



NORMAN BROMLEY
PARTNERSHIP

PROJECT REF: BS 2131
DATE: - JULY 2024
REVISION: 09

WENSLEY ROAD, READING
EXTERNAL LIGHTING PROPOSALS

PREPARED BY :-

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PROJECT REVISION SHEET

<u>Revision No.</u>	<u>Date</u>	<u>Details</u>	<u>Changes</u>	<u>Author</u>	<u>Approved</u>
0	April 2021			MR	MR
01	July 2023		Revised to include luminaire location changes	MR	MR
02	September 2023		Revised to include additional luminaires	CH	MR
03	September 2023		Revised to include detailed calculation areas & footpath locations.	CH	MR
04	September 2023		Revised to include additional luminaire	CH	MR
05	December 2023		Revised to incorporate comments	CH	MR
06	April 2024		Revised to incorporate comments	CH	MR
07	April 2024		Revised to incorporate comments	CH	MR
08	July 2024		Revised to incorporate comments	CH	MR
09	July 2024		Revised to incorporate comments	CH	MR

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1.0 **INTRODUCTION**

The project is a residential development comprising 46 dwellings including 28 individual town houses and a block of apartments containing 18 apartments.

The site includes extensive landscape works including access roads, car parks and community space.

The lighting calculations and this report has been produced by Norman Bromley Partnership Consulting Engineers to detail external lighting proposed for the development and demonstrate compliance with BS 5849-1 : 2013 Lighting of Road and Public Amenity.

2.0 **READING COUNCIL REQUIREMENTS**

2.1 **External Lighting Systems**

2.1.1 System Description

The main site external lighting will be designed in conjunction with the Landscape Architect in line with the performance design drawings which have been submitted for planning approval.

The main site external lighting shall be designed in accordance with the Reading Borough Council standards for adoptable roads including the control requirements and preferred manufacturers. This consists of column mounted energy efficient LED luminaires. All to be to adoptable standards.

In addition to the main site external lighting installation, additional pedestrian access and landscape lighting to central amenity areas/routes and local external lighting down the rear access ways between the rows of townhouses and local building mounted external lighting to the apartment block shall be incorporated with 'landlord' electrical supplies for these to be obtained from the SSEN network where not able to be supplied from the apartment block landlord supply.

Domestic external lighting will be provided to the townhouses adjacent to the front and rear entrance doors at ground floor, and along access routes from the external rear entrances to the rear townhouse entrance doors.

All adoptable and common area landscape lighting shall have power supplies derived from the local Scottish and Southern Energy Networks LV network, will an application to be made for these connections once the design for them and final quantity of connections has been determined.

2.2.1 Planning Requirements

Energy-efficient light fittings are specified, in accordance with the Reading Borough Council specification for street lighting installations. The lighting will also be controlled for dusk to dawn operation with connection to a Mayflower Smart Control System master controller system.

The external lighting will be designed in compliance with the ILP Guidance notes for the reduction of obtrusive light.

All external lighting will be designed in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas and BS EN 12464-2:2014.

The final external lighting design shall be in compliance with the planning permission requirements.

External luminaires will be specified with an output of at least 60 luminaire lumens per circuit watt.

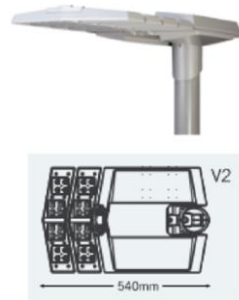
Street lighting shall be designed in accordance with Reading Borough Council specification for street lighting installations.

The installation will achieve the following design lighting levels:

External Area	Design Illuminance Level
Pathways Adjacent to Buildings	10 lux (floor level)
External plant	50-100 lux
Car parking/Roads/Site Wide Pedestrian Routes	5 lux (floor level) average maintained, 1 lux minimum.

3.0 **PROPOSED LUMINAIRES**

The luminaires to be installed are as follows: -

REF	DESCRIPTION	MANUFACTURER'S DETAILS	IMAGE	LOCATION
X	Product Name: Holophane VMX 2 Description: V-max Street lighting luminaire Mounting: 6m Column Lamp Wattage: 18W Lumen Output: 2204lm Lamp type: LED Colour Temperature: 2700K Dimensions: 540mm x 340mm x 80mm Finish: Grey IP Rating: IP66 Control Gear: Electronic with Mayflower Smart Control Integrated	Name: Holophane		Street
Y	Product Name: NYX 330 Description: Architectural external luminaire Fortimo FastFlex G4 LED Module SW-X Optic Setting Mounting: 5m Column Lamp wattage: 37.5W Lumen output: 3136lm Lamp Type: LED Colour temperature: 2700K Dimensions: 416mm x 330mm x 191mm Finish: TBC by landscape architect IP rating: IP66 Control Gear: Electronic with Mayflower Smart Control integrated	Name: DW Windsor		Footpath in central landscaped area
Q	Product Name: Eye Description: Exterior die cast aluminium amenity bulkhead Mounting: Surface mounted Lamp wattage: 15W Lumen output: 1600lm Lamp Type: LED Colour temperature: 2700K Dimensions: 330mm x 176mm Finish: Black IP rating: IP65 Control Gear: Photocell	Name: Smart Systems		Garden access footpath

The proposed luminaires use good quality LED lighting which is an environmentally friendly light source.

The proposed luminaires are provided with very good lighting control to avoid spill light to adjacent properties and upward light.

Final Details to be confirmed in Technical Submission by electrical contractor.

4.0 **CONCLUSION**

The results included in Appendix A of this report demonstrate that the design is in accordance with the Reading Council brief and BS 5489-1 : 2013 Lighting of Roads and Public Amenity Areas. The following lighting levels are achieved:-

Pathways Adjacent to Buildings – 10 Lux

Car Parking / Roads / Site Wide Pedestrian Routes – 5 Lux (Floor Level) average maintained minimum 1 Lux.

The results also indicate that there will be minimum light spill to adjacent properties.

