

**BEFORE THE WAIKATO DISTRICT COUNCIL**

**IN THE MATTER OF  
AND**

the Resource Management Act 1991

**IN THE MATTER OF**

Proposed Waikato District Plan  
Hearing 22 - Infrastructure

**SUBMITTER**

COUNTIES POWER LIMITED  
Submitter 405  
Further Submission F-1134

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STATEMENT OF EVIDENCE IN CHIEF BY SHRAVAN MIRYALA ON BEHALF OF  
COUNTIES POWER LIMITED

DATED: 29 SEPTEMBER 2020

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## INTRODUCTION

1. My full name is Shraavan Miryala.
2. I am currently working as a Planning Consultant for Align Ltd., based in Kingsland, Auckland. Prior to this role I held the position of Planner at Harrison Grierson; and Davie-Lovell Smith Ltd, in Christchurch and previously as a Graduate Planner at EMACS Group Ltd, based in Auckland.
3. I have a Master of Urban Planning from the University of Auckland and I am an Intermediate member of the New Zealand Planning Institute. I also hold a Bachelor of Technology in Planning from Jawaharlal Nehru Architecture and Fine Arts University, Hyderabad, India.
4. I have practiced in the planning profession for over 5 years working for both private and public sector clients in New Zealand. I have worked on a broad range of projects that have included the preparation, management and obtaining various land use, subdivision, Outline Plan of Works, alteration to designation conditions and regional consents. I have experience processing consents on behalf of Christchurch City Council; Auckland Council; Selwyn District Council and Mackenzie District Council. I have limited experience assisting Senior Planners in policy analysis and development; and the development of rules.
5. My evidence shall address the Council officer's evidence and further submission of Transpower (#FS1350.78).
6. I am authorised to present this evidence on behalf of the Counties Power Limited (CPL), in support of its primary submission on the Proposed Waikato District Plan (PWDP). I was not involved in the preparation of the submissions (stage 1) made to the PWDP by CPL.
7. The key documents I have used, or referred to, in forming my view while preparing my statement of evidence are:
  - a) The section 42A recommendation of the Infrastructure and Energy Chapter (including the recommended versions in Appendices 2, 3 and 4), dated 14 September 2020.
  - b) The notified version of Chapter 6 (Objectives and Policies); and Chapter 14 (Infrastructure and Energy).

8. With me today are Rachel Bilbe, Land Access Coordinator at CPL and Adrian Nadan, Network Development Manager at CPL, both of whom are happy to answer any specific technical questions relating to the Counties Power network.

### **CODE OF CONDUCT**

9. I have read, understood, and will comply with the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note 2014. This evidence has been prepared in accordance with this Note and I agree to comply with it.

### **SCOPE OF EVIDENCE**

10. My evidence relates to submissions made by CPL on Chapters 6; and 14. Counties Power wish to provide evidence around the topics contained in these Chapters following Mr Trevor Mackie's section 42A recommendation dated 14 September 2020.

11. The specific parts of the Proposal that my evidence relates to are as follows:

- Rule 14.5.1(P1) (#405.17); 14.5.1 (P2) & (P3) (#405.52); Rule 14.5.2 (RD1)(405.55);
- Rule 14.5. 1 (P4) (#405.92) and Rule 14.5.3 (D3) (#405.94); and
- Rule 14.4.2 (RD4) (#405.51) and Transpower's objection (#FS1350.78).

### **SUMMARY OF EVIDENCE**

12. I consider that new overhead distribution lines (OH) shall be enabled in Village Zone; Country Living Zone; Industrial and Heavy Industrial Zones and within formed and unformed roads adjacent to these Zones for the reasons discussed below. I also consider that subdivision within proximity of existing lines shall be protected from subdivision, use and development in a manner similar to Transpower's National Grid for the reasons discussed below. I consider that the permitted size of the switch room should be increased, or a less onerous activity status imposed for the reasons discussed below.

### **COUNTIES POWER LTD. BACKGROUND**

13. Counties Power Ltd. is a customer-owned lines company, successor to the Franklin Electric Power Board. It has developed, owned and operated the electricity distribution network in the south Auckland, north Waikato and Hauraki region since 1924. The network currently has a system length of 3,200km covering an area of approximately 2,250km<sup>2</sup>, 1,340km<sup>2</sup>, (or 60%) of which is within the Waikato District. Other than the settlements of Tuakau and Pokeno, Counties Power serves a predominantly rural area in north Waikato, with a low customer density. It does however serve a number of

customers who are critical to the Region (e.g. Watercare's Waikato treatment and river pumping stations) as well as the businesses, households and community services in the network area.

