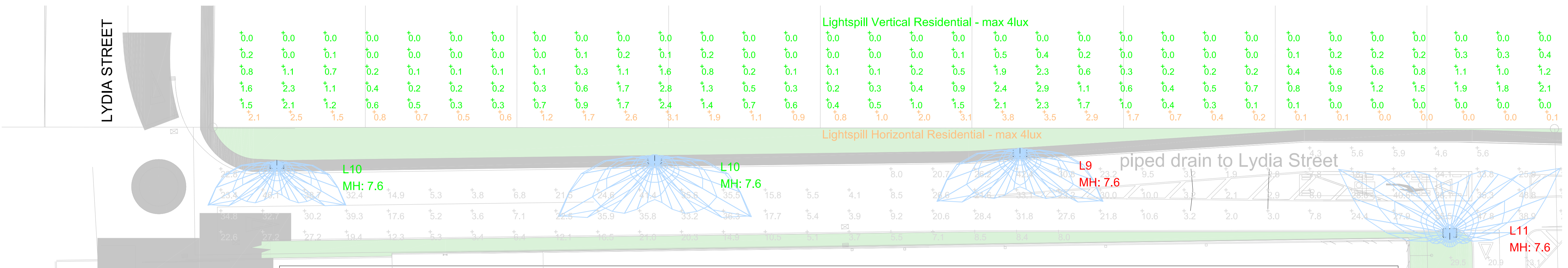




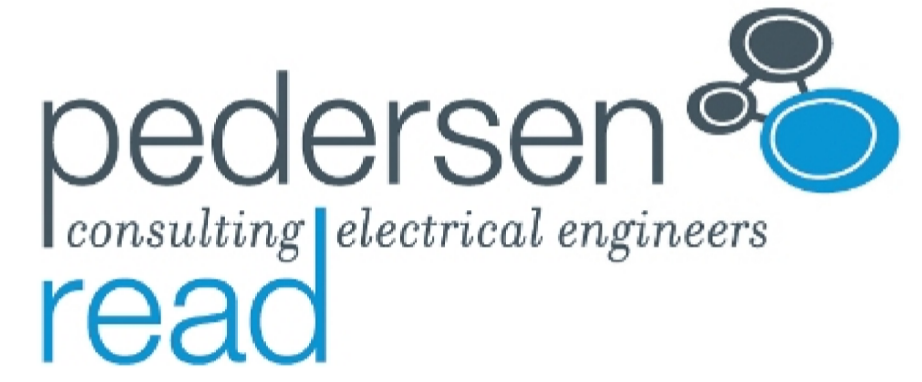
Appendix T

Car Park Lighting Plan



5077 Christchurch Papanui Pak'n Save Carpark - Initial Illuminance Calculation

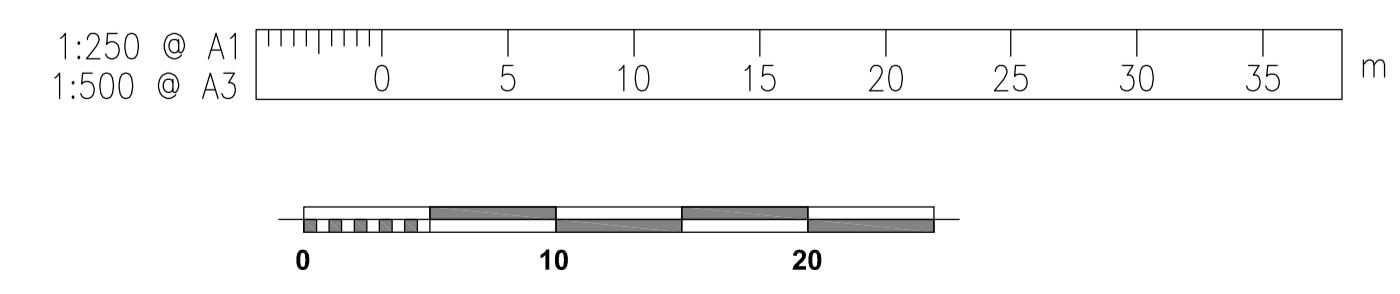
- Design illuminance to AS/NZS1158.3.1:**
- cat. P11a (horizontal: min 3lux, avg 14lux, uni <10; vertical at 1.5m: min 3lux)
 - and cat. P12 (min: avg P11a, not less than 14lux)
 - and additional client requirement of horizontal avg 20lux
- Pole heights:**
- 8.2m overall (7.6m Ruud square crown-weld steel pole on 600mm concrete plinth).
 - 7.6m overall (7.6m Ruud square crown-weld steel pole on concrete foundation).
- Lumen depreciation:**
- 1.0 for initial worst case boundary glare/spill lighting calculation
- Permitted maximum Lux spill:**
- 4.0 Lux (Residential Zones, all other)
 - 2.5 Lux (Major Arterial Roads)
- Luminaires:**