APPENDIX A – SITE PLAN INDICATING LIGHTING LEVELS

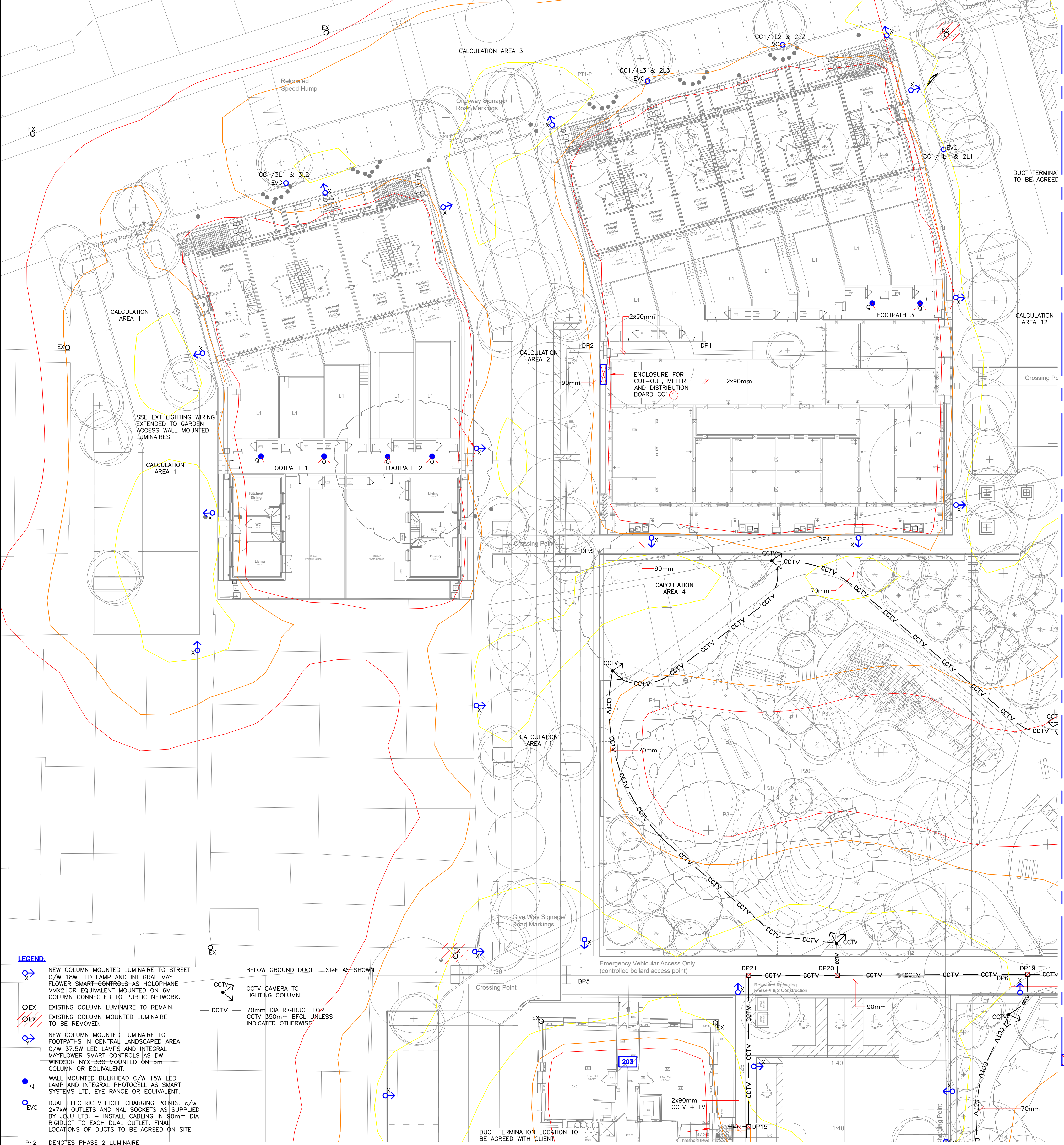
PROJECT NOTES

- STREET LIGHTING P CLASS SELECTION - P4: MINIMUM MAINTAINED AVERAGE 5 LUX MINIMUM MAINTAINED 1 LUX. MAXIMUM NOT TO EXCEED 7.5 LUX
- PROVIDE STREET LIGHTING IN ACCORDANCE WITH THE READING BOROUGH COUNCIL SPECIFICATION FOR STREET LIGHTING INSTALLATIONS. PROVIDE DUSK TO DAWN OPERATION WITH MAYFLOWER MASTER CONTROLLER SYSTEM.
- COLUMN TYPE: 6M UN-FLANGED, TUBULAR STEEL BS EN ISO 1461: HOT DIP GALVANIZED, STRAIGHT SHAFT (NO BRACKET) UNPAINTED.
- COLUMNS MUST NOT OBSTRUCT FOOTPATHS OR VEHICULAR ACCESS. THEY SHALL BE SITED IN ACCORDANCE WITH BS5489-1:2003 + A2:2008, CODE OF PRACTICE FOR THE DESIGN OF ROAD LIGHTING PART 1: LIGHTING OF ROADS AND PUBLIC AMENITY AREAS AND GENERALLY BE PLANTED IN THE FOOTPATH AT THE REAR OR IN THE ABSENCE OF A FOOTPATH, A MINIMUM OF 0.8 METRES FROM THE KERB EDGE TO THE FACE OF THE COLUMN AND WITHIN THE HIGHWAY TO BE ADOPTED. NO

- OBSTRUCTION OR PLANTING SHALL HINDER ACCESS TO THE COLUMN BASE COMPARTMENT OR THE LIGHT DISTRIBUTION FROM THE LANTERN. ON TERRACED STREETS COLUMNS SHOULD BE SITED ON OR AS CLOSE AS POSSIBLE TO THE PROPERTY BOUNDARY LINE TO PREVENT OBSTRUCTION OF VIEWS TO AND FROM THE PROPERTY.
- ALL COLUMNS SHALL HAVE A ROOT FOR PLANTING TO A DEPTH SHOWN BY THE MIDDLE RANGE LISTED IN CLAUSE 5 OF PART 2 OF BS 5649: 6 METRE COLUMNS 1000MM PLANTING DEPTH.
- LANTERN TYPE: HOLOPHANE VMX024 V1 NW 3.92KLM, 2700K, WITH DALI EQUIPPED. ELECTRONIC BALLAST, 6 PIN NEMA SOCKET AND MAYFLOWER CMS NODE. POST TOP MOUNTED MAXIMUM TILT 5 DEGREES. COLOUR LIGHT GREY.
- LANTERNS MUST COMPLY WITH BS EN 60958-2-3 2011 AND BE LIGHT GREY IN COLOUR. LIGHT SOURCES SHALL BE LED.
- ALL CUT-OUTS SHALL INCORPORATE A DOUBLE POLE ISOLATION SWITCH COMPLYING WITH BS EN 60947-3:1992 HAVING A RATING OF 32 AMPS AND OF ADEQUATE SHORT CIRCUIT WITHSTAND FOR THE POSITION IN THE CIRCUIT IN WHICH IT IS INSTALLED. THE

- ISOLATION SWITCH SHALL BE CAPABLE OF BEING POSITIVELY AND VISIBLY LOCKED OFF BY MEANS OF A PADLOCK OR LOCKING BAR AND IT SHALL NOT BE POSSIBLE TO REMOVE THE OUTGOING FUSE(S) UNLESS THE ISOLATION SWITCH IS IN THE OFF POSITION. FUSE CARRIERS SHALL UTILISE HRC FUSE LINKS TO BS 88-2. THE INSTALLATION SHALL BE EARTHED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT BS 7671, AND WITH THE RECOMMENDATIONS CONTAINED IN BS 7430

Wensley Road Site



FOR CONTINUATION SEE DRAWING No. 2131-NBP-00-GA-E-141

FOR CONTINUATION SEE DRAWING No. 2131-NBP-00-GA-E-142

Notes

- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER ENGINEERING AND ARCHITECTURAL DRAWINGS.
 - EXACT POSITIONS AND MOUNTING HEIGHTS OF ALL EQUIPMENT TO BE AGREED WITH THE ARCHITECT BEFORE THE INSTALLATION IS COMMENCED.
- DP1 TO DP2 600x600x800D
DP3 TO DP6 450x450x600D
DP7 TO DP16 600x600x600 CCTV + LV
DP17 TO DP22 450x450x450 CCTV
- DP CABLE PITS TO BE AS ADVANCED EASY PIT CONNECT COMPLETE WITH MEDIUM DUTY DUCTILE IRON COVER AND FRAME. COVER SPECIFICATION TO BE AGREED WITH LANDSCAPE ARCHITECT.

ISOLINE LEGEND.

- 1 LUX
- 2 LUX
- 5 LUX
- 10 LUX
- 20 LUX

Rev	Date	Revision	Dwn	Chk
C18	09.07.24	(FOR INFORMATION ONLY)	CH	MR
C17	11.06.24	(FOR INFORMATION ONLY)	CH	MR
C16	22.05.24	REVISED TO INCORPORATE COMMENTS	CH	MR
C15	15.04.24	NOTE AMENDED	CH	MR
C14	09.04.24	COMMENTS INCLUDED	CH	MR
C13	26.09.23	REVISED TO INCORPORATE COMMENTS	DP	MR

Project	WENSLEY ROAD, READING
Client	READING BOROUGH COUNCIL
Title	EXTERNAL ELECTRICAL SITE SERVICES LAYOUT (SHEET 1 OF 3)

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Scale	Date	Drawn	Approved
1:200@A1	MAR'21	DP	MR
Drawing No.			Rev.
2131-NBP-XX-XX-GA-E-140			C18

PROJECT NOTES

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FOR CONTINUATION SEE DRAWING No. 2131-NBP-00-GA-E-140

