Technical Note

Project: **Northern Hub**

Subject: **Water Street / Liverpool Road Junction – Lighting and Cabling calculations – Revision D**

Revision	Date	Originator	Checker	Approver	Description
A	May 2015	B Ezedimora	K Radband	S Alexander	Highway alignment information First Issue
B	August 2015	B Ezedimora	S Alexander	B Duguid	Updated to include alignment changes, lighting and drainage
C	August 2015	B Ezedimora	S Alexander	B Duguid	Updated to include changes to lighting layout
D	June 2017	A Hilton	S Alexander	B Duguid	Updated to remove superseded cable calculations and to reflect change in lighting layout at COL 125A

This document comprises the lighting for the Water Street and Liverpool road highway junction, and the cable calculations for Water Street and Liverpool Road, and the adjacent public realm area.

This document should be read in conjunction with the design drawings.

1	Water Street and Liverpool Rd - Proposed Lighting
2	Water Street ME Calc - Proposed Lighting 5m Columns
3	Water Street ME Calc - Proposed Lighting 8m Columns
4	Liverpool Rd ME Calc - Proposed Lighting

DATE:	**13 June 2017**
DESIGNER:	**James Brazendale**
PROJECT No:	**321604**
PROJECT NAME:	**ORDSALL CHORD - Water Street / Liverpool Road**

CE Calculation

Lighting Scheme Design to BS5489 - ME3c, CE2

Outdoor Lighting Report

PREPARED BY: Mott MacDonald
4th Floor 9 Portland Street
Manchester
M1 3BE

DATE: 13 June 2017 **DESIGNER: James Brazendale**

PROJECT No: 321604 **PROJECT NAME: ORDSALL CHORD - Water Street / Liverpool Road**

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

No.	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	202644.07	404997.68	18.15	90.28	1.40	1.48
2	Grid 2	202644.05	404965.01	26.29	20.97	1.46	1.50
3	Grid 3	202646.48	404968.24	67.58	43.06	1.47	1.48
4	Grid 4	202613.43	404956.24	13.79	24.93	1.38	1.47

Luminaires



Luminaire A Data

Supplier	PHILIPS WRTL
Type	Luma 1 R4
Lamp(s)	20-80 DS-CW 1 1800-18100 NW LED
LampFlux(klm)/Colour	6.20 NW/70
File Name	LUMA 1A R4 DS-NW 1 6200 NW LED.ldt
Maintenance Factor	0.74
Imax70,80,90(cd/klm)	515.1, 43.6, 0.0
No. in Project	2



Luminaire B Data

Supplier	PHILIPS WRTL
Type	MiniLuma R7
Lamp(s)	12-30 DS-NW 1 1100-7850 NW LED
LampFlux(klm)/Colour	3.60 NW/70
File Name	MiniLuma R7 DS-NW 1 3600 NW LED.ldt
Maintenance Factor	0.64
Imax70,80,90(cd/klm)	662.9, 49.9, 0.0
No. in Project	8



Luminaire C Data

Supplier	PHILIPS WRTL
Type	Luma 1 R5
Lamp(s)	20-80 DS-CW 1 1800-18100 NW LED
LampFlux(klm)/Colour	13.50 NW/70
File Name	LUMA 1A R5 DS-NW 1 13500 NW LED.ldt
Maintenance Factor	0.74
Imax70,80,90(cd/klm)	446.7, 88.9, 0.0
No. in Project	3



Luminaire D Data

Supplier	PHILIPS WRTL
Type	MiniLuma R4
Lamp(s)	12-30 DS-NW 1 1100-7850 NW LED
LampFlux(klm)/Colour	6.60 NW/70
File Name	MiniLuma R4 DS-NW 1 6600 NW LED.ldt
Maintenance Factor	0.64
Imax70,80,90(cd/klm)	528.3, 31.5, 0.0
No. in Project	6



Luminaire E Data

Supplier	_Historic Lanterns
Type	SGS203 PC P3
Lamp(s)	PL-T/4P42W/840
LampFlux(klm)/Colour	3.20 840/
File Name	SGS203 1xPL-T_4P42W PC P3.ldt
Maintenance Factor	1.00
Imax70,80,90(cd/klm)	214.0, 82.0, 6.0
No. in Project	2

Layout

No.	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	202610.17	404955.50	8.00	323.00	0.00	0.00	0.83			
2	C	202660.18	404971.00	8.00	70.00	0.00	0.00	0.83			
3	C	202683.46	404965.45	8.00	70.00	0.00	0.00	0.83			
4	C	202706.78	404959.81	8.00	73.00	0.00	0.00	0.83			
5	B	202655.92	405004.48	5.00	319.00	0.00	0.00	0.83			
6	A	202707.54	405067.01	8.00	323.00	0.00	0.00	1.00			
7	B	202680.02	405033.81	5.00	319.00	0.00	0.00	0.83			
8	B	202670.71	405022.13	5.00	318.00	0.00	0.00	0.83			
9	D	202629.86	404978.35	5.00	323.00	0.00	0.00	0.83			
10	D	202642.48	404970.25	5.00	140.00	0.00	0.00	0.83			
11	D	202659.65	404988.89	5.00	148.00	0.00	0.00	0.83			
12	D	202646.83	404994.34	5.00	310.00	0.00	0.00	0.83			
13	D	202633.12	404959.66	5.00	137.00	0.00	0.00	0.83			
14	B	202662.20	404998.56	5.00	137.00	0.00	0.00	0.83			
15	B	202677.11	405016.25	5.00	144.00	0.00	0.00	0.83			
16	B	202695.90	405053.14	5.00	321.00	0.00	0.00	0.83			
17	B	202691.33	405034.02	5.00	143.00	0.00	0.00	0.83			
18	D	202624.17	404971.00	5.00	314.00	0.00	0.00	1.00			
19	E	202662.13	404984.42	6.00	253.00	0.00	0.00	1.00			
20	B	202706.55	405052.95	6.00	147.00	0.00	0.00	1.00			
21	E	202710.07	404970.49	6.00	257.00	0.00	0.00	1.00			

