	C	277541.65	186370.91	12.00	290.00	0.00	0.00	1.48	100%			
192	C	277563.22	186378.46	12.00	287.00	0.00	0.00	1.48	100%			
193	C	277564.13	186378.76	12.00	290.00	0.00	0.00	1.48	100%			
194	C	277585.48	186386.32	12.00	288.00	0.00	0.00	1.48	100%			
195	C	277586.56	186386.71	12.00	290.00	0.00	0.00	1.48	100%			
196	C	277607.90	186394.19	12.00	289.00	0.00	0.00	1.48	100%			
197	C	277608.83	186394.52	12.00	291.00	0.00	0.00	1.48	100%			
198	C	277630.15	186402.01	12.00	291.00	0.00	0.00	1.48	100%			
199	C	277630.95	186402.34	12.00	291.00	0.00	0.00	1.48	100%			
200	C	277507.74	186316.85	12.00	19.00	0.00	0.00	1.48	100%			
201	C	277507.43	186317.68	12.00	18.00	0.00	0.00	1.48	100%			
202	C	277515.46	186294.04	12.00	21.00	0.00	0.00	1.48	100%			
203	C	277515.82	186293.28	12.00	18.00	0.00	0.00	1.48	100%			
204	C	277523.10	186271.68	12.00	18.00	0.00	0.00	1.48	100%			
205	C	277523.40	186270.93	12.00	15.00	0.00	0.00	1.48	100%			
206	C	277532.12	186241.76	12.00	16.00	0.00	0.00	1.48	100%			
207	C	277532.33	186241.00	12.00	12.00	0.00	0.00	1.48	100%			
208	C	277539.80	186219.21	12.00	19.00	0.00	0.00	1.48	100%			
209	C	277540.11	186218.31	12.00	17.00	0.00	0.00	1.48	100%			
210	C	277547.20	186197.43	12.00	19.00	0.00	0.00	1.48	100%			
211	C	277547.46	186196.64	12.00	19.00	0.00	0.00	1.48	100%			
212	C	277573.78	186155.94	12.00	108.00	0.00	0.00	1.48	100%			
213	C	277574.70	186156.18	12.00	107.00	0.00	0.00	1.48	100%			
214	C	277596.39	186163.66	12.00	109.00	0.00	0.00	1.48	100%			
215	C	277597.27	186163.90	12.00	107.00	0.00	0.00	1.48	100%			
216	C	277618.02	186170.98	12.00	111.00	0.00	0.00	1.48	100%			

Layout Continued

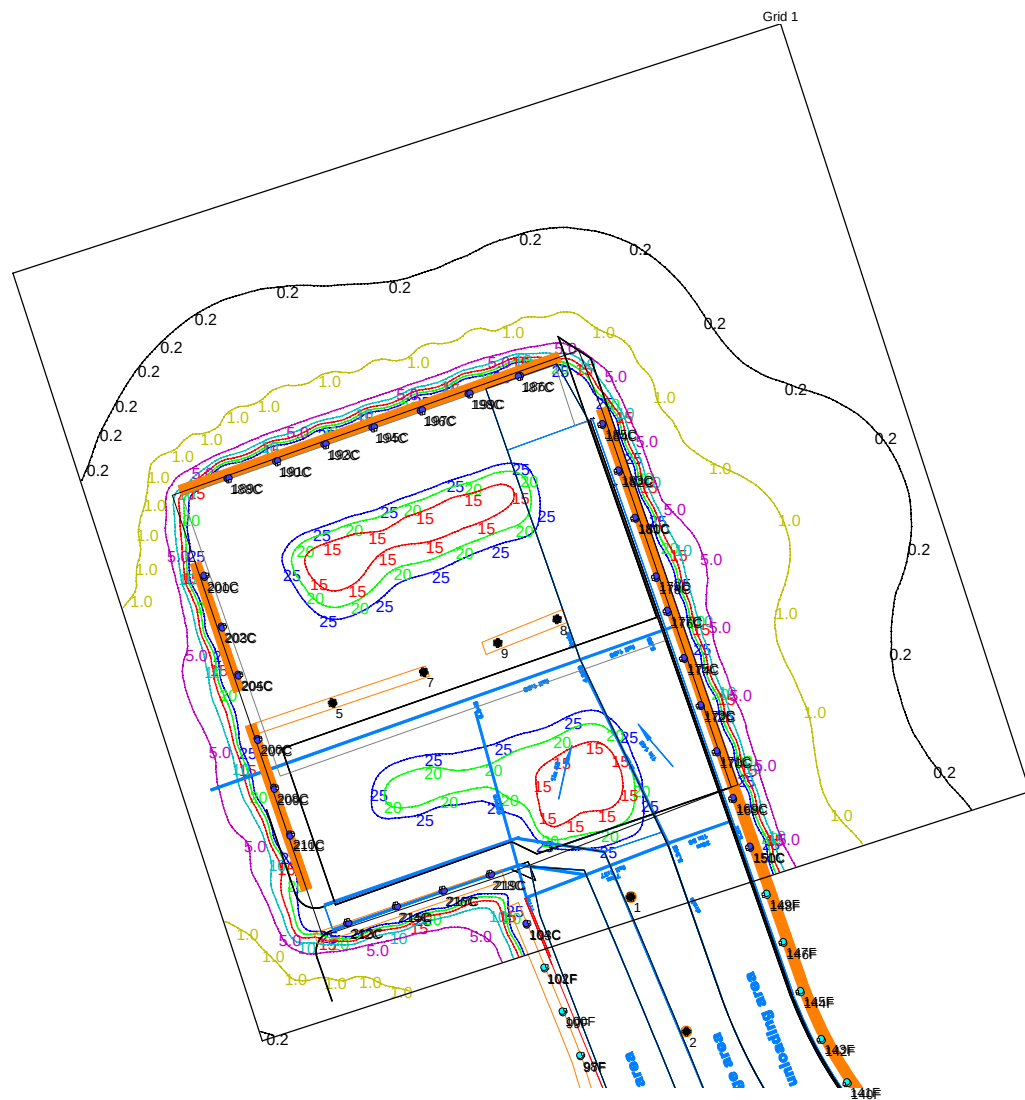
ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
217	C	277619.02	186171.22	12.00	107.00	0.00	0.00	1.48	100%			
218	C	277639.97	186178.42	12.00	109.00	0.00	0.00	1.48	100%			
219	C	277640.91	186178.72	12.00	106.00	0.00	0.00	1.48	100%			
220/5	B	277567.14	186258.38	25.00	290.00	0.00	0.00	1.48	100%			
221/5	B	277567.14	186258.38	25.00	350.00	0.00	0.00	1.48	100%			
222/5	B	277567.14	186258.38	25.00	50.00	0.00	0.00	1.48	100%			
223/5	B	277567.14	186258.38	25.00	110.00	0.00	0.00	1.48	100%			
224/7	B	277609.49	186272.69	25.00	288.00	0.00	0.00	1.48	100%			
225/7	B	277609.49	186272.69	25.00	348.00	0.00	0.00	1.48	100%			
226/7	B	277609.49	186272.69	25.00	48.00	0.00	0.00	1.48	100%			
227/7	B	277609.49	186272.69	25.00	108.00	0.00	0.00	1.48	100%			
228/8	B	277671.50	186297.26	25.00	24.00	0.00	0.00	1.48	100%			
229/8	B	277671.50	186297.26	25.00	84.00	0.00	0.00	1.48	100%			
230/8	B	277671.50	186297.26	25.00	144.00	0.00	0.00	1.48	100%			
231/8	B	277671.50	186297.26	25.00	204.00	0.00	0.00	1.48	100%			
232/9	B	277643.90	186286.26	25.00	26.00	0.00	0.00	1.48	100%			
233/9	B	277643.90	186286.26	25.00	86.00	0.00	0.00	1.48	100%			
234/9	B	277643.90	186286.26	25.00	146.00	0.00	0.00	1.48	100%			
235/9	B	277643.90	186286.26	25.00	206.00	0.00	0.00	1.48	100%			
236/5	B	277567.14	186258.38	25.00	170.00	0.00	0.00	1.48	100%			
237/5	B	277567.14	186258.38	25.00	230.00	0.00	0.00	1.48	100%			
238/7	B	277609.49	186272.69	25.00	168.00	0.00	0.00	1.48	100%			
239/7	B	277609.49	186272.69	25.00	228.00	0.00	0.00	1.48	100%			
240/10	A	277885.15	185728.67	25.00	0.00	0.00	0.00	1.48	100%			
241/10	A	277885.15	185728.67	25.00	60.00	0.00	0.00	1.48	100%			
242/10	A	277885.15	185728.67	25.00	120.00	0.00	0.00	1.48	100%			
243/10	A	277885.15	185728.67	25.00	180.00	0.00	0.00	1.48	100%			
244/10	A	277885.15	185728.67	25.00	240.00	0.00	0.00	1.48	100%			
245/10	A	277885.15	185728.67	25.00	300.00	0.00	0.00	1.48	100%			
246/11	A	277941.68	185666.53	25.00	0.00	0.00	0.00	1.48	100%			
247/11	A	277941.68	185666.53	25.00	60.00	0.00	0.00	1.48	100%			
248/11	A	277941.68	185666.53	25.00	120.00	0.00	0.00	1.48	100%			
249/11	A	277941.68	185666.53	25.00	180.00	0.00	0.00	1.48	100%			
250/11	A	277941.68	185666.53	25.00	240.00	0.00	0.00	1.48	100%			
251/11	A	277941.68	185666.53	25.00	300.00	0.00	0.00	1.48	100%			
252/8	B	277671.50	186297.26	25.00	264.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
253/8	B	277671.50	186297.26	25.00	324.00	0.00	0.00	1.48	100%			
254/9	B	277643.90	186286.26	25.00	266.00	0.00	0.00	1.48	100%			
255/9	B	277643.90	186286.26	25.00	326.00	0.00	0.00	1.48	100%			
256/1	B	277705.71	186168.18	25.00	240.00	0.00	0.00	1.48	100%			
257/1	B	277705.71	186168.18	25.00	300.00	0.00	0.00	1.48	100%			