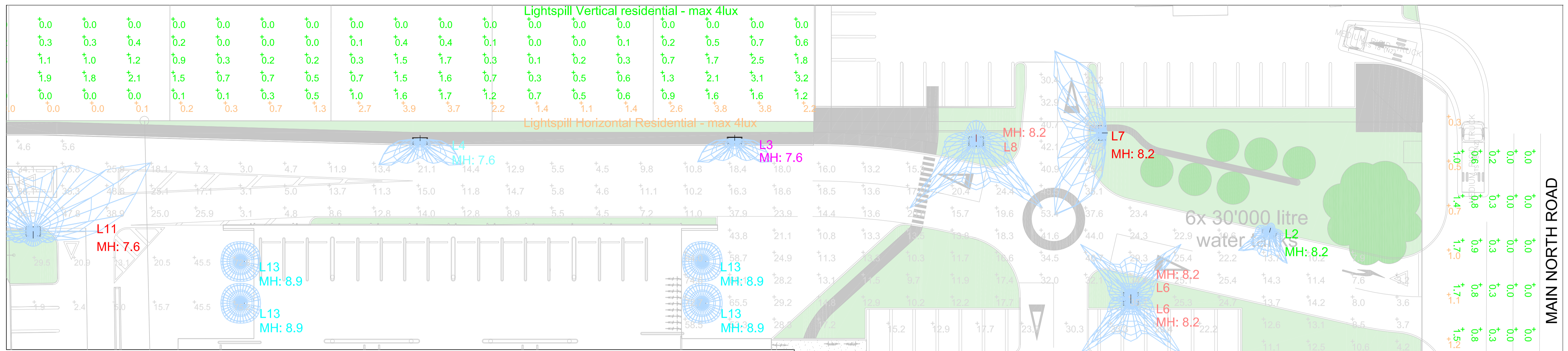
Luminaire Schedule								
Scene: CREE OSQ - INITIAL ILLUMINANCE								
Symbol	Qty	Label	Lumens/Lamp	LLF	LLD	LDD	Lumen Multiplier	Description
	3	L1	N.A.	0.380	1.000	1.000	0.38 - Q1	CREE OSQ 3ME K 40K BLSMF - Q1 51W - INITIAL
	1	L2	N.A.	0.380	1.000	1.000	0.38 - Q1	CREE OSQ 4ME K 40K - Q1 51W - INITIAL
	1	L3	N.A.	0.610	1.000	1.000	0.61 - Q1	CREE OSQ 2ME A 40K - Q1 56W - INITIAL
	1	L4	N.A.	0.730	1.000	1.000	0.73 - Q3	CREE OSQ 2ME A 40K BLSMF - Q3 71W - INITIAL
	1	L5	N.A.	0.800	1.000	1.000	0.80 - Q4	CREE OSQ 4ME A 40K - Q4 79W - INITIAL
	15	L6	N.A.	0.940	1.000	1.000	0.94 - Q7	CREE OSQ 4ME A 40K - Q7 101W - INITIAL
	1	L7	N.A.	0.680	1.000	1.000	0.68 - Q2	CREE OSQ 2ME S 40K - Q2 128W - INITIAL
	1	L8	N.A.	0.680	1.000	1.000	0.68 - Q2	CREE OSQ 4ME S 40K - Q2 128W - INITIAL
	1	L9	N.A.	0.730	1.000	1.000	0.73 - Q3	CREE OSQ 2ME S 40K BLSMF - Q3 144W - INITIAL
	2	L10	N.A.	0.850	1.000	1.000	0.85 - Q5	CREE OSQ 2ME S 40K BLSMF - Q5 175W - INITIAL
	1	L11	N.A.	1.000	1.000	1.000	1.00 - Q9	CREE OSQ 2ME S 40K - Q9 223W - INITIAL
	4	L12	7800	1.000	1.000	1.000	N.A.	CPY250A 40K 65W - INITIAL
	4	L13	12000	1.000	1.000	1.000	N.A.	CPY250A 40K 94W - INITIAL
	6	L14	10600	1.000	1.000	1.000	N.A.	PHILIPS MINI500 G2 100W NW ASYMMETRIC - INITIAL
	1	L15	4100	1.000	1.000	1.000	N.A.	WEEF DOC240 WW 55W - INITIAL

