AUCKLAND STAR, VOLUME XLI, ISSUE 18, 21 JANUARY 1910

ELECTRIC POWER SCHEME, APPROVED BY CITY COUNCIL.

PROPOSED EXPENDITURE OF £215,000.

THE ENGINEERS' REPORTS.

A special meeting of the Auckland City Council in committee was held last night, when the question of providing a new electrical power station for the requirements of the city and principal suburbs was considered. Exhaustive reports made by Mr A. Wyllie (city electrical engineer), and supported by Mr Stuart Richardson, M.I.C.E., of Wellington, were finally considered. It was decided to recommend the adoption of Mi Wyllie's scheme, providing for the expenditure of £215.000, including the erection of a new electrical power station on the reclaimed land near the Railway wharf, known as the Fanners' Freezing Company's reclamation, recently acquired under the Public Works Act, and now the property of the City Council.

The recommendation of the committee will come before the ordinary meeting of the City Council next Thursday night, and, on being confirmed in open meeting, a loan proposal to cover the cost of the undertaking will be submitted to the ratepayers.

COST OF THE SCHEME.

After referring to the inadequacy of the present plant, Mr Wyllie, in his report, gives the following estimate of the cost of the new scheme:—

"Building and Sites (£63,300).—Sites for generating and sub-stations (£20,000 is also reserved out of the last loan for this purpose), £30,000: clearing site, etc., £1000: stations, buildings, including piling, raft and foundation for machinery, £31,000, sheds for stores, etc., £400; offices, test rooms, etc., £900.

Boiler House (£20,100).—Six boilers, with feed pumps, etc., £ 14,775: feed tank, pipes, etc.. £725; coal conveyor and steel work, £4500; gantry crane, £1350; chimney, £1700; flues, £1650: economiser, £1000; motors, gearings, etc., £400

"Engineroom (£58,000).—Four D.C. generators, 3000 K.W., with condensers, £32,200; two A.C. generators, 1000 K.W., with condensers, £11,300; balancers, boosters, and auxiliary plant, £4250, switch board and connections, £4000; steam pipes, circulating pumps and pipes, £4600; oil separators, etc., £850; overhead travelling crane, £1600.

"Sub-stations (£ 10,000).—Equipment of two sub-stations, with transformers and converter.-, £ 10,000.

"Mains (£46,000).—Twelve new feeders and additional distributers, £42,000; service mains and meters, £4000; tools, instruments, etc., £800; cost of floating loan and contingencies, £ 10,000.

Total cost, £215,000

“This estimate,” Mr Wyllie points out, "is expected to cover the whole of the capital expenditure during the next five years from the present time. As the undertaking develops with time, periodic extensions of the plant and mains, will become necessary, and the ultimate capacity of the plant will eventually be greater than that provided for by the present estimate. The station on the new site, however, will be so designed as to admit of the largest extensions that may be required. The estimate given above will raise the total capital of the undertaking to £290,000. The new capital will only be expended as the growth of the undertaking warrants extensions. The above figures leave out of account any credits that may be obtained by the transfer of the existing buildings or the sale of the existing plant. It is not proposed to transfer the present generator to the new' station. The boiler, battery, and booster will be transferred, and al! the existing supply mains will be connected to the new station. The cost of the existing buildings, generators, and connections, which cannot be transferred, was approximately £15,700, and the possible credits on this plant will be about £4500.”

THE AREA TO BE SUPPLIED.

“The area that will be embraced by this supply,” Mr. Wyllie goes on, "will have a radius of about a mile and three- quarters from the power station, and will include Parnell, Khyber Pass, Newton-road, Ponsonby road, and St. Mary’s road. In order to reach further and supply large power consumers not in the vicinity of the power station, a high tension three-phase alternating supply at 6000 volts will be required, and provision is made in the loan for two turbine-driven alternators arranged longitudinally on the western side of the engine-room.

