

IN THE MATTER

of the Resource
Management Act 1991

AND

IN THE MATTER

of a resource consent
application by **LIMITED
VACO INVESTMENTS
(WAIPU PROJECT) Ltd**
to the **WHANGAREI
DISTRICT COUNCIL**
under section 88 of the
Act to construct and
operate the Waipu
Service Centre

STATEMENT OF EVIDENCE OF KIN LEUNG

1. INTRODUCTION

Qualifications and experience

- 1.1 My name is Kin Leung. I am a director and electrical engineer / lighting designer at Lumen 8 Consultants Ltd ("Lumen8").
- 1.2 I hold the degree of Bachelor of Electrical & Electronics Engineering with First Class Honour (1988) from University of Auckland and Certificate of Illumination Engineering 1 & 2, 1996 – 1997 from Auckland University of Technology.
- 1.3 I am an independent lighting designer / chartered electrical engineer with 35 years of experience in New Zealand, Australia, Fiji, American Samoa, California USA & Vancouver Canada and has been an expert witness for resource consent applications.
- 1.4 At the IESANZ International Lighting Award 2006, I won an "Award of Commendation" for the "Bendon Distribution Centre in Mangere". This winning design was "*low maintenance*", had "*low running costs*", and was "*ecologically sustainable*".

1.5 I hold the following qualifications and professional affiliations:

- a) Chartered Professional Engineer, Charter Member of Engineering New Zealand (Electrical & Building Services)
- b) Technical Member of Illumination Engineering Society– TechIES
- c) International Professional Engineers Register – IntPE (NZ)
- d) APEC Engineer Register – APEC Engineer
- e) Engineer-in-Training, State of California, USA – EIT(California)

Purpose and scope of evidence

1.6 The purpose of my evidence is to:

- (a) Describe the lighting solution for which consent is sought;
- (b) Identify the relevant statutory and plan provisions and reasons for consent; and
- (c) Provide an overall assessment of the proposed lighting solution.

1.7 A summary of my evidence is contained in Section 2.

Expert Witness Code of Conduct

1.8 I have read the Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note (2023) and I agree to comply with it. I can confirm that the issues addressed in this statement are within my area of expertise and that in preparing my evidence I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

2. SUMMARY OF MY EVIDENCE

Proposal

2.1 From a performance point of view, the proposed lighting scheme for the carparking areas, vehicle accessway, pedestrian crossings and associated pedestrian pathways had been designed in compliance with the requirements under the District Plan rules contained in the

Lighting Chapter of Whangarei District Plan (WDP) and AS/NZS 1158.3.1:2020 "Lighting for roads and public spaces". Consideration has also been given to the CPTED requirements.

- 2.2 With the updated application plans being developed in two stages and two options being shown for Stage 2, the performance of the updated lighting design remains in compliance with the requirements under the District Plan rules contained in the Lighting Chapter of WDP and AS/NZS 1158.3.1:2020 "Lighting for roads and public spaces".
- 2.3 Whilst some of the food outlets and the service centre under Stage 1 could be on a 24/7 operation, we envisage the building use under Stage 2 would be of the standard 8:30am – 5pm operation. As such, for the lighting associated with the Stage 2 area, a dimming control system consisting of motion sensors can be implemented.
- 2.4 The dimming control strategy would be:
 - a) Each luminaire is equipped with a built-in motion sensor.
 - b) The luminaires are connected together, creating a mesh network.
 - c) The network is controlled via a cloud-base lighting management system.
- 2.5 The lighting system would be programmed to switch on at dusk and then dim down to say 20% at 10pm. When movement is detected, the lighting will be dimmed up to provide a safe lighting to users / vehicles detected in the area. When the movement is not detected after a pre-set period of time, the lighting will dim back down again.
- 2.6 Such lighting control system offers the following environmental benefits:
 - a) Sustainability.
 - b) Energy Conservation.
 - c) Energy Saving.
 - d) Increase in life expectancy of the LEDs and drivers for the luminaires by reducing waste.
 - e) Reduction in sky pollution.

2.7 Below is a case study conducted in Chur, Switzerland illustrating the benefits of the proposed dimming control system.