Horizontal Illuminance (lux)

Grid 1

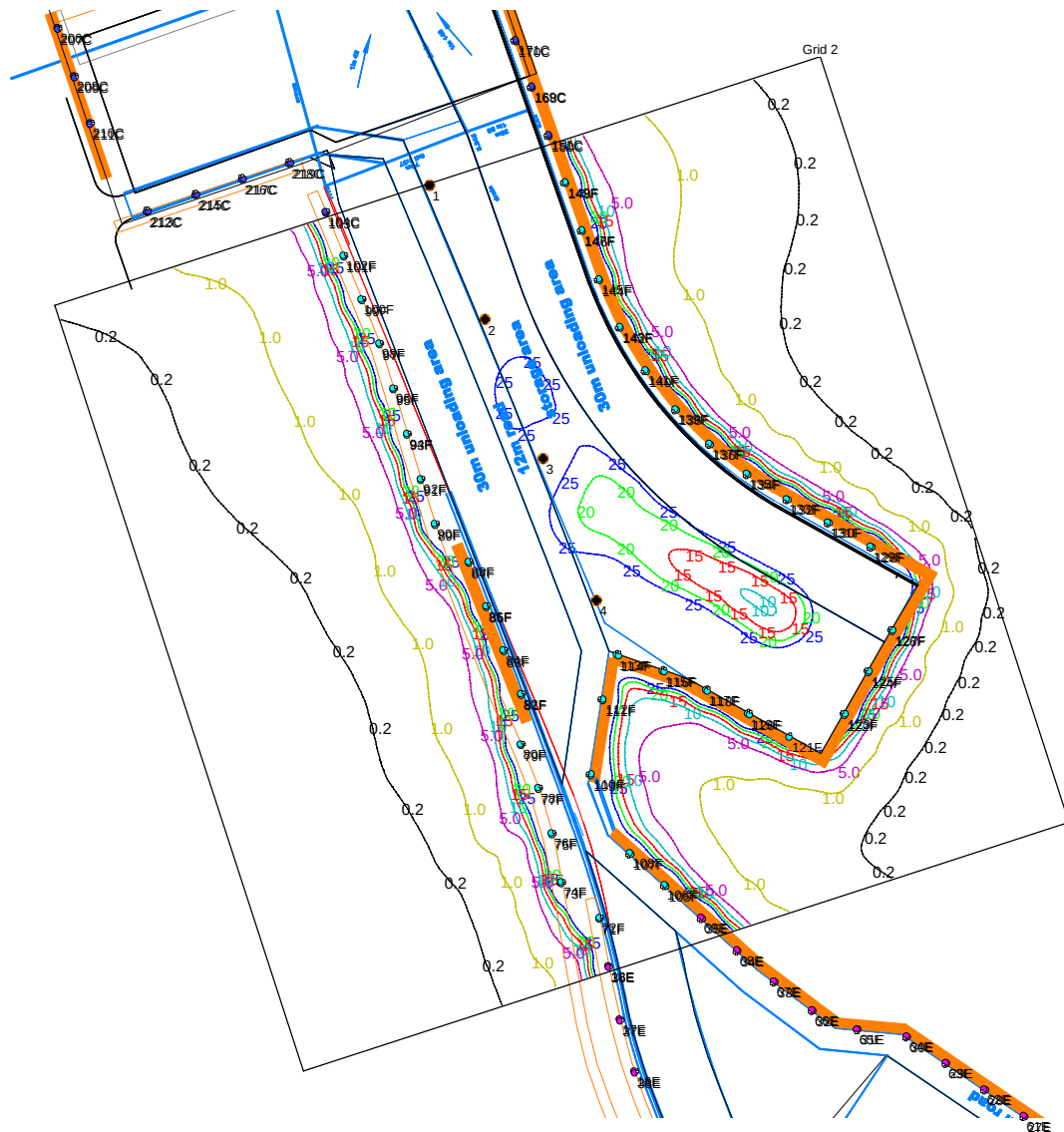


Results

Eav	52.82
Emin	11.20
Emax	149.02
Emin/Emax	0.08
Emin/Eav	0.21

Horizontal Illuminance (lux)

Grid 2

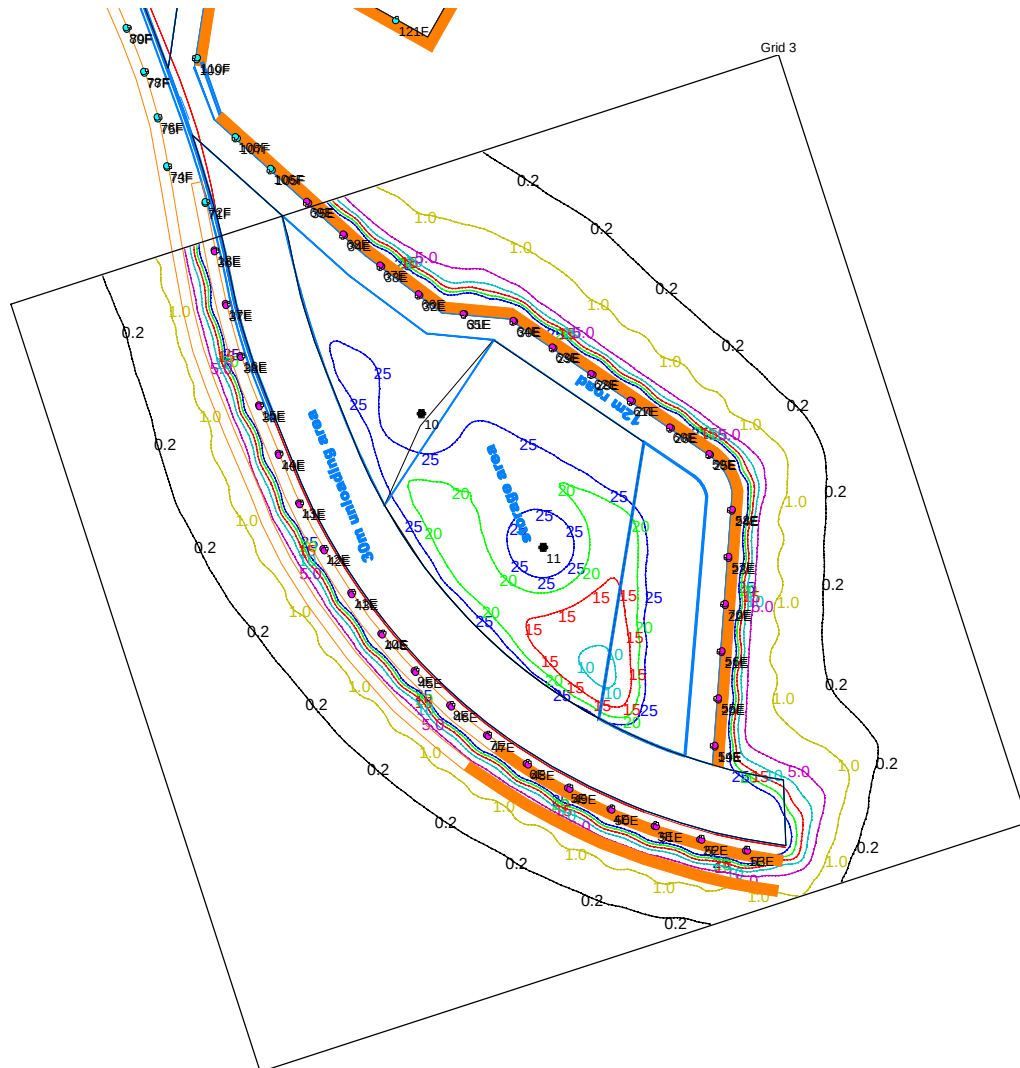


Results

Eav	54.81
Emin	9.48
Emax	139.19
Emin/Emax	0.07
Emin/Eav	0.17

Horizontal Illuminance (lux)

Grid 3



Results

Eav	53.38
Emin	8.87
Emax	132.49
Emin/Emax	0.07
Emin/Eav	0.17

DATE: 4 May 2026
DESIGNER: Jaydrathsinh Raulji
PROJECT No: 350811
PROJECT NAME: TATA Steel CE1 Slab



Document Reference No.- 350811-WSP-HLG-SWI-CA-EO-1303
Lighting Calculation in accordance with BS EN 12464-2:2014
Scrap Yard Lighting-Required Lighting Levels as per Table 5.7 — Industrial sites and storage area-5.7.2
Eav (lux) = 50Lux, Uo = 0.40

Based upon LLMF & LSF values received from the manufacturer and LMF value based upon 72 months clean and inspect cycle in accordance with BS5489 (Table C.1) Environmental zone E3/E4. This gives a calculation of $0.92 \times 1 \times 0.92 = 0.85$

All the grids have not compiled with results. For all grids, a 12 m high lighting column has been used. Grid 1, Grid 2 & Grid 3 are with TRT Lanterns.

