Hydrock

Residential Development on land west of Elizabeth Way, Trowbridge

Light Monitoring Regime

For Bellway Homes

Date: *15 June 2023*

Doc ref: *EWT-HYD-XX-XX-RP-E-2001*

DOCUMENT CONTROL SHEET

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1. INTRODUCTION

Hydrock Consultants Ltd have been commissioned by Bellway Homes to provide a Light Monitoring Regime for a proposed residential development on land west of Elizabeth Way, Trowbridge, Wiltshire.

The site secured Outline Planning Approval from Wiltshire Council under application reference 16/00672/OUT in May 2021. Condition 11 related to external lighting. Bellway Homes discharged this condition under a Reserved Matters Application: reference PL/2021/08554. The detail of which was contained with a Lighting Assessment completed by Hydrock Consultants, reference: EW-HYD-ZZ-ZZ-RP-E-2001 dated 14.04.22.

A subsequent condition (4) of the approval was imposed by Wiltshire Council as follows:

> *No external lighting shall be installed on the site until a lighting monitoring regime has been submitted and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved details.*
>
> *REASON: In the interests of the amenities of the area, to minimise unnecessary light spillage above and outside the development site and to ensure core bat habitat meets the requirements of the Trowbridge Bat Mitigation Strategy.*

Reference to the monitoring of light on a completed development is made within the Trowbridge Bat Mitigation Strategy (TBMS) produced by Johns Associates Ltd which was prepared in support of the Housing Site Allocations Plan (February 2020) and issued by Wiltshire Council as a supplementary planning document.

Clause 8.3.4 states:

> *In order to ensure the accuracy of modelled lighting and conformity with predicted lux contours, a post-development lighting survey should be carried out by a lighting professional using a calibrated cosine corrected light meter within three months following completion. This will be required by planning condition provided that options for remediation are likely to be available. Otherwise, the planning authority will place the onus on the developer demonstrating that a precautionary approach has been followed.*
>
> *A further compliance survey may also be required 2 years post-completion to check that no alterations have been made within the development.*
>
> *The survey should be carried out with all lighting active (to replicate the lighting state within the modelling) and notes should be taken as to the output and activity of luminaires observed during the survey. Surveys should be timed to take place on evenings of little moonlight, either due to cloud cover or a new moon. Readings of illuminance should be taken at representative locations according to the planes and orientations used in the modelled calculations as chosen by the lighting professional. Results and discussion must be submitted to Wiltshire Council for approval.*
>
> *Where lighting levels are greater than predicted, remedial measures must be put in place to reduce illuminance as per the lighting condition.*

This document provides the methodology for a Lighting Monitoring Regime to satisfy the requirement of Wiltshire Council prior to development.

2. DEVELOPMENT DETAILS

The site comprises 7.95 hectares of greenfield land, with access from Elizabeth Way. The site has two small watercourses on the west of the site which meet before running south, with the land falling slightly in the direction of water flow.

There are hedgerows on the southern and eastern boundaries, with trees located along the watercourses.

The development proposes to include the following:

- 151 dwellings
- Public open spaces, landscaping and play facilities
- Access for vehicles and pedestrians

The masterplan layout can be found within Appendix A.

3. LIGHTING ASSESSMENT

Considerable work was undertaken during the reserved matters application to limit light spill beyond the site boundary and along bat flyways.

Hydrock Consultants Ltd were appointed to undertake a desktop modelling exercise to predict the combined effect of the following:

- Street lighting (provided by Highways Lighting Solutions Ltd in support of the Section 38 Agreement).
- External lighting on the dwellings
- Internal lighting of the dwellings emitted through windows.

Where elevated levels were encountered, mitigation measures were employed to both the internal and external lighting designs to improve compliance with the ecological requirements listed as follows:

- Zone A (core bat habitat zone) represents a 15m wide area centred on the core bat habitat zone. The requirement in this zone is not to exceed 0.2 Lux horizontally and 0.4 Lux on the vertical surface (between 1.5m and 4m) of the boundary on either side.
- Zone B (dark buffer zone) extends 15m from zone A towards the development areas. The lighting requirement on this zone is not to exceed 1 Lux horizontally.
- Zone C (development zone) exists outwardly from the boundary of zone B and covers the rest of the site. There are no specific illuminance limits, other than to ensure the lighting design to does not exceed the requirements of zones A and B.

The site masterplan used to represent predicted illumination levels has been annotated with the agreed bat habitat zones (by Tyler Grange who were the appointed ecologist acting for the developer). These are shown on layouts located within Appendix B, C & D.

It should be noted that it was not possible to mitigate elevated illumination levels everywhere on the site

4. PREDICTED LIGHTING RESULTS – PRE DEVLOPMENT

Specific areas are anticipated to exceed the ecological design criteria; however, these were considered tolerable for the purposes of planning permission. The areas were these occur have been highlighted within the table of results presented within Appendix E and are described briefly below:

- Horizontal: A small number of isolated patches (<1m2) of horizontal illumination were found to exist within Zone A, but no values exceeded the criteria (i.e., ≤0.2 Lux). The horizontal values within Zone B were found to be within the specified criteria (i.e., ≤1 Lux), with the exception of plots 147 to 149, which are located within the Zone B boundary itself.
- Vertical: Despite significant improvement through mitigation a number of areas continued to fail the criteria for the vertical surfaces of Zone A - see layout in Appendix C. When the light levels were modelled at increasing distances (set back) into Zone A these were found to be compliant with the exception of isolated areas on four measuring surfaces.