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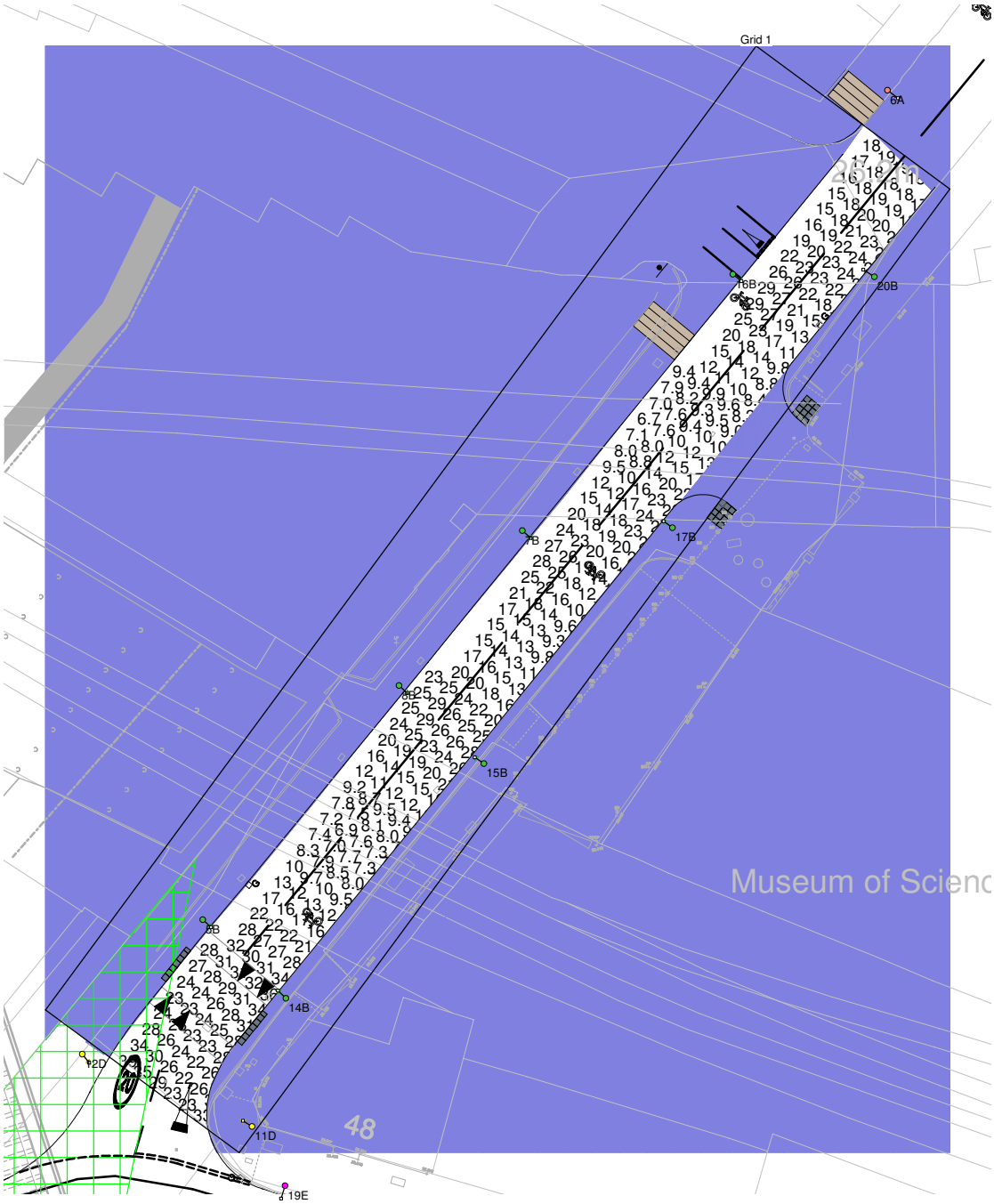
DATE: 13 June 2017 DESIGNER: James Brazendale

PROJECT No: 321604 PROJECT NAME: ORDSALL CHORD - Water Street / Liverpool Road

Horizontal Illuminance (lux)

Grid 1



Results

Eav	18.08
Emin	6.73
Emax	39.18
Emin/Emax	0.17
Emin/Eav	0.37

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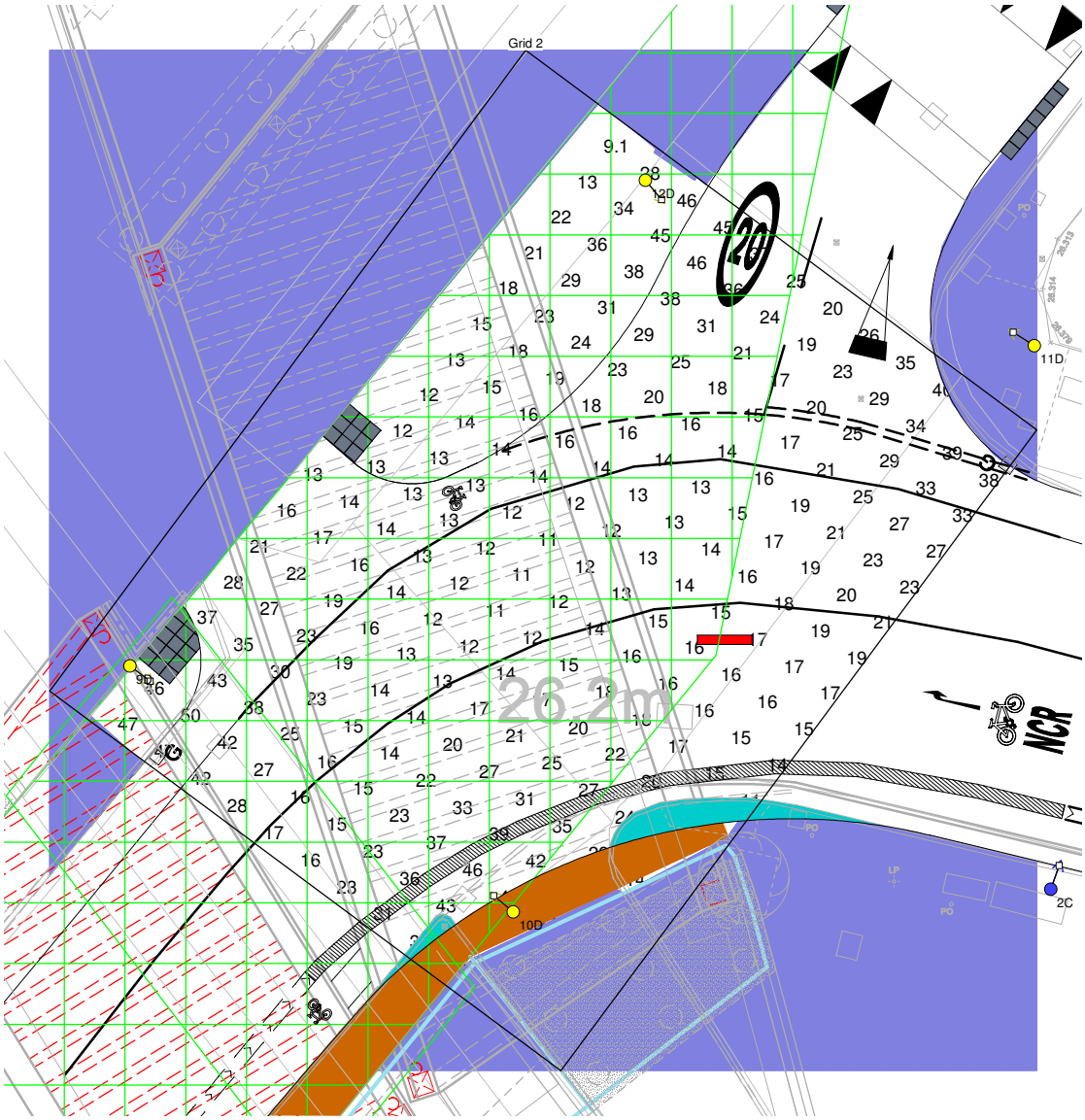
DATE: 13 June 2017 DESIGNER: James Brazendale

