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AUCKLAND - HARBOUR - BOARD

INSPECTION OF WORKS AND PROPERTIES

22<sup>nd</sup>. JUNE 1938

# Auckland Harbour Board

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Inspection of Harbour and Works, etc, - 22nd.  
June, 1938.

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SUPERINTENDENT & ENGINEER.

# Auckland Harbour Board

## CRANES AND CARGO HANDLING APPLIANCES.

HEAVY LIFTS: 1 - 80 ton self-propelled steam floating crane.

QUAY CRANES: 24 - 5 ton  
                   1 - 4 ton  
                   24 - 3 ton  
                   Electric quay cranes.

ROOF CRANES: 4 - 5 ton Electric roof cranes.

SHED CRANES: 6 - 1 ton electric mono-rail cranes.

### PORTABLE CRANES & EQUIPMENT.

- 1 - 2½ ton Petrol-electric Mobile Crane.
- 1 - 1 ton pedestal crane.
- 1 - 1 ton electric battery runabout crane
- 4 - 15 cwt. electric portable jib cranes.
- 8 - 1 ton electric elevator conveyors
- 1 - portable electric stacker
- 2 - electric cargo lifts
- 1 - 1 ton electric Wadsworth hoist.
- 1 - Donald elevator
- 6 - portable electric conveyors
- 17 - self-dumping and
- 3 - double chain grabs for handling bulk cargoes.
- 17 - electric 1 ton capstans
- 1 - ½ ton Electric Hoisting Block. (Onehunga)
- 1 - 15 cwt. Portable Electric Friction Hoist.

The horse-power of all motors installed in the Board's cranes and other electrically operated plant exceeds.....5,600h.p.

The following tables give a comparison and show the expansion over a period of 10 years.

The current consumed in operating this plant and for lighting purposes amounted to:-

	in 1926-7	in 1936-7
Power	651,659 units	988,236 units
Light	242,478 "	272,314 "
	894,137 units	1,260,550 units
Cost of current for Power & Light	£5534	£5,581

### USE OF CRANES BY SHIPPING.

	1926-7	1936-7
Total crane hours worked including grab work	46,658	72,403½
Work with grabs only	6,563	6216
Total working expenses including maintenance	£24,133	£31,139
Total revenue	£37,877	£53,854

Total cost of all cranes installed including electric power mains etc. ....£260,000.

REINFORCED CONCRETE WHARVES.

WHARF.	DATE BUILT.	AREA SQ. FT.
Kings Wharf	1905-07	255,672
Queens Wharf	1909-14	321,651
Northern Wharf	1912	35,883
Ferries	1909	37,341
North Wall	1907-10	35,973
Birkenhead Wharf	1908-09	12,933
Training Pier. Calliope Dock	1936-37	14,870
Bayswater Wharf	1909	4,752
Quay Street Landing	1912-16	63,135
Central Wharf	1916-17	195,021
Western Wharf	1921-31	104,956
Princes Wharf	1922-24	339,300
Low Landings Kings Wharf	1924	21,195
Devonport	1927-28	57,155
Viaduct to Freemans Bay- Western Section only	1930	84,569
Onehunga Wharf	1924-26	53,820
Hobson Wharf	1938	50,559
		<u>1,688,785 sq. ft.</u>

= 39 Acres.

39 Acres of reinforced concrete wharves constructed from 1905 to 1938 at a cost of approximately, £1,120,000 (wharves only) have cost only £37,193 in Maintenance during whole period.

The Construction of the new Export Wharf will add approximately 140,000 sq.ft., (approx. 3 acres) to the total area of reinforced concrete wharves.

A.H.B. TRANSIT SHEDS.

Wharf.	No of sheds.	Type.	Net floor area avail- able for cargo. Sq. Feet.	Total covered space. Cubic Feet.	Total capacity at 40c. ft. per ton allowing 33% of floor area for pass- ageways etc.
					Tons
Princes	6	Double storey reinf. concrete with flat roofs.	(including roofs.) 416,000	3,282,000	54,700
Queens	5	Three Double Storey, Two Single Storey. Steel framed C.G. iron	177,500	1,772,000	29,500
Wings	5	Single Storey Steel framed C.G. iron.	85,800	928,000	15,500
Central	4	Single storey steel and reinforced concrete.	65,500	870,700	14,500
Northern	2	Single Storey wood and C.G. iron	29,600	353,000	5,800
Western	2	Single storey wood and C.G. iron	16,300	334,500	5,500
Robson	3	Single Storey steel and concrete.	11,800	165,000	2,750
	27		802,500	7,705,200	128,250

SUMMARY: 27 Sheds with total net floor area 802,500 sq.ft.

or over 18 Acres, and capacity for 128,250 Tons  
Cargo.