FOR CONTINUATION SEE DRAWING No. 2131-NBP-00-GA-E-142

LEGEND

- NEW COLUMN MOUNTED LUMINAIRE TO STREET C/W 18W LED LAMP AND INTEGRAL MAYFLOWER SMART CONTROLS AS HOLOPHANE VMX2 OR EQUIVALENT MOUNTED ON 6M COLUMN CONNECTED TO PUBLIC NETWORK.
- EXISTING COLUMN LUMINAIRE TO REMAIN.
- EXISTING COLUMN MOUNTED LUMINAIRE TO BE REMOVED.
- NEW COLUMN MOUNTED LUMINAIRE TO FOOTPATHS IN CENTRAL LANDSCAPED AREA C/W 37.5W LED LAMP AND INTEGRAL MAYFLOWER SMART CONTROLS AS DW WINDSOR NY 330 MOUNTED ON 5m COLUMN OR EQUIVALENT.
- WALL MOUNTED BULKHEAD C/W 15W LED LAMP AND INTEGRAL PHOTOCELL AS SMART SYSTEMS LTD; EYE RANGE OR EQUIVALENT.
- DUAL ELECTRIC VEHICLE CHARGING POINTS, c/w 2x7kW OUTLETS AND NAL SOCKETS AS SUPPLIED BY JOUJI LTD. - INSTALL CABLEING IN 90mm DIA RIGIDUCT TO EACH DUAL OUTLET. FINAL LOCATIONS OF DUCTS TO BE AGREED ON SITE
- Ph2 DENOTES PHASE 2 LUMINAIRE
- BELOW GROUND DUCT - SIZE AS SHOWN
- CCTV CAMERA TO LIGHTING COLUMN
- 70mm DIA RIGIDUCT FOR CCTV 350mm BFLG UNLESS INDICATED OTHERWISE

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- 1 LUX
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C19	09.07.24	(FOR INFORMATION ONLY)	CH	MR
C18	11.06.24	(FOR INFORMATION ONLY)	CH	MR
C17	22.05.24	REVISED TO INCORPORATE COMMENTS	CH	MR
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Rev	Date	Revision	Dwn	Chk
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Project
WENSLEY ROAD, READING

Client
READING BOROUGH COUNCIL

Title
EXTERNAL ELECTRICAL SITE SERVICES LAYOUT
(SHEET 2 OF 3)

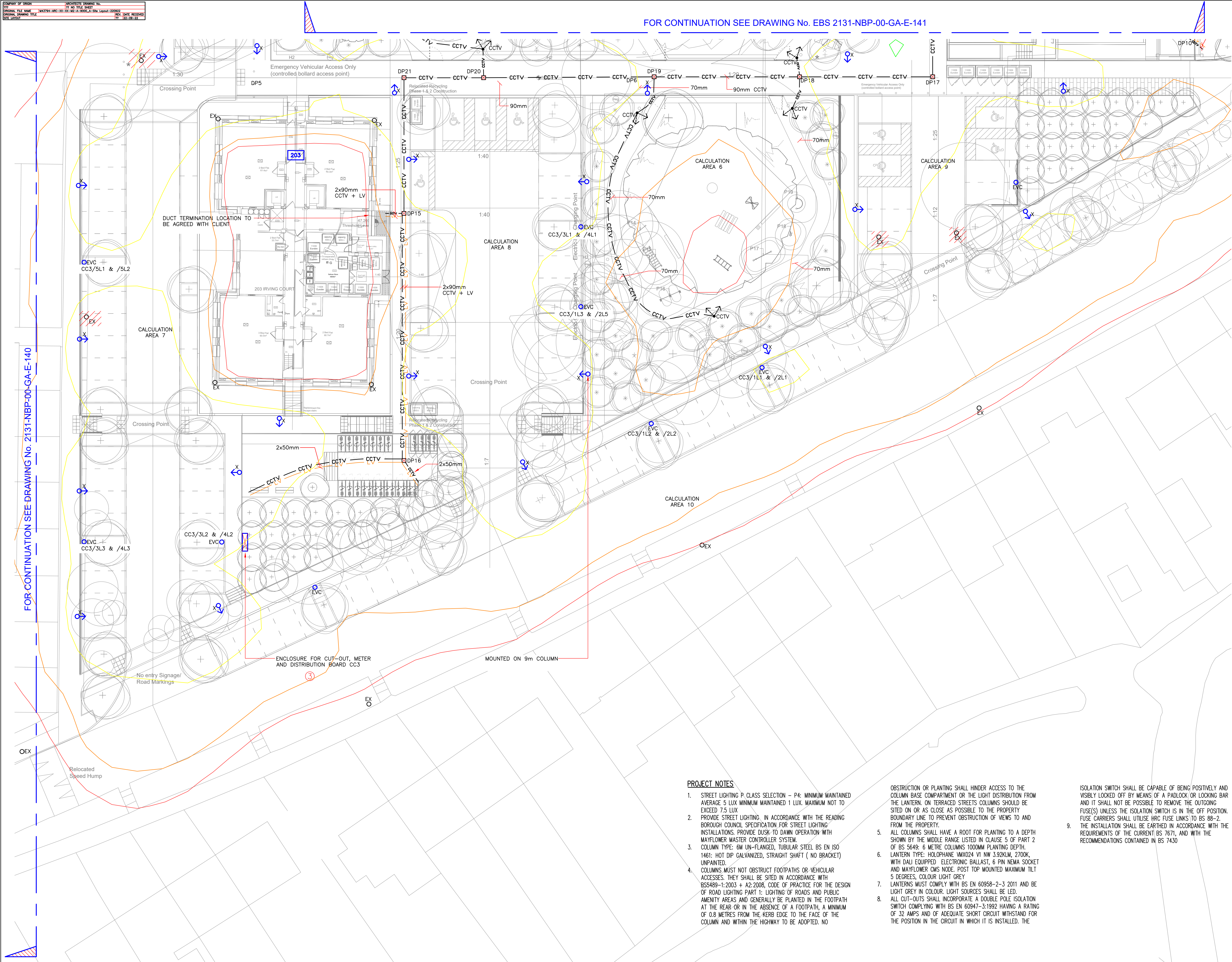
NORMAN BROMLEY
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Scale	Date	Drawn	Approved
1:200@A1	MAR'21	DP	MR

Drawing No. 2131-NBP-XX-XX-GA-E-141 Rev. C19

FOR CONTINUATION SEE DRAWING No. EBS 2131-NBP-00-GA-E-141



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Client
READING BOROUGH COUNCIL

Project
WENSLEY ROAD, READING

Service
ELECTRICAL ENGINEERING

Title
EXTERNAL ELECTRICAL SITE SERVICES LAYOUT (SHEET 3 OF 3)

Scale 1:200@A1	Date MAR'21	Drawn DP	Approved MR
Drawing No. 2131-NBP-XX-XX-GA-E-142	Rev. C18		

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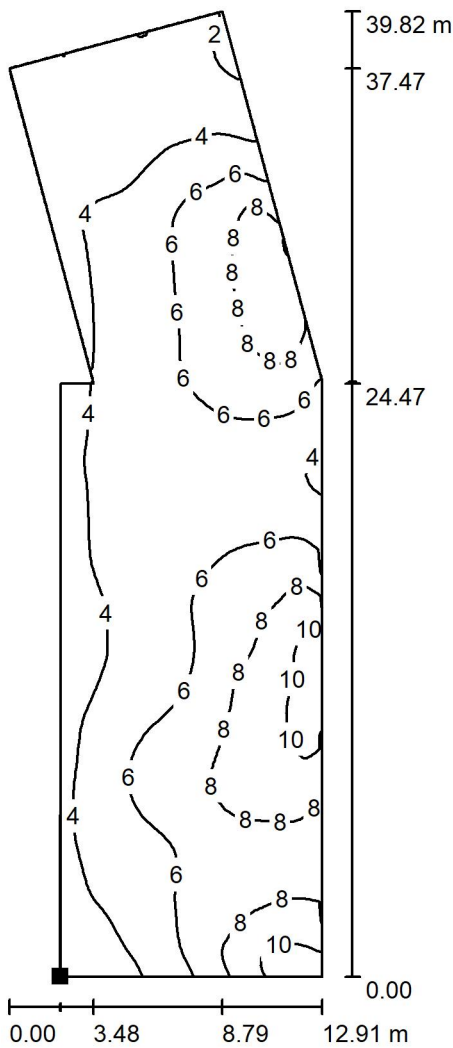
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APPENDIX B – INDIVIDUAL CALCULATION AREAS FOR FLAT ACCESS ALLEYWAYS



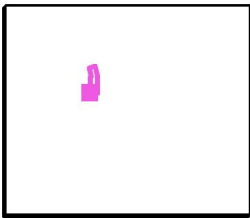
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 1 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 312

Position of surface in external scene:
Marked point:
(150.868 m, 204.589 m, 0.750 m)



