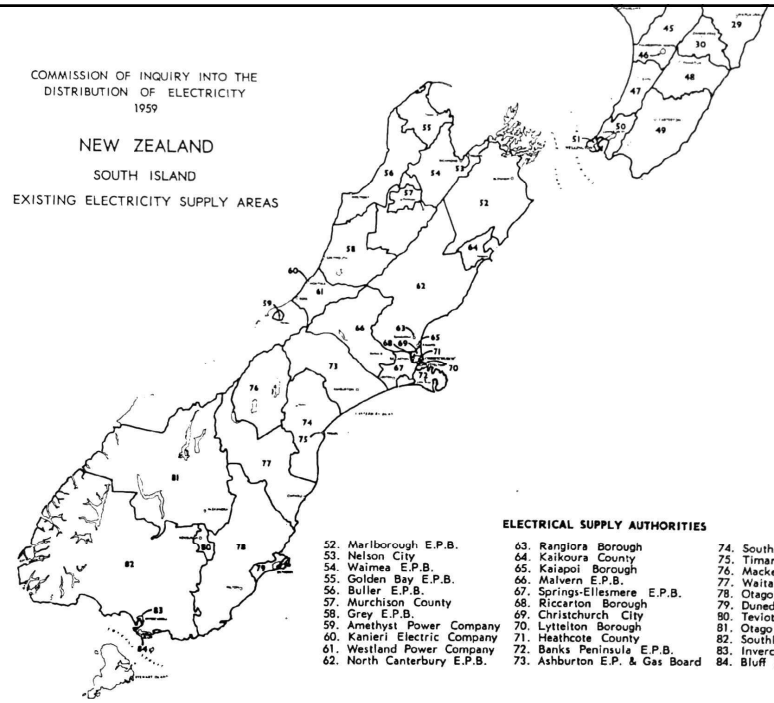
ODF - Introduction

Carl Rathbone

1



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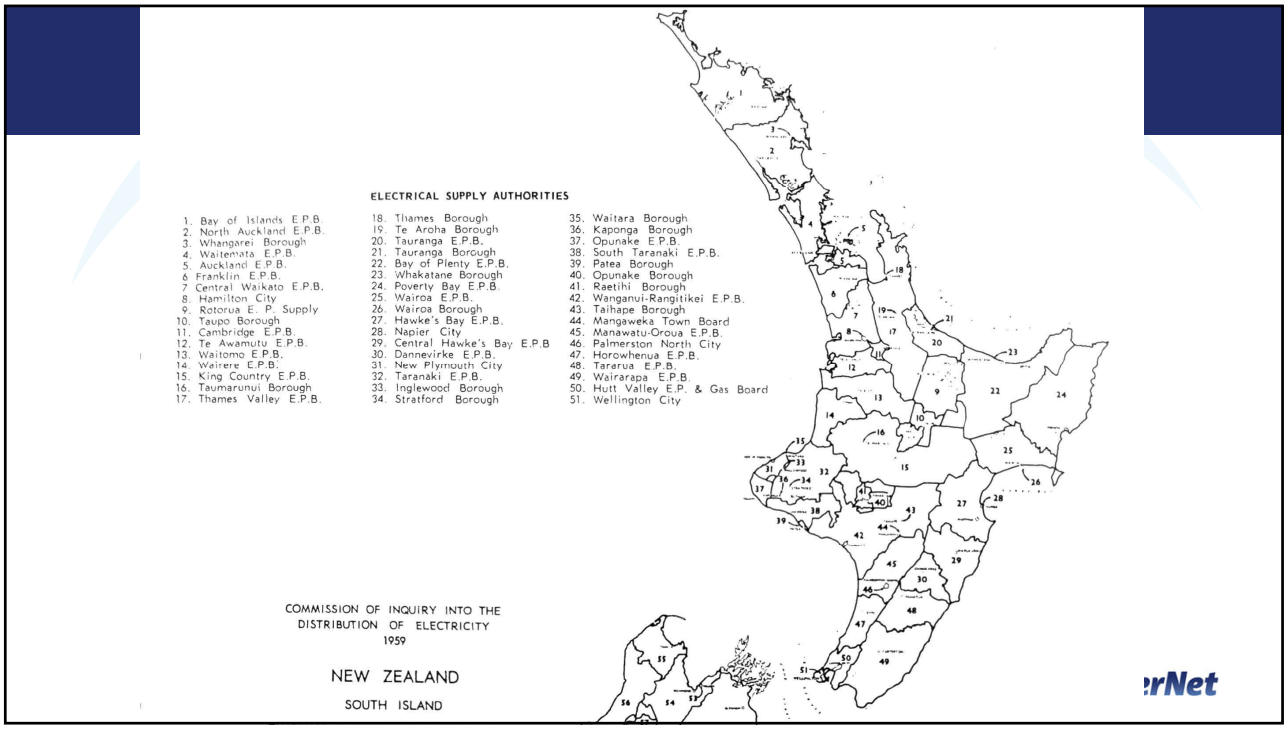
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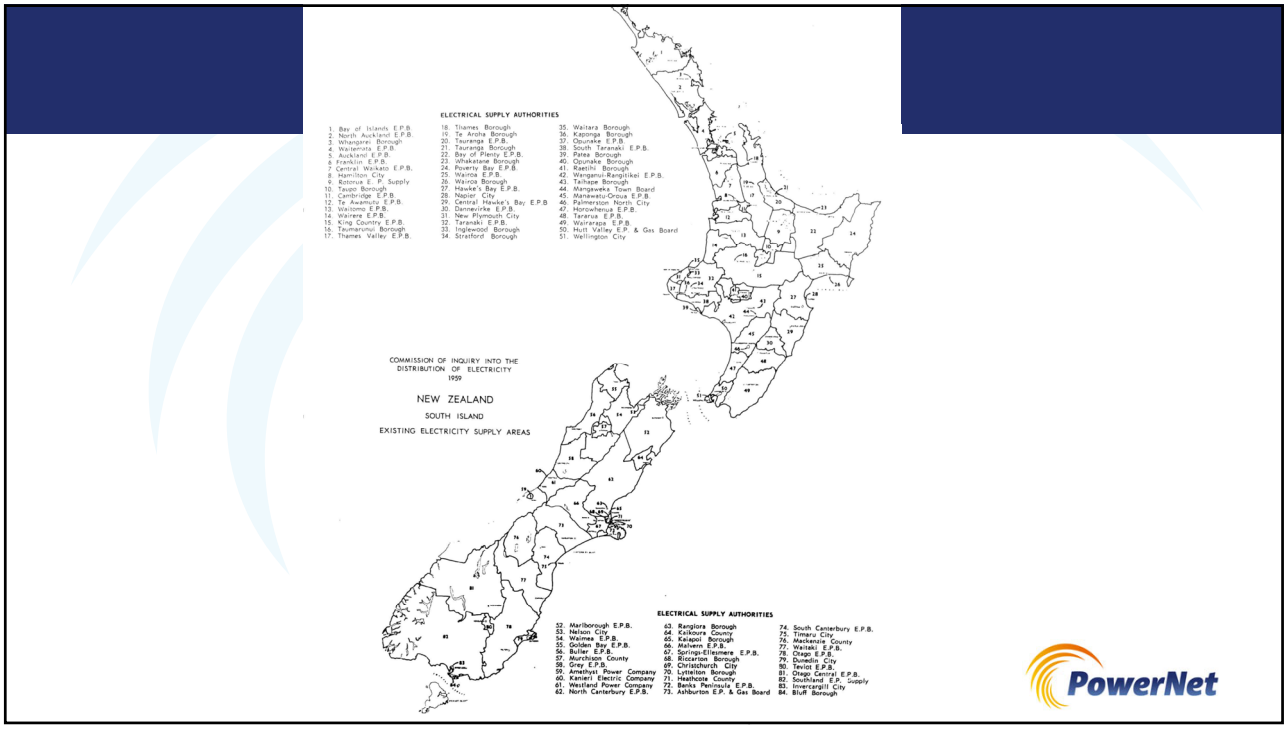
COMMISSION OF INQUIRY INTO THE DISTRIBUTION OF ELECTRICITY
1959
NEW ZEALAND
SOUTH ISLAND