Outdoor Lighting Report

Designer:

Checker:

Approver:

PREPARED BY: Unit 9, The Chase
John Tate Road
Foxholes Business Park
Hertford
SG13 7NN

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	277534.49	186101.41	375.00	375.00	1.50	1.50
2	Grid 2	277646.94	185755.65	375.00	375.00	1.50	1.50
3	Grid 3	277810.28	185422.88	375.00	375.00	1.50	1.50

Luminaires

Luminaire B Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_307W_GA1_(Pink)_G0_3000K_FG
Lamp(s)	42 0307 0000 100
Lamp Flux (klm)	41.10
File Name	A128_GEN2_LED_307W_GA1_(Pink)_G0_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	753.3, 402.1, 0.0
No. in Project	24

Luminaire C Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_3000K_FG
Lamp(s)	42 0307 0000 100
Lamp Flux (klm)	41.08
File Name	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	635.2, 122.4, 0.0
No. in Project	56

Luminaire D Data



Supplier	TRT Lighting
Type	ASF96_LED-V1_290W_F08_SYM_3000K_FG
Lamp(s)	42 0290 0000 100
Lamp Flux (klm)	36.81
File Name	ASF96_LED-V1_290W_F08_SYM_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	476.0, 31.6, 0.0
No. in Project	12

Luminaire E Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_2700K_FG
Lamp(s)	42 0307 0000 100
Lamp Flux (klm)	38.12
File Name	A128_GEN2_LED_307W_GA2_(Yellow)_G2_EBS_2700K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	635.2, 122.4, 0.0
No. in Project	70

Luminaire F Data



Supplier	TRT Lighting
Type	A128_GEN2_LED_236W_GA2_(Yellow)_G2_EBS_3000K_FG
Lamp(s)	42 0236 0000 100
Lamp Flux (klm)	33.19
File Name	A128_GEN2_LED_236W_GA2_(Yellow)_G2_EBS_3000K_FG.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	635.2, 122.4, 0.0
No. in Project	77