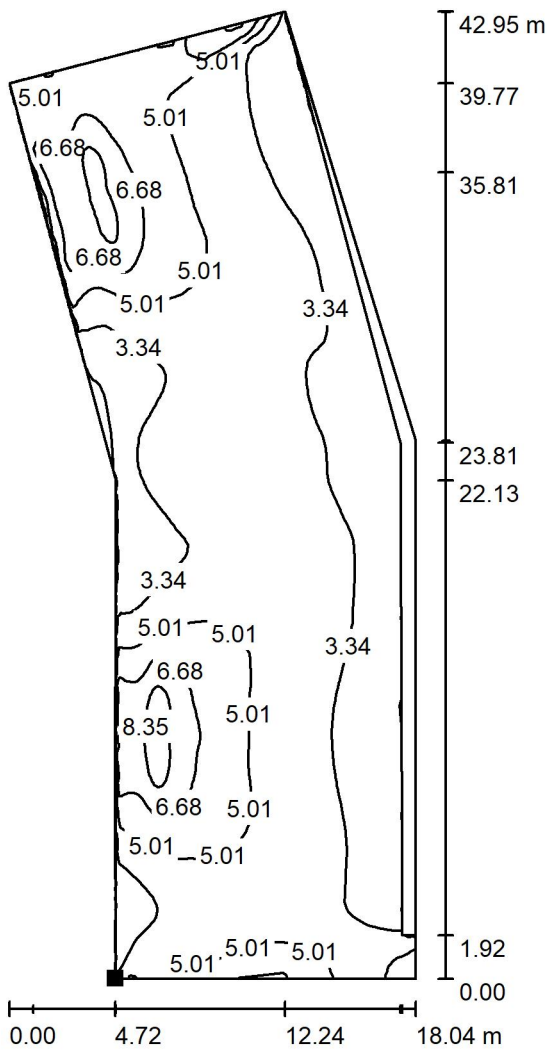
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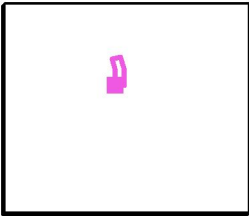
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 2 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 336

Position of surface in external scene:
Marked point:
(189.600 m, 212.670 m, 0.750 m)



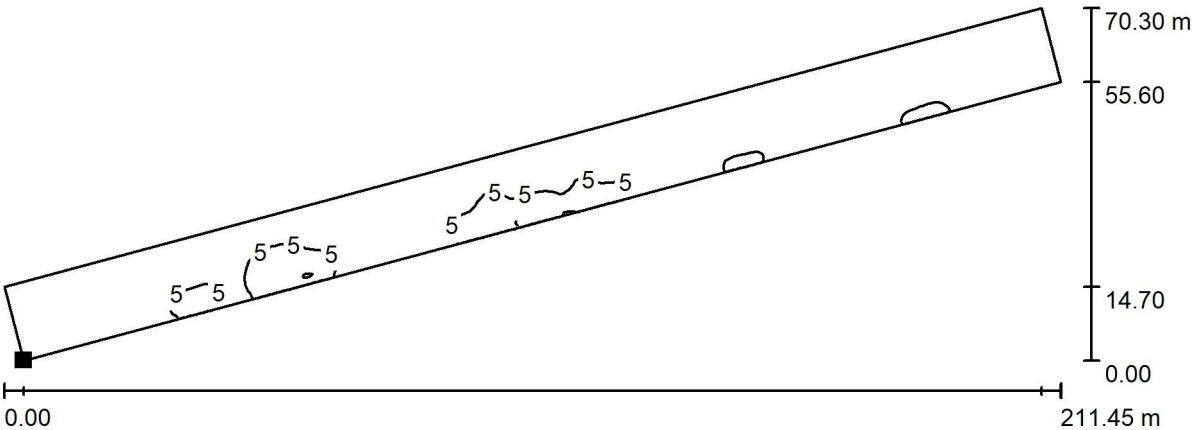
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
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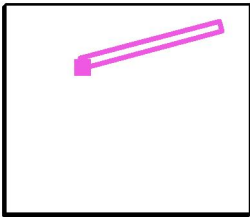
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 3 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 1512

Position of surface in external scene:
Marked point:
(139.841 m, 240.392 m, 0.750 m)



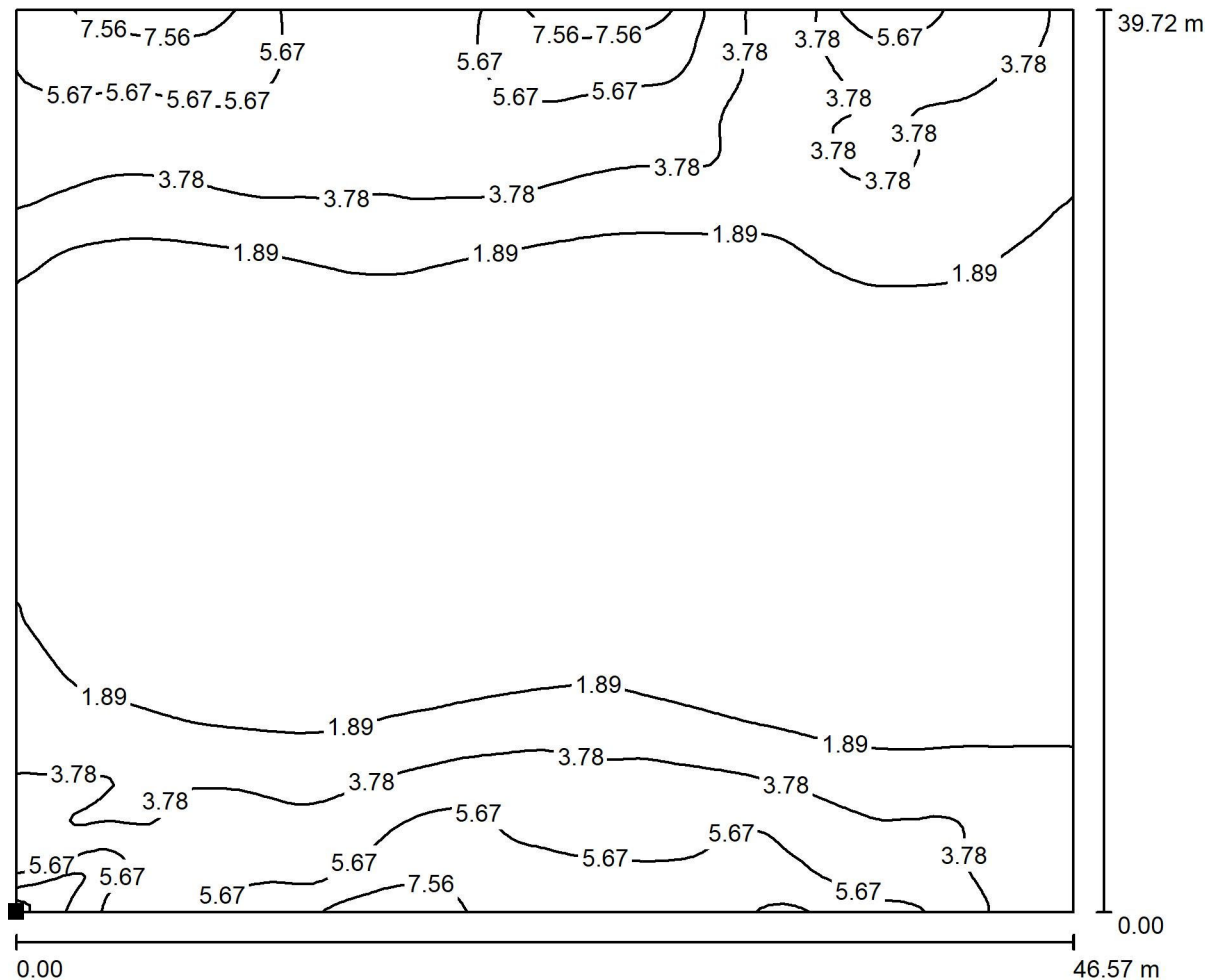
Grid: 128 x 64 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
2.49	0.07	10	0.029	0.007