5. PREDICTED LIGHTING RESULTS - POST DEVELOPMENT.

The predicted results of the lighting assessment are considered to be pessimistic based upon the criteria imposed as part of the assessment:

- All street lights, and the internal and external lights associated with the dwellings were switched on. Whilst all street lights can be anticipated to be on, the use of internal lights will be sporadic to suit the individual occupants. The external lights on each dwelling will be provided with motion sensor activation which will switch off after a predetermined period.
- No curtains, blinds or variable obstructions were included. It can be anticipated that as the dwellings are occupied, these will be introduced, reducing light emitted from the dwellings.

- No vegetation was included in the lighting model due to the inaccuracy of modelling and the variable screening abilities dictated by seasons and possible mortality. As the vegetation within the landscaping plan matures, it will increase the amount of screening, reducing light transmission.
- The calculations were run using a maintenance factor of 1. Over time the light output of luminaires would be expected to decrease as a result of both lamp performance and the accumulation of dirt on the lamp optic. The amount of inter-reflected light can also reduce as the reflectance of surfaces change (e.g., become dirty).

  The model assumed all street lights would operate at full brightness; however, a dimming regime is expected to be introduced. The timing and extent of dimming would be confirmed by the Highway Authority.

6. PREDICTED LEVELS - RISK

The above assumes that the development is constructed in accordance with the details within the planning permission.

Elements that can anticipated to change, outside the direct control of the developer are:

- Replacement of street lighting without reference to the original planning constraints (e.g., different optic)
- An increase in internal lighting, where the occupants use of table lamps near windows increases light spill
- Addition or replacement of external lighting on dwellings (by the occupants) with an inappropriate selection.

However, these are unlike to have occurred at the time of a post completion survey.

7. LIGHT MONITORING REGIME

The proposed Light Monitoring Regime provides a methodology for measuring post-completion illumination levels on the site.

It will be required to undertake this within three months of the completion of the development (to confirm initial compliance).

The requirement for any subsequent test would be subject to agreement with Wiltshire Council, however as properties are occupied it would be unrealistic to expect all residents to turn on all their lights and open all curtains and blinds to simulate the conditions assumed in the original model.

It is anticipated that any subsequent monitoring exercise would follow the same methodology for the purposes of comparison.

8. LIGHT MONITORING METHODOLOGY

It is proposed to take illumination measurements at the Zone A boundary, being the key ecological consideration. This will include a horizontal value at ground level; and a vertical measurement, facing into Zone B at a height of 1.5m (being a practical height to take readings).

Measurement will be taken perpendicular to the sky (as opposed to the ground) to reflect the flat topology used within the predictive light model.

An approximate method of determining the spacings between measuring points can be determined by using the following formulae:

Spacing (ρ) = 0.2 x 5 log(d)

(where d is the length of the surface to be measured).

The length of the water course running across the top of the site is some 180m, which gives a spacing of 7.5m.

When points are plotted onto the site plan, these provide at least one measuring point on each of the major measuring surfaces used within the calculations.

These points have been plotted onto the masterplan located within Appendix D.

9. LIGHT MONITORING SURVEY

The light monitoring survey shall be undertaken in accordance with the applicable recommendations of the ILP Professional Lighting Guide PLG04 Section 7.3.1.

Measurement of photometric performance should only be undertaken by persons who are professionally qualified and competent in the discipline of lighting design. Such awareness should include:

- the type and requirements of the lighting installation being assessed
- measurement standards and guidance
- the correct operation of the test instruments concerned
- health and safety needs of the site.

It is important to plan in advance all aspects of the survey. This will involve liaison with the developer and any occupier of the dwellings facing an ecological zone to ensure safe and suitable access.

The survey should commence in daylight to aid the identification of any site-specific health and safety requirements and enable a survey risk assessment to be undertaken and any mitigation measures taken, such as safe access and personal protective equipment. Consideration should be given to any traffic management requirements.

The measurements will need to be taken in true night-time (when it is fully dark) - ideally on, or close to, the night of a new moon (so as to minimise any light contribution from the moon) and in good weather conditions (light rain can affect light readings).

Metering equipment shall be calibrated, cosine corrected and have a resolution to 0.01 Lux at 3% accuracy.

Recorded values should be tabulated using the template in Appendix E. It will be necessary to highlight any points which exceed the ecological requirements (0.2Lux horizontal; 0.4 Lux vertical) as opposed to values that exceed the predicted levels.

Upon completion of the survey, a report shall be prepared for use by the developer to satisfy the requirements of the planning condition.

10. LIGHT MONITORING REPORT - CHECKLIST

The lighting monitoring report referencing the planning condition shall be submitted to Wiltshire Council and include the following information as a minimum:

- Details of persons / employer conducting survey
- Date of survey
- Phase of moon
- Time survey commenced / completed
- Weather conditions
- Extent of stars visible
- Temperature
- Light meter make, model, range and calibration certificate.
- Any observable differences from the masterplan & street lighting layouts
- Description of observable sources of light
  - Street lighting
  - External lights on properties
  - Internal light from properties
  - Other sources of light.
  - Details of any luminaires observed to be off / failed (which might normally be expected to be on)
- Description of physical elements affecting light distribution (e.g., permanent features such as walls, fences, hedges; site topology and temporary features such as parked vehicles).
- Representative night time photographs of the measured areas at the time of the survey
- Layout confirming measuring points. The agreed layout is provided within Appendix D, however where site constraints require alternative or additional measuring points, the layout should be annotated to reflect them – along with details of any relevant observations and locations of the representative photographs.
- Tabulated results of survey (see Appendix E for template).