Layout

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
1	E	278035.79	185525.68	12.00	79.00	0.00	0.00	1.48	100%			
2	E	278014.47	185530.82	12.00	75.00	0.00	0.00	1.48	100%			
3	E	277993.32	185537.12	12.00	73.00	0.00	0.00	1.48	100%			
4	E	277972.84	185545.01	12.00	63.00	0.00	0.00	1.48	100%			
5	E	277953.05	185554.75	12.00	61.00	0.00	0.00	1.48	100%			
6	E	277933.82	185566.15	12.00	58.00	0.00	0.00	1.48	100%			
7	E	277915.44	185579.33	12.00	56.00	0.00	0.00	1.48	100%			
8	E	277898.26	185593.28	12.00	45.00	0.00	0.00	1.48	100%			
9	E	277881.73	185609.31	12.00	47.00	0.00	0.00	1.48	100%			
10	E	277866.27	185626.54	12.00	40.00	0.00	0.00	1.48	100%			
11	E	277852.28	185645.50	12.00	36.00	0.00	0.00	1.48	100%			
12	E	277839.44	185665.97	12.00	35.00	0.00	0.00	1.48	100%			
13	E	277828.12	185687.23	12.00	30.00	0.00	0.00	1.48	100%			
14	E	277818.52	185710.22	12.00	21.00	0.00	0.00	1.48	100%			
15	E	277809.45	185732.69	12.00	23.00	0.00	0.00	1.48	100%			
16	E	277800.87	185755.59	12.00	21.00	0.00	0.00	1.48	100%			
17	E	277794.08	185779.83	12.00	11.00	0.00	0.00	1.48	100%			
18	E	277788.84	185804.74	12.00	8.00	0.00	0.00	1.48	100%			
19	E	278021.46	185573.82	12.00	174.00	0.00	0.00	1.48	100%			
20	E	278023.06	185595.70	12.00	176.00	0.00	0.00	1.48	100%			
21	E	278024.64	185617.68	12.00	178.00	0.00	0.00	1.48	100%			
22	E	278026.20	185639.60	12.00	174.00	0.00	0.00	1.48	100%			
23	E	278027.79	185661.46	12.00	177.00	0.00	0.00	1.48	100%			
24	E	278029.41	185683.40	12.00	176.00	0.00	0.00	1.48	100%			
25	E	278019.33	185709.63	12.00	237.00	0.00	0.00	1.48	100%			
26	E	278001.21	185721.97	12.00	239.00	0.00	0.00	1.48	100%			
27	E	277983.03	185734.40	12.00	237.00	0.00	0.00	1.48	100%			
28	E	277964.73	185746.86	12.00	238.00	0.00	0.00	1.48	100%			
29	E	277946.67	185759.19	12.00	238.00	0.00	0.00	1.48	100%			
30	E	277928.36	185771.50	12.00	237.00	0.00	0.00	1.48	100%			
31	E	277905.23	185775.12	12.00	264.00	0.00	0.00	1.48	100%			
32	E	277884.36	185783.78	12.00	236.00	0.00	0.00	1.48	100%			
33	E	277866.64	185797.08	12.00	241.00	0.00	0.00	1.48	100%			
34	E	277849.39	185811.50	12.00	235.00	0.00	0.00	1.48	100%			
35	E	277832.77	185826.53	12.00	234.00	0.00	0.00	1.48	100%			
36	E	277788.97	185803.99	12.00	6.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
37	E	277794.28	185779.02	12.00	11.00	0.00	0.00	1.48	100%			
38	E	277801.16	185754.82	12.00	19.00	0.00	0.00	1.48	100%			
39	E	277809.75	185731.95	12.00	23.00	0.00	0.00	1.48	100%			
40	E	277818.86	185709.40	12.00	21.00	0.00	0.00	1.48	100%			
41	E	277828.49	185686.43	12.00	26.00	0.00	0.00	1.48	100%			
42	E	277839.97	185665.04	12.00	34.00	0.00	0.00	1.48	100%			
43	E	277852.84	185644.62	12.00	36.00	0.00	0.00	1.48	100%			
44	E	277866.92	185625.84	12.00	39.00	0.00	0.00	1.48	100%			
45	E	277882.47	185608.57	12.00	46.00	0.00	0.00	1.48	100%			
46	E	277899.03	185592.47	12.00	45.00	0.00	0.00	1.48	100%			
47	E	277916.18	185578.72	12.00	53.00	0.00	0.00	1.48	100%			
48	E	277934.74	185565.51	12.00	59.00	0.00	0.00	1.48	100%			
49	E	277954.02	185554.23	12.00	59.00	0.00	0.00	1.48	100%			
50	E	277973.57	185544.61	12.00	62.00	0.00	0.00	1.48	100%			
51	E	277994.22	185536.76	12.00	69.00	0.00	0.00	1.48	100%			
52	E	278015.33	185530.57	12.00	73.00	0.00	0.00	1.48	100%			
53	E	278036.69	185525.50	12.00	78.00	0.00	0.00	1.48	100%			
54	E	278021.49	185574.62	12.00	173.00	0.00	0.00	1.48	100%			
55	E	278023.08	185596.55	12.00	175.00	0.00	0.00	1.48	100%			
56	E	278024.69	185618.52	12.00	175.00	0.00	0.00	1.48	100%			
57	E	278027.91	185662.39	12.00	174.00	0.00	0.00	1.48	100%			
58	E	278029.43	185684.23	12.00	174.00	0.00	0.00	1.48	100%			
59	E	278018.73	185710.05	12.00	233.00	0.00	0.00	1.48	100%			
60	E	278000.52	185722.42	12.00	236.00	0.00	0.00	1.48	100%			