Calculation Summary - LIGHT SPILL - INITIAL ILLUMINANCE				
Label	CalcType	Units	Max	
Lightspill Horizontal Residential - max 4lux	illuminance	Lux	3.9	
Lightspill Vertical Residential - max 4lux	illuminance	Lux	3.2	
Lightspill Horizontal Main North Road - max 2.5lux	illuminance	Lux	2.4	
Lightspill Vertical Main North Road - max 2.5lux	illuminance	Lux	2.4	

Calculation Summary - DESIGN ILLUMINANCE						
Label	CalcType	Units	Avg	Max	Min	Max/Avg
Carpark Ground Horizontal Illuminance	illuminance	Lux	22.60	35.9	6.6	1.74
Disabled Parks - min 14 and avg P11a	illuminance	Lux	N/A	N/A	25.3	N/A



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5077 Christchurch Papanui Pak'n Save Carpark - Initial Illuminance Calculation

Christchurch District Plan Rules:

Chapter 6 General Rules and Procedures

6.3 Outdoor Lighting

6.3.4 Rules - Activity status tables - Control of glare

6.3.4.1 Permitted activities

The activities listed below are permitted activities if they meet the activity specific standards set out in the following table and the activity specific standards in Rule 6.3.5 Control of Light Spill.

Activities may also be restricted discretionary or non-complying as specified in Rules 6.3.4.2, 6.3.4.3 and 6.3.5.2.

Activity	Activity specific standards
P1 Any activity involving artificial outdoor lighting, other than activities specified in Rule 6.3.4.3 NC1 or NC2.	<p>a. All fixed exterior lighting shall, as far as practicable, be aimed, adjusted and/or screened to direct lighting away from the windows of habitable spaces of sensitive activities, other than residential units located in industrial zones, so that the obtrusive effects of glare on occupants are minimised.</p> <p>b. Artificial outdoor lighting shall not result in a greater than 2.5 lux spill (horizontal or vertical) into any part of a major or minor arterial road or arterial route identified in Appendix 7.12 where this would cause driver distraction.</p> <p>Advice Note: See Appendix 6.11.13 for guidance on lighting design to reduce light spill and glare.</p>

6.3.5 Rules - Activity status tables - Control of Light Spill

6.3.5.1 Permitted activities

The activities listed below are permitted activities if they meet the activity specific standards set out in the following table and the activity specific standards in Rule 6.3.4 Control of Glare.