2.8 Lighting for the on-site roundabout will be designed by NZTA and I envisage the lighting design will be similar to that of the Marsden Point turn-off roundabout.

Reason for consent

2.9 The proposal requires resource consent for compliance with the District Plan rules contained in the Lighting Chapter of Whangarei District Plan and AS/NZS 1158.3.1:2020 "Lighting for roads and public spaces".

Assessment of Effects

Lighting effects

2.10 With the service station now positioned at the back of the site under the new plans, together with the revised landscape scheme, the service station would be "visually shielded" from State Highway 1 (SH1). Compared to the existing petrol station located by the roundabout further up SH1 at the turn-off to Marsden Point or the existing petrol station at Oakleigh, both of which have no form of

screening and are located directly adjacent to SH1, this service station would have minimal impact on the surrounding landscape.

- 2.11 As a frequent SH1 road user between Auckland and Kerikeri myself, I am familiar with this area: the petrol station at Oakleigh generally closes at midnight whereas the petrol station by Marsden Point roundabout turn-off has a general floodlighting-type luminaire installed on the forecourt with the lamp source fully exposed, creating a visual glare to the drivers.
- 2.12 Lighting for the on-site roundabout will be designed by NZTA and we envisage the lighting design will be similar to that of the Marsden Point turn-off roundabout.

Overall assessment

- 2.13 Based on the analysis contained within my evidence, the proposed lighting scheme offers the following design performance parameters:
- a) All the lighting luminaires are aimed within the site, away from the boundaries and any roading networks,
 - b) As the LED lighting luminaires are of efficient output performance, the number of lighting pole columns required is significantly reduced, mitigating the visual pollution,
 - c) The proposed lighting luminaires provide good and precise cut-off control, mitigating any unwanted spill light and visual glare, and
 - d) The proposed lighting luminaires have no tilt from the horizontal, avoiding any unwanted light pollution to the sky.
- 2.14 It is my view that the proposed lighting solution is appropriate having regard to the relevant design standard and Whangarei District Plan Light Chapter requirements.

3. CONCLUSION

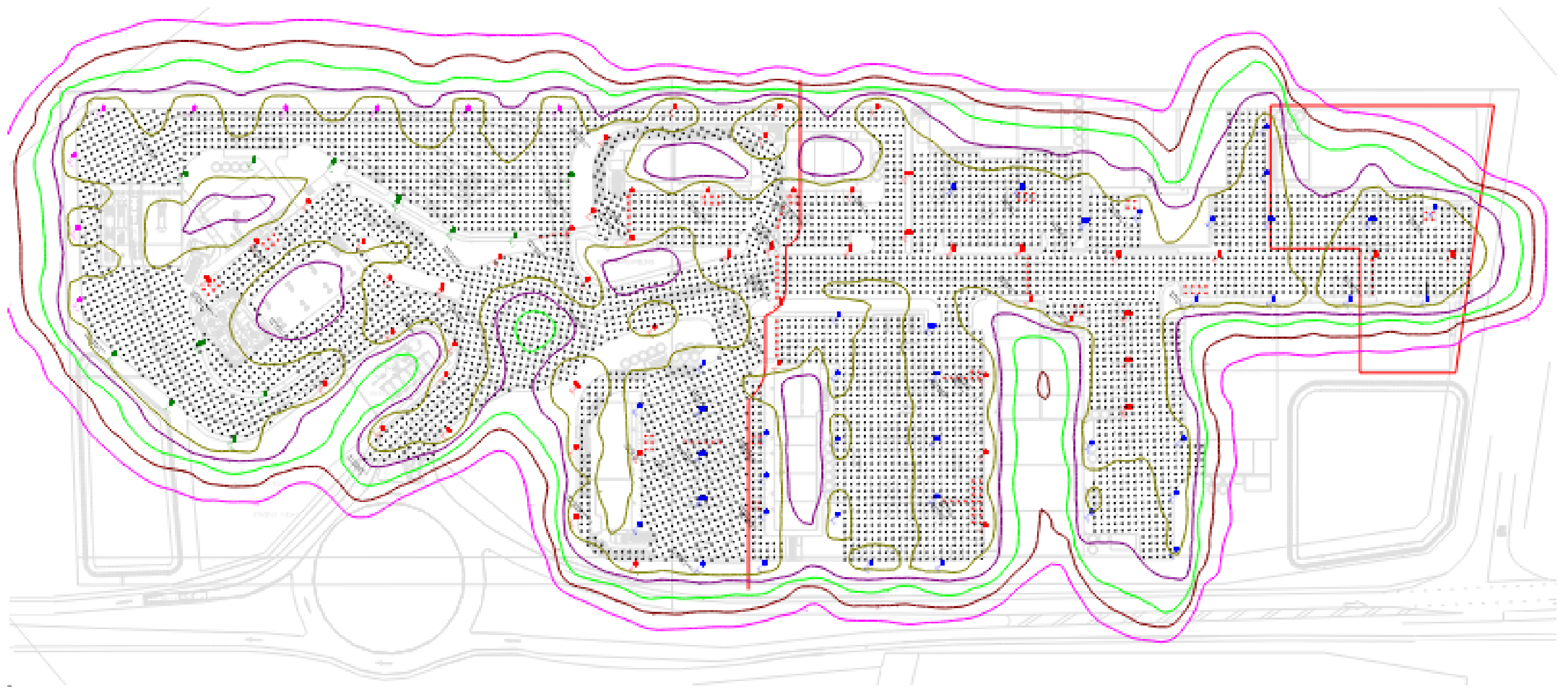
3.1 Based on the expert assessment provided, it is my opinion that the lighting proposal will provide for a well-suited and safe space for the users of the service centre, given the following:

- a) The proposed location is already well lit, given it is an intersection on SH1 with Millbrook Road and The Braigh, and issues of driver safety are considered paramount.
- b) The proposed illumination of the service centre and Stage 2 development complies with the WDP provisions and the relevant Australian / New Zealand Standard which are considered the acceptable standard for the zone, and are consistent with other planning provisions throughout the country.
- c) The illumination from the Stage 1 activities will be mitigated by the proposed landscaping (acting as a visual screen) and their relative positions in relation to SH1, in comparison to other existing services stations along SH1 in close proximity to the site, i.e. located directly adjacent to SH1 with no form of screening installed.
- d) The illumination of the sign at the entrance will be back-lit, i.e. the light source is fully concealed and does not create any glare to the drivers. The luminance of the signage will be in compliance with the requirement under the Signs Chapter of Whangarei District Plan.
- e) The illumination and dimmability of the lighting solution will further mitigate the effects of the Stage 2 development such that the lighting pollution to the sky is significantly reduced – refer to the case study shown above.

3.2 Overall, I consider the effects of lighting are acceptable, comply with the plan provisions, and will produce light spill/glare that is less than other locations, and that nonetheless, the application has sought to have these effects mitigated further through the use of dimmable LED in the lighting solution.

Kin Leung
24 September 2024

Attachment 1 - Lighting Layouts



NOTES

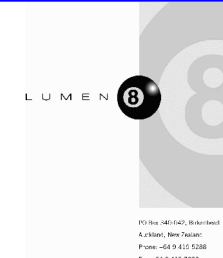
1. CALCULATION RESULTS ARE BASED UPON MAINTENANCE FACTOR OF 0.8.
2. ALL THE CALCULATION POINTS ARE AT GROUND LEVEL.

ISSUE FOR RESOURCE CONSENT

Rev	Description	Date	Rev	Description	Date
-	ISSUE FOR RESOURCE CONSENT	28.03.23			
A	ISSUE FOR RESOURCE CONSENT	25.09.24			