61	E	277982.24	185734.90	12.00	237.00	0.00	0.00	1.48	100%			
62	E	277963.91	185747.31	12.00	236.00	0.00	0.00	1.48	100%			
63	E	277945.97	185759.67	12.00	235.00	0.00	0.00	1.48	100%			
64	E	277927.70	185771.98	12.00	233.00	0.00	0.00	1.48	100%			
65	E	277904.50	185775.15	12.00	264.00	0.00	0.00	1.48	100%			
66	E	277883.73	185784.28	12.00	233.00	0.00	0.00	1.48	100%			
67	E	277865.91	185797.65	12.00	237.00	0.00	0.00	1.48	100%			
68	E	277848.71	185812.10	12.00	231.00	0.00	0.00	1.48	100%			
69	E	277831.89	185827.31	12.00	233.00	0.00	0.00	1.48	100%			
70	E	278026.28	185640.47	12.00	173.00	0.00	0.00	1.48	100%			
71	F	277784.71	185826.42	12.00	10.00	0.00	0.00	1.48	100%			
72	F	277784.61	185827.15	12.00	13.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
73	F	277767.02	185843.01	12.00	8.00	0.00	0.00	1.48	100%			
74	F	277766.87	185843.78	12.00	14.00	0.00	0.00	1.48	100%			
75	F	277762.64	185865.70	12.00	18.00	0.00	0.00	1.48	100%			
76	F	277762.36	185866.55	12.00	20.00	0.00	0.00	1.48	100%			
77	F	277756.38	185886.87	12.00	22.00	0.00	0.00	1.48	100%			
78	F	277756.05	185887.65	12.00	22.00	0.00	0.00	1.48	100%			
79	F	277748.28	185907.32	12.00	21.00	0.00	0.00	1.48	100%			
80	F	277747.90	185908.02	12.00	21.00	0.00	0.00	1.48	100%			
81	F	277748.36	185930.68	12.00	22.00	0.00	0.00	1.48	100%			
82	F	277748.05	185931.42	12.00	23.00	0.00	0.00	1.48	100%			
83	F	277740.26	185951.15	12.00	19.00	0.00	0.00	1.48	100%			
84	F	277739.91	185951.86	12.00	19.00	0.00	0.00	1.48	100%			
85	F	277732.17	185971.58	12.00	18.00	0.00	0.00	1.48	100%			
86	F	277731.87	185972.36	12.00	21.00	0.00	0.00	1.48	100%			
87	F	277724.04	185992.22	12.00	19.00	0.00	0.00	1.48	100%			
88	F	277723.73	185993.07	12.00	21.00	0.00	0.00	1.48	100%			
89	F	277708.26	186009.84	12.00	21.00	0.00	0.00	1.48	100%			
90	F	277707.97	186010.67	12.00	20.00	0.00	0.00	1.48	100%			
91	F	277701.54	186030.85	12.00	21.00	0.00	0.00	1.48	100%			
92	F	277701.34	186031.60	12.00	18.00	0.00	0.00	1.48	100%			
93	F	277695.14	186051.92	12.00	19.00	0.00	0.00	1.48	100%			
94	F	277694.89	186052.60	12.00	19.00	0.00	0.00	1.48	100%			
95	F	277688.77	186073.03	12.00	20.00	0.00	0.00	1.48	100%			
96	F	277688.53	186073.74	12.00	18.00	0.00	0.00	1.48	100%			
97	F	277682.27	186094.07	12.00	20.00	0.00	0.00	1.48	100%			
98	F	277681.99	186094.74	12.00	21.00	0.00	0.00	1.48	100%			
99	F	277674.11	186114.54	12.00	21.00	0.00	0.00	1.48	100%			
100	F	277673.76	186115.30	12.00	19.00	0.00	0.00	1.48	100%			
101	F	277665.64	186134.86	12.00	20.00	0.00	0.00	1.48	100%			
102	F	277665.35	186135.64	12.00	22.00	0.00	0.00	1.48	100%			
103	C	277657.31	186155.26	12.00	20.00	0.00	0.00	1.48	100%			
104	C	277656.98	186156.02	12.00	25.00	0.00	0.00	1.48	100%			
105	F	277815.71	185841.80	12.00	231.00	0.00	0.00	1.48	100%			
106	F	277814.97	185842.54	12.00	227.00	0.00	0.00	1.48	100%			
107	F	277799.52	185856.62	12.00	229.00	0.00	0.00	1.48	1%			
108	F	277798.72	185857.32	12.00	227.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
109	F	277780.72	185893.18	12.00	172.00	0.00	0.00	1.48	100%			
110	F	277780.90	185894.09	12.00	170.00	0.00	0.00	1.48	100%			
111	F	277786.23	185928.14	12.00	172.00	0.00	0.00	1.48	100%			
112	F	277786.38	185928.94	12.00	171.00	0.00	0.00	1.48	100%			
113	F	277792.67	185949.54	12.00	72.00	0.00	0.00	1.48	100%			
114	F	277793.68	185949.23	12.00	70.00	0.00	0.00	1.48	100%			
115	F	277814.11	185942.09	12.00	73.00	0.00	0.00	1.48	100%			
116	F	277815.01	185941.69	12.00	75.00	0.00	0.00	1.48	100%			
117	F	277834.35	185933.17	12.00	63.00	0.00	0.00	1.48	100%			
118	F	277835.13	185932.70	12.00	64.00	0.00	0.00	1.48	100%			
119	F	277853.81	185922.24	12.00	65.00	0.00	0.00	1.48	100%			
120	F	277854.73	185921.67	12.00	66.00	0.00	0.00	1.48	100%			
121	F	277873.11	185911.29	12.00	65.00	0.00	0.00	1.48	100%			