PROJECT No: 321604 PROJECT NAME: ORDSALL CHORD - Water Street / Liverpool Road

Horizontal Illuminance (lux)

Grid 2



Results

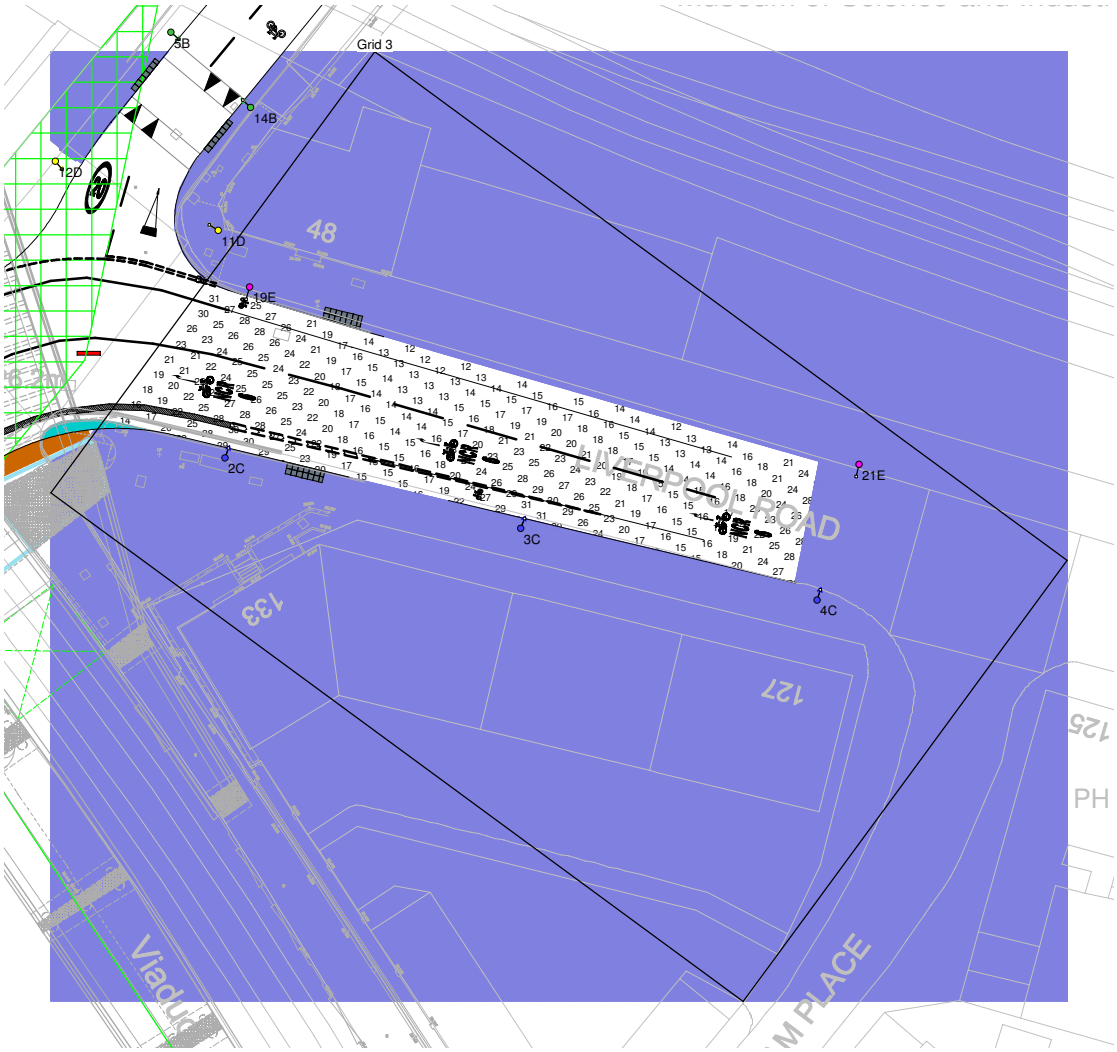
Eav	22.35
Emin	8.64
Emax	50.16
Emin/Emax	0.17
Emin/Eav	0.39

DATE: 13 June 2017 DESIGNER: James Brazendale

PROJECT No: 321604 PROJECT NAME: ORDSALL CHORD - Water Street / Liverpool Road

Horizontal Illuminance (lux)

Grid 3



Results

Eav	20.05
Emin	11.80
Emax	31.34
Emin/Emax	0.38
Emin/Eav	0.59

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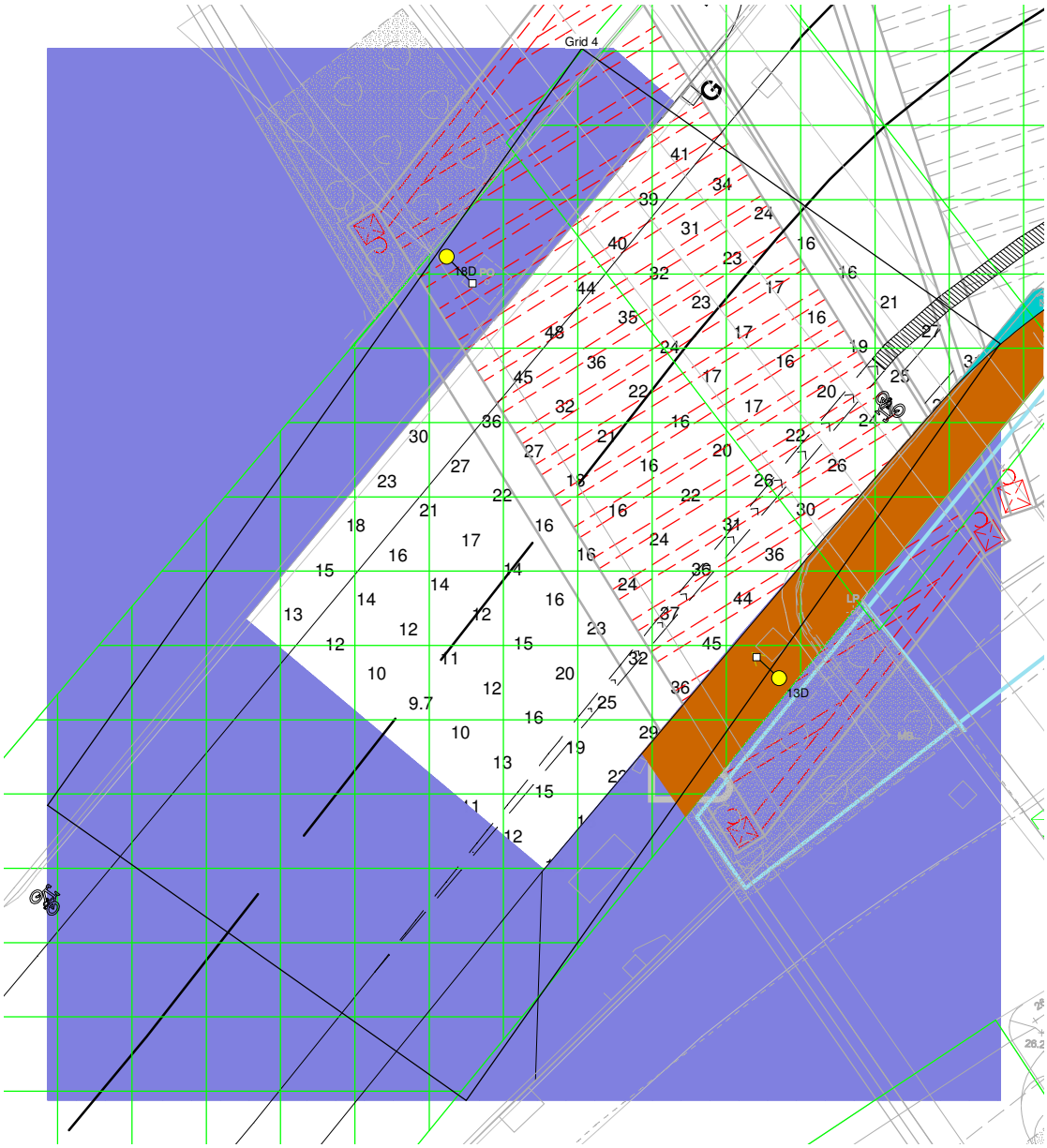
DATE: 13 June 2017 DESIGNER: James Brazendale