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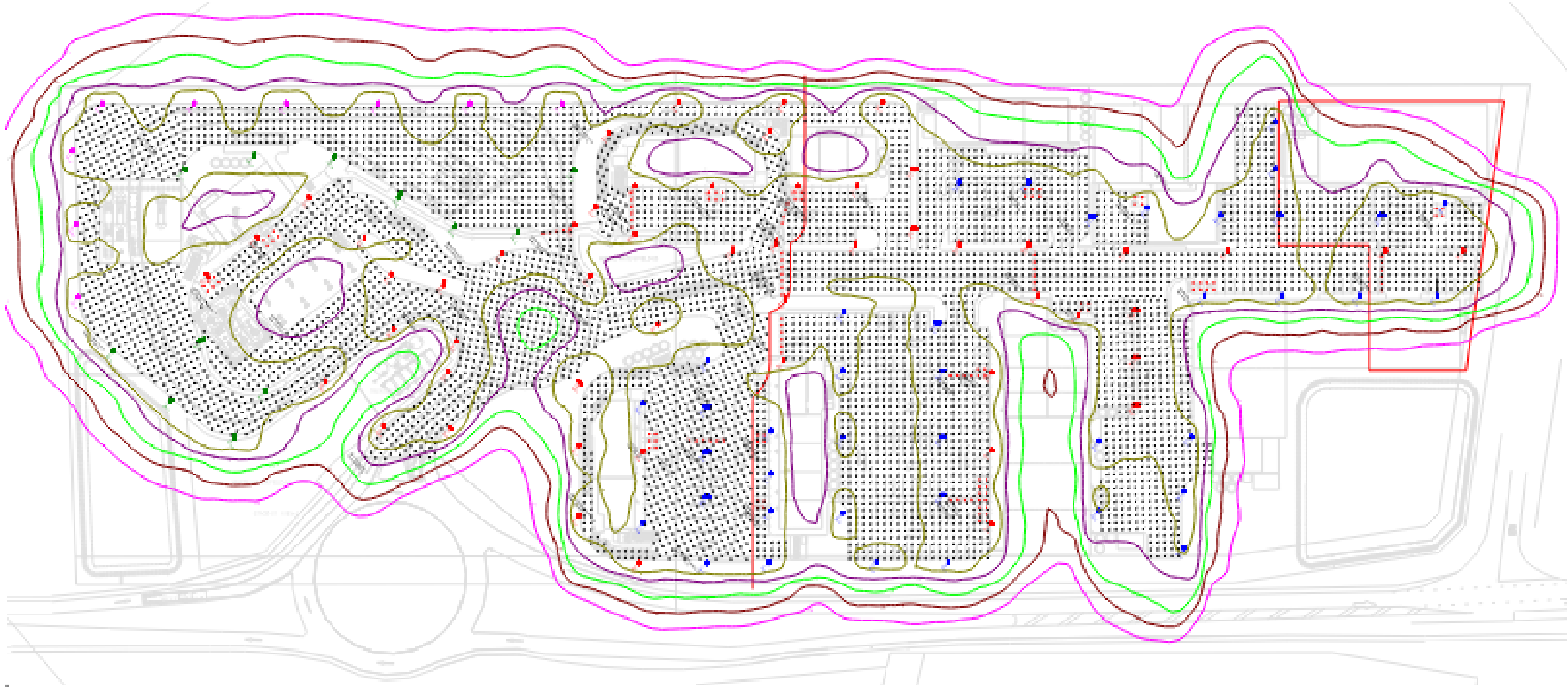


Job Title
 WAIPU GATEWAY
 PROPOSED SERVICE CENTRE
 47 MILLBROOK ROAD
 WAIPU, WHANGAREI DISTRICT

Sheet Title
 ELECTRICAL SERVICES
 EXTERIOR LIGHTING LAYOUT
 LIGHTING PERFORMANCE
 STAGE 1 + STAGE 2 OPTION 1

Drawn
 KL
Date
 08.12.22
CAD File Ref.
 ELighting-01
Scale (A1 Original)
 1:600 (1:1200 @ A3)

Drawing
 E1-01
Amendment
 A
Project No.
 2211



NOTES

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 WAIPU, WHANGAREI DISTRICT

Sheet Title
 ELECTRICAL SERVICES
 EXTERIOR LIGHTING LAYOUT
 LIGHTING PERFORMANCE
 STAGE 1 + STAGE 2 OPTION 2

Drawn KL	Drawing E1-02
Date 08.12.22	
CAD File Ref. ELighting-01	Amendment A
Scale (A1 Original) 1:600 (1:1200 @ A3)	Project No. 2211