122	F	277898.86	185921.40	12.00	150.00	0.00	0.00	1.48	100%			
123	F	277899.30	185922.11	12.00	150.00	0.00	0.00	1.48	100%			
124	F	277910.06	185941.31	12.00	152.00	0.00	0.00	1.48	100%			
125	F	277910.51	185941.97	12.00	149.00	0.00	0.00	1.48	100%			
126	F	277921.08	185960.41	12.00	152.00	0.00	0.00	1.48	100%			
127	F	277921.49	185961.11	12.00	147.00	0.00	0.00	1.48	100%			
128	F	277911.76	185999.71	12.00	247.00	0.00	0.00	1.48	100%			
129	F	277910.89	186000.20	12.00	243.00	0.00	0.00	1.48	100%			
130	F	277891.85	186011.00	12.00	243.00	0.00	0.00	1.48	100%			
131	F	277891.03	186011.39	12.00	240.00	0.00	0.00	1.48	100%			
132	F	277872.65	186021.78	12.00	242.00	0.00	0.00	1.48	100%			
133	F	277871.81	186022.23	12.00	242.00	0.00	0.00	1.48	100%			
134	F	277854.03	186033.49	12.00	240.00	0.00	0.00	1.48	100%			
135	F	277853.19	186034.04	12.00	238.00	0.00	0.00	1.48	100%			
136	F	277836.52	186047.45	12.00	235.00	0.00	0.00	1.48	100%			
137	F	277835.84	186048.13	12.00	233.00	0.00	0.00	1.48	100%			
138	F	277820.67	186063.49	12.00	227.00	0.00	0.00	1.48	100%			
139	F	277820.10	186064.17	12.00	227.00	0.00	0.00	1.48	100%			
140	F	277806.64	186081.60	12.00	218.00	0.00	0.00	1.48	100%			
141	F	277806.08	186082.31	12.00	219.00	0.00	0.00	1.48	100%			
142	F	277794.53	186101.73	12.00	212.00	0.00	0.00	1.48	100%			
143	F	277794.10	186102.53	12.00	209.00	0.00	0.00	1.48	100%			
144	F	277784.76	186123.88	12.00	198.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
145	F	277784.45	186124.71	12.00	197.00	0.00	0.00	1.48	100%			
146	F	277776.77	186146.75	12.00	199.00	0.00	0.00	1.48	100%			
147	F	277776.51	186147.58	12.00	198.00	0.00	0.00	1.48	100%			
148	F	277768.97	186169.15	12.00	201.00	0.00	0.00	1.48	100%			
149	F	277768.70	186169.95	12.00	196.00	0.00	0.00	1.48	100%			
150	C	277761.35	186190.98	12.00	200.00	0.00	0.00	1.48	100%			
151	C	277761.04	186191.84	12.00	196.00	0.00	0.00	1.48	100%			
152/1	B	277705.71	186168.18	12.00	0.00	0.00	0.00	1.48	100%			
153/1	B	277705.71	186168.18	12.00	90.00	0.00	0.00	1.48	100%			
154/1	B	277705.71	186168.18	12.00	180.00	0.00	0.00	1.48	100%			
155/1	B	277705.71	186168.18	12.00	270.00	0.00	0.00	1.48	100%			
156/2	D	277731.55	186105.72	12.00	0.00	0.00	0.00	1.48	100%			
157/2	D	277731.55	186105.72	12.00	90.00	0.00	0.00	1.48	100%			
158/2	D	277731.55	186105.72	12.00	180.00	0.00	0.00	1.48	100%			
159/2	D	277731.55	186105.72	12.00	270.00	0.00	0.00	1.48	100%			
160/3	D	277758.68	186040.95	12.00	0.00	0.00	0.00	1.48	100%			
161/3	D	277758.68	186040.95	12.00	90.00	0.00	0.00	1.48	100%			
162/3	D	277758.68	186040.95	12.00	180.00	0.00	0.00	1.48	100%			
163/3	D	277758.68	186040.95	12.00	270.00	0.00	0.00	1.48	100%			
164/4	D	277783.43	185974.88	12.00	0.00	0.00	0.00	1.48	100%			
165/4	D	277783.43	185974.88	12.00	90.00	0.00	0.00	1.48	100%			
166/4	D	277783.43	185974.88	12.00	180.00	0.00	0.00	1.48	100%			
167/4	D	277783.43	185974.88	12.00	270.00	0.00	0.00	1.48	100%			
168	C	277753.46	186213.56	12.00	201.00	0.00	0.00	1.48	100%			
169	C	277753.13	186214.43	12.00	198.00	0.00	0.00	1.48	100%			
170	C	277745.82	186235.21	12.00	200.00	0.00	0.00	1.48	100%			
171	C	277745.47	186236.11	12.00	196.00	0.00	0.00	1.48	100%			
172	C	277738.39	186256.82	12.00	201.00	0.00	0.00	1.48	100%			
173	C	277738.07	186257.63	12.00	198.00	0.00	0.00	1.48	100%			
174	C	277730.64	186278.70	12.00	200.00	0.00	0.00	1.48	100%			
175	C	277730.34	186279.45	12.00	197.00	0.00	0.00	1.48	100%			
176	C	277723.08	186300.47	12.00	200.00	0.00	0.00	1.48	100%			
177	C	277722.69	186301.45	12.00	197.00	0.00	0.00	1.48	100%			
178	C	277717.59	186316.34	12.00	199.00	0.00	0.00	1.48	100%			
179	C	277717.36	186317.34	12.00	194.00	0.00	0.00	1.48	100%			
180	C	277707.96	186343.84	12.00	200.00	0.00	0.00	1.48	100%			