3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4

NEW ZEALAND ELECTRICITY DEPT.

Phenomenal Growth

To meet the demand for power in New Zealand, it will be necessary to double the capacity of the systems every ten years. For domestic purposes, New Zealanders rate among the greatest consumers of electricity in the world. The New Zealand Electricity Department, established as a separate entity in 1945, has grown concurrently with the demand. Since that time the capital outlay has increased from £30 million to £220 million.

Engineering and Trading

The Department, operating on a strictly commercial basis, designs and arranges for the construction of hydro-electric and other schemes, builds transmission lines for the distribution of power, and maintains and operates the completed networks. Power is supplied to electric power boards and other distributing authorities, who in turn sell it to consumers. Head Office in Wellington is a clearing house for the work of District Offices in Auckland, Hamilton, Napier, Palmerston North, Nelson, Christchurch, Dunedin and Invercargill. The work of the Department is carried out largely by professional engineers, draughtsmen, technicians and tradesmen, and general administrative staff.

The control room at Haywards Substation, Wellington, which will be the first vital North Island link with the Benmore-Cook Strait power transmission lines. The General Manager of the N.Z. Electricity Department, Mr. A. E. Davenport, accompanied by Mr. C. E. Taylor, Managing Director of A.S.E.A., speaks with Mr. H. J. Withers, Substation operator.

Engineering Graduates

Engineers are responsible for the design, installation, and maintenance of electrical equipment and for the technical operations of the Department. They include 150 graduates.

Suitable young men are assisted to attend University. Over the last five years 33 have been granted study awards for full-time engineering studies. Graduates take up employment as Assistant Engineers and are given experience in all aspects of the Department's technical work under a three-year training schedule.

Accountancy and Commerce

Qualified staff have responsibility for the Department's accounting, costing, stores and general administrative functions, and making arrangements for the finance of this huge trading business. Time off is granted for attendance at lectures, and for a final year those with good records may be offered bursaries on full pay. Training is given in all aspects of the work.

Arts and Law

Some graduates in Arts and Law are also employed on specialist work.

