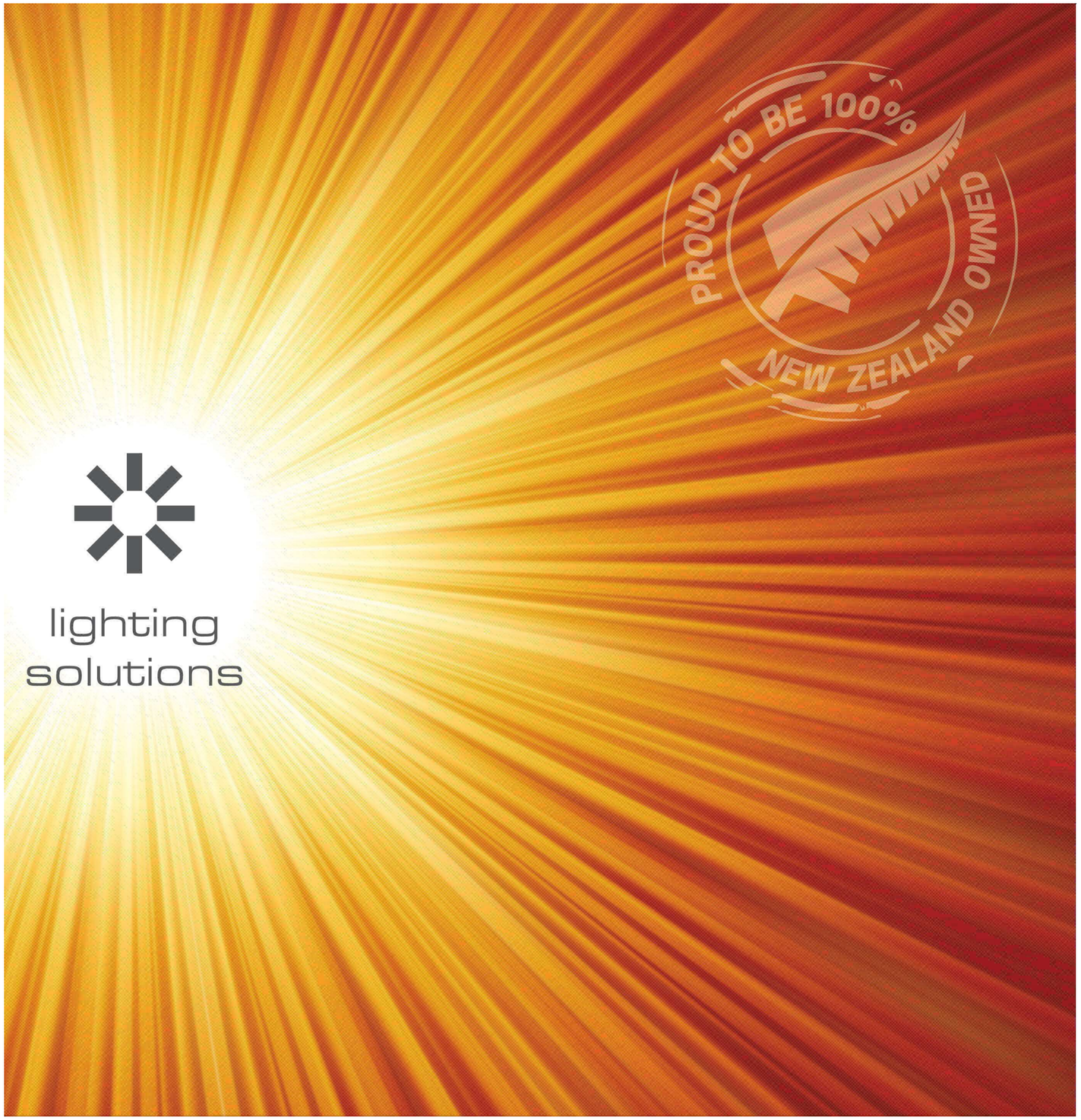

Project:
96 Beach Haven Site Lighting

Address:
96 Beach Haven Rd
Auckland

Client:

Auckland Electricians
Registered Electrician

Design Time:
7 hours of professional service

Designed by:
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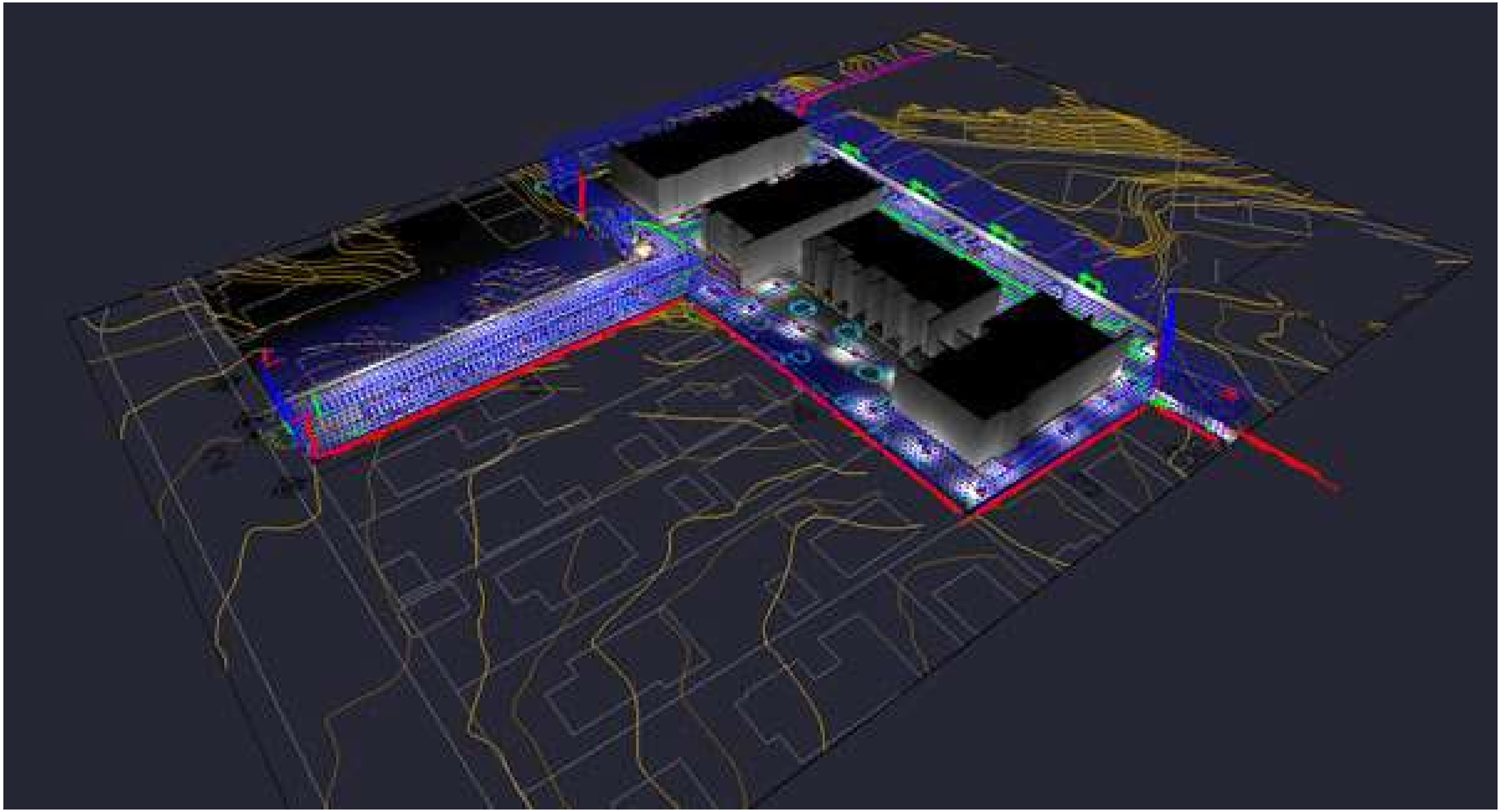
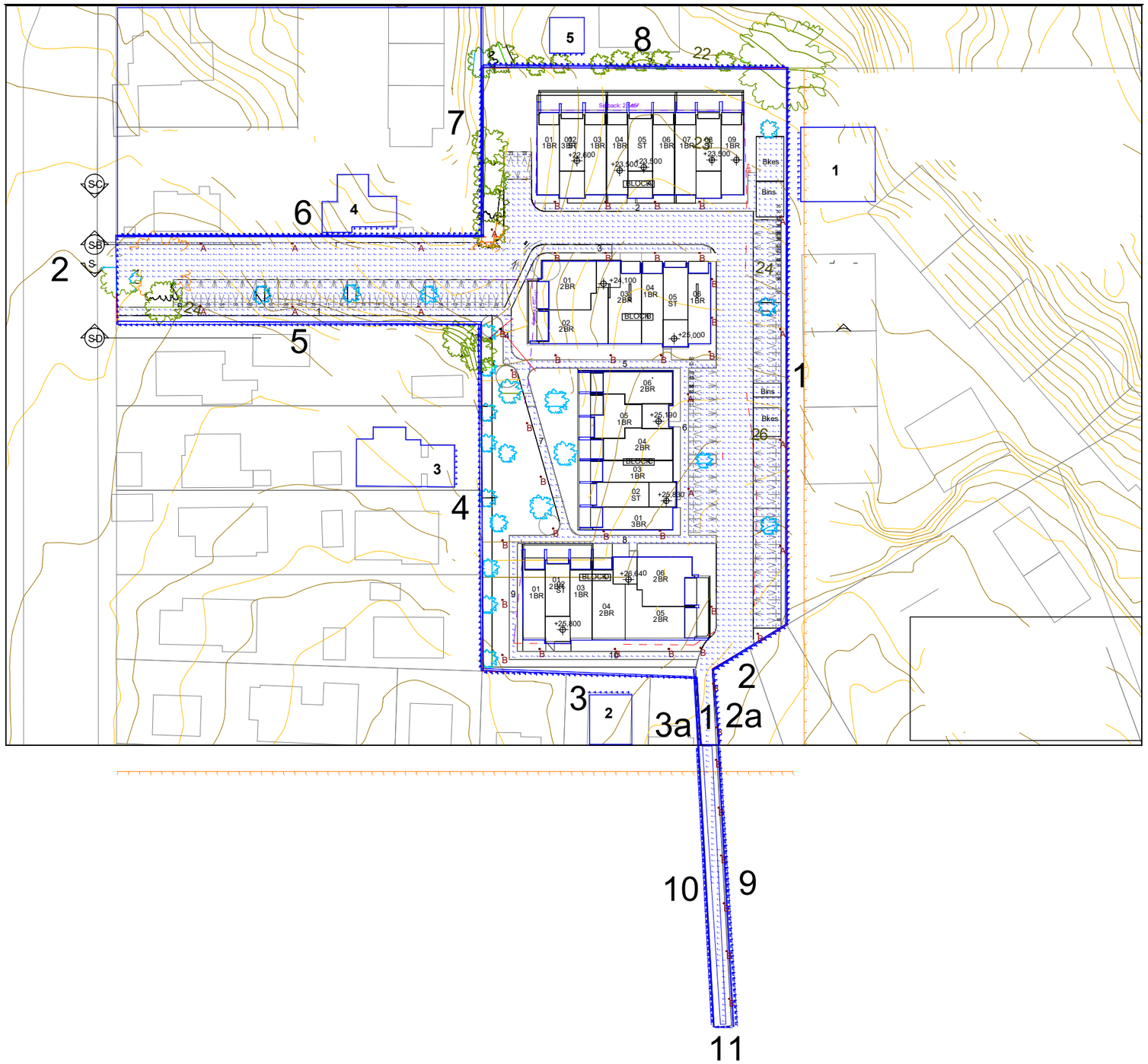
ian.durrant@jarussell.co.nz