14. Counties Power is an electricity operator under the Electricity Act, a network operator under the Telecommunications Act, and a network utility operator under the Resource Management Act. Counties Power is a requiring authority in respect of its electricity network.
15. Electricity is an essential infrastructure that enables development to occur. Power which is received from the National Grid at the Bombay and Glenbrook Grid Exit Points (GXPs) at either 110kV or 33kV, is conveyed via overhead lines to one of four zone substations located in north Waikato (the most recent of these being constructed at Pokeno), before being converted to either 22kV or 11kV and distributed via an extensive network of overhead lines, cables, transformers and other equipment, to business and households.
16. As with any other technology, future proofing to meet the needs of the communities and businesses is a priority for CPL. Key to this is the integration of land use and infrastructure planning, i.e. to identify, protect and provide existing and future electricity network infrastructure to ensure that the existing and future needs of the north Waikato region are met in light of pressures from urban growth.
17. CPL must be able to operate, maintain and replace existing assets as the need arises, and secure and develop new line routes and substations in response to demand generated by urban growth. Rules which are difficult to interpret or are unduly restrictive cause complexity, delay and ultimately additional cost for Counties Power customers as well as posing a significant and unacceptable risk to the efficient operation and development of the network and hence, security of supply for the customers. CPL's submission therefore seeks to enable a clear framework for the ongoing operation, maintenance, upgrading and development of the electricity distribution network whilst appropriately managing potential adverse effects. Therefore, the requested amendments in the CPL submissions and this evidence is necessary in achieving its core purpose to consistently deliver a safe, secure and cost-effective supply of electricity.

## EVIDENCE

### Overhead distribution lines

18. Electricity distribution lines meets the definition of 'regionally significant infrastructure' in the Waikato Regional Policy Statement 2016. Policy 6.1.17 seeks to have particular regard to and protection of effectiveness and efficiency of the planned and existing regionally significant infrastructure. Policy 6.1.2 seeks to provide for the development, operation, maintenance, repair, replacement, upgrading and removal of infrastructure throughout the district. I acknowledge that new infrastructure is permitted under Rule 14.2.1 (P1). However, the proposed/ recommended rules only permit OH distribution lines in Rural Zones and are not fully giving effect to Policy 6.1.2 throughout the district as a permitted activity.
19. CPL in their submission points (#405.17; 405.52; 405.55) sought to amend Rules 14.5.1 (P1); Rule 14.5.1 (P2) & (P3); and Rule 14.5.2 (RD1), to enable overhead distribution lines in other Zones apart from Rural and Identified Areas. Mr. Mackie has rejected the submission points. Mr Mackie states that maintenance and enhancement of amenity values; protection of identified areas and resilience are the primary three reasons why he considers that the OH distribution lines and support structures need to be undergrounded. I agree that OH lines should require a consent in the Identified Areas and address any relevant issue depending on the context.
20. In terms of addressing the maintenance and enhancement of amenity values, it comes down to the density of human population in the receiving environment i.e. as the population density and visual clutter is less in rural areas, OH distribution lines are a permitted activity and are either restricted discretionary or discretionary in other zones and in Identified Areas respectively.
21. Most new subdivisions in urban areas will incorporate underground (UG) power cables as space/area for ducting is provided for in the subdivision layout within roads and as required by the Territorial Authority's engineering standards. There may be instances where the OH lines are required for temporary duration until the subdivision layout and demand is ascertained to avoid rework. With Industrial areas, the level of amenity that is anticipated is low and so is the population density. The Village Zone and the Rural Lifestyle Zone are characterised as semi-rural and rural environments respectively with low density. In existing urban areas it may be complicated to UG new power cables for any of the following reasons: no accurate as-built data; no space within the road reserve and high costs associated with open trenching the road and rebuilding it (in

comparison with OH lines). Therefore, it is practical and cost effective to incorporate permitted activity standards in existing and established urban areas. There may also be situations where the proposed network passes across predominantly rural land and through another Zone (for example a Village Zone and Rural Lifestyle Zone) for a short section and it is more practical, and cost effective to design one type of transmission method.

22. Mr Mackie notes that resilience of the infrastructure is an additional reason for supporting undergrounding. In terms of resilience, one of the goals for CPL is to provide resilient power supply without any interruptions to their customers.