Appendix A: Site Masterplan

A0



LEGEND

- RENTED
- SHARED OWNERSHIP
- M4(2) COMPLIANT
- Unobstructed areas allowing for possible future enlargement of parking space to 3.3m wide in compliance with M4(2)

NOTE: all affordable house types are NDSS compliant

- CS — Cycle Store
- Existing Trees to be removed
- Existing Trees to be retained
- Root Protection Zones

PRIVATE

House Type	No of Bedrooms	SqFt	No	Total SqFt
Cooper	2B	770	6	4620
Thespian	3B	921	11	10131
Chandler	3B	951	22	20922
Mason	3B	1059	23	24357
Scrivener	4B	1214	17	20638
Bowyer	4B	1356	8	10848
Philosopher	4B	1507	16	24112
Cutler	4B	1335	3	4005
TOTALS			106	119633

Private housing plot areas (sqft)	119633

30% AFFORDABLE - (60% rented & 40% shared ownership)

House Type	No of Bedrooms	SqFt	No	Total SqFt
1B2P GF	1B	541	3	1623
1B2P 1F	1B	615	3	1845
Baker	2B	876	8	7008
2B8	2B	776	2	1552
3B8	3B	1025	1	1025
Tillman	3B	1026	8	8208
Cartographer +	4B	1261	2	2522
Baker (SO)	2B	876	12	10512
Tillman (SO)	3B	1026	6	6156
TOTALS			45	40451

Affordable housing plot areas (sqft)	40451

SITE TOTALS	151	160084

Total housing plot areas (sqft)	160084
Total net developable area (acres)	10.52
Total coverage sqft/acre	15217

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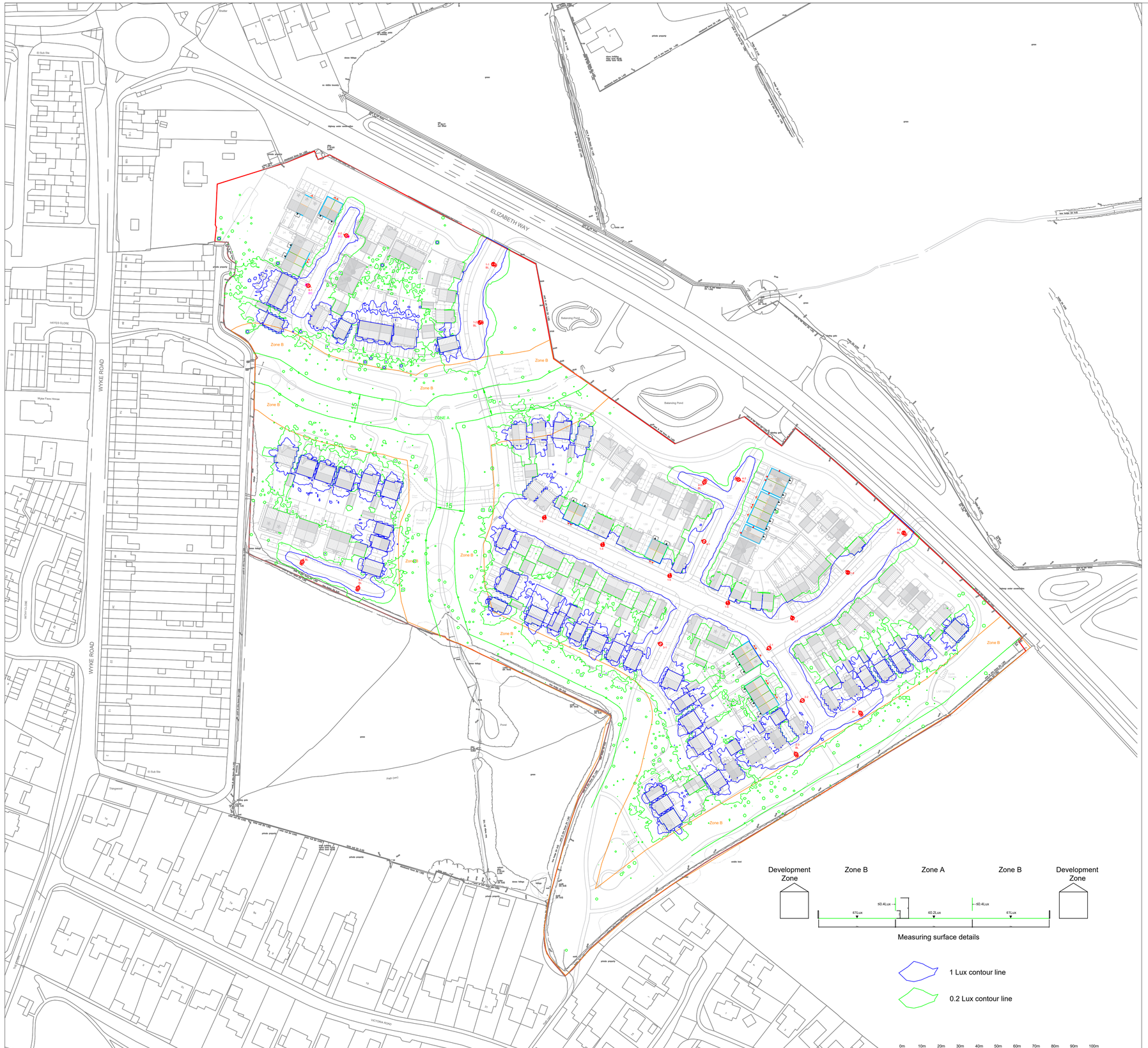
Rev	Description	Date	Au	Ch
E	Layout reconfigured across plots 1-31, 74,75,109-129. Path following PRoW revised. Cycle path link to Wyke Road added. Plots numbering and schedule updated.	04.02.22	VM	VM
F	Paths added to plots 1-31, 74,75,109-129.	09.02.22	VM	VM
G	Garden gates and cycle stores added/ repositioned. Boundary treatment amended throughout.Link paths added by plot 1, 130/151. Roof configuration amended to Thespian bay , Chandler bay, Mason, Bungalows.	17.03.22	BK/VM	VM
H	Cycle link added by plot 46. Roof adjustment to plots 12,13,119. Screen wall adjustment to plot 4. Affordable markers to plots 74/75.	23.03.22	VM	VM