“The outgoing feeders from the switch-board,” says the engineer, “will be laid along a footpath made on a portion of the present roadway. Twenty-four earthen ducts will be laid solid in a bed of concrete from the switchboard to Beach-road, with suitable man-holes at intervals, through which feeder cables can be drawn as required. Special ducts will be laid for drawing in high tension

cables later on. These high tension cables will be laid to sub stations on sites determined by the future growth of the demand. The sub-stations will contain transforming and converting machinery for supplying low pressure current to the consumers. It is not proposed to install the high tension plant until it is actually required. The feeding points on the distributing circuits will be as at present, with the addition of others as the demand grows, and the low tension distributing network will be divided into several sections, so as to confine any troubles that may arise on the mains to as small an area as possible.

"The estimate includes for laying distributing mains with feeder connections in the following streets:—Alfred-street, Beach-road and Strand-road. Custom-street West, Eden Crescent, Grafton-road, Grey-street, Hobson-street, Khyber Pass (portion), Lorne street, Ponsonby-road and Newton-road. Shortland-street (north side), Stanley-street, Upper Queen-street, Wyndham-street, Upper Symonds-street, Wakefield-street, Victoria-street (west of Hobson-street), Wynyard-street, Waterloo Quadrant waterside for harbour supply.

THE NEW STATION.

"The proposed station," continues Mr. Wyllie, "will be situated on the northern portion of the site previously referred to, and now occupied by Messrs. J. J. Craig, Ltd., John Burns and Co., Logan Bros., and the Premier Joinery Company. The southern portion of the site occupied by the Waitemata Timber Company, and Mr. David Goldie, are reserved for future extensions. The depth of the rock is very uniform over the site, being everywhere about 25 feet from the existing surface, which consists of made ground, but well consolidated; nevertheless it will be necessary to drive ferroconcrete piles to carry the weight of the power station. The number of piles will be about 600, and these will carry a concrete raft 2ft 6in thick, on which the building and the foundations of the machinery will stand. The boiler-house will be 112ft long and 96ft wide, and the height will be 38ft. from the raft to the tie-rods. It will be big enough to hold 12 large boilers forming two rows of six on each side, it is proposed to install only four boilers to begin with, and two more later, thus completing one side. The boilers will be of the water tube type, fitted with mechanical stokers and superheaters. An economiser with about 480 tubes will be erected over the main flue at the back of the boilers, which will be capable of extension, the chimney will be of steel, 10ft in diameter and I50ft high, and provision is made for the erection of an induced draught fan near the base of the chimney if this

should ultimately be needed, but the cost of such a fan is not included in the estimate. A second chimney will be added for the second row of boilers.

"On the north side of the boiler house next to the water will be erected a gantry crane with a 70ft jib and a one-ton grab standing on a carriage 10ft high. This will lift coal from the holds of vessels lying at the wharf and deliver it straight into a hopper in front of the boiler house, where it will be automatically weighed and picked up by a bucket conveyor capable of handling 40 tons an hour. This conveyor will travel the whole length of the centre of the boiler house close to the roof, and will deliver the coal into steel bunkers over the boilers whence it will be fed into the hoppers of the automatic stokers. The bunkers will be 100ft long, 21ft wide and 14ft deep, and will have a total capacity of about 750 tons. Outside coal bunkers will be added later as required. The conveyor will then pass into the ash pit under the central gang-way of the boiler house, where it will pick up the ashes and deliver them into a hopper outside the boiler house. The engine-room will be parallel with the boiler house, and the same length, but 80ft wide. The height will be 50ft from the raft to the tie-rods. Its first equipment will be four steam-driven direct-current low pressure generators, two of 500 kilowatt capacity, and two having a capacity of 1000 kilowatts. The engine-room and boiler house will be equipped with all the necessary testing instruments for ensuring the economic working of the machinery. Each set will be capable of carrying an overload of 20 per cent for one hour. These four sets will supply continuous current at approximately 460 volts straight to the consumers. This is the system of supply already in use, and is the simplest cheapest, safest, and best for a limited range. By this system the heavy cost of transforming machinery is saved and the loss in efficiency due to transformation is avoided. This most important saving is rendered possible by the very central position of the site chosen."

PROBABLE PROFITS.