PROJECT No: 321604 PROJECT NAME: ORDSALL CHORD - Water Street / Liverpool Road

Horizontal Illuminance (lux)

Grid 4



Results

Eav	23.17
Emin	9.70
Emax	48.50
Emin/Emax	0.20
Emin/Eav	0.42

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DATE: **25 August 2015**

DESIGNER: **Ben Eze**

PROJECT No: **321604**

PROJECT NAME: **ORDSALL CHORD - Water Street**

Water Street ME Calc - Proposed Lighting 5m Columns

Roadway Lighting Report

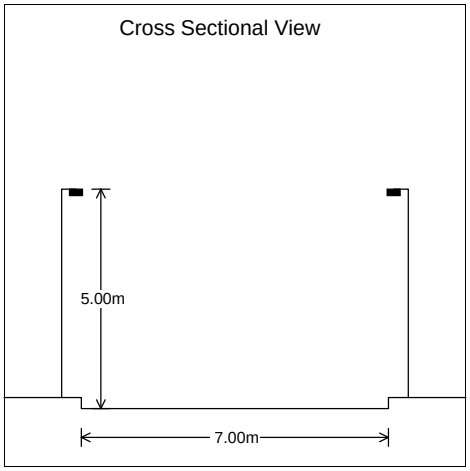
PREPARED BY:

Mott MacDonald
35 Newhall Street
Birmingham
B3 3PU.

Tel: +44 (0) 121 234 1500
website: www.buildings.mottmac.com
www.mottmac.com

Roadway Report Summary

Layout



Road Data

Calculation Grid	EN13201 Luminance
Width (m)	7.00
No. of Lanes	2
Road Surface	C2
Q0	0.07
Lane Width (m)	3.50
SR Width (m)	3.50

Main Lighting



Column Data

Configuration	Opposite
Spacing (m)	25.00
Height (m)	5.00
Tilt (deg)	0.00
Left Setback (m)	0.45
Left Outreach (m)	0.33
Left Overhang (m)	-0.12
Right Setback (m)	0.45
Right Outreach (m)	0.33
Right Overhang (m)	-0.12

Luminaire Data

Supplier	PHILIPS WRTL
Type	MiniLuma R7
Lamp(s)	12-30 DS-NW 1 1100-7850 NW LED
LampFlux(klm)/Colour	3.60 NW/70
File Name	MiniLuma R7 DS-NW 1 3600 NW LED.ldt
Maintenance Factor	0.64
Lum. Int. Class	G3

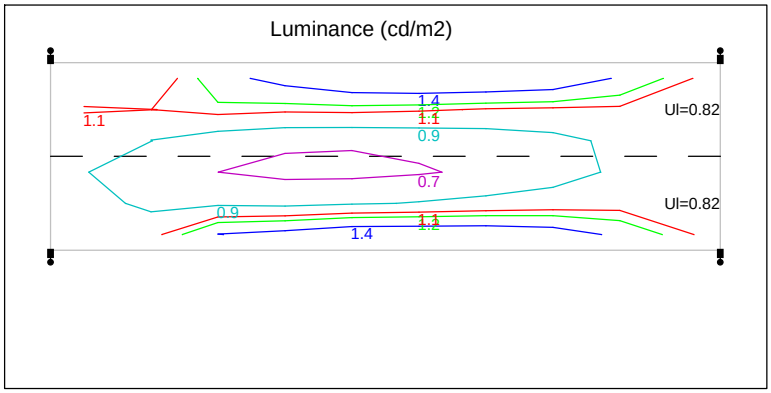
Results

Main

Complies with ME3c

Lavmin	1.07 (2)
Lmin	0.65 (2)
Lmax	1.66 (1)
U0min	0.61 (1)
Ulmin	0.82 (2)
TI(%)	14.94 (2)
SR	0.66

Number in brackets is the Observer Lane for Result shown.