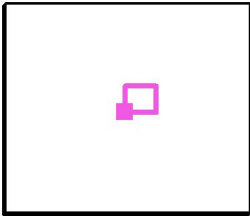
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 4 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 333

Position of surface in external scene:
Marked point:
(202.432 m, 172.852 m, 0.750 m)



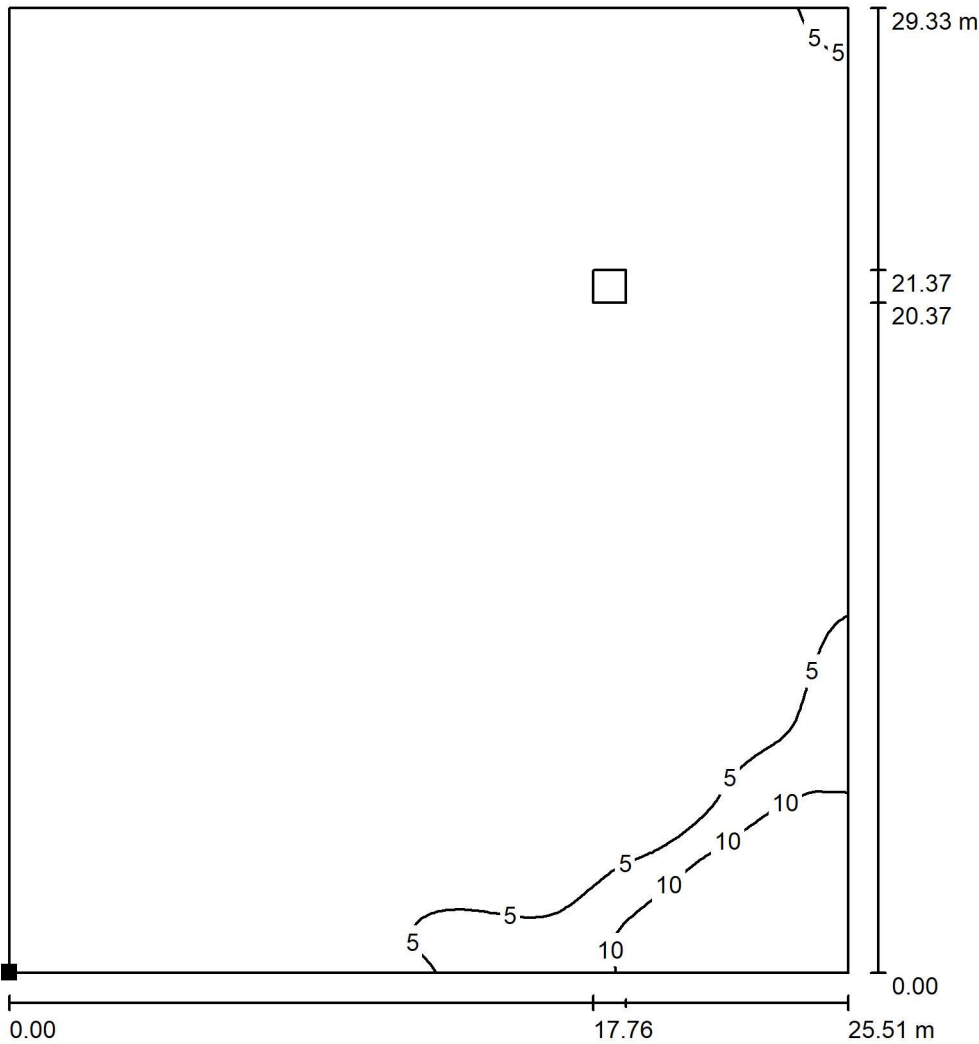
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
2.42	0.26	9.71	0.107	0.027



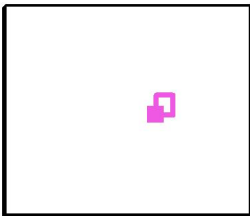
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 5 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 230

Position of surface in external scene:
Marked point:
(248.985 m, 172.167 m, 0.750 m)



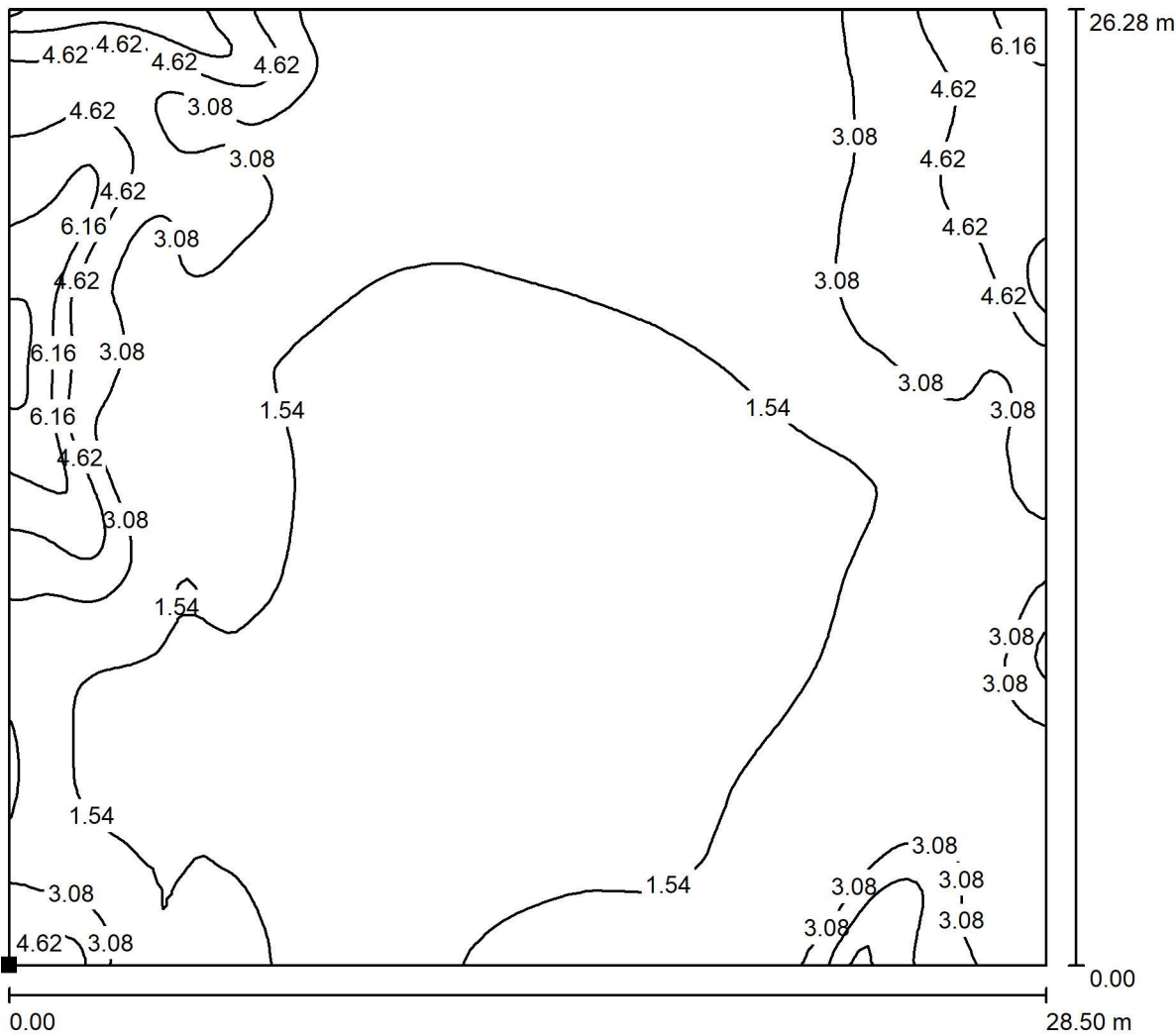
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
2.05	0.20	14	0.097	0.015



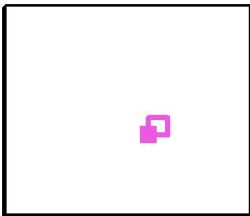
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 6 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 206

Position of surface in external scene:
Marked point:
(237.797 m, 141.822 m, 0.750 m)