23. With the exception of infrastructure associated with the undergrounding of 110kV sub-transmission circuits, the installation of underground power cables does not result in visual effects but for the following reasons OH lines may be necessary in zones other than Rural according to CPL:

- A lot of UG services paired with limited berm space can impact CPL's ability to UG;
- Difficult ground conditions (rock/undulating ground);
- Unknown load requirements in industrial/ heavy industrial areas – a temporary OH solution would be desirable until final layouts and demand is known to avoid rework;
- Cost of UG cables per km compared with overhead distribution lines (at 110kV UG = \$1.62million 'v' \$661K per km for OH. For 22kV distribution UG= \$386K 'v' \$317K)
- Speed of repair and fault finding (OH is quicker and easier to detect than UG faults) – particularly with 110kV as the impact of a fault can result in prolonged outages, therefore having a visual on the lines is important.

24. Counties Power Limited's UG network is relatively new compared to the OH network but at some stage (30 – 40 years from now UG network failure is likely to increase and as stated above, faults on overhead lines are more easily and quickly detected and repaired than those involving underground cables.

25. Looking at the matters of discretion under Rule 14.5.2 (RD1) include the following: (i) *The functional need and operational need of, and benefits derived from, the infrastructure;* (ii) *The extent to which alternative technologies and techniques have been considered;* (iii) *The extent to which co-location of overhead lines is technically,*

*economically and practically reasonable; (iv) The extent to which the proposal is in accordance with relevant industry standards and meets specified clearance requirements for operational and safety reasons; (v) The extent to which the proposal will adversely affect the amenity values of the site and locality. (vi) The extent to which there are difficult ground conditions, topography or obstructions which make undergrounding impractical.* All these matters are considered by Counties Power's network design engineers as part of their due diligence and feasibility before finalising a route and design for any location, even where consent is not required.

26. Furthermore, earthworks associated with OH distribution line poles are very minimal (approximately 0.9m<sup>3</sup> per pole) as the disturbed area is significantly reduced.
27. For the above reasons, I consider that it is reasonable to expect new OH lines as a minimum in Village Zone; Rural Lifestyle Zone; Industrial and Heavy Industrial Zones and within Road Zone adjacent to these Zones. The proposed amendments in blue in Appendix 1 enables OH lines (up to 110kV) up to a maximum height of 25m in the Village Zone; Rural Lifestyle Zone; Industrial and Heavy Industrial Zones and Road Zone adjoining these Zones.
28. Therefore, I request Rules 14.5.1 (P1); 14.5.1 (P2) & (P3); and Rule 14.5.2 (RD1) to be amended to incorporate these factors.

### **Ancillary buildings**

29. Counties Power Limited [405.92 and 405.94] seeks to amend Rule 14.5.1 (P4) and Rule 14.5.3 (D3) to increase the floor area to 250m<sup>2</sup> per ancillary building, as a typical switch room (the submitter presumes this is what is meant by "ancillary building") has a floor area up to 250m<sup>2</sup>.
30. Mr Mackie in his evidence has requested CPL to provide some examples of the switch rooms. CPL are in the process of serving notice on Auckland Council to establish a new designated site to establish a substation in Bombay. The design plans indicate a switch room with a gross floor area of 224m<sup>2</sup>. Other examples include Tuakau – 187m<sup>2</sup>; Pokeno - 420m<sup>2</sup>; and Waiuku- 280m<sup>2</sup>. A switch room typically comprises distribution switchgear that takes supply from one or several transformers and splits it up into multiple feeders, control cabinets, communications cabinets and protection cabinets which serve to control the switch gear inside the building or other assets outside the building and this is why a minimum floor area of 250m<sup>2</sup> is required. An example floor

and site plan is included in Appendix 2. Typically, substations are built on designated land that requires an Outline Plan of Works approval under the Act. The discretionary activity status proposed is onerous and we request that Council either revisit the gross floor area limits or insert a less onerous activity status if there are non-compliances with the permitted standards. I consider a controlled activity status would be appropriate because in terms of the effects, landscape visual mitigation is typically prepared and provided with any application for new switch rooms/ substations and transformers, including Outline Plan of Works applications, to mitigate the effects. The matters of control can address visual effects and any mitigation offered or proposed by the network utility provider.