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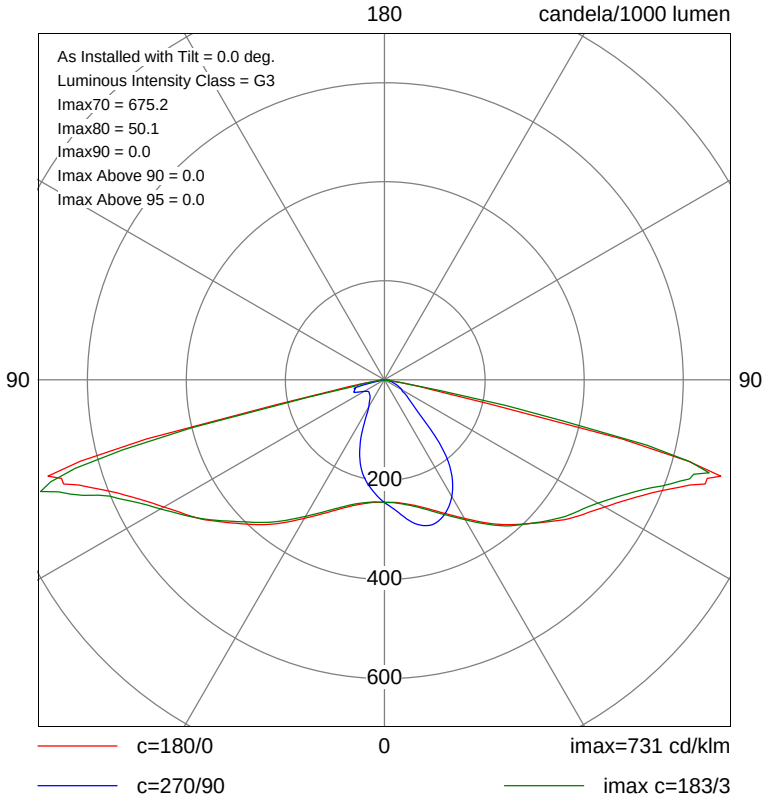
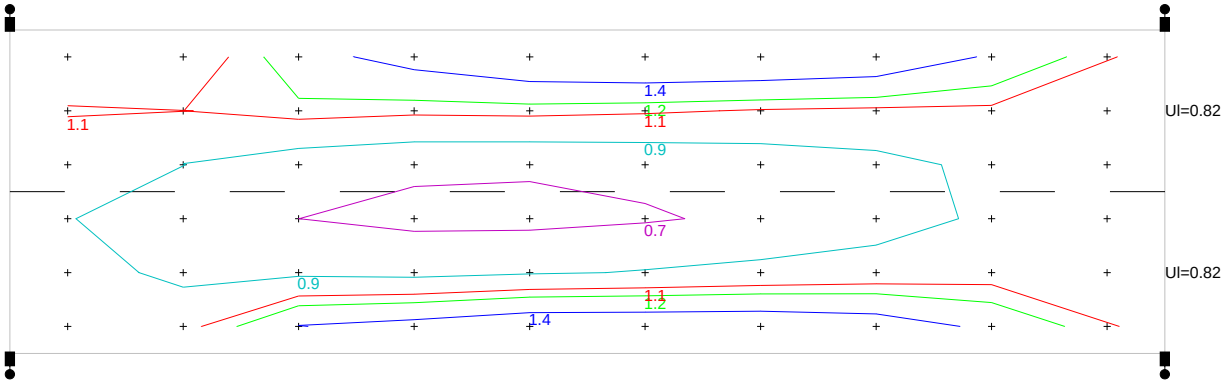
Polar Diagram

Main Luminaire MiniLuma R7



Luminance (cd/m2)

Observer in Lane 1



Main Results

Observers in all Lanes

Lavmin	1.07 (2)
Lmin	0.65 (2)
Lmax	1.66 (1)
U0min	0.61 (1)
Ulmin	0.82 (2)
TImax(%)	14.94 (2)
SR	0.66

Number in brackets is the
Observer Lane for Result shown.

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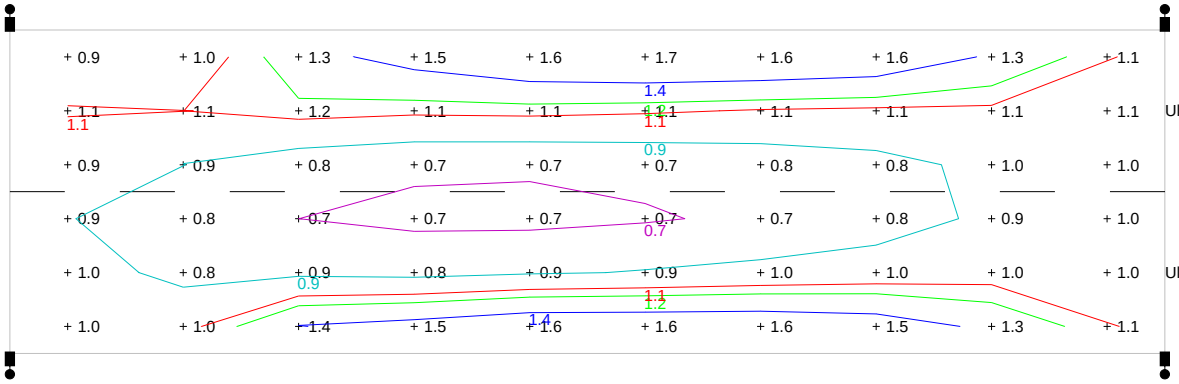
Luminance (cd/m2)

Observer in Lane 1



Main Results

Observer in Lane 1

Lav	1.07
Lmin	0.65
Lmax	1.66
U0	0.61
Ul	0.82
TI(%)	14.94

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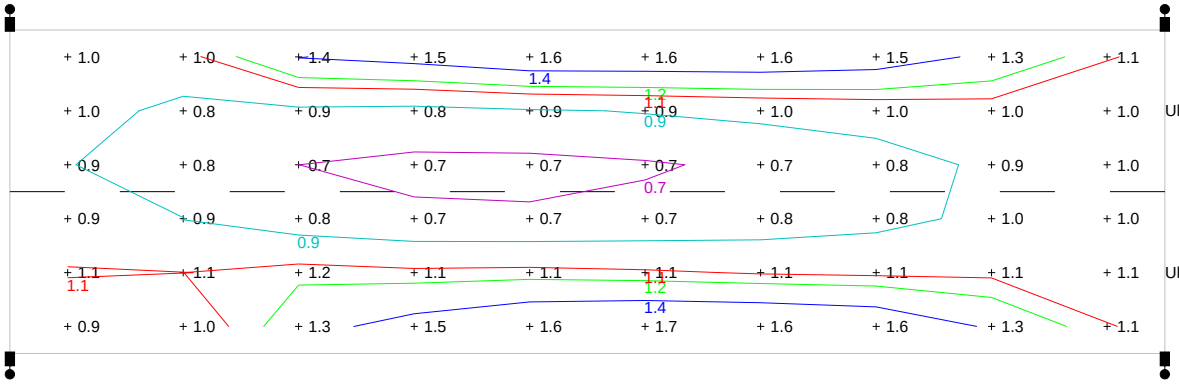
Luminance (cd/m2)

Observer in Lane 2



Main Results

Observer in Lane 2

Lav	1.07
Lmin	0.65
Lmax	1.66
U0	0.61
Ul	0.82
TI(%)	14.94

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DATE: **25 August 2015**

DESIGNER: **Ben Eze**

PROJECT No: **321604**

PROJECT NAME: **ORDSALL CHORD - Water Street**

Water Street ME calc - Proposed Lighting 8m Columns

Roadway Lighting Report

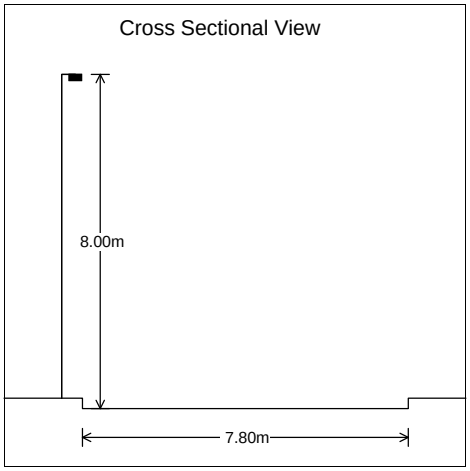
PREPARED BY:

Mott MacDonald
35 Newhall Street
Birmingham
B3 3PU.