Radcliffe ELECTRICAL

Client: Auckland Electricians Registered Electrician

Project Name:	Designed by:	Date:	Design No:	
96 Beach Haven Site Lighting	ID	20/07/2021	LSD08058-0	
Project Address:	Checked by:	Date:	Revision:	
Auckland	DB	20/07/2021	1	Page 1 of 7





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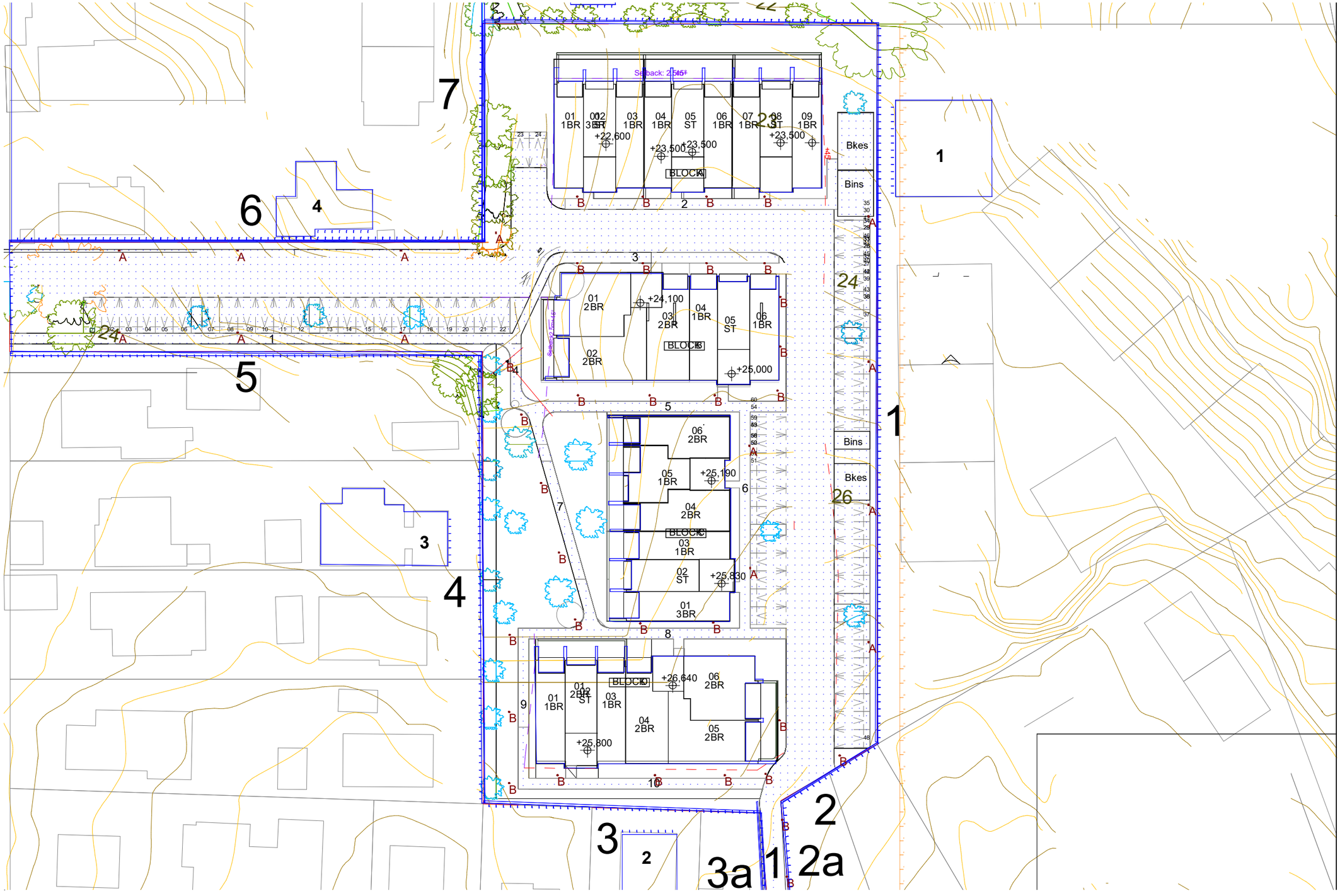
Lighting Design 2021 © J.A.Russell Ltd

Radcliffe ELECTRICAL

Client:

Auckland Electricians
Registered Electrician

Project Name: 96 Beach Haven Site Lighting	Designed by: **ID**	Date: 20/07/2021	Design No: **LSD08058-0**
Project Address: Auckland	Checked by: **DB**	Date: 20/07/2021	Revision: **1**



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Radcliffe ELECTRICAL

Client:

Auckland Electricians
Registered Electrician

Project Name: 96 Beach Haven Site Lighting	Designed by: ID	Date: 20/07/2021	Design No: LSD08058-0
Project Address: Auckland	Checked by: DB	Date: 20/07/2021	Revision: 1