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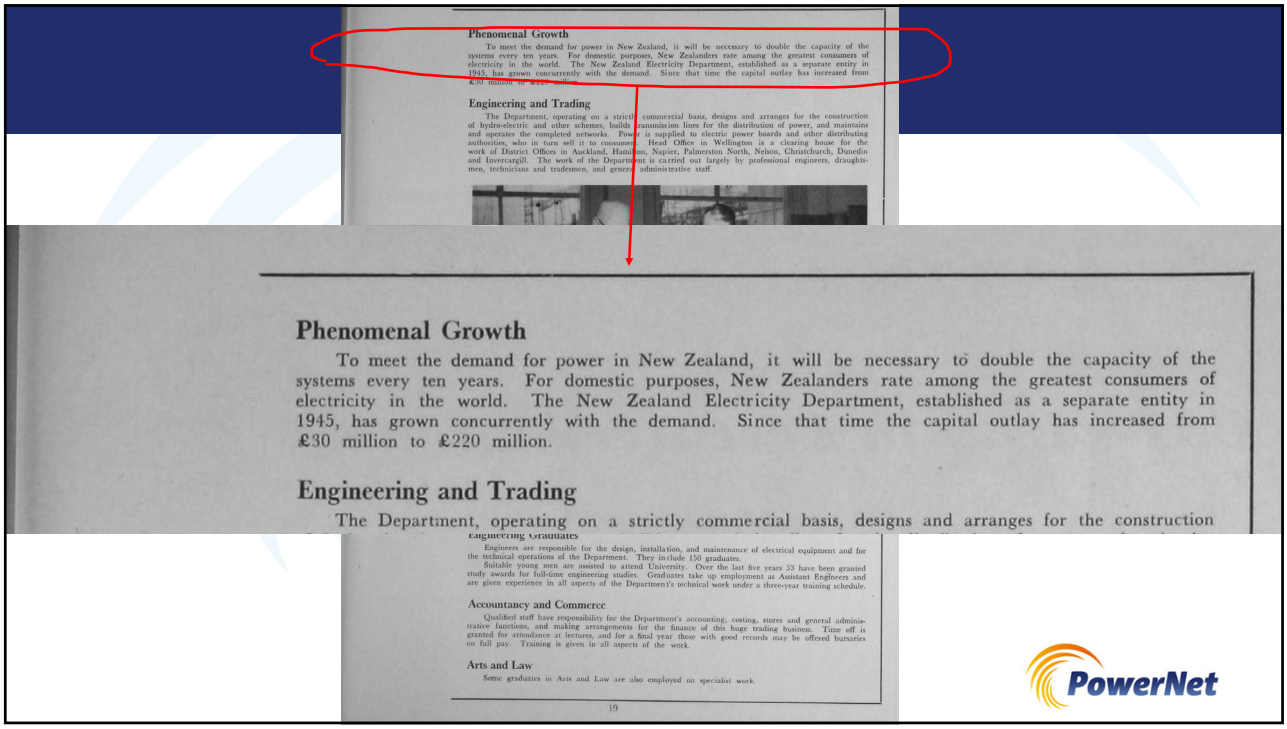

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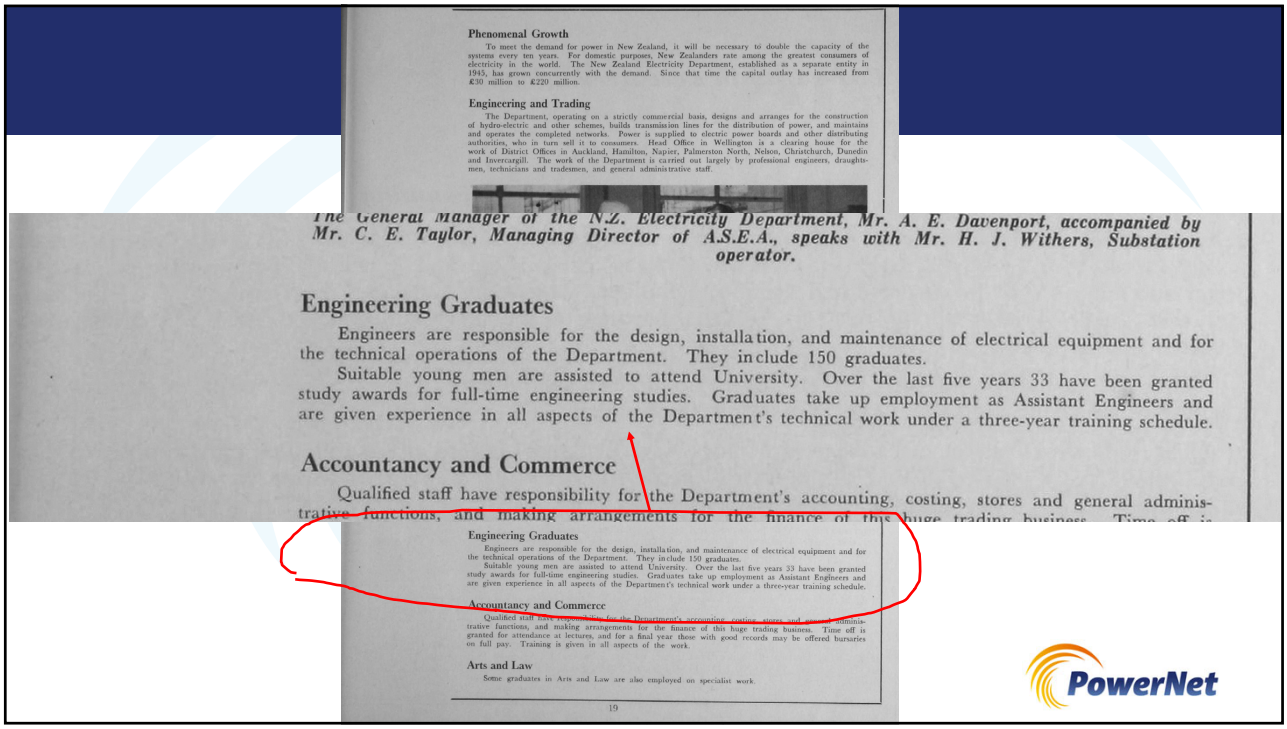