Tel: +44 (0) 121 234 1500
website: www.buildings.mottmac.com
www.mottmac.com

Roadway Report Summary

Layout



Road Data

Calculation Grid	EN13201 Luminance
Width (m)	7.80
No. of Lanes	2
Road Surface	C2
Q0	0.07
Lane Width (m)	3.90
SR Width (m)	3.90

Main Lighting



Column Data

Configuration	Single Sided Left
Spacing (m)	19.00
Height (m)	8.00
Tilt (deg)	0.00
Setback (m)	0.50
Outreach (m)	0.33
Overhang (m)	-0.17

Luminaire Data

Supplier	PHILIPS WRTL
Type	Luma 1 R4
Lamp(s)	20-80 DS-CW 1 1800-18100 NW LED
LampFlux(klm)/Colour	6.20 NW/70
File Name	LUMA 1A R4 DS-NW 1 6200 NW LED.ldt
Maintenance Factor	0.74
Lum. Int. Class	G3

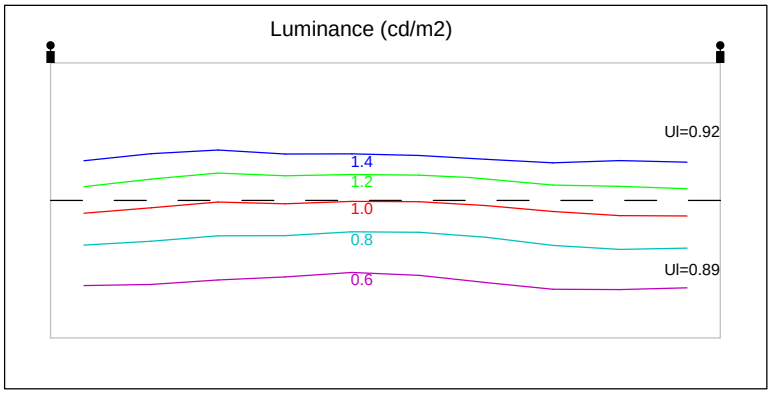
Results

Main

Complies with ME3c

Lavmin	1.00 (2)
Lmin	0.42 (2)
Lmax	1.84 (2)
U0min	0.41 (1)
Ulmin	0.89 (1)
TI(%)	8.98 (2)
SR	0.67

Number in brackets is the Observer Lane for Result shown.



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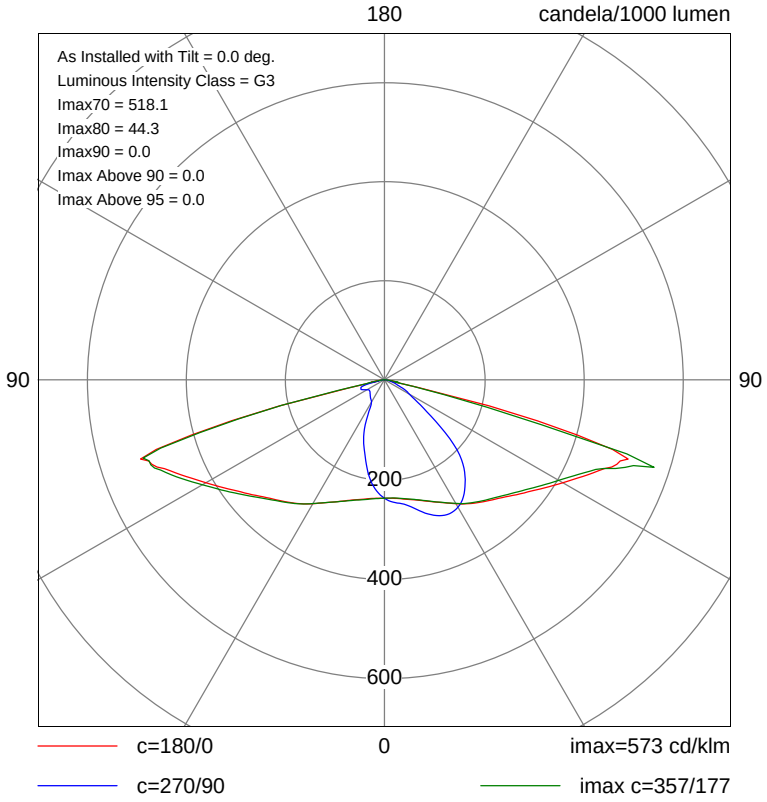
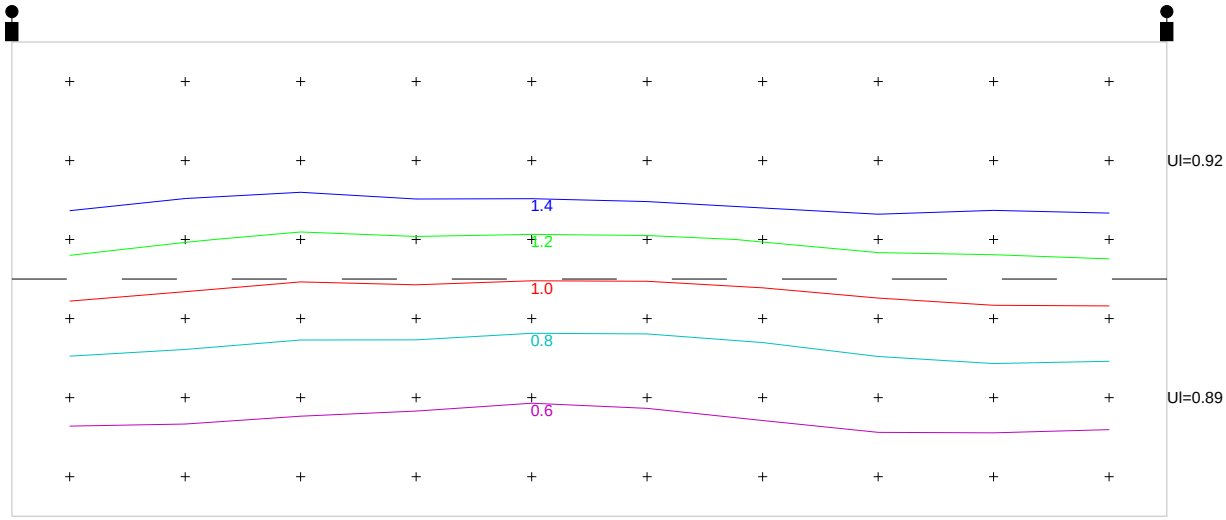
Polar Diagram

Main Luminaire Luma 1 R4



Luminance (cd/m2)

Observer in Lane 1



Main Results

Observers in all Lanes

Lavmin	1.00 (2)
Lmin	0.42 (2)
Lmax	1.84 (2)
U0min	0.41 (1)
Ulmin	0.89 (1)
TImax(%)	8.98 (2)
SR	0.67

Number in brackets is the
Observer Lane for Result shown.