Calculation Summary - Obtrusive Lighting Outside Property Boundaries

Obtrusive Light - Compliance Report

E24.61.2 Horizontal and Vertical illuminance at a boundary & E24 .6.6 Curfew Luminous intensity limits
Filename: LSD08058-0 REV1
20/07/2021 1:25:22 pm

Illuminance

Maximum Allowable Value: 10 Lux

Calculations Tested (14):

Calculation Label	Test Results	Max. Illum.
Boundary 11_Ill_Seg1	PASS	2.49
Boundary 6_Ill_Seg1	PASS	3.1
Boundary 1_Ill_Seg1	PASS	6.3
Boundary 2_Ill_Seg1	PASS	3.0
Boundary 2a_Ill_Seg1	PASS	1.0
Boundary 3a_Ill_Seg1	PASS	3.9
Boundary 3_Ill_Seg1	PASS	2.6
Boundary 4_Ill_Seg1	PASS	0.5
Boundary 7_Ill_Seg1	PASS	3.2
Boundary 8_Ill_Seg1	PASS	0.1
Boundary 5_Ill_Seg1	PASS	1.3
Road Boundary Entry 2_Ill_Seg1	PASS	4.8
Boundary 9_Ill_Seg1	PASS	0.20
Boundary 10_Ill_Seg1	PASS	1.96

Luminous Intensity (Cd) Per Luminaire

Maximum Allowable Value: 1000 Cd
Control Angle: 83 Degrees

Luminaire Locations Tested (51)
Test Results: PASS

Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 1000 Cd

Calculations Tested (14):

Calculation Label	Test Results
Boundary 11_Cd_Seg1	PASS
Boundary 6_Cd_Seg1	PASS
Boundary 1_Cd_Seg1	PASS
Boundary 2_Cd_Seg1	PASS
Boundary 2a_Cd_Seg1	PASS
Boundary 3a_Cd_Seg1	PASS
Boundary 3_Cd_Seg1	PASS
Boundary 4_Cd_Seg1	PASS
Boundary 7_Cd_Seg1	PASS
Boundary 8_Cd_Seg1	PASS
Boundary 5_Cd_Seg1	PASS
Road Boundary Entry 2_Cd_Seg1	PASS
Boundary 9_Cd_Seg1	PASS
Boundary 10_Cd_Seg1	PASS

Obtrusive Light - Compliance Report

E24.61.2 Horizontal and Vertical illuminance at a window & E24 .6.6 Curfew Luminous intensity limits
Filename: LSD08058-0 REV1
20/07/2021 1:29:05 pm

Illuminance

Maximum Allowable Value: 2 Lux

Calculations Tested (6):

Calculation Label	Test Results	Max. Illum.
Dwelling1 window (OPB)_Lux_Ill_Seg1	PASS	1.5
Dwelling2 window (OPB)_Lux_Ill_Seg1	PASS	1.1
Dwelling4 window (OPB)_Lux_Ill_Seg1	PASS	1.6
Dwelling5 window (OPB)_Lux_Ill_Seg1	PASS	0.0
Dwelling3 window (OPB)_Lux_Ill_Seg1	PASS	0.1
Dwelling4 window 2 (OPB)_Lux_Ill_Seg1	PASS	1.3

Failed Meter Locations (246):

Calculation Label	Lux	Meter Coords
Road Boundary Entry 2_Ill_Seg1	4.6	-0.15, 86.05, 0.5
Road Boundary Entry 2_Ill_Seg1	4.8	-0.15, 84.05, 0.5
Road Boundary Entry 2_Ill_Seg1	4.8	-0.15, 85.05, 0.5

Luminous Intensity (Cd) Per Luminaire

Maximum Allowable Value: 1000 Cd
Control Angle: 83 Degrees

Luminaire Locations Tested (51)
Test Results: PASS

Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 1000 Cd

Calculations Tested (6):

Calculation Label	Test Results
Dwelling1 window (OPB)_Lux_Cd_Seg1	PASS
Dwelling2 window (OPB)_Lux_Cd_Seg1	PASS
Dwelling4 window (OPB)_Lux_Cd_Seg1	PASS
Dwelling5 window (OPB)_Lux_Cd_Seg1	PASS
Dwelling3 window (OPB)_Lux_Cd_Seg1	PASS
Dwelling4 window 2 (OPB)_Lux_Cd_Seg1	PASS

Design Notes

Lighting levels shown are initial values.

Lighting Caregory 3 and Curfew Conditions.