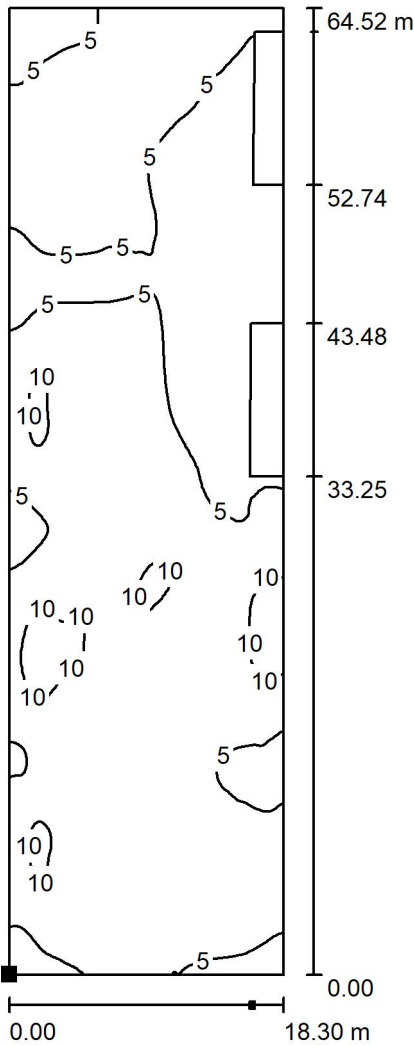
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
2.25	0.48	8.16	0.213	0.059



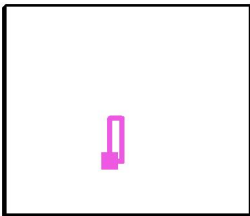
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 7 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 505

Position of surface in external scene:
Marked point:
(180.000 m, 102.600 m, 0.750 m)



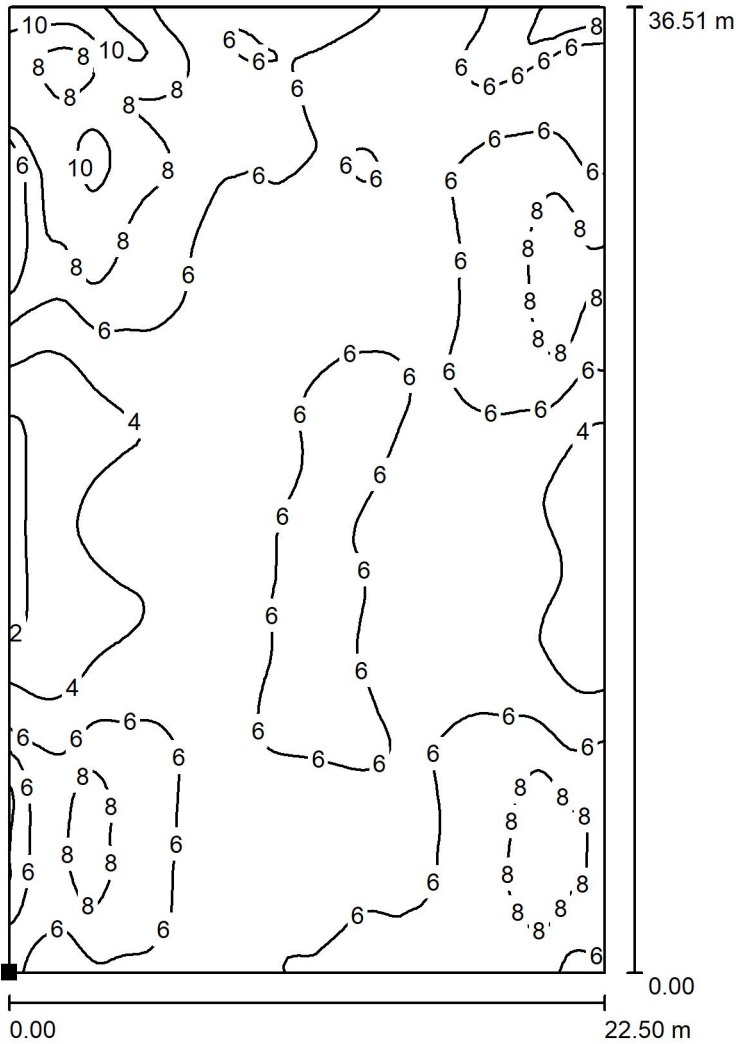
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
6.47	0.36	13	0.055	0.028



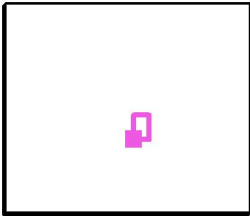
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 8 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 286

Position of surface in external scene:
Marked point:
(215.949 m, 132.263 m, 0.750 m)



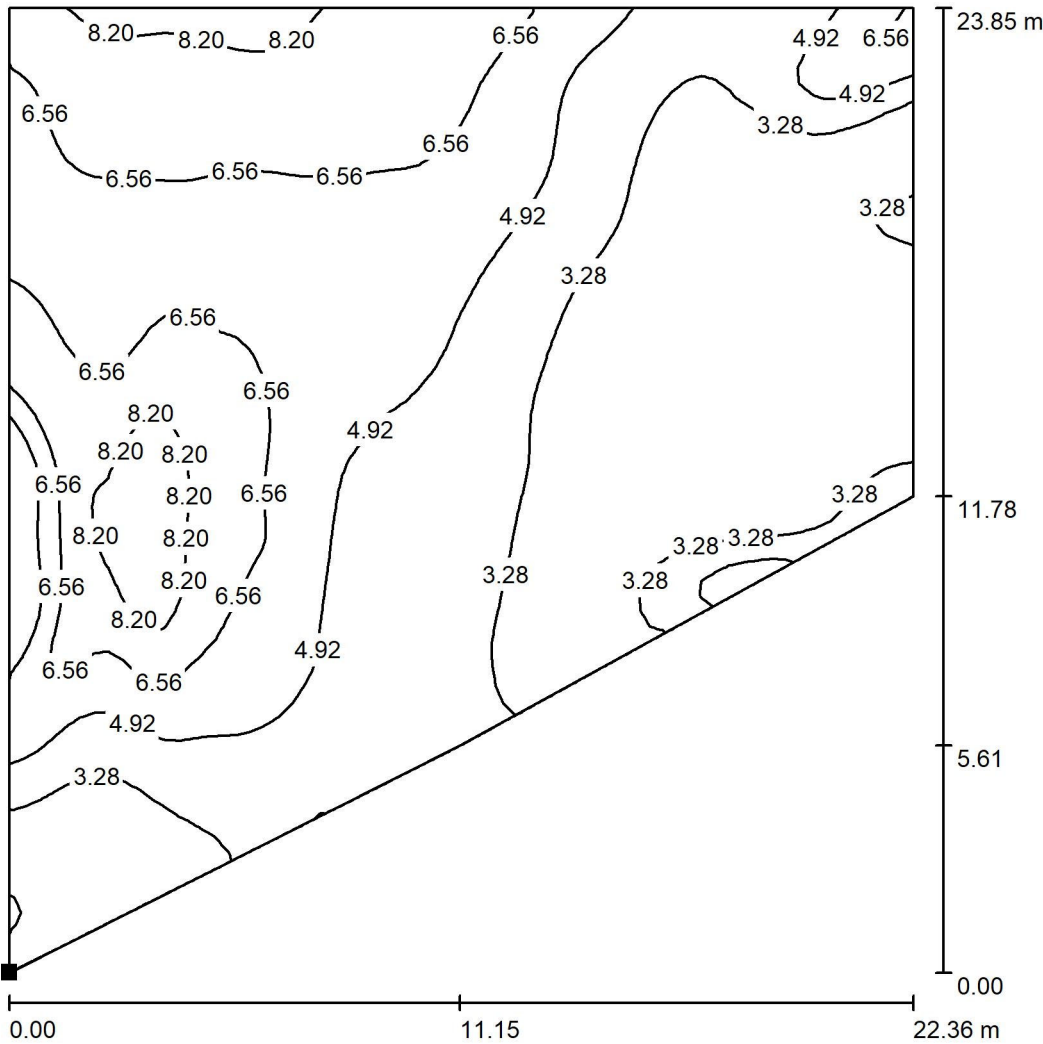
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
5.90	1.51	11	0.256	0.135