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Luminance (cd/m2)

Observer in Lane 1



Main Results

Observer in Lane 1

Lav	1.09
Lmin	0.45
Lmax	1.78
U0	0.41
Ul	0.89
TI(%)	4.92

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Luminance (cd/m2)

Observer in Lane 2



Main Results

Observer in Lane 2

Lav	1.00
Lmin	0.42
Lmax	1.84
U0	0.42
Ul	0.92
TI(%)	8.98

5764680757

DATE: **25 August 2015**

DESIGNER: **Ben Eze**

PROJECT No: **321604**

PROJECT NAME: **ORDSALL CHORD - Liverpool Road**

Liverpool Road ME Calc - Proposed Lighting 8m Columns

Roadway Lighting Report

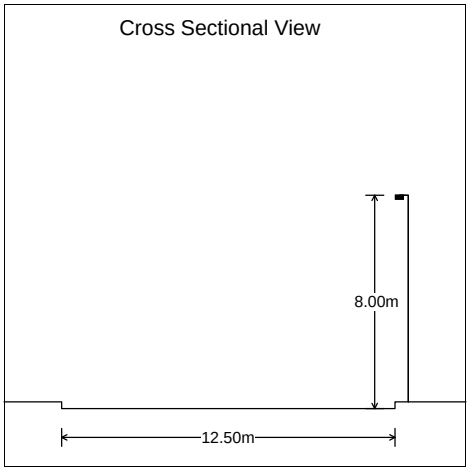
PREPARED BY:

Mott MacDonald
35 Newhall Street
Birmingham
B3 3PU.

Tel: +44 (0) 121 234 1500
website: www.buildings.mottmac.com
www.mottmac.com

Roadway Report Summary

Layout



Road Data

Calculation Grid	EN13201 Luminance
Width (m)	12.50
No. of Lanes	2
Road Surface	C2
Q0	0.07
Lane Width (m)	6.25
SR Width (m)	5.00

Main Lighting



Column Data

Configuration	Single Sided Right
Spacing (m)	26.00
Height (m)	8.00
Tilt (deg)	0.00
Setback (m)	0.50
Outreach (m)	0.33
Overhang (m)	-0.17

Luminaire Data

Supplier	PHILIPS WRTL
Type	Luma 1 R5
Lamp(s)	20-80 DS-CW 1 1800-18100 NW LED
LampFlux(klm)/Colour	13.50 NW/70
File Name	LUMA 1A R5 DS-NW 1 13500 NW LED.ldt
Maintenance Factor	0.74
Lum. Int. Class	G4

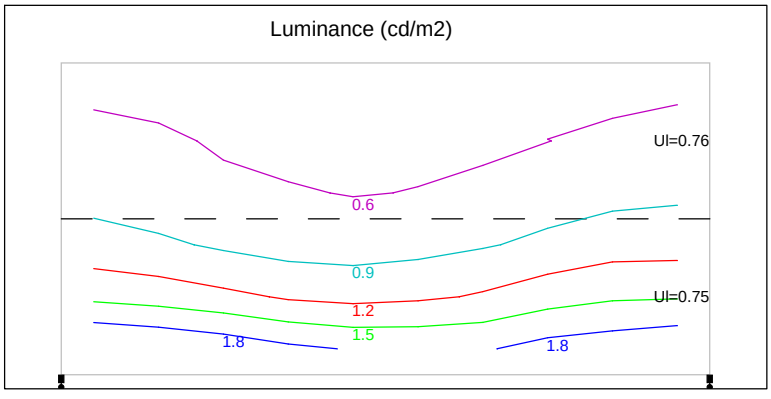
Results

Main

Complies with ME3c

Lavmin	1.00 (1)
Lmin	0.48 (1)
Lmax	2.18 (1)
U0min	0.45 (2)
Ulmin	0.75 (1)
TI(%)	12.60 (1)
SR	0.67

Number in brackets is the Observer Lane for Result shown.



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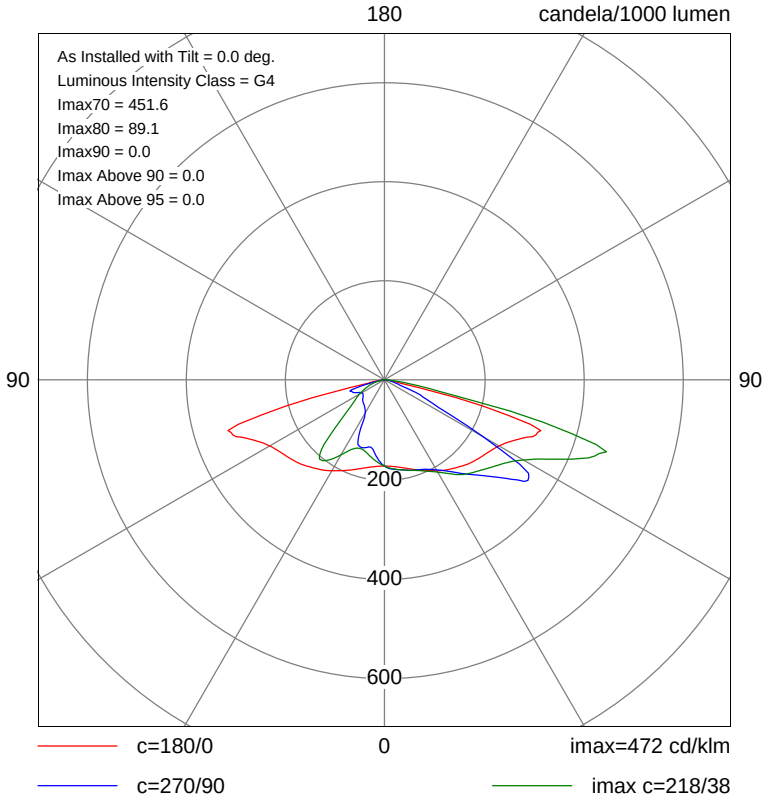
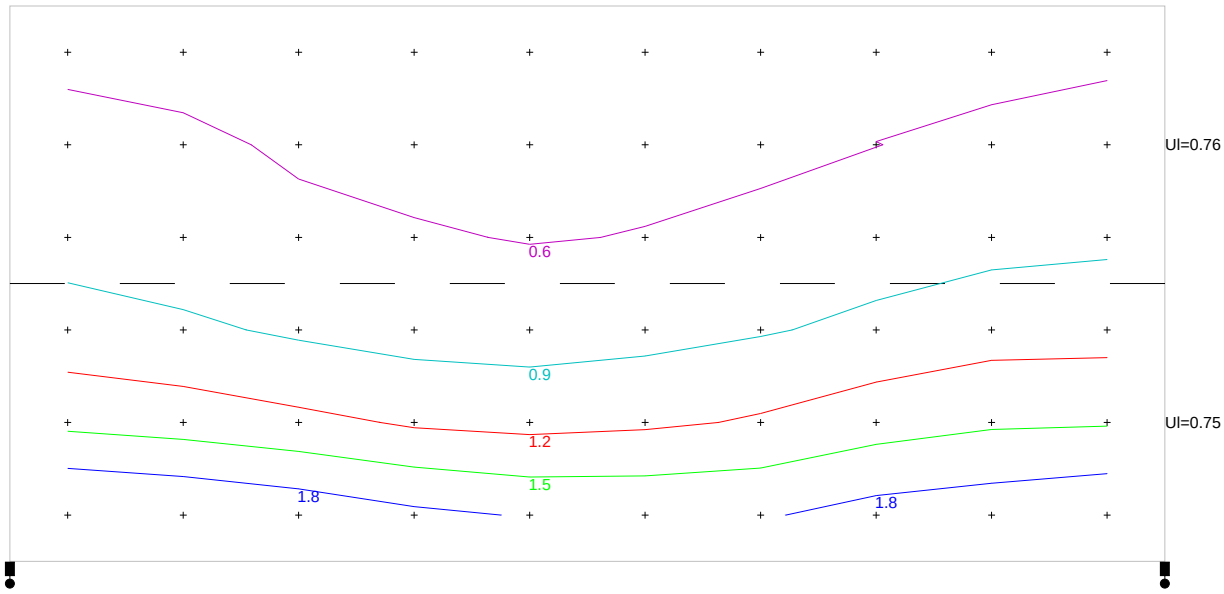
Polar Diagram