Standard Design Parameters

Working plane height:

Carparks	- 0.00m
Roaways	- 0.00m
Pathways	- 0.00m
Pathways(vertical)	- 1.50m

Maintenance Factors:

Maintenance Factors derived from AS/NZS1158.3.1:2005 and manufacturers lumen depreciation values. Based upon 36mth cleaning cycle and Medium Pollution category and 5 year (20,000hrs) project life for Roadways, pathways and carparks for LED product.

As per clause 2.9.4 Maintenance Factors are capped at 0.70 for IP5X luminaires and 0.80 for IP6X luminaires.

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Radcliffe ELECTRICAL

Client:
Auckland Electricians
Registered Electrician

Project Name: 96 Beach Haven Site Lighting	Designed by: ID	Date: 20/07/2021	Design No: LSD08058-0	
Project Address: Auckland	Checked by: DB	Date: 20/07/2021	Revision: 1	Page 5 of 7

Calculation Summary - Communal Lighting

Calculation Summary							
Project: Communal							
Label	**Avg**	**Min**	**Max**	**Max/Avg**	**Standard**	**Lighting Parameters**	**Compliance**
Bikes and Bins	6.11	0.7	21.9	3.58	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Entry 1 Drive	11.40	0.76	110.04	9.65	AS/NZS1158.3.1:2005 Cat P11c	3.5 Lux avg, 0.7 Lux min, 10 Max/Avg	YES
Main Drive and Carpark	6.94	0.76	61.40	8.85	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 1	7.77	0.64	22.91	2.95	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 10	8.88	0.21	39.58	4.46	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 2	10.38	0.77	47.02	4.53	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 3	15.82	0.90	80.70	5.10	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 4	14.00	1.54	74.58	5.33	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 5	8.29	0.58	46.74	5.64	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 6	11.78	4.1	21.2	1.80	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 7	5.27	0.36	39.36	7.47	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 8	7.22	0.48	68.49	9.49	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES
Path 9	3.91	0.43	11.25	2.88	AS/NZS1158.3.1:2005 Cat P4	0.85 Lux avg, 0.14 Lux min, 10 Max/Avg	YES

Luminaire Schedule

Symbol	Qty	Label	Lumens	LLF	Description	Image
	13	A	1920	0.800	ITRON LED STREETLIGHT OC6 STA4.90-1M 19W IP66 L80;_100HRS	
	38	B	580	0.750	BOLLARD ALVA 16W 4K 180DEG CLEAR 940MM ANTHRACITE L80_70HRS IP65 IK09	

Design Notes

Lighting levels shown are maintained values.

Lighting categories based on Low Pedestrian/cycle activity and Low Risk of crime.

Hedges taken as 1m.

Standard Design Parameters

Working plane height:

Carparks	- 0.00m
Roaways	- 0.00m
Pathways	- 0.00m
Pathways(vertical)	- 1.50m

Maintenance Factors:

Maintenance Factors derived from AS/NZS1158.3.1:2005 and manufacturers lumen depreciation values. Based upon 36mth cleaning cycle and Medium Pollution category and 5 year (20,000hrs) project life for Roadways, pathways and carparks for LED product.

As per clause 2.9.4 Maintenance Factors are capped at 0.70 for IP5X luminaires and 0.80 for IP6X luminaires.

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Radcliffe ELECTRICAL

Client:
Auckland Electricians
Registered Electrician

Project Name:	Designed by:	Date:	Design No:	
96 Beach Haven Site Lighting	ID	20/07/2021	LSD08058-0	
Project Address:	**Checked by:**	**Date:**	**Revision:**	
Auckland	DB	20/07/2021	1	Page 6 of 7

Luminaire Images

Label : A

Label : B

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Lighting Design 2021 © J.A.Russell Ltd

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Client:

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Registered Electrician

Project Name: 96 Beach Haven Site Lighting	Designed by: ID	Date: 20/07/2021	Design No: LSD08058-0	
Project Address: Auckland	Checked by: DB	Date: 20/07/2021	Revision: 1	Page 7 of 7

Obtrusive Light - Compliance Report

E24.61.2 Horizontal and Vertical illuminance at a boundary & E24 .6.6 Curfew Luminous intensity limits
Filename: LSD08058-0 REV1
20/07/2021 1:25:22 pm