Mr. Wyllie concludes his report by giving estimates of income and expenditure for the first four years of the combined old and new schemes, showing the commencement of profits after the second year. The estimates are as follows.—

"First Year (ended March 31, 1909) : Total capital expenditure at cud of year, £48,338; number of customers, 198; units sold, 225,063; income, £3451; expenditure, £3269. interest and sinking fund (on £25,000), £829; loss on

year's working, £647; total loss since starting, including loss of first few weeks. £873. (This loss was less than the estimate for the first year)

"Second Year (ending March 31, 1910), based on output to Christmas, 1909; Total capital expended at end of year, £55,000: number of customers, 400; units sold. 482,000; income, £7150; expenditure, £4150; interest and sinking fund (on £75,000, less bank interest), £2800: profit on year's working, £200; total loss since starting, £673.

"Third Year (ending March 31, 1911) : Total capital expended at end of year. £110,000; number of customers, 620; units sold, 725.000; income. £10,650; expenditure. £5400; interest and sinking fund (on £75,000, plus portion of new loan), £4500; profit on year's working, £750; total profit since starting, £127.

"Fourth Year (ending March 31. 1912): Total capital expended at end of year, £190,000; number of customers. 900; units sold, 1,250,000; income. £17,000; expenditure, £6500; interest and sinking fund. £9500; profit on year's working. £1000; total profit since starting. £1127

"The above estimates are by no means excessive. The Dunedin electricity works, in its second year, sold to private consumers more units than I have estimated for our fourth year. To meet the demand of the fourth year it will be absolutely necessary to have the new station equipped and working, and this is only possible by beginning now. We shall be able to work more efficiently and cheaper with the new plant than at present, and from the fourth year onwards. the financial result will show ample balances on the right aide. It will thus be seen that the undertaking will be quite self-supporting and wholly independent of the rates. An immediate start with the works is also of the utmost importance, in order to avoid expenditure ultimately useless on extending the present station."

Mr. Wyllie gives a comparison with other towns in New Zealand as follows:

"Wellington- Capital expenditure, "March 31, 1909, £223,499; capacity of plant, 3450 kilowatt; capital outlay per kilowatt, £65; number of customers, 41315. units sold to private customers, 2,586,444-

Dunedin: Capital expenditure, March 31, 1909, £217,000; capacity of plant, -2000 kilowatts; capital outlay per kilowatt, £108; number of customers, 444; units sold to private customers, 2,691,989).

"The above figures -for Dunedin are for the second year of operation, and the plant is being doubled at the present time. Auckland in a few years -will surpass both the above undertakings."

"AN IDEAL SITE."Mr. Stuart Richardson, M.I.C.E., of Wellington, in supporting the scheme, says.—

The Railway Wharf site is an ideal one, with good facilities for coaling. Condensing water is at hand, and the site is centrally situated for supplying the maximum demand area. The one drawback is the greater cost of this site on account of the claims for compensation -which will have to be met. This, however, will be compensated for in the saving effected in the cost and handling of coal, which could be delivered from railway trucks or boats without handling. in addition to this saving, railway-borne and water-borne coals would be brought into keen competition, which would certainly effect a saving to the Corporation in the annual coal bill. Apart (from the cheaper price due to competition, a saving of from 2/ to 2/6 per ton would be effected in cartage, which, on a yearly output of from one and a-quarter million units (your engineers estimate of the output for the year ending March 31, 1912) would mean an annual saving of at least some £600.

The total output for lighting and power purposes {other than for tramway traction from the lighting station and the tramways power house) in Wellington for the year ended March 31, 1909, was nearly three million units, and I think it is safe to assume that before many years have passed this output would be exceeded in Auckland. With this output, the saving in cartage would, amount to over £1200 per annum, an amount sufficient to pay interest, at 5 per cent., on a sum of £24,000. It will be noted that in the above estimate no allowance has been made for the saving on coal, which would undoubtedly be procurable at a cheaper rate on this site, nor for the saving effected by easy access to good condensing water. The above savings would be the annual ones, increasing as the station output increased, and in the near future would amount to more than sufficient to pay the increased interest payable on account of the greater first cost of the site. Cheap coal and water materially assist in keeping the costs of generation low, and ensure a profitable business with a low charge to consumers.

(Searchable PDF version prepared by David Hyde - pseudonym 'David de la Hyde')