Rev	Description	Date	Au	Ch

Project	**Hilperton, Trowbridge**				
Drawing	**Site Layout**				
Client	**Bellway Homes SW**				
Job no.	**BELL210101 - SW**			Date	**08.12.20**
Dwg no.	**SL01**			Rev.	**H**
Author	**PH**	Checked	**VM**	Scale	**1:500 at A0**
Status	PLANNING			Office	**Portishead**
Client ref.					

thrive. architects

Appendix B: Anticipated Horizontal Surface Values



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KEY PLAN

NOTES

REVISIONS

REV						
P03	ISSUED FOR INFORMATION					
	AB	08.04.22	JM	08.04.22	IG	08.04.22
P02	INITIAL ISSUE | SUITABLE FOR REVIEW AND COMMENT					
	AB	29.11.21	JM	29.11.21	IG	29.11.21
P01	INITIAL ISSUE | SUITABLE FOR REVIEW AND COMMENT					
	AB	19.10.21	JM	19.10.21	IG	19.10.21
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT

Bellway

PROJECT

LAND OFF ELIZABETH WAY
HILPERTON

TITLE

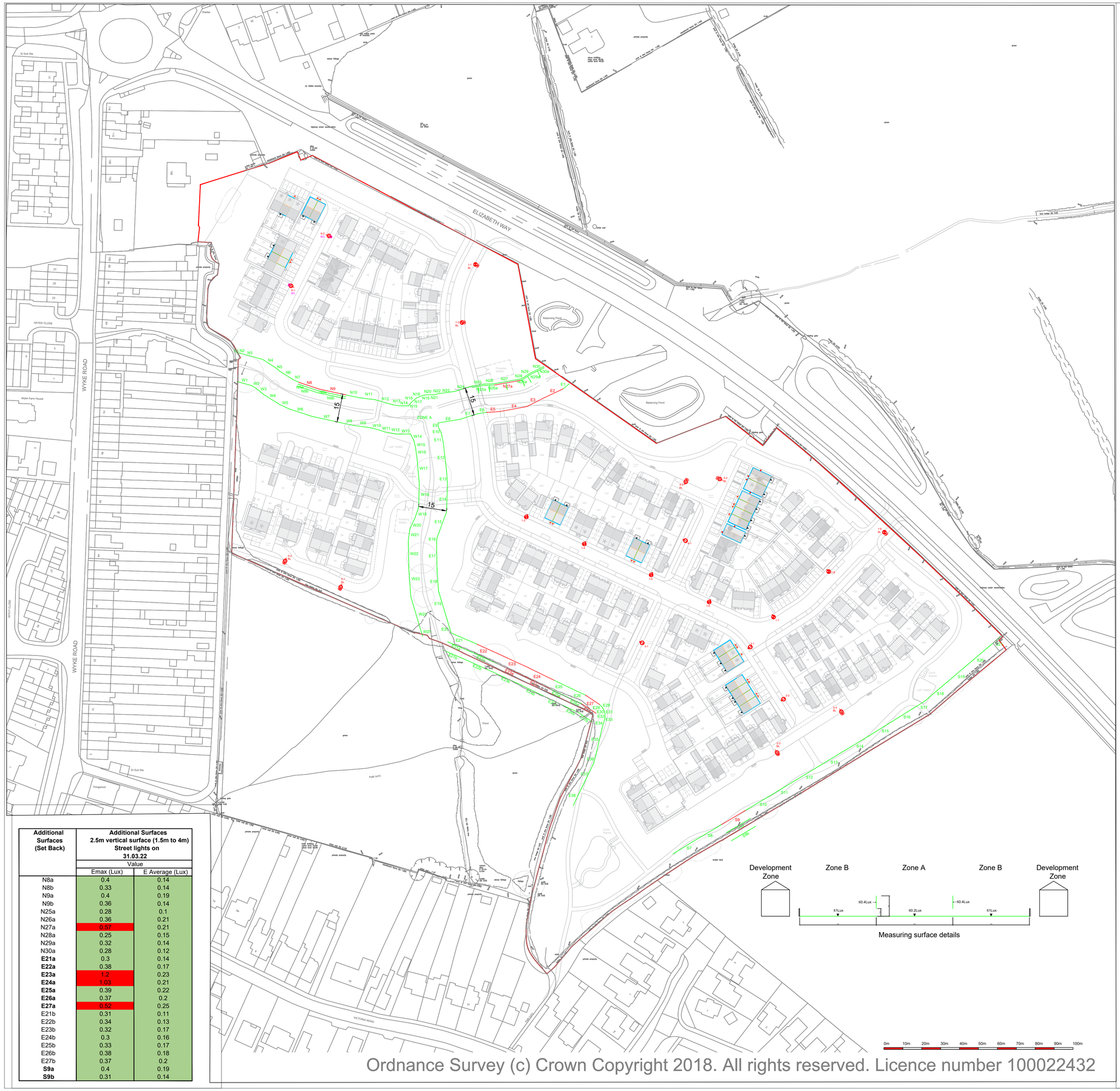
SITE PLAN
HORIZONTAL SURFACE VALUES

HYDROCK PROJECT NO.	SCALE @ A1
C-20919	1:1000

STATUS DESCRIPTION	STATUS
FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
EWT-HYD-ZZ-ZZ-DR-E-2000	P03

Appendix C: Anticipated Vertical Surface Values.



Additional Surfaces (Set Back)	Additional Surfaces 2.5m vertical surface (1.5m to 4m) Street lights on 31.03.22	
	Value	
	Emax (Lux)	E Average (Lux)
N8a	0.4	0.14
N8b	0.33	0.14
N9a	0.4	0.19
N9b	0.36	0.14
N25a	0.28	0.1
N26a	0.36	0.21
N27a	0.57	0.21
N28a	0.25	0.15
N29a	0.32	0.14
N30a	0.28	0.12
E21a	0.3	0.14
E22a	0.38	0.17
E23a	1.2	0.23
E24a	1.03	0.21
E25a	0.39	0.22
E26a	0.37	0.2
E27a	0.52	0.25
E21b	0.31	0.11
E22b	0.34	0.13
E23b	0.32	0.17
E24b	0.3	0.16
E25b	0.33	0.17
E26b	0.38	0.18
E27b	0.37	0.2
S9a	0.4	0.19
S9b	0.31	0.14

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Lighting Assessment
Land West of Elizabeth Way, Hilperton, Trowbridge