Illuminance

Maximum Allowable Value: 10 Lux

Calculations Tested (14):

Calculation Label	Test Results	Max. Illum.
Boundary 11_Ill_Seg1	**PASS**	2.49
Boundary 6_Ill_Seg1	**PASS**	3.1
Boundary 1_Ill_Seg1	**PASS**	6.3
Boundary 2_Ill_Seg1	**PASS**	3.0
Boundary 2a_Ill_Seg1	**PASS**	1.0
Boundary 3a_Ill_Seg1	**PASS**	3.9
Boundary 3_Ill_Seg1	**PASS**	2.6
Boundary 4_Ill_Seg1	**PASS**	0.5
Boundary 7_Ill_Seg1	**PASS**	3.2
Boundary 8_Ill_Seg1	**PASS**	0.1
Boundary 5_Ill_Seg1	**PASS**	1.3
Road Boundary Entry 2_Ill_Seg1	**PASS**	4.8
Boundary 9_Ill_Seg1	**PASS**	0.20
Boundary 10_Ill_Seg1	**PASS**	1.96

Luminous Intensity (Cd) Per Luminaire

Maximum Allowable Value: 1000 Cd
Control Angle: 83 Degrees

Luminaire Locations Tested (51)
Test Results: **PASS**

Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 1000 Cd

Calculations Tested (14):

Calculation Label	Test Results
Boundary 11_Cd_Seg1	**PASS**
Boundary 6_Cd_Seg1	**PASS**
Boundary 1_Cd_Seg1	**PASS**
Boundary 2_Cd_Seg1	**PASS**
Boundary 2a_Cd_Seg1	**PASS**
Boundary 3a_Cd_Seg1	**PASS**
Boundary 3_Cd_Seg1	**PASS**
Boundary 4_Cd_Seg1	**PASS**
Boundary 7_Cd_Seg1	**PASS**
Boundary 8_Cd_Seg1	**PASS**
Boundary 5_Cd_Seg1	**PASS**
Road Boundary Entry 2_Cd_Seg1	**PASS**
Boundary 9_Cd_Seg1	**PASS**
Boundary 10_Cd_Seg1	**PASS**

Obtrusive Light - Compliance Report

E24.61.2 Horizontal and Vertical illuminance at a window & E24 .6.6 Curfew Luminous intensity limits
Filename: LSD08058-0 REV1
20/07/2021 1:29:05 pm

Illuminance

Maximum Allowable Value: 2 Lux

Calculations Tested (6):

Calculation Label	Test Results	Max. Illum.
Dwelling1 window (OPB)_Lux_Ill_Seg1	**PASS**	1.5
Dwelling2 window (OPB)_Lux_Ill_Seg1	**PASS**	1.1
Dwelling4 window (OPB)_Lux_Ill_Seg1	**PASS**	1.6
Dwelling5 window (OPB)_Lux_Ill_Seg1	**PASS**	0.0
Dwelling3 window (OPB)_Lux_Ill_Seg1	**PASS**	0.1
Dwelling4 window 2 (OPB)_Lux_Ill_Seg1	**PASS**	1.3

Failed Meter Locations (246):

Calculation Label	Lux	Meter Coords
Road Boundary Entry 2_Ill_Seg1	4.6	-0.15, 86.05, 0.5
Road Boundary Entry 2_Ill_Seg1	4.8	-0.15, 84.05, 0.5
Road Boundary Entry 2_Ill_Seg1	4.8	-0.15, 85.05, 0.5

Luminous Intensity (Cd) Per Luminaire

Maximum Allowable Value: 1000 Cd
Control Angle: 83 Degrees

Luminaire Locations Tested (51)
Test Results: **PASS**

Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 1000 Cd

Calculations Tested (6):

Calculation Label	Test Results
Dwelling1 window (OPB)_Lux_Cd_Seg1	**PASS**
Dwelling2 window (OPB)_Lux_Cd_Seg1	**PASS**
Dwelling4 window (OPB)_Lux_Cd_Seg1	**PASS**
Dwelling5 window (OPB)_Lux_Cd_Seg1	**PASS**
Dwelling3 window (OPB)_Lux_Cd_Seg1	**PASS**
Dwelling4 window 2 (OPB)_Lux_Cd_Seg1	**PASS**