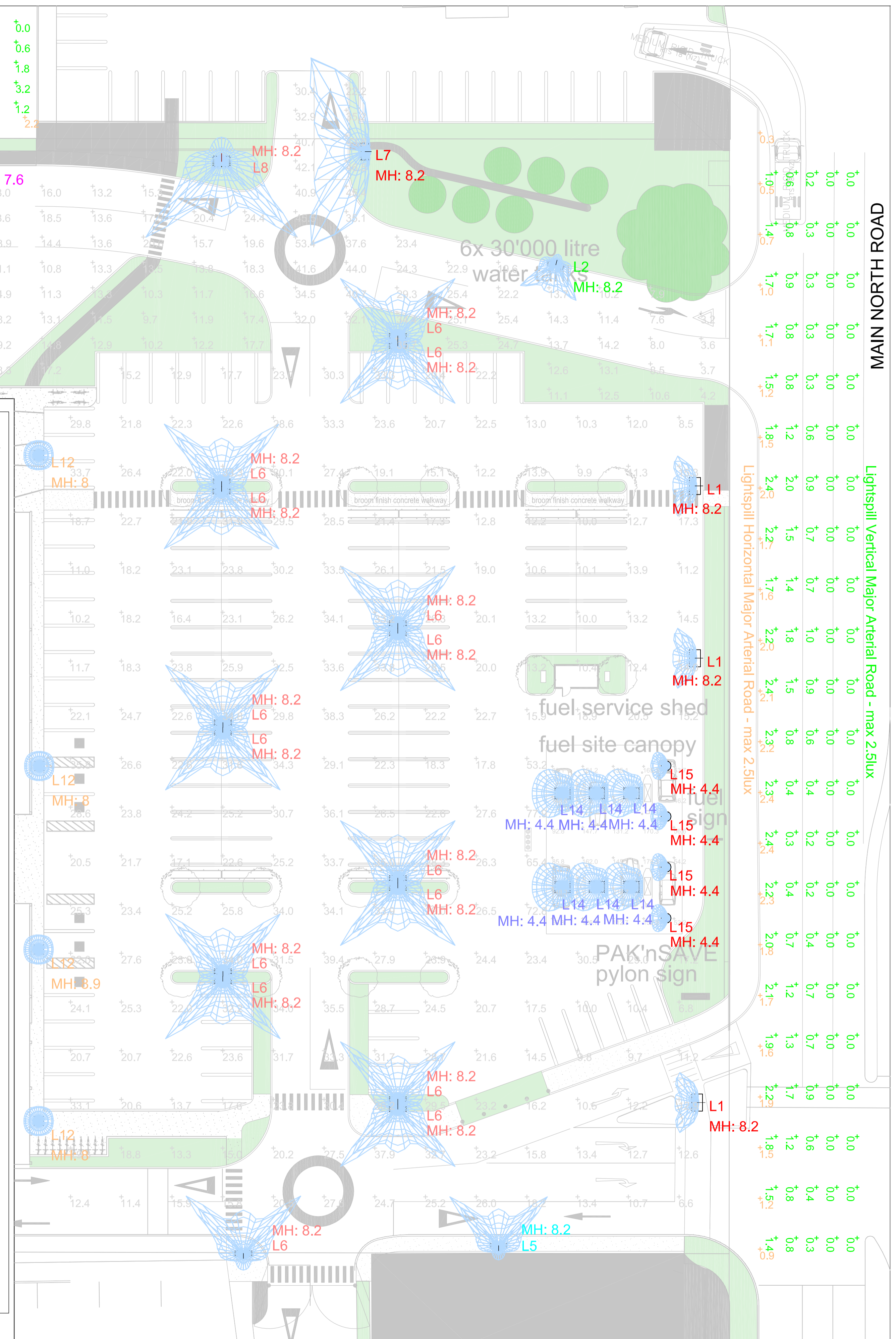
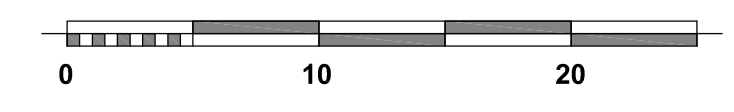
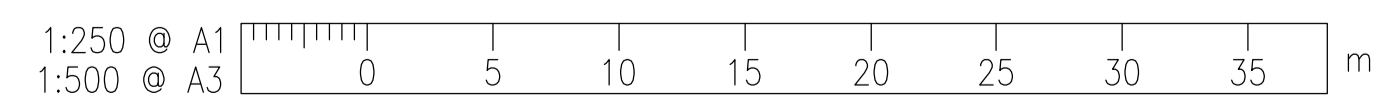
Activities may also be restricted discretionary or non-complying as specified in Rules 6.3.4.2, 6.3.4.3 and 6.3.5.2.

6.3.6 Rules - Light Spill Standards by Zone

- The added horizontal or vertical illuminance from the use of artificial outdoor lighting must not exceed the limits in the following table of light spill standards by zone, when measured or calculated 2 metres within the boundary of any adjacent site.
- Where a site is divided by a zone boundary, each part of the site shall be treated as a separate site for the purpose of the standards contained in the following table of light spill standards by zone.

Table of Light Spill Standards by Zone applicable Zone:

Zone X. : "Residential zones, all other: Permitted lux spill (horizontal and vertical): 4.0 Lux"



MAIN NORTH ROAD

Lightspill Vertical Major Arterial Road - max 2.5lux

Lightspill Horizontal Major Arterial Road - max 2.5lux