Layout Continued

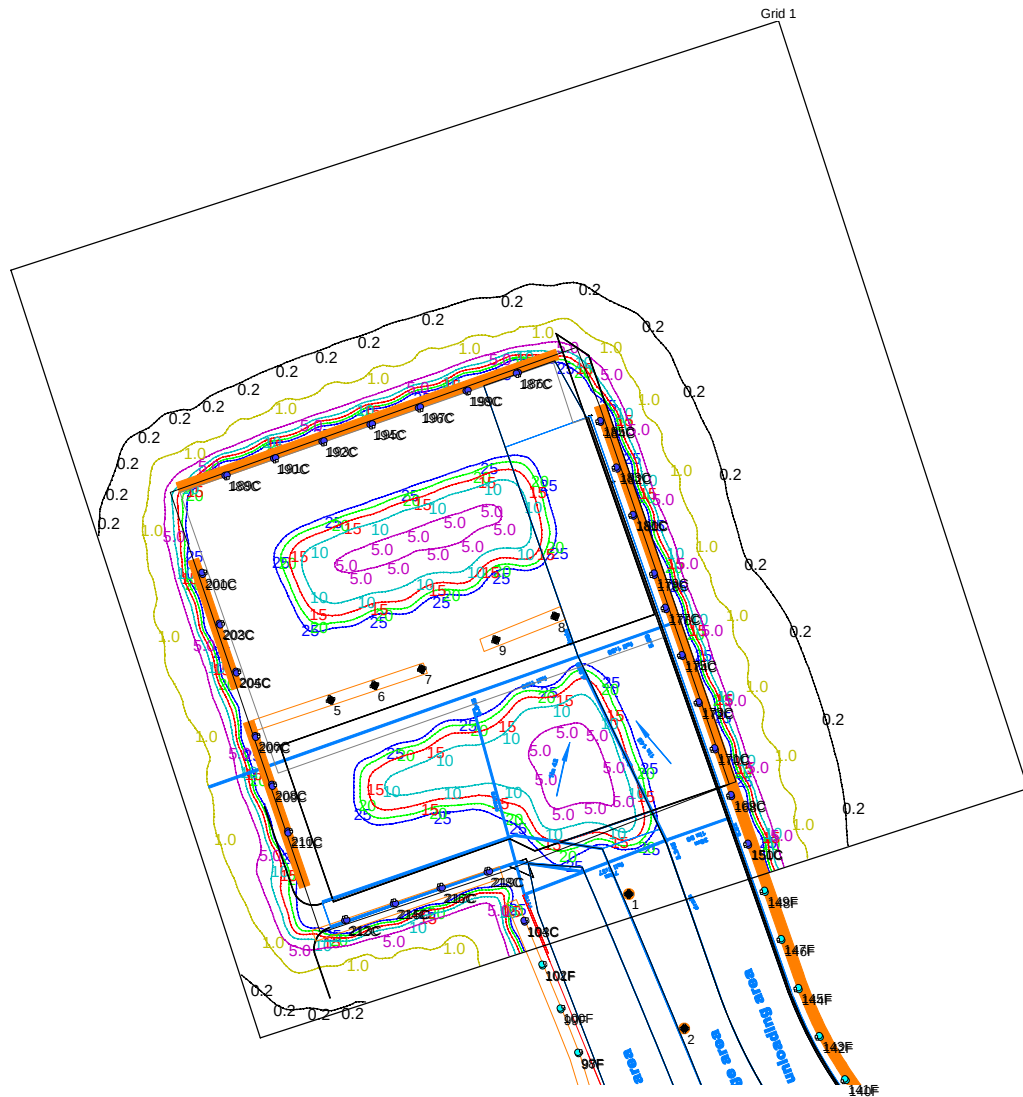
ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
181	C	277707.66	186344.65	12.00	199.00	0.00	0.00	1.48	100%			
182	C	277700.26	186365.73	12.00	199.00	0.00	0.00	1.48	100%			
183	C	277699.92	186366.67	12.00	196.00	0.00	0.00	1.48	100%			
184	C	277692.59	186387.46	12.00	200.00	0.00	0.00	1.48	100%			
185	C	277692.36	186388.22	12.00	196.00	0.00	0.00	1.48	100%			
186	C	277654.34	186410.54	12.00	289.00	0.00	0.00	1.48	100%			
187	C	277653.50	186410.26	12.00	288.00	0.00	0.00	1.48	100%			
188	C	277518.16	186362.68	12.00	287.00	0.00	0.00	1.48	100%			
189	C	277519.01	186362.94	12.00	290.00	0.00	0.00	1.48	100%			
190	C	277540.67	186370.58	12.00	289.00	0.00	0.00	1.48	100%			
191	C	277541.65	186370.91	12.00	290.00	0.00	0.00	1.48	100%			
192	C	277563.22	186378.46	12.00	287.00	0.00	0.00	1.48	100%			
193	C	277564.13	186378.76	12.00	290.00	0.00	0.00	1.48	100%			
194	C	277585.48	186386.32	12.00	288.00	0.00	0.00	1.48	100%			
195	C	277586.56	186386.71	12.00	290.00	0.00	0.00	1.48	100%			
196	C	277607.90	186394.19	12.00	289.00	0.00	0.00	1.48	100%			
197	C	277608.83	186394.52	12.00	291.00	0.00	0.00	1.48	100%			
198	C	277630.15	186402.01	12.00	291.00	0.00	0.00	1.48	100%			
199	C	277630.95	186402.34	12.00	291.00	0.00	0.00	1.48	100%			
200	C	277507.74	186316.85	12.00	19.00	0.00	0.00	1.48	100%			
201	C	277507.43	186317.68	12.00	18.00	0.00	0.00	1.48	100%			
202	C	277515.46	186294.04	12.00	21.00	0.00	0.00	1.48	100%			
203	C	277515.82	186293.28	12.00	18.00	0.00	0.00	1.48	100%			
204	C	277523.10	186271.68	12.00	18.00	0.00	0.00	1.48	100%			
205	C	277523.40	186270.93	12.00	15.00	0.00	0.00	1.48	100%			
206	C	277532.12	186241.76	12.00	16.00	0.00	0.00	1.48	100%			
207	C	277532.33	186241.00	12.00	12.00	0.00	0.00	1.48	100%			
208	C	277539.80	186219.21	12.00	19.00	0.00	0.00	1.48	100%			
209	C	277540.11	186218.31	12.00	17.00	0.00	0.00	1.48	100%			
210	C	277547.20	186197.43	12.00	19.00	0.00	0.00	1.48	100%			
211	C	277547.46	186196.64	12.00	19.00	0.00	0.00	1.48	100%			
212	C	277573.78	186155.94	12.00	108.00	0.00	0.00	1.48	100%			
213	C	277574.70	186156.18	12.00	107.00	0.00	0.00	1.48	100%			
214	C	277596.39	186163.66	12.00	109.00	0.00	0.00	1.48	100%			
215	C	277597.27	186163.90	12.00	107.00	0.00	0.00	1.48	100%			
216	C	277618.02	186170.98	12.00	111.00	0.00	0.00	1.48	100%			