Zone A Vertical Calculation Surfaces

Surface	Measuring Surfaces 2.5 vertical surface (1.5m to 4m) Street lights on 31.03.22	
	Value	
	Emax (Lux)	E Average (Lux)
N1	0.056	0.027
N2	0.087	0.032
N3	0.31	0.045
N4	0.35	0.19
N5	0.31	0.18
N6	0.34	0.23
N7	0.31	0.16
N8	0.69	0.16
N9	0.72	0.18
N10	0.39	0.14
N11	0.4	0.14
N12	0.29	0.12
N13	0.24	0.085
N14	0.29	0.1
N15	0.19	0.075
N16	0.11	0.065
N17	0.19	0.081
N18	0.29	0.11
N19	0.21	0.12
N20	0.4	0.17
N21	0.21	0.14
N22	0.22	0.16
N23	0.26	0.18
N24	0.26	0.15
N25	0.16	0.086
N26	0.15	0.074
N27	0.12	0.067
N28	0.051	0.032
N29	0.064	0.031
N30	0.052	0.026
E1	0.19	0.078
E2	0.63	0.2
E3	0.88	0.4
E4	1.56	0.66
E5	1.06	0.44
E6	0.25	0.16
E7	0.29	0.12
E8	0.16	0.058
E9	0.12	0.045
E10	0.12	0.058
E11	0.23	0.074
E12	0.23	0.078
E13	0.39	0.067
E14	0.31	0.096
E15	0.36	0.15
E16	0.29	0.16
E17	0.36	0.15
E18	0.33	0.17
E19	0.31	0.14
E20	0.37	0.17
E21	0.37	0.2
E22	0.63	0.24
E23	0.89	0.3
E24	0.73	0.27
E25	0.4	0.28
E26	0.4	0.29
E27	0.63	0.34
E28	0.33	0.26
E29	0.3	0.22
E30	0.4	0.24
E31	0.33	0.018
E32	0.23	0.14
E33	0.36	0.14
E34	0.33	0.12
E35	0.26	0.11
E36	0.26	0.11
E37	0.34	0.11
E38	0.26	0.099
S7	0.2	0.077
S8	0.33	0.16
S9	1.37	0.26
S10	0.4	0.27
S11	0.4	0.23
S12	0.31	0.16
S13	0.38	0.16
S14	0.35	0.19
S15	0.4	0.22
S16	0.39	0.21
S17	0.35	0.17
S18	0.39	0.18
S19	0.37	0.11
S20	0.2	0.033
S21	0.09	0.024
W1	0.11	0.035
W2	0.077	0.027
W3	0.11	0.037
W4	0.24	0.085
W5	0.39	0.14
W6	0.33	0.15
W7	0.39	0.16
W8	0.4	0.19
W9	0.38	0.18
W10	0.33	0.17
W11	0.32	0.15
W12	0.34	0.12
W13	0.22	0.08
W14	0.23	0.074
W15	0.13	0.063
W16	0.19	0.074
W17	0.13	0.056
W18	0.14	0.034
W19	0.12	0.041
W20	0.19	0.074
W21	0.3	0.12
W22	0.4	0.19
W23	0.33	0.16
W24	0.16	0.043
W25	0.076	0.015

Mitigation Summary - 31.03.22
Based upon Thrive Architects site layout drawing SL.01 H.