VALUE of Sheds - £317,000.

The construction of the Export Wharf will add approximately  
81,000 sq. ft., 975,000 Cubic feet, and 16,000 tons respectively  
to the above totals.

AUCKLAND HARBOUR BOARD.DREDGING.

As is the case in most Ports, Auckland has had to dredge vast quantities of spoil to provide deep water for shipping at and approaching its wharves.

Although invisible, this represents one of the Board's greatest assets.

Since 1898, 8,824,000 cubic yards of solid spoil has been removed and although only £90,460 appears against this item in the Board's books, it is safe to say that its value exceeds £500,000.

In most cases the cost of dredging has been charged against reclamation work, the major works during that period being:-

	<u>C.Yards.</u>
1908-1917 Freeman's Bay Reclamation	1,400,000
1912-1915 Mechanics Bay Reclamation	1,300,000
1913-1912 Hobson St. Reclamation (City Markets area)	115,000
1915 Auckland Dock Site	15,000
1915-1916 St. Georges Bay Reclamation	440,000
1916-1919 Reclamation E. of Power Station	120,000
1919-1923 Eastern Reclamation No.1	570,000
1924-1926 Eastern Reclamation No. 2.	325,000
1923-1925 Princes Wharf Approach	60,000
1928-1930 Western Reclamation	845,000
1937-1938 Boatharbour, St. Mary's Bay Reclamation	163,000
Other earlier Reclamations and Dumped at Sea	3471,000
<u>See Diagram next sheet.</u>	<u>8,824,000</u>



# Auckland Harbour Board

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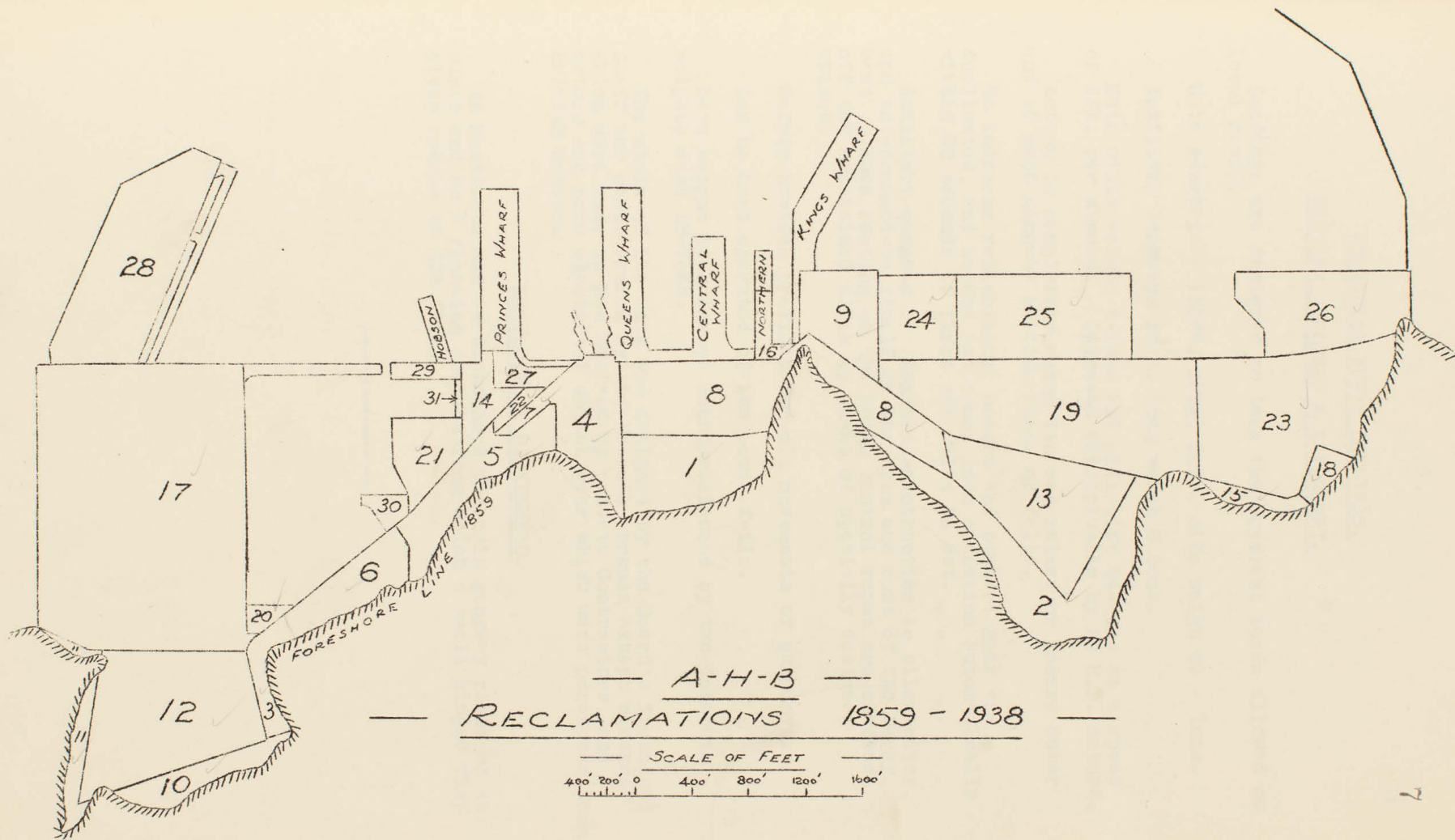
## RECLAMATIONS.