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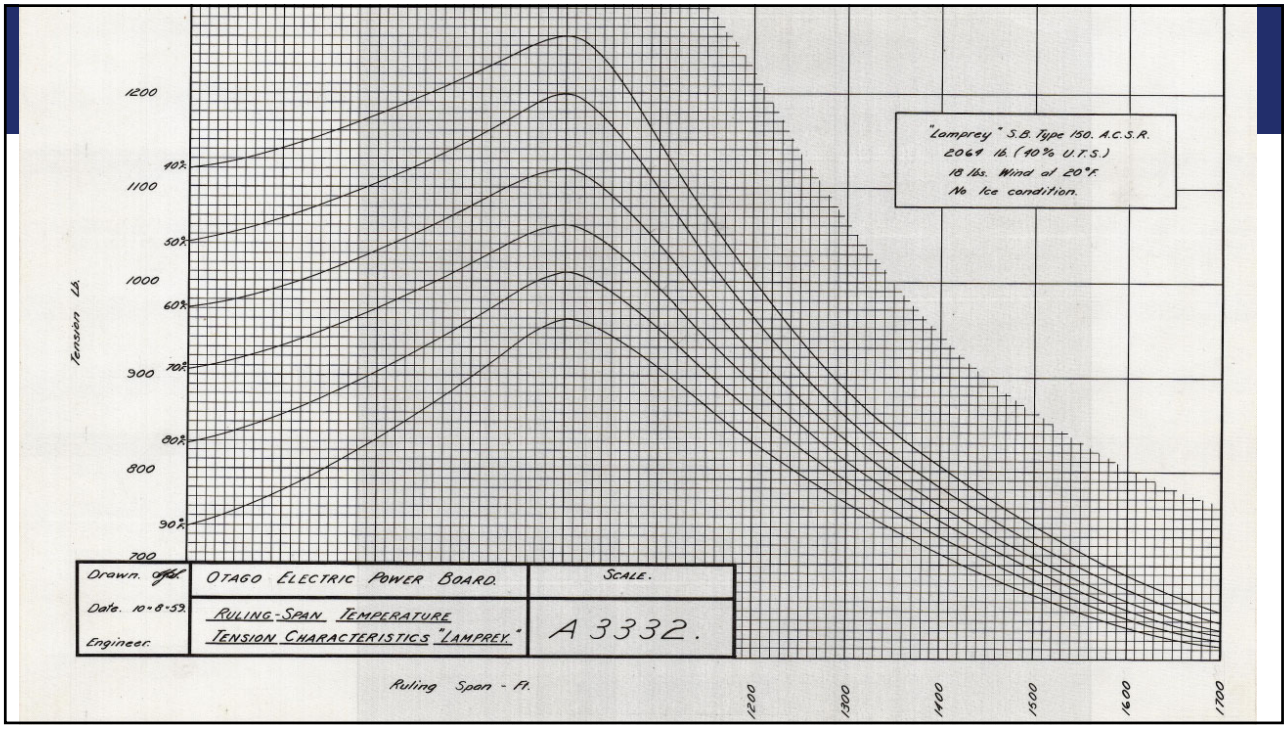