- All street lights on (See HLS drawing number HLS-801 Rev D).
- Ecologist boundaries adopted.
- Vertical surface dimensions to TBMS
- All internal luminaires on elevations facing sensitive boundaries changed from pendants to downlights.
- Glazing transmission factors reduced to 0.6 on selected elevations facing sensitive boundaries (refer to report for plot numbers).
- Street light 1-3 turned off.
- Plots 28; 64-66; 61; 88 & 89 moved back by 1m produced negligible improvements (circa 0.01 Lux) so plots reinstated
- Additional vertical measuring surfaces provided:
  - N25 to N30 facing south (N25a-N30a)
  - S9 - 5m and 10m back from buffer zone (S9a & b)
  - N8&9 - 1m and 2m back from buffer zone (N8a & b / N9 a & b)
  - E21 to E27 - 5m and 10m back from buffer zone (E22a/b - E27a/b)

KEY PLAN

NOTES

REVISIONS

P01	ISSUED FOR INFORMATION					
	AB	08.04.22	JM	08.04.22	IG	08.04.22
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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PROJECT
LAND OFF ELIZABETH WAY
HILPERTON

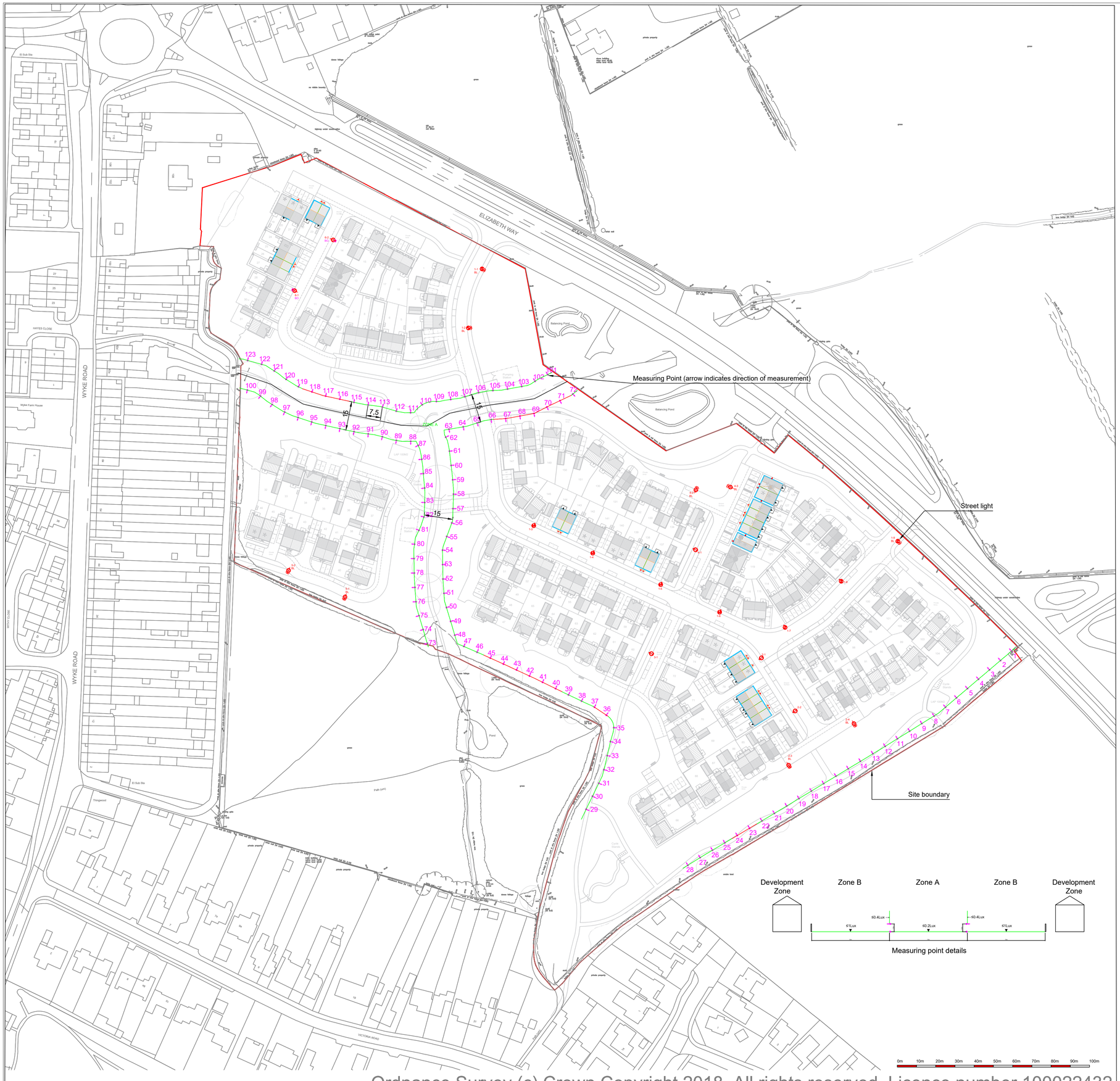
TITLE
SITE PLAN
VERTICAL SURFACE VALUES

HYDROCK PROJECT NO.	SCALE @ A1
C-20919	1:1000

STATUS DESCRIPTION	STATUS
FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
EWT-HYD-ZZ-ZZ-DR-E-2001	P01

Appendix D: Proposed Measuring Points.