No. on Plan.	Date.	Locality.	Approximate Area. (Acres).
1.	1859-6(?)	Fort Street to Customs St. East.	9
2.	1872-77.	Mechanic's Bay from Railway Bridge, Parnell, to Point Britomart, including Factory St.	18 $\frac{1}{2}$
3.	1873-74.	Hardinge St. to Patteson St.	3 $\frac{3}{4}$
4.	1875-77.	Queen Street to Albert Street.	8
5.	1876-79.	Albert Street to Nelson Street.	11 $\frac{1}{2}$
6.	1875-77.	Nelson St. to Hardinge Street.	5 $\frac{1}{2}$
7.	1878-79.	Auckland Garving Dock.	1
8.	1879-86.	Railway Station.	18 $\frac{3}{4}$
9.		N.Z. Frozen Meat Company.	6 $\frac{3}{4}$
10.	1886.	Freeman's Bay: Drake Street to Patteson Street.	6 $\frac{1}{4}$
11.	1885-88.	Freeman's Bay: Auckland Gas Co. (Beaumont Street).	3
12.	1886-1901.	Freeman's Bay: Victoria Park, etc.	23 $\frac{1}{4}$
13.	1901-10.	Mechanic's Bay from Railway embankment to old King's Drive.	16 $\frac{3}{4}$
14.	1902-08.	Hobson St. including solid portion of Hobson Street Wharf.	3 $\frac{3}{4}$
15.	1904.	St. George's Bay (section).	2 $\frac{1}{4}$
16.	1909-10.	Northern Wharf and approach thereto.	3 $\frac{1}{2}$
17.	1905-17.	Freeman's Bay, North of Victoria Park.	69 $\frac{1}{4}$
18.	1911-12.	St. George's Bay, from St. George's Bay Road.	2
19.	1912-15.	Mechanic's Bay, from the old to new King's Drive.	32 $\frac{1}{2}$
20.	1913-14.	Customs Street, East of Julian's Wall (Fanshawe Street).	1
21.	1913-14.	Hobson Street (Markets area).	4 $\frac{1}{2}$
22.	1915.	Auckland Graving Dock site.	1
23.	1915-16.	St. George's Bay from Campbell's Point.	24
24.	1916-19.	Reclamation, East of Electric Power Station.	7 $\frac{3}{4}$
25.	1919-23.	Eastern Reclamation No.1.	17 $\frac{1}{4}$
26.	1924-26.	Eastern Reclamation No.2 (Campbell's Point)	14 $\frac{1}{4}$
27.	1923-25.	Prince's Wharf Approach.	2 $\frac{1}{4}$
28.	1928-30.	Western Reclamation	23
29.	1929-30.	Viaduct - Eastern Section	1 $\frac{1}{2}$
30.	1936-37.	Nelson Street Reclamation (first section)	1 $\frac{1}{4}$
31.	1938.	Hobson Street Workshops (Viaduct to Fish Landing)	1/5
32.	1937-38.	Boatharbour St. Mary's Bay Reclamation.	10