### **Subdivision in proximity to distribution lines network**

31. It appears the CPL submission point (#405.51) was misinterpreted by Mr Mackie and Transpower (#FS1350.78) as the submission was unclear and for this, we apologise. The main intention of the submission point was to support the rule and also to apply it to address subdivision of land within the vicinity of CPL lines throughout the various zones. CPL do not wish to propose a specific setback as this can vary due to a number of factors addressed in the NZECP34. CPL seek that the presence of line/cable is acknowledged at the subdivision consenting stage and advice sought from CPL on a case by case basis. This approach will ensure that matters can be addressed which include but are not necessarily limited to how close the buildings can be erected to a line, and safeguarding suitable access to the line for future maintenance and operation purposes. The submission point sought a similar activity status for subdivision provided for in Rule 14.4.2 (RD4) when subdivision of land is located within the National Grid Subdivision Corridor. This will ensure any subdivision within the CPL lines corridor will ensure the safe and efficient operation of the distribution line and enable compliance with New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34). Therefore, CPL requests that matters of control/discretion that addresses this within the subdivision rules of the individual Zone Chapters are incorporated.
32. The proposed changes will give effect to Policies 6.1.7 and 6.1.17 that seeks to avoid reverse sensitivity effects on infrastructure from subdivision, use; development and have particular regard to and protection of the effectiveness and efficiency of the planned and existing regionally significant infrastructure.



## **AREAS FOR FURTHER CONSIDERATION**

33. I recommend that the wording in Rule 14.3.1.3(g) be amended as follows for ease of interpretation: *'The finished ground levels (after the cut and fill works) shall not cause ponding/drainage/run-off related nuisance to the neighbouring (surrounding) properties or change of the current drainage patterns (existing overland flow paths) to the detriment of the surrounding properties.'*
34. All other submissions points made by CPL have been satisfactorily addressed by Mr Mackie's S42A Assessment.
35. We note that Pokeno Substation that was designated under DES0013/19 in July 2019 at 55 Munro Road is not reflected on the Proposed Planning Maps.
36. Overall, I consider that the amended version of the PWDP recommended by Mr Mackie, subject to the amendments sought as outlined above and contained in Appendix 1 below, address CPL's submissions.

## **CONCLUSION**

37. My evidence is limited to the matters which CPL wish to pursue in light of the recommended amended version of Chapters 6 and Chapter 14 primarily and consequent amendments to other parts of PWDP.
38. I consider that the amendments to Rules 14.5.1 (P1) and (P2) and Rule 14.5.2 (RD1) proposed by CPL seek to enable OH distribution lines as a minimum in the Village Zone; Rural Lifestyle Zone; Industrial and Heavy Industrial Zones and Road Zone adjoining these Zones.
39. Overall, I consider that the amended version of the PWDP recommended by Mr Mackie, subject to the amendments sought as outlined above and contained in Appendix 1 below, provide a clear framework for the ongoing operation, maintenance, upgrading and development of the electricity distribution network whilst appropriately managing potential adverse effects. In my view, it will support Counties Power Limited in achieving its core purpose to consistently deliver a safe, secure and cost-effective supply of electricity.

## APPENDIX 1 – AMENDMENTS SOUGHT TO CHAPTER 14

### 14.5 Electrical distribution

#### 14.5.1 Permitted Activities

Activity		Activity specific conditions
P1	Below ground distribution lines	Nil
P2	<u>New</u> <del>Overhead</del> distribution lines and support structures within the Rural Zone; <u>Village Zone; Rural Lifestyle Zone; Industrial Zone and Heavy Industrial Zone.</u>	14.5.1.1 (a) <u>New</u> <del>Overhead</del> distribution lines and support structures that comply with the following: (i) Do not exceed a voltage up to and including 110kV; and (ii) Do not exceed a maximum height of 25m; or (iii) Do not exceed a maximum height of 30m for co-location of at least two operators; and (iv) Are not located within an <b>Identified Area</b> .
P3	<u>New</u> <del>Overhead</del> distribution lines and support structures within road or unformed road located adjacent to the Rural Zone; <u>Village Zone; Rural Lifestyle Zone; Industrial Zone and Heavy Industrial Zone.</u>	
P4	Substations and associated transformers and switching stations	14.5.1.2 (a) Substations and associated transformers and switching stations distributing electricity that comply with the following: (i) Distribute electricity at a voltage up to and including 110kV; and (ii) Are located within the Business Zone, Business Town Centre Zone, Tamahere Business zone, Te Kowhai Airpark Zone, Industrial Zone, Industrial Zone <u>Heavy</u> <sup>1</sup> and Motor Sport and Recreation Zone; <u>and the Rural Zone</u> <sup>2</sup> (iii) Any ancillary <b>buildings</b> do not exceed 100m <sup>2</sup> in gross floor area; and (iv) Are not located within an <b>Identified Area</b> . (v) <u>Maximum height 10m</u> <sup>3</sup>