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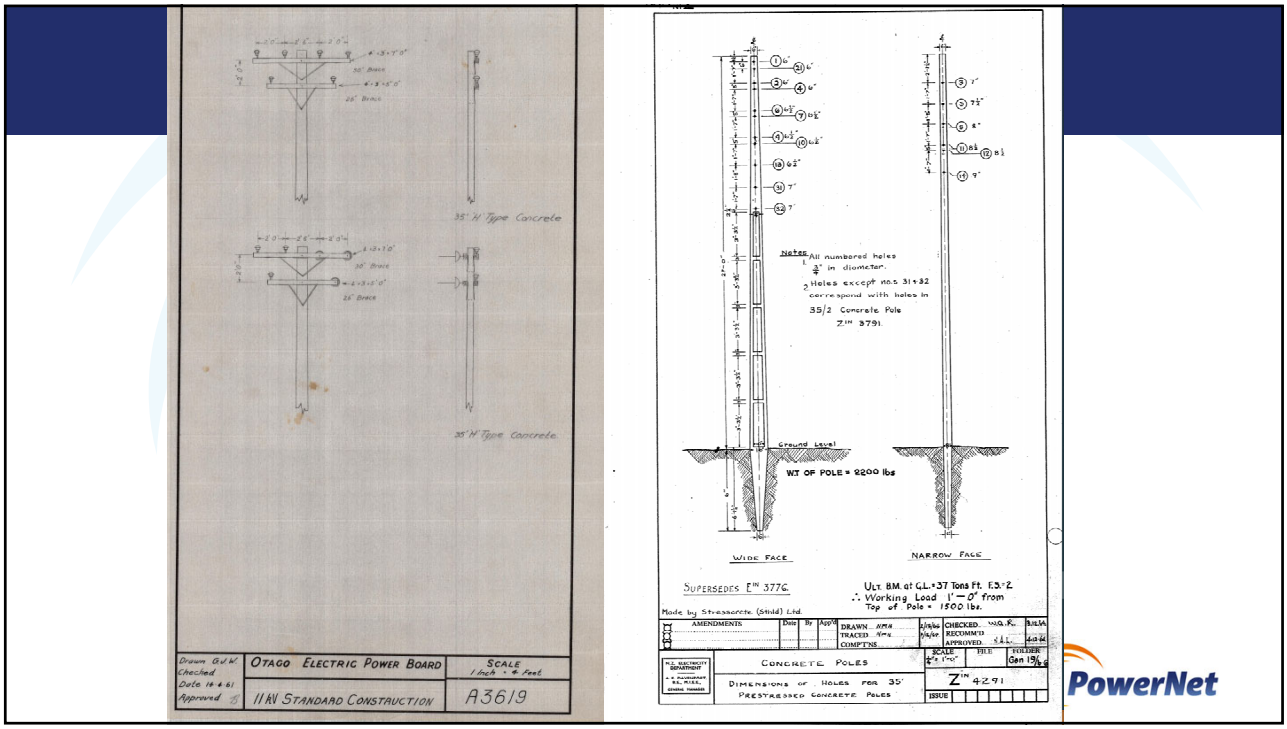
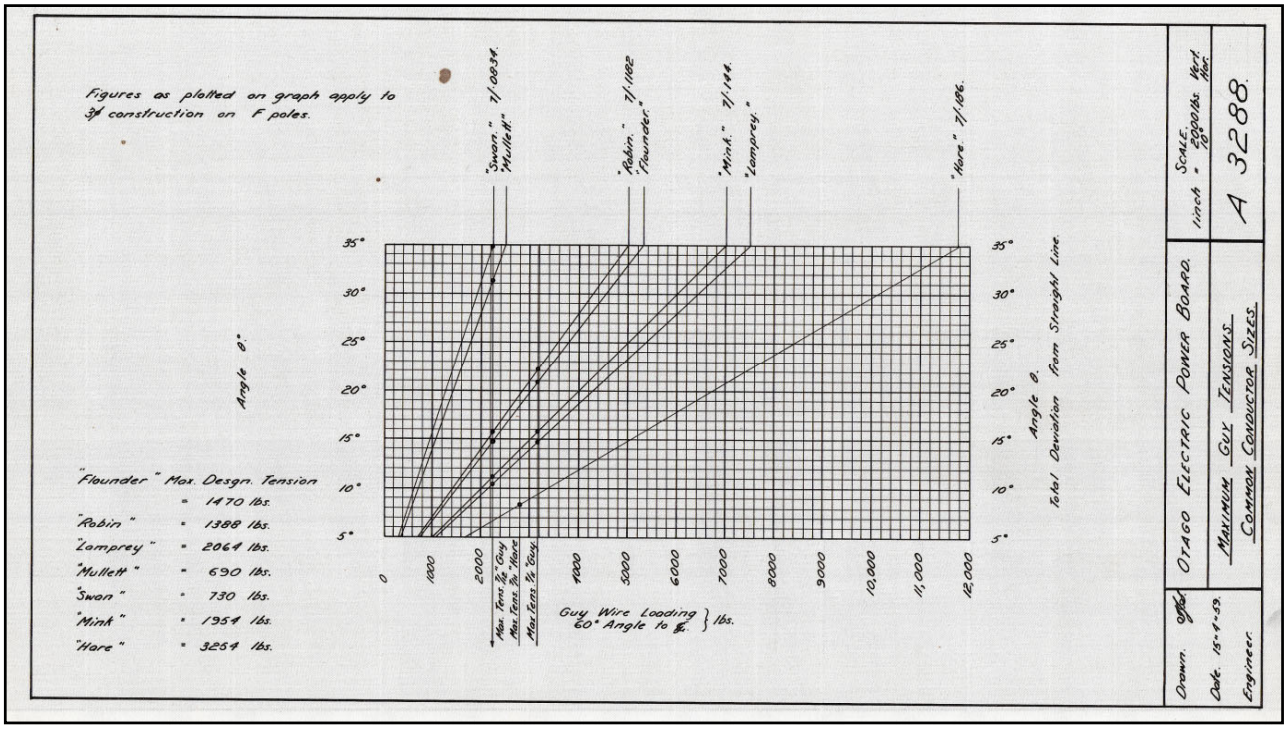
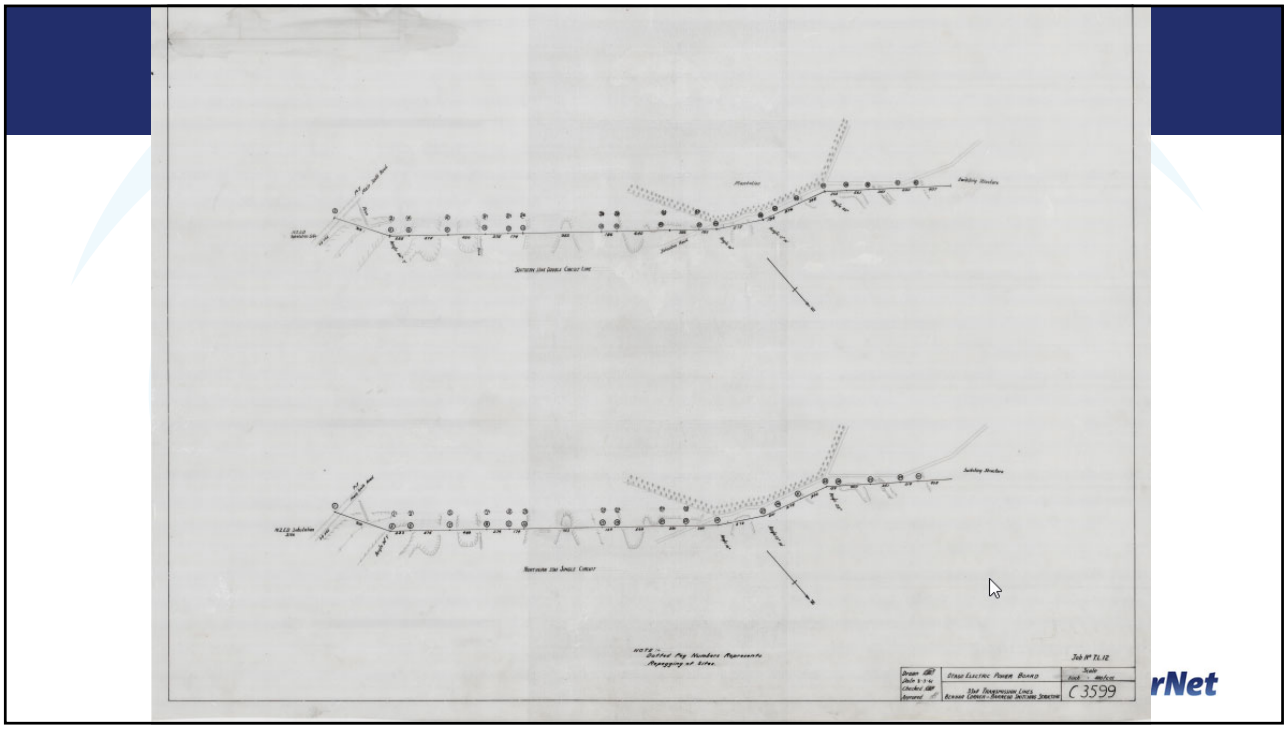