Main Luminaire Luma 1 R5



Luminance (cd/m2)

Observer in Lane 1



Main Results

Observers in all Lanes

Lavmin	1.00 (1)
Lmin	0.48 (1)
Lmax	2.18 (1)
U0min	0.45 (2)
Ulmin	0.75 (1)
TImax(%)	12.60 (1)
SR	0.67

Number in brackets is the
Observer Lane for Result shown.

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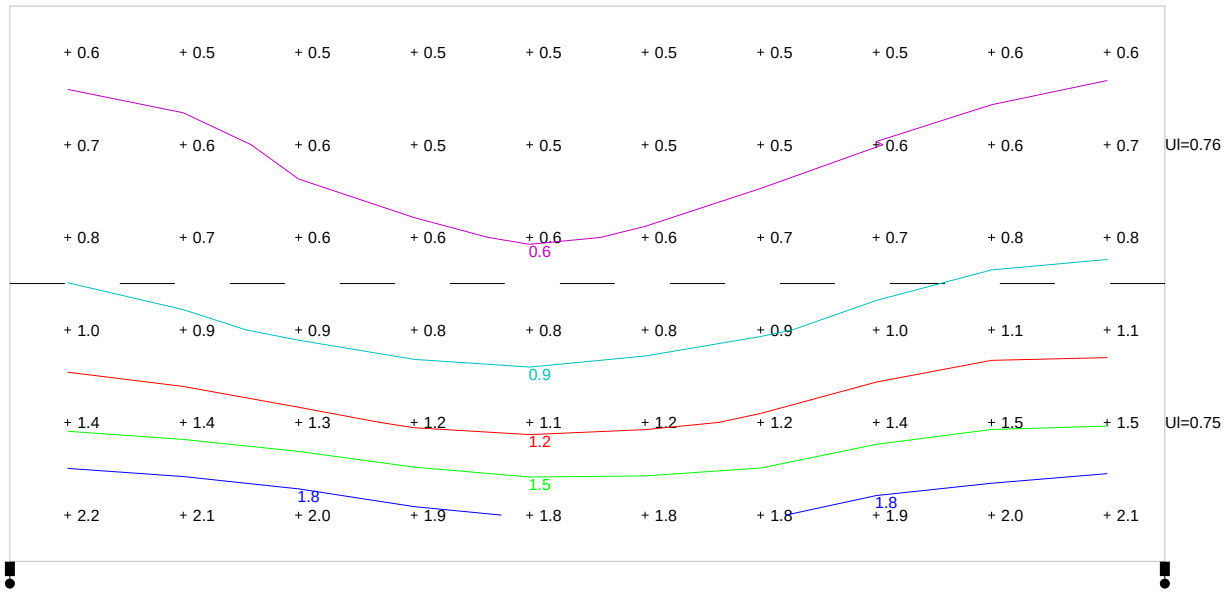
Luminance (cd/m2)

Observer in Lane 1



Main Results

Observer in Lane 1

Lav	1.00
Lmin	0.48
Lmax	2.18
U0	0.48
Ul	0.75
TI(%)	12.60

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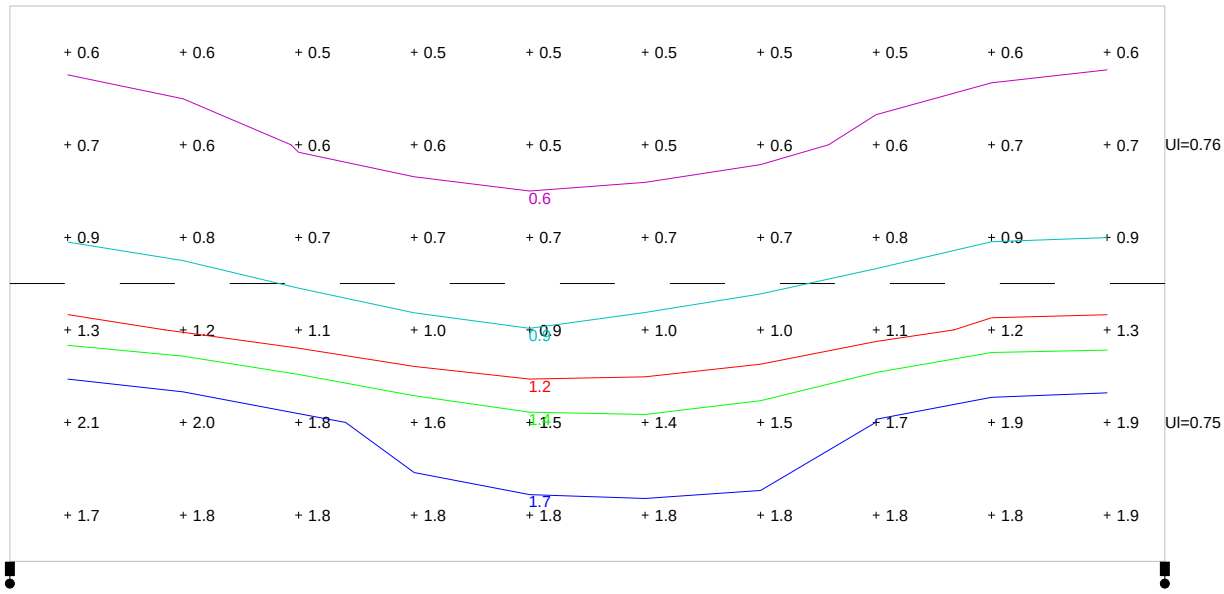
Luminance (cd/m2)

Observer in Lane 2



Main Results

Observer in Lane 2

Lav	1.09
Lmin	0.49
Lmax	2.09
U0	0.45
Ul	0.76
TI(%)	4.82

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