#### 14.5.2 Restricted Discretionary Activities

Activity	Matters of Discretion
RD1 (a) <u>New</u> <del>Overhead</del> distribution lines and support structures not exceeding a voltage up to and including 110kV: (i) Not located within the Rural Zone; Village Zone; <del>Country Living</del> <u>Rural Lifestyle Zone; Industrial Zone; Heavy Industrial Zone, and Road Zone adjoining these Zones;</u> (ii) Not located within an <b>Identified Area</b> .	(a) Discretion is restricted to: (i) The <b>functional need</b> and <b>operational need</b> of, and benefits derived from, the <b>infrastructure</b> ; (ii) The extent to which alternative technologies and techniques have been considered; (iii) The extent to which co-location of overhead lines is technically, economically and practically reasonable; (iv) The extent to which the proposal is in accordance with relevant industry standards

<sup>1</sup> 697.518 Waikato District Council

<sup>2</sup> 405.53 Counties Power Limited; 836.19 Powerco

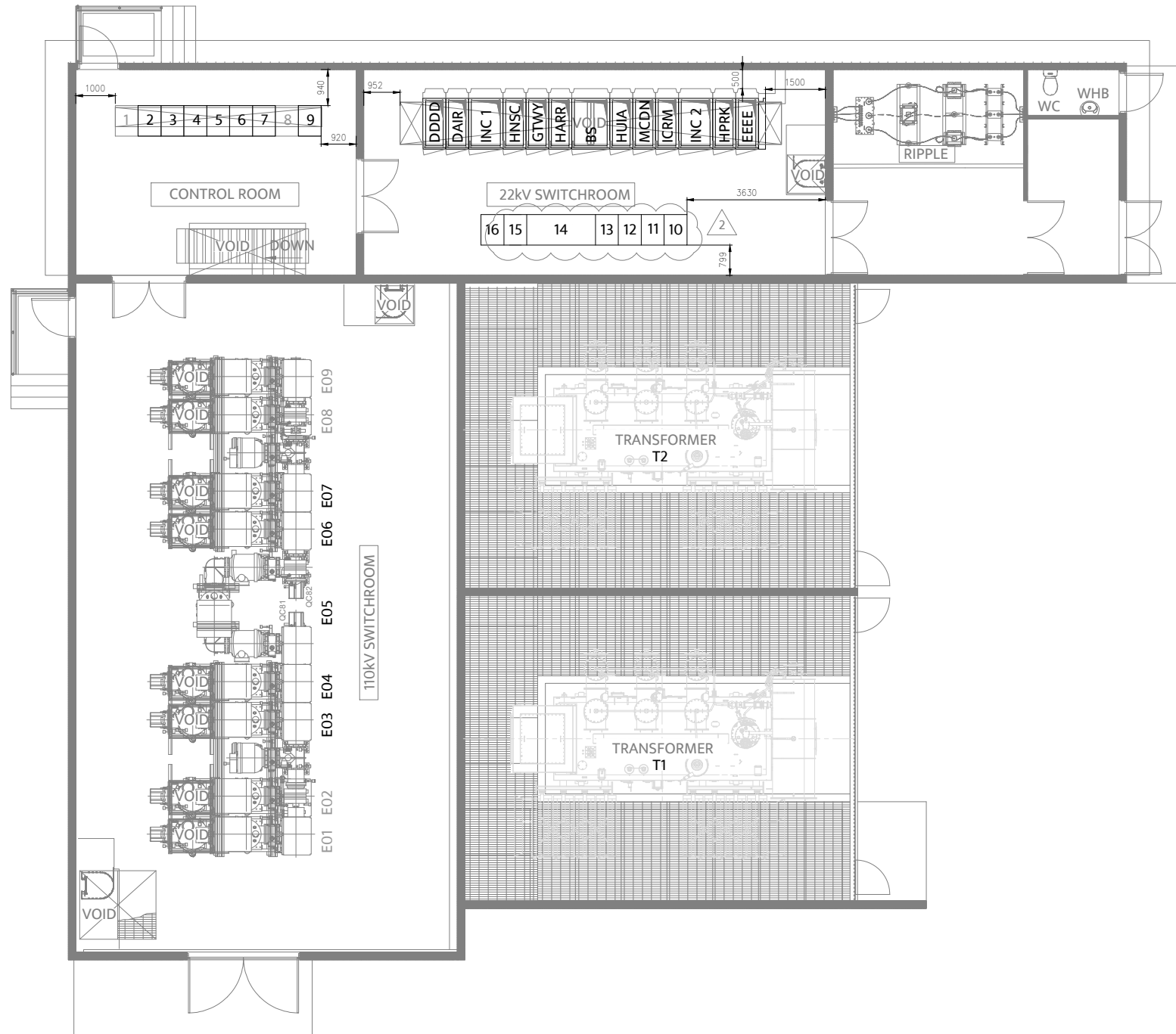
<sup>3</sup> 697.22 Waikato District Council