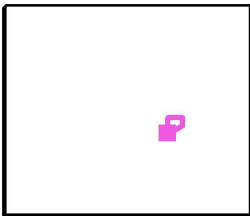
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 9 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 187

Position of surface in external scene:
Marked point:
(266.345 m, 144.519 m, 0.750 m)



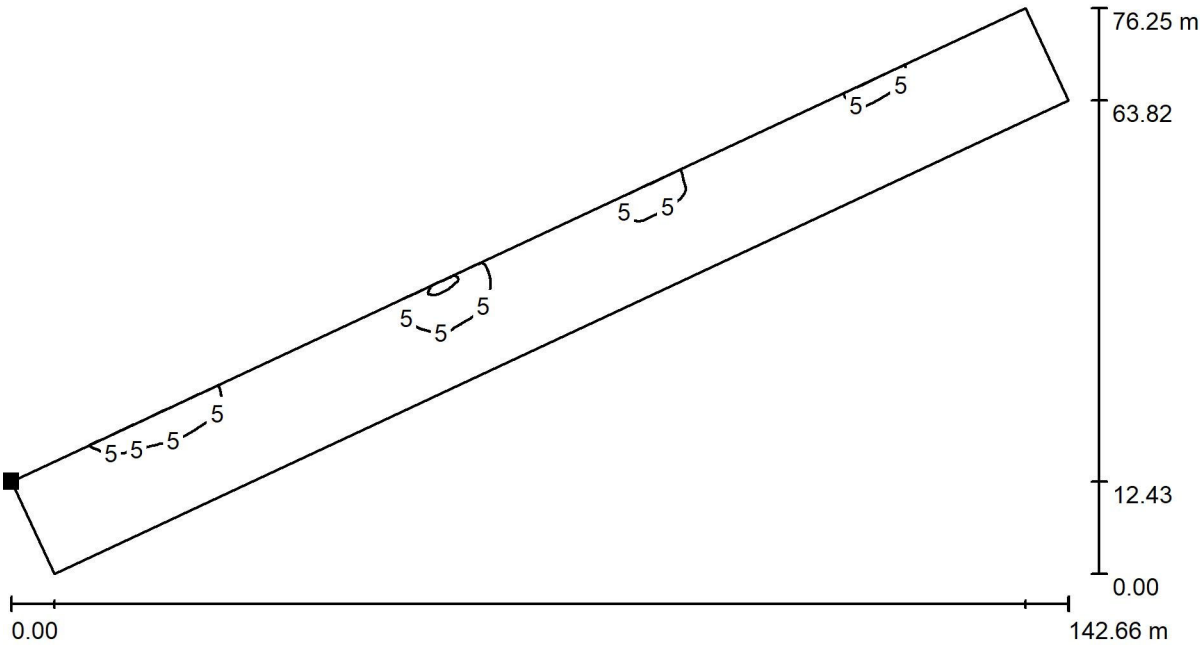
Grid: 64 x 64 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
4.84	1.50	9.69	0.310	0.155



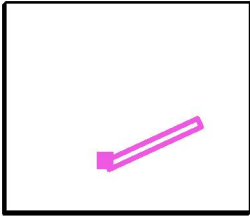
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 10 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 1020

Position of surface in external scene:
Marked point:
(173.540 m, 98.580 m, 0.750 m)



Grid: 128 x 128 Points

E_{av} [lx]
2.68

E_{min} [lx]
0.20

E_{max} [lx]
11

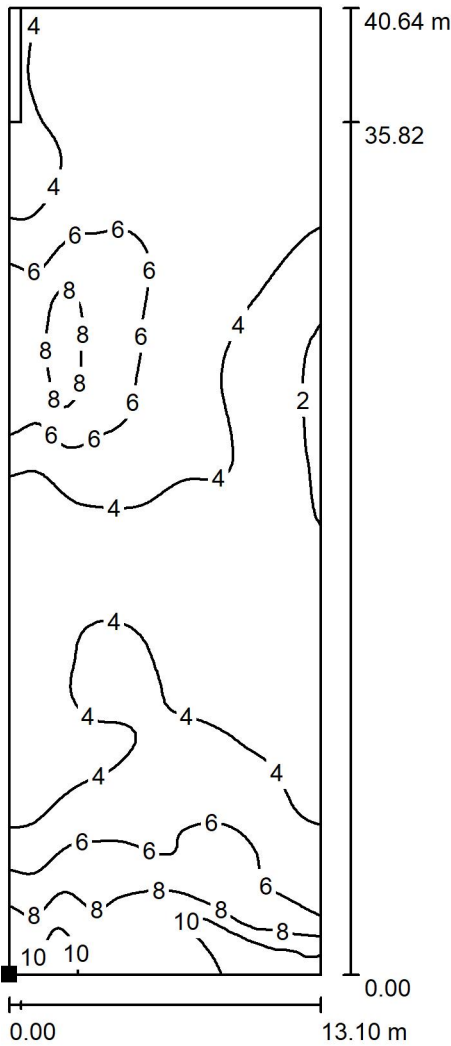
u_0
0.074

E_{min} / E_{max}
0.018



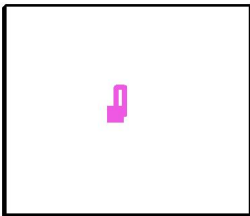
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 11 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 318

Position of surface in external scene:
Marked point:
(189.100 m, 172.311 m, 0.750 m)



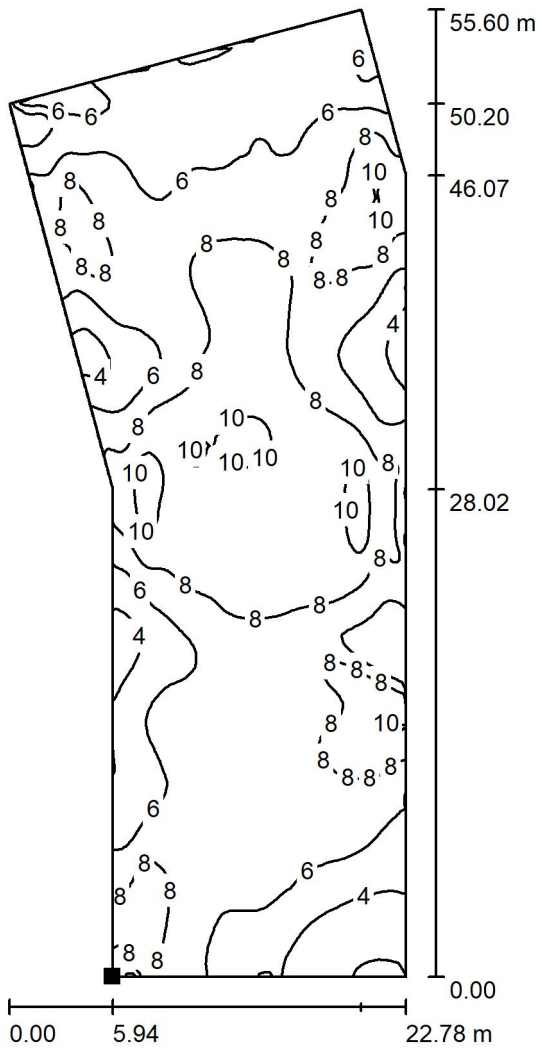
Grid: 64 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
4.95	1.71	11	0.345	0.152



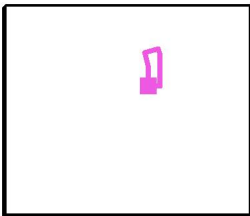
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 12 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 435

Position of surface in external scene:
Marked point:
(237.963 m, 214.700 m, 0.750 m)