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Light Monitoring Regime
Land West of Elizabeth Way, Hilperton, Trowbridge

Measuring Point Reference	Recorded Horizontal Value (Lux)	Anticipated maximum value (Lux)	Recorded Vertical Value (Lux)	Anticipated Maximum Value (Lux)	Comment
1		≤0.2		0.09	
2		≤0.2		0.2	
3		≤0.2		0.2	
4		≤0.2		0.37	
5		≤0.2		0.37	
6		≤0.2		0.39	
7		≤0.2		0.39	
8		≤0.2		0.35	
9		≤0.2		0.39	
10		≤0.2		0.39	
11		≤0.2		0.4	
12		≤0.2		0.35	
13		≤0.2		0.35	
14		≤0.2		0.35	
15		≤0.2		0.38	
16		≤0.2		0.38	
17		≤0.2		0.31	
18		≤0.2		0.31	
19		≤0.2		0.4	
20		≤0.2		0.4	
21		≤0.2		0.4	
22		≤0.2		0.4	
23		≤0.2		1.37	
24		≤0.2		1.37	
25		≤0.2		0.33	
26		≤0.2		0.33	
27		≤0.2		0.2	
28		≤0.2		0.2	
29		≤0.2		0.26	
30		≤0.2		0.34	
31		≤0.2		0.34	
32		≤0.2		0.26	
33		≤0.2		0.26	
34		≤0.2		0.26	
35		≤0.2		0.23	
36		≤0.2		0.63	
37		≤0.2		0.63	
38		≤0.2		0.4	
39		≤0.2		0.4	
40		≤0.2		0.73	
41		≤0.2		0.73	
42		≤0.2		0.89	
43		≤0.2		0.89	
44		≤0.2		0.63	
45		≤0.2		0.63	
46		≤0.2		0.37	
47		≤0.2		0.37	
48		≤0.2		0.37	
49		≤0.2		0.31	
50		≤0.2		0.31	
51		≤0.2		0.33	
52		≤0.2		0.33	
53		≤0.2		0.36	
54		≤0.2		0.29	
55		≤0.2		0.36	
56		≤0.2		0.36	
57		≤0.2		0.31	
58		≤0.2		0.31	
59		≤0.2		0.39	
60		≤0.2		0.3	
61		≤0.2		0.3	
62		≤0.2		0.12	
63		≤0.2		0.16	
64		≤0.2		0.16	
65		≤0.2		0.29	
66		≤0.2		0.25	
67		≤0.2		1.56	
68		≤0.2		1.56	
69		≤0.2		1.56	
70		≤0.2		0.88	
71		≤0.2		0.63	
72		≤0.2		0.19	
73		≤0.2		0.076	
74		≤0.2		0.16	
75		≤0.2		0.16	
76		≤0.2		0.33	
77		≤0.2		0.33	
78		≤0.2		0.4	
79		≤0.2		0.4	
80		≤0.2		0.3	
81		≤0.2		0.19	
82		≤0.2		0.12	
83		≤0.2		0.14	
84		≤0.2		0.13	
85		≤0.2		0.13	
86		≤0.2		0.19	
87		≤0.2		0.23	
88		≤0.2		0.22	
89		≤0.2		0.34	
90		≤0.2		0.33	
91		≤0.2		0.38	
92		≤0.2		0.4	
93		≤0.2		0.39	
94		≤0.2		0.39	
95		≤0.2		0.33	
96		≤0.2		0.33	
97		≤0.2		0.39	
98		≤0.2		0.24	
99		≤0.2		0.11	
100		≤0.2		0.1	
101		≤0.2		0.05	
102		≤0.2		0.064	
103		≤0.2		0.05	
104		≤0.2		0.12	
105		≤0.2		0.15	
106		≤0.2		0.16	
107		≤0.2		0.26	
108		≤0.2		0.26	
109		≤0.2		0.21	
110		≤0.2		0.29	
111		≤0.2		0.29	
112		≤0.2		0.29	
113		≤0.2		0.29	
114		≤0.2		0.4	
115		≤0.2		0.39	
116		≤0.2		0.72	
117		≤0.2		0.72	
118		≤0.2		0.69	
119		≤0.2		0.31	
120		≤0.2		0.34	
121		≤0.2		0.35	
122		≤0.2		0.31	
123		≤0.2		0.31	

KEY PLAN

NOTES

1. This drawing to be read in conjunction with Hydrock Light Monitoring strategy EW-HYD-ZZ-ZZ-RP-E-2001.
2. Lighting survey to be undertaken by a lighting professional.
3. Site risk assessment to be undertaken before any survey work undertaken
4. Lighting survey to be undertaken on or close to the night of a new moon under favourable weather conditions.
5. Light measurements to be taken with calibrated cosine corrected meter.
6. Horizontal measurement to be taken at ground level.
7. Vertical measurements to be taken at 1.5m above ground perpendicular to ground in direction of arrow indicated on plan.
8. Survey results to be presented in format prescribed in the agreed Lighting Monitoring Regime - see (1) above.

REVISIONS

P01	ISSUED FOR INFORMATION					
	AB	08.04.22	JM	08.04.22	IG	08.04.22
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
Bellway

PROJECT
LAND OFF ELIZABETH WAY
HILPERTON

TITLE
SITE PLAN
VERTICAL SURFACE VALUES

HYDROCK PROJECT NO.	SCALE @ A1	
C-20919	1:1000	
STATUS DESCRIPTION		STATUS
FOR INFORMATION		S2
DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)		REVISION
EWT-HYD-ZZ-ZZ-DR-E-2001		P01

Appendix E: Schedule of Measuring Results.