		<p>and meets specified clearance requirements for operational and safety reasons;</p> <p>(v) The extent to which the proposal will adversely affect the amenity values of the <b>site</b> and locality;</p> <p>(vi) The extent to which there are difficult ground conditions, topography or obstructions which make undergrounding impractical.</p>
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**Potential matters of control/discretion that could be incorporated within subdivision rules in individual chapters**

<b>Matters of Control/Discretion</b>
<p><u>Discretion is restricted to:</u></p> <p>(a) <u>The subdivision layout and design in regard to how this may impact on the operation, maintenance, upgrading and development of, including access to, the distribution line;</u></p> <p>(b) <u>The ability to provide a complying <b>building platform</b> outside of the distribution line corridor;</u></p> <p>(c) <u>The risk of electrical hazards affecting public or individual safety, and the risk of property damage;</u></p> <p>(d) <u>The nature and location of any vegetation to be planted in the vicinity of distribution lines, and the how such landscaping will impact on the operation, maintenance, upgrade and development (including access) of the distribution lines;</u></p> <p>(e) <u>The risk to the structural integrity of the distribution line;</u></p> <p>(f) <u>The extent to which the subdivision design and consequential development will minimise the potential reverse sensitivity on and amenity and nuisance effects of the distribution line asset; and</u></p> <p>(g) <u>Whether any easement is required.</u></p> <p>(h) <u>Any adverse effects on access to for maintenance or any associated natural hazard protection works.</u></p>

## APPENDIX 2 – SWITCH ROOM FLOOR PLAN EXAMPLES



SECONDARY PANEL SCHEDULE	
PANEL No.	DESCRIPTION
1	SPACE FOR FUTURE 110kV LINE PROT. PANEL
2	110 kV POKENO - TUAKAU LINE PROT. PANEL
3	TRANSFORMER 1 HV PROTECTION PANEL
4	110 kV BUS SECTION PROTECTION PANEL
5	110 kV BUSBAR PROTECTION PANEL
6	TRANSFORMER 2 HV PROTECTION PANEL
7	110kV POKENO - BOMBAY LINE PROTECTION PANEL
8	SPACE FOR FUTURE 110kV LINE PROTECTION PANEL
9	HMI PANEL FOR 110kV+22kV SWITCHGEAR
10	LOAD CONTROL PANEL
11	COMMUNICATIONS PANEL
12	SCADA PANEL
13	110V+24V DC CHARGERS+ DISTRIBUTION PANEL
14	AC DISTRIBUTION BOARD & MECHANICAL SERVICES
15	110V DC BATTERY
16	24V DC BATTERY

REV	DESCRIPTION	DES	DATE	APP	REV	DESCRIPTION	DES	DATE	APP	DRAWN	JS	MAR'19
1	ISSUED FOR APPROVAL	JS	03.19	AW						DESIGNED		
2	UPDATED AS PER CP COMMENTS	MJK	05.19	AW						CHECKED	AW	MAR'19
										APPROVED		
											© COUNTIES POWER LIMITED 2018	



**POKENO SUBSTATION**  
 110kV/22kV GIS SUBSTATION  
 BUILDING ELECTRICAL  
 FLOOR PLAN

SIZE	SCALE	FOLDER
A1		
<b>PKN-1A2-001-1</b>		<b>2</b>
FILE NAME: PKN-1A2-001-1.dwg		