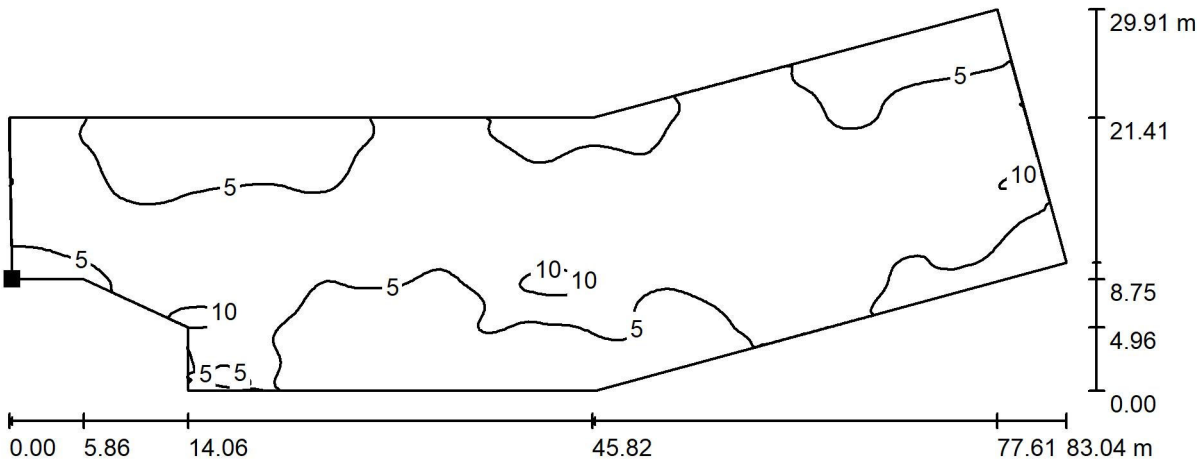
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
7.02	1.71	11	0.244	0.153



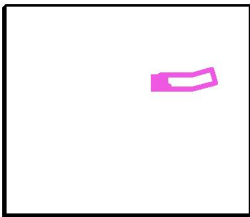
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 13 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 594

Position of surface in external scene:
Marked point:
(254.902 m, 218.885 m, 0.750 m)



Grid: 128 x 128 Points

E_{av} [lx]
5.77

E_{min} [lx]
1.23

E_{max} [lx]
12

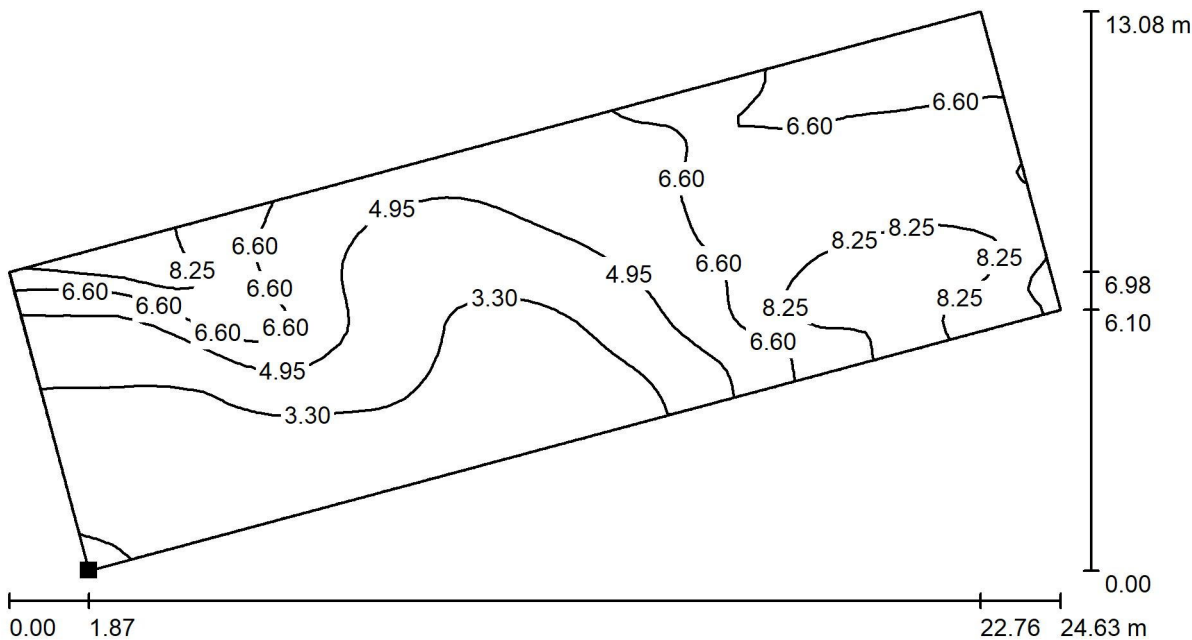
u_0
0.214

E_{min} / E_{max}
0.106



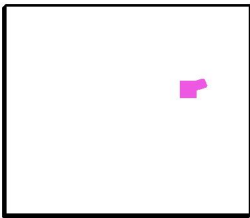
Operator
Telephone
Fax
e-Mail

Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 14 / Isolines (E, Perpendicular)



Values in Lux, Scale 1 : 177

Position of surface in external scene:
Marked point:
(297.948 m, 209.358 m, 0.750 m)



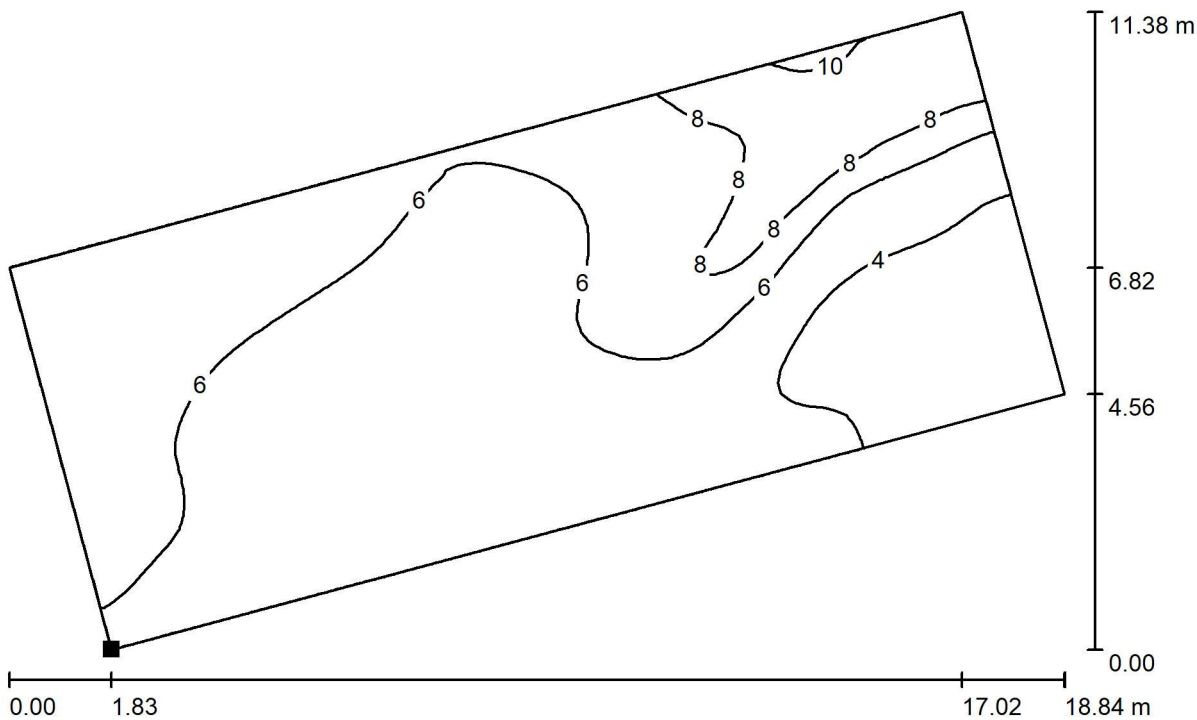
Grid: 64 x 32 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
5.35	1.45	9.68	0.271	0.150



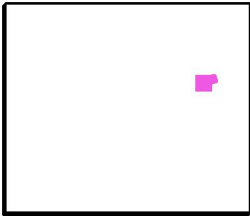
Operator
Telephone
Fax
e-Mail

**Exterior Scene 1 - (Redistributed) [Original Layout modified to reduce 10 lux areas] /
Calculation Area 15 / Isolines (E, Perpendicular)**



Values in Lux, Scale 1 : 135

Position of surface in external scene:
Marked point:
(320.663 m, 215.612 m, 0.750 m)



Grid: 64 x 32 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u_0	E_{min} / E_{max}
5.67	2.03	11	0.357	0.189