353 Acres.

The leasing of reclaimed lands produces an annual rental of over £60,000, and this figure will increase as old leases are renewed and further areas are leased.





VEHICULAR FERRY LANDINGS.EASTERN, WESTERN & DEVONPORT.

Landings are designed to take the heaviest loads allowed on local roads.

Main gangways - 110ft. long, 12ft. wide weigh 69 - Tons.

Auxiliary Gangways 16ft. long weigh 8 tons.

Main winch weighs 8-tons and will lift 64-tons at a speed of 2ft. per minute. Operated electrically by 25 H.P. motors.

Action is completely automatic and raises or lowers outer end of main gangway as tide rises or falls.

To increase reliability, motors and control gear are duplicated, and second set comes into operation automatically within 22 seconds if first set fails to act.

Auxiliary gangway of flexible construction to allow outer end to accommodate itself to the trim and cant of the ferry boat. When resting on the deck, control ropes are slacked off and maintained slack by means of specially designed switch.

Safety devices provided for all movements of gangways.

Can be hand operated if the power fails.

Dead weight of gangways counterbalanced by two concrete weights each 18-Tons.

The whole of the work was designed by the Board's Technical Staff and manufactured by the Board's workmen except winches which were made in New Zealand by private Contractors, and motors and some electrical switch gear which were purchased from British makers.

NORTHCOTE & BIRKENHEAD.

At Northcote and at Birkenhead the main gangway rests at its outer end on a floating pontoon from which a small hinged flap gives access to the ferry.

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RANGITOTO QUARRIES.

Books

Plant stands in Board's @ £3,306 as on 30.9.1937.

- Board Commenced Quarrying Operations - November 1913. -

Total amount quarried 1913 to 1938 = 667,457 C. Yards,

Valued at over, £250,000.

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This was principally supplied to:-	Stone.
1914-15 Western Breakwater	65,522 C. Yds.
1915-18 Reclamation - E. of Power Station	32,905 " "
1919-21 Eastern Reclamation - 1919	101,993" "
1921-24 Eastern Breakwater	158,380" "
1922-23 Princes Wharf Reclamation	25,708" "
1922-24 Crushed Stone for Concrete Work	35,045" "
1923-24 Eastern Reclamation No. 2 (Campbells Point)	45,919" "
1926-28 Boat Harbour St. Mary's Bay	115,489" "
1926-28 Western Reclamation & Breakwater Ext.	57,649" "

In 1922 owing to impossibility of securing suitable shingle the Board installed crushing plant to provide 100 cubic yards concrete aggregate per day.

Quarry has not been worked since 1928, all requirements for stone since that date having been met by contractors, but quarry is maintained in working order and is available if stone required in large quantities, or if unreasonable prices are charged for supplies.

HARBOUR LIGHTS AND BEACONS.

The Board is responsible for the safety of navigation within the harbour limits.

For the guidance of shipping, lighthouses, light-buoys, lighted beacons and unlighted buoys and beacons are installed and maintained wherever necessary.

A system of denoting lights on the wharves assists vessels to approach the berths at night time.

The Principal harbour lights are:-

RANGITOTO BEACON, 1768 Candle Power through red screen -  
 Visibility 12 miles.  
 Focal height 64ft..  
 Revolving single beam, red light giving one flash every  $12\frac{1}{2}$  seconds.  
 This light previously operated on Pintsch's Patent Gas, and later on dissolved acetylene was electrified on 15th. December, 1930 at which time a submarine electric cable was laid from Takapuna.