Measuring Point Reference	Recorded Horizontal Value (Lux)	Anticipated maximum value (Lux)	Recorded Vertical Value (Lux)	Anticipated Maximum Value (Lux)	Comment
1		≤ 0.2		0.09	
2		≤ 0.2		0.2	
3		≤ 0.2		0.2	
4		≤ 0.2		0.37	
5		≤ 0.2		0.37	
6		≤ 0.2		0.39	
7		≤ 0.2		0.39	
8		≤ 0.2		0.35	
9		≤ 0.2		0.39	
10		≤ 0.2		0.39	
11		≤ 0.2		0.4	
12		≤ 0.2		0.35	
13		≤ 0.2		0.35	
14		≤ 0.2		0.35	
15		≤ 0.2		0.38	
16		≤ 0.2		0.38	
17		≤ 0.2		0.31	
18		≤ 0.2		0.31	
19		≤ 0.2		0.4	
20		≤ 0.2		0.4	
21		≤ 0.2		0.4	
22		≤ 0.2		0.4	
23		≤ 0.2		1.37	
24		≤ 0.2		1.37	
25		≤ 0.2		0.33	

Measuring Point Reference	Recorded Horizontal Value (Lux)	Anticipated maximum value (Lux)	Recorded Vertical Value (Lux)	Anticipated Maximum Value (Lux)	Comment
26		≤ 0.2		0.33	
27		≤ 0.2		0.2	
28		≤ 0.2		0.2	
29		≤ 0.2		0.26	
30		≤ 0.2		0.34	
31		≤ 0.2		0.34	
32		≤ 0.2		0.26	
33		≤ 0.2		0.26	
34		≤ 0.2		0.26	
35		≤ 0.2		0.23	
36		≤ 0.2		0.63	
37		≤ 0.2		0.63	
38		≤ 0.2		0.4	
39		≤ 0.2		0.4	
40		≤ 0.2		0.73	
41		≤ 0.2		0.73	
42		≤ 0.2		0.89	
43		≤ 0.2		0.89	
44		≤ 0.2		0.63	
45		≤ 0.2		0.63	
46		≤ 0.2		0.37	
47		≤ 0.2		0.37	
48		≤ 0.2		0.37	
49		≤ 0.2		0.31	
50		≤ 0.2		0.31	

Measuring Point Reference	Recorded Horizontal Value (Lux)	Anticipated maximum value (Lux)	Recorded Vertical Value (Lux)	Anticipated Maximum Value (Lux)	Comment
51		≤ 0.2		0.33	
52		≤ 0.2		0.33	
53		≤ 0.2		0.36	
54		≤ 0.2		0.29	
55		≤ 0.2		0.36	
56		≤ 0.2		0.36	
57		≤ 0.2		0.31	
58		≤ 0.2		0.31	
59		≤ 0.2		0.39	
60		≤ 0.2		0.3	
61		≤ 0.2		0.3	
62		≤ 0.2		0.12	
63		≤ 0.2		0.16	
64		≤ 0.2		0.16	
65		≤ 0.2		0.29	
66		≤ 0.2		0.25	
67		≤ 0.2		1.56	
68		≤ 0.2		1.56	
69		≤ 0.2		1.56	
70		≤ 0.2		0.88	
71		≤ 0.2		0.63	
72		≤ 0.2		0.19	
73		≤ 0.2		0.076	
74		≤ 0.2		0.16	
75		≤ 0.2		0.16	

Measuring Point Reference	Recorded Horizontal Value (Lux)	Anticipated maximum value (Lux)	Recorded Vertical Value (Lux)	Anticipated Maximum Value (Lux)	Comment
76		≤ 0.2		0.33	
77		≤ 0.2		0.33	
78		≤ 0.2		0.4	
79		≤ 0.2		0.4	
80		≤ 0.2		0.3	
81		≤ 0.2		0.19	
82		≤ 0.2		0.12	
83		≤ 0.2		0.14	
84		≤ 0.2		0.13	
85		≤ 0.2		0.13	
86		≤ 0.2		0.19	
87		≤ 0.2		0.23	
88		≤ 0.2		0.22	
89		≤ 0.2		0.34	
90		≤ 0.2		0.33	
91		≤ 0.2		0.38	
92		≤ 0.2		0.4	
93		≤ 0.2		0.39	
94		≤ 0.2		0.39	
95		≤ 0.2		0.33	
96		≤ 0.2		0.33	
97		≤ 0.2		0.39	
98		≤ 0.2		0.24	
99		≤ 0.2		0.11	
100		≤ 0.2		0.1	

Measuring Point Reference	Recorded Horizontal Value (Lux)	Anticipated maximum value (Lux)	Recorded Vertical Value (Lux)	Anticipated Maximum Value (Lux)	Comment
101		≤ 0.2		0.05	
102		≤ 0.2		0.064	
103		≤ 0.2		0.05	
104		≤ 0.2		0.12	
105		≤ 0.2		0.15	
106		≤ 0.2		0.16	
107		≤ 0.2		0.26	
108		≤ 0.2		0.26	
109		≤ 0.2		0.21	
110		≤ 0.2		0.29	
111		≤ 0.2		0.29	
112		≤ 0.2		0.29	
113		≤ 0.2		0.29	
114		≤ 0.2		0.4	
115		≤ 0.2		0.39	
116		≤ 0.2		0.72	
117		≤ 0.2		0.72	
118		≤ 0.2		0.69	
119		≤ 0.2		0.31	
120		≤ 0.2		0.34	
121		≤ 0.2		0.35	
122		≤ 0.2		0.31	
123		≤ 0.2		0.31	