Layout Continued

ID /Mast	Type	X	Y	Height	Angle	Tilt	Cant	Out- reach	Dimmed to	Target X	Target Y	Target Z
217	C	277619.02	186171.22	12.00	107.00	0.00	0.00	1.48	100%			
218	C	277639.97	186178.42	12.00	109.00	0.00	0.00	1.48	100%			
219	C	277640.91	186178.72	12.00	106.00	0.00	0.00	1.48	100%			
220/5	B	277567.14	186258.38	12.00	290.00	0.00	0.00	1.48	100%			
221/5	B	277567.14	186258.38	12.00	20.00	0.00	0.00	1.48	100%			
222/6	B	277587.51	186265.21	12.00	289.00	0.00	0.00	1.48	100%			
223/6	B	277587.51	186265.21	12.00	19.00	0.00	0.00	1.48	100%			
224/7	B	277609.49	186272.69	12.00	288.00	0.00	0.00	1.48	100%			
225/7	B	277609.49	186272.69	12.00	18.00	0.00	0.00	1.48	100%			
226/7	B	277609.49	186272.69	12.00	108.00	0.00	0.00	1.48	100%			
227/7	B	277609.49	186272.69	12.00	198.00	0.00	0.00	1.48	100%			
228/8	B	277671.50	186297.26	12.00	24.00	0.00	0.00	1.48	100%			
229/8	B	277671.50	186297.26	12.00	114.00	0.00	0.00	1.48	100%			
230/8	B	277671.50	186297.26	12.00	204.00	0.00	0.00	1.48	100%			
231/8	B	277671.50	186297.26	12.00	294.00	0.00	0.00	1.48	100%			
232/9	B	277643.90	186286.26	12.00	26.00	0.00	0.00	1.48	100%			
233/9	B	277643.90	186286.26	12.00	116.00	0.00	0.00	1.48	100%			
234/9	B	277643.90	186286.26	12.00	206.00	0.00	0.00	1.48	100%			
235/9	B	277643.90	186286.26	12.00	296.00	0.00	0.00	1.48	100%			
236/6	B	277587.51	186265.21	12.00	109.00	0.00	0.00	1.48	100%			
237/6	B	277587.51	186265.21	12.00	199.00	0.00	0.00	1.48	100%			
238/5	B	277567.14	186258.38	12.00	110.00	0.00	0.00	1.48	100%			
239/5	B	277567.14	186258.38	12.00	200.00	0.00	0.00	1.48	100%			

Horizontal Illuminance (lux)

Grid 1

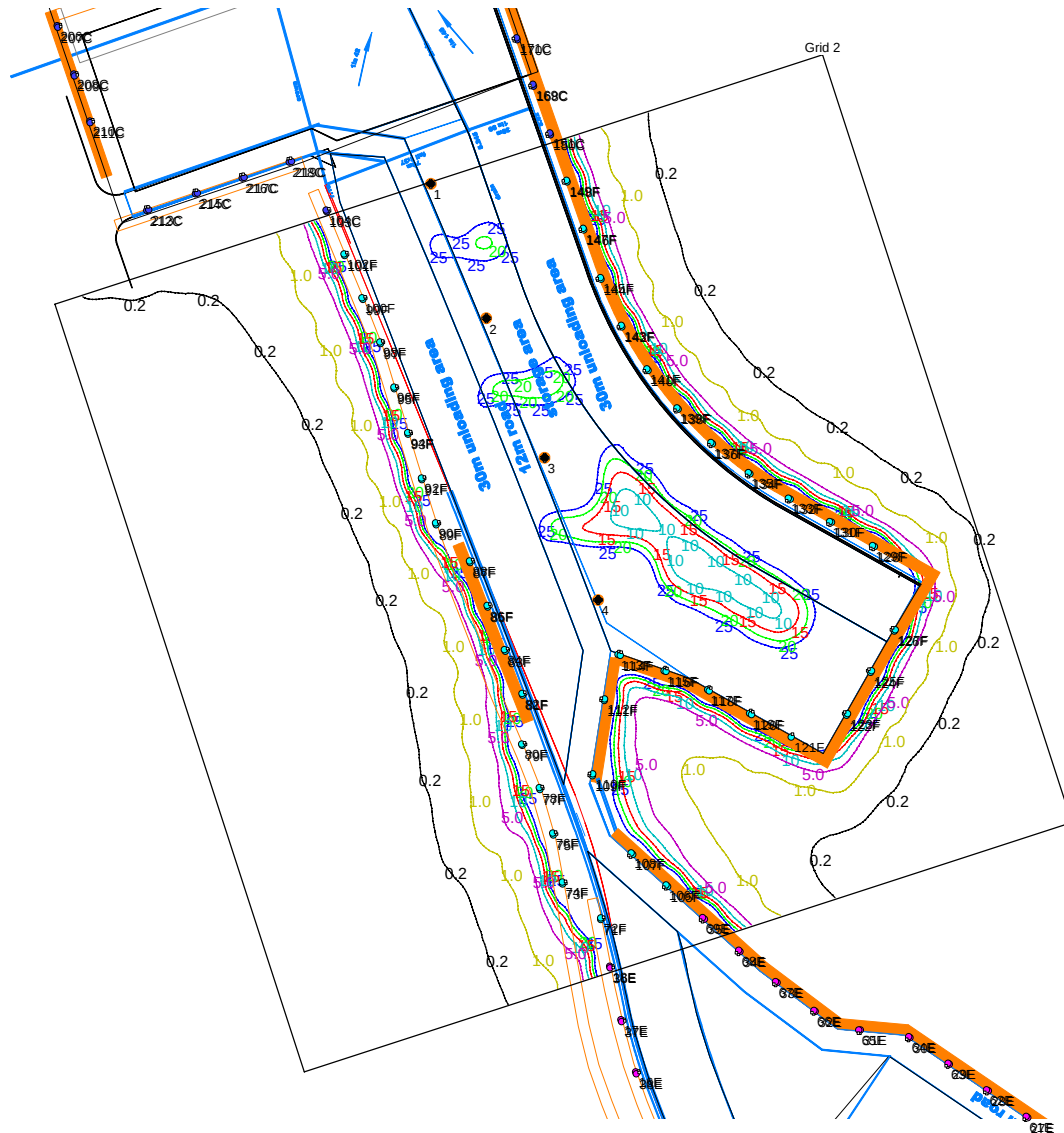


Results

Eav	51.15
Emin	2.87
Emax	147.14
Emin/Emax	0.02
Emin/Eav	0.06

Horizontal Illuminance (lux)

Grid 2



Results

Eav	55.85
Emin	6.60
Emax	138.83
Emin/Emax	0.05
Emin/Eav	0.12

Horizontal Illuminance (lux)

Grid 3



Results

Eav	45.33
Emin	0.76
Emax	129.15
Emin/Emax	0.01
Emin/Eav	0.02

Appendix B

DRAWINGS