35' 'H' Type Concrete
35' 'H' Type Concrete
OTAGO ELECTRIC POWER BOARD
11 KV STANDARD CONSTRUCTION
SCALE 1 Inch = 4 Feet
A3619
Ground Level
WT OF POLE = 2200 lbs
WIDE FACE
NARROW FACE
SUPERSEDES E IN 3776.
Ult. B.M. at G.L. = 37 Tons Ft. F.S. = 2
∴ Working Load 1'-0" from Top of Pole = 1500 lbs.
Made by Stressecrete (Stnld) Ltd.
CONCRETE POLES
DIMENSIONS OF HOLES FOR 35' PRESTRESSED CONCRETE POLES
Z IN 4271
PowerNet

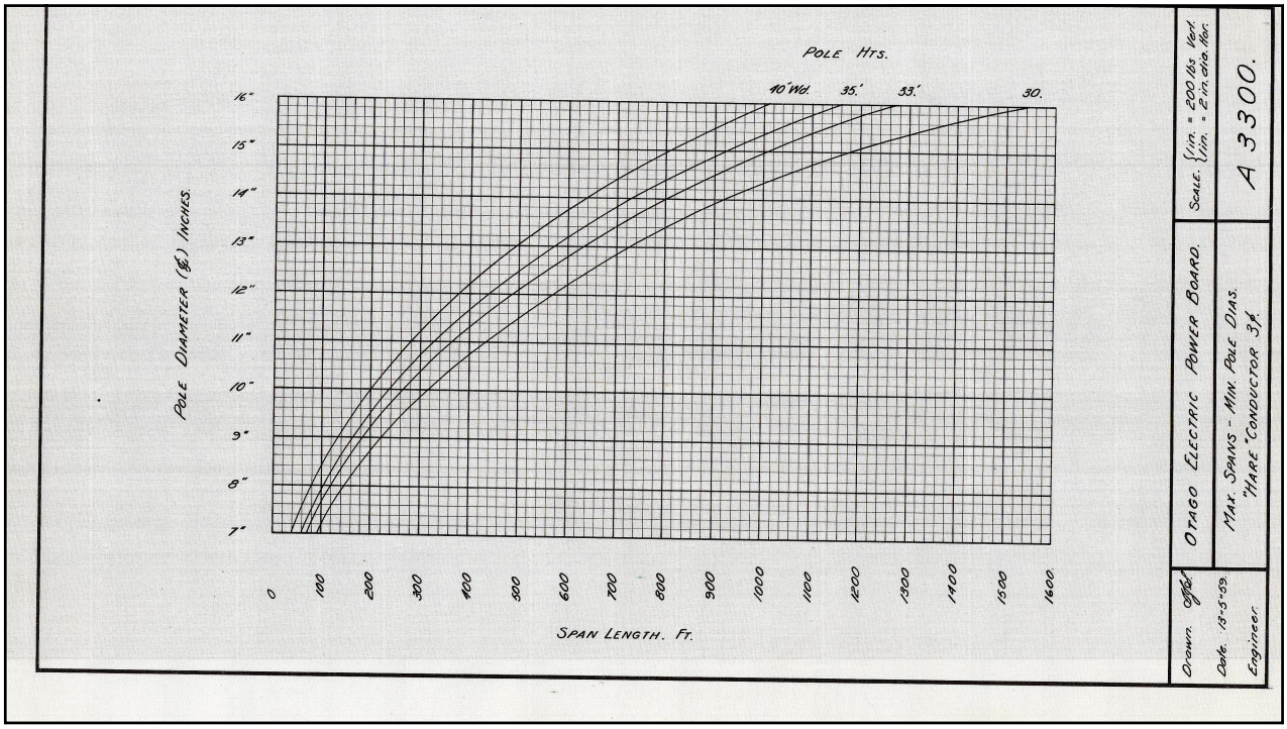
9


Figures as plotted on graph apply to 3φ construction on F poles.
"Swan" 7/.0834
"Mullett"
"Robin" 7/.1102
"Flounder"
"Mink" 7/.144
"Lamprey"
"Hare" 7/.186
Angle θ°
35°
30°
25°
20°
15°
10°
5°
0
1000
2000
4000
5000
6000
7000
8000
9000
10,000
11,000
12,000
Guy Wire Loading 60° Angle to ℄ lbs.
Max. Tens. in "Guy"
Max. Tens. in "Hare"
Max. Tens. in "Coup"
Total Deviation from Straight Line
Angle θ.
"Flounder" Max. Desgn. Tension = 1470 lbs.
"Robin" = 1388 lbs.
"Lamprey" = 2064 lbs.
"Mullett" = 690 lbs.
"Swan" = 730 lbs.
"Mink" = 1954 lbs.
"Hare" = 3254 lbs.
OTAGO ELECTRIC POWER BOARD.
MAXIMUM GUY TENSIONS
COMMON CONDUCTOR SIZES.
SCALE. 1 inch = 2000 lbs. Vert. 1 inch = 10° Horiz.
A 3288.
Drawn.
Date. 15-1-59.
Engineer.

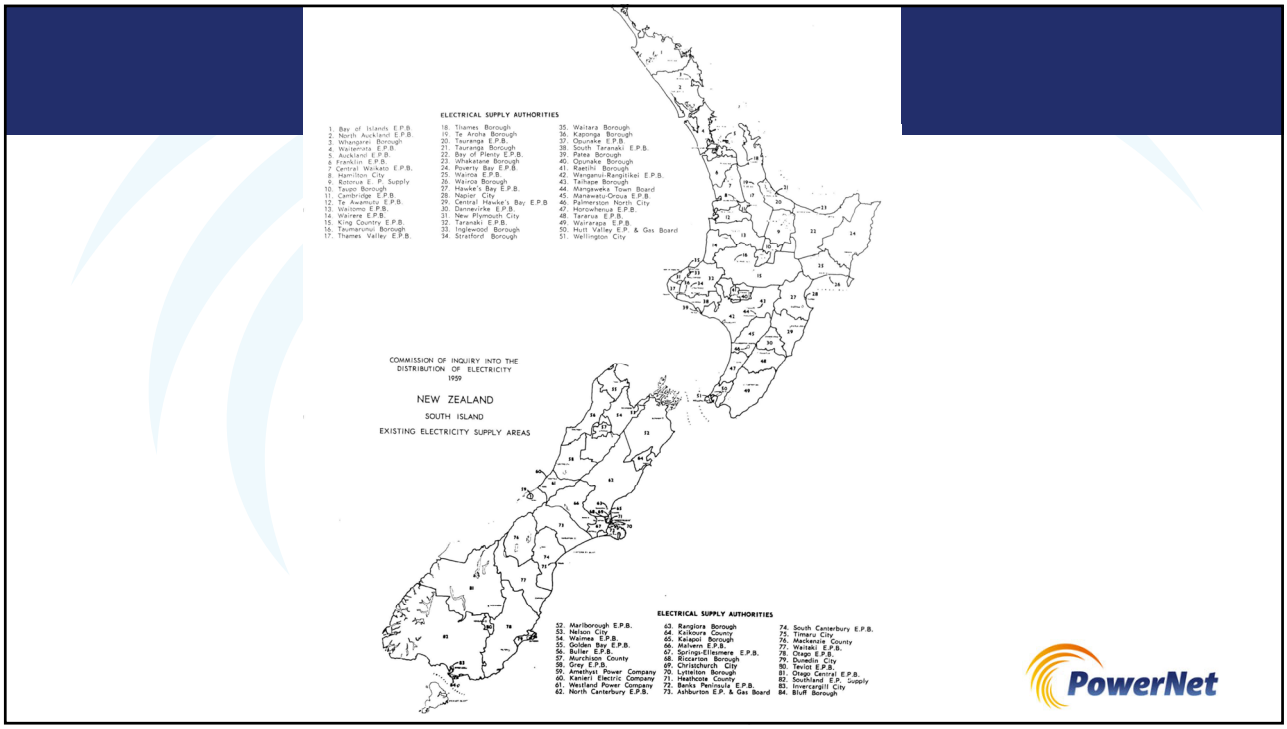
10


C3599

11


POLE HTS.
10'Wd.
35.'
33.'
30.
POLE DIAMETER (ϕ) INCHES.
16"
15"
14"
13"
12"
11"
10"
9"
8"
7"
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
SPAN LENGTH. FT.
OTAGO ELECTRIC POWER BOARD.
MAX. SPANS - MIN. POLE DIAS.
"HARE" CONDUCTOR 3/4".
A 3300.
Drawn.
Date. 13-5-59.
Engineer

12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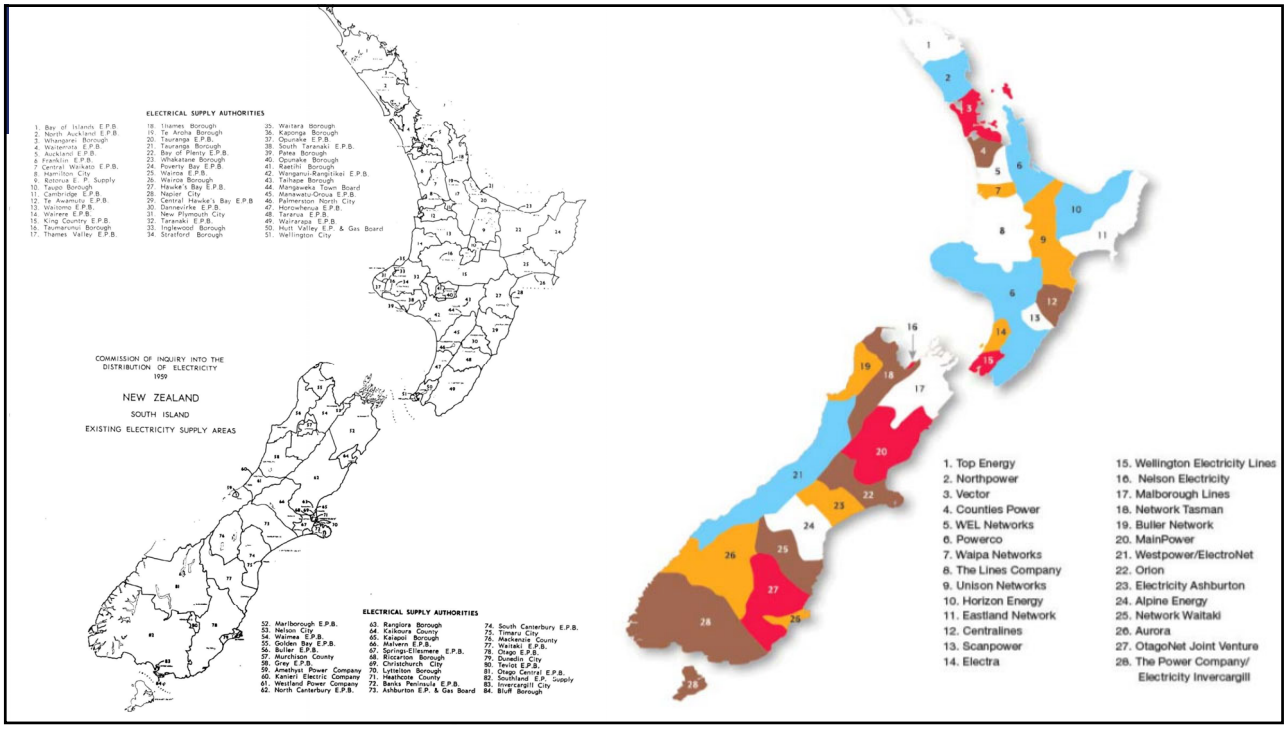
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2. Northpower
3. Vector
4. Counties Power
5. WEL Networks
6. Powerco
7. Waipa Networks
8. The Lines Company
9. Unison Networks
10. Horizon Energy
11. Eastland Network
12. Centralines
13. Scanpower
14. Electra
15. Wellington Electricity Lines
16. Nelson Electricity
17. Malborough Lines
18. Network Tasman
19. Buller Network
20. MainPower
21. Westpower/ElectroNet
22. Orion
23. Electricity Ashburton
24. Alpine Energy
25. Network Waitaki
26. Aurora
27. OtagoNet Joint Venture
28. The Power Company/ Electricity Invercargill

14

Comparing our situations

Now	Then
Computers	Slide rules
Brownfield sites	Greenfield sites
Reliability expected	Expectations not established
Old assets	New assets
Safety is critical	Drinks after work
Complex engineering requirements	Relatively simple engineering
Off-grid alternatives increasingly economic	No competition
Developing systems and resources?	Established systems and resources
Training?	Training?
Industry collaboration?	Industry collaboration?

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15

OHL Designer's Forum

- Learning from each other, avoiding repetition of work or mistakes
- Supporting community (information, knowledge, resources)
- Pool resources to build common resources (people, processes and systems)

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OHL Designer's Forum

Community

Communication, Training

Collaboration, Consolidation

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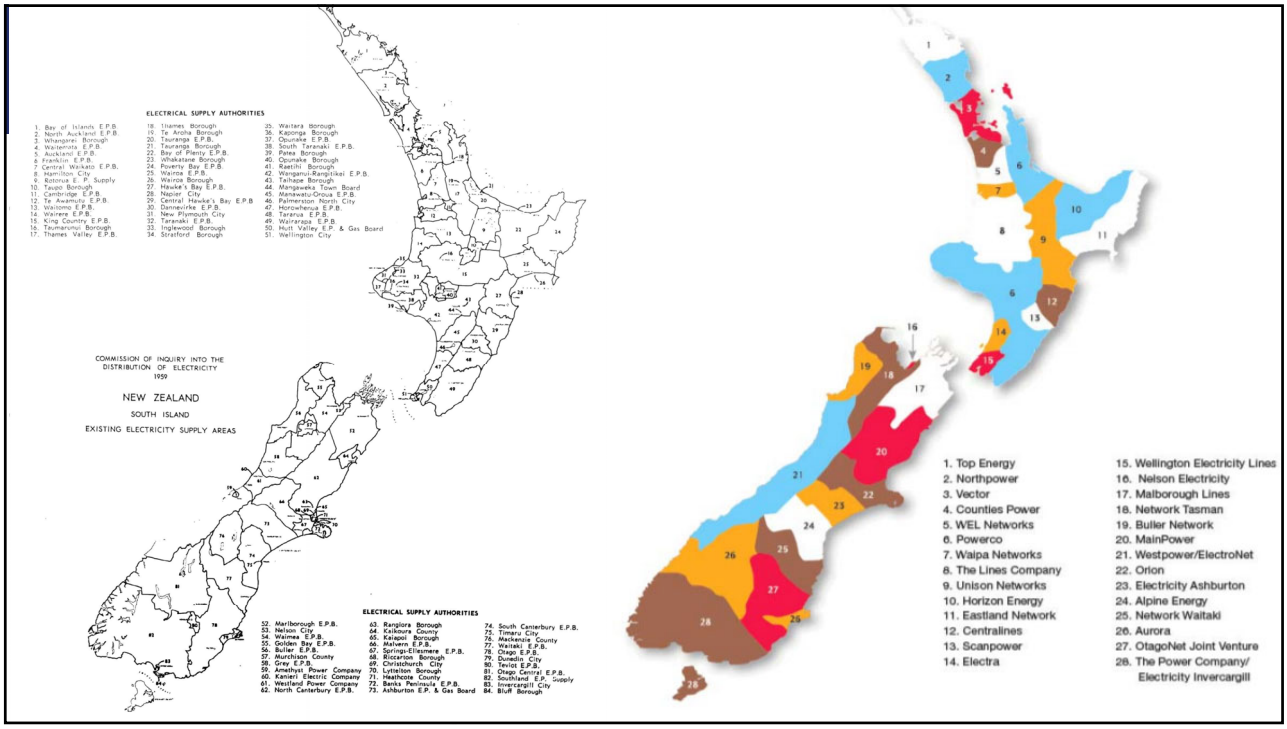
17



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