BEAN ROCK

4000 Candle Power in white Sectors,  
 1600 Candle Power in Red Sectors,  
 1200 Candle Power in Green Sector.  
 Visibility 10 miles, focal height 50ft.  
 Group flashing Electric light, period 8 secs.  
 3 flashes of 1 second each, Eclipse between flashes 1 second and between groups 3 seconds. The light has white, red and green sectors showing white down Motukoreho Channel, Rangitoto Channel and up the Harbour - red sectors over North Head and Brown's Island, and green sector over Rangitoto Island.  
 This lighthouse was originally built by the Marine Department for an attended light and room is provided for living quarters.  
 It was converted to an unattended light using dissolved acetylene and in 1936 was electrified by laying a submarine cable from Mission Bay to the lighthouse.

BROWN'S ISLAND LIGHT.

275 Candle power, reduced in red sector to 112  
 Visibility 10 miles, focal height 27ft.  
 Flashing red light with white sector, 1 second flash, 3 seconds dark. The white sector guides vessels through Motuihi Channel.  
 Installed by Auckland Harbour Board in January, 1923 and is an unattended light using dissolved acetylene.

LIGHTS AND BEACONS.DEVONPORT SANDSPIT BEACON.

110 Candle Power reduced by green screen to  
34 Candle Power. Visibility 5 miles, focal  
height 15ft.  
Flashing green light 2 seconds flash, 4 secs.  
dark.  
Erected by Auckland Harbour Board in 1916 to  
operate on Pintsch's Patent Gas and in 1926  
converted to dissolved acetylene.

BASTION BEACON.

A flashing red light on the Northern end of  
reef off Bastion Point, .3 seconds light,  
4.7 seconds dark. Originally Kerosene, but  
converted to dissolved acetylene in 1936.

LIGHT BUOYS - RANGITOTO CHANNEL.

Eastern Side - North West Corner of Duder's Spit.  
90 Candle Power reduced by red screen to  
40 Candle Power.  
Visibility 5 miles, focal height 9ft.  
Flashing red light, 1/3 second flash, 2/3 sec.  
dark.  
Dissolved acetylene.

" " - 080° 4600 ft. from Rough Rock Beacon.  
130 Candle Power reduced by red screen to  
50 Candle Power.  
Visibility 5 miles, focal height 9 feet.  
Flashing Red Light, 2 Seconds flash, 10 secs.  
dark.  
Dissolved acetylene.

Western Side. 130 Candle Power.  
Visibility 7 miles, focal height 9ft.  
Flashing white light, 1 second flash, 4 secs.  
dark.  
Dissolved acetylene.

Orakei Wharf Light

A flashing red light operated by electricity,  
2 seconds flash, 4 seconds dark.  
Visibility 6 miles, focal height 18feet.

This was previously operated by dissolved  
acetylene and was converted to electricity  
on 2nd. March 1938.

BAYSWATER LIGHT.

A flashing red light, .3 seconds flash,  
2.7 seconds dark, focal height 7 feet, on  
the outer of five dolphins which define the  
channel to Bayswater Wharf.  
Previously used Kerosene but converted to  
operate on dissolved acetylene in 1936.

KAURI POINT LIGHT.

A flashing red light .3 seconds flash, 2.7  
seconds dark, focal height 7ft, is exhibited  
from the Northern end of the Point Chevalier  
Reef opposite Kauri Point.  
Operates on dissolved acetylene and installed  
in 1935.

Lights and Beacons. (Cont.)

UNLIGHTED BEACONS ARE MAINTAINED AT:-

- Rough Rock
- Saltworks Rangitoto
- Bean Rock
- Bastion Reef
- Iliomama
- Kohimarama
- Tamaki Heads and River
- Motuihi
- Horseshoe Reef
- Narrow Neck, and in many positions  
in the shallower waterways in the  
upper harbour.

A number of unlighted buoys are maintained to mark navigable channels, protected anchorages, etc.

HARBOUR WORKS AND EXTENSIONS UNDER CONSTRUCTION, 1937-38.1. EASTERN BERTH CENTRAL WHARF: - EQUIPMENT & DREDGING:

This berth is being equipped with three new 5-ton electric cranes and an intershed crane-girder is being constructed. The two existing cranes are being modernised and jibs lengthened. The berth and approaches are being dredged to give a minimum of 33ft. L.W.S.T.

These works will convert this berth which up to the present has been suitable only for coastal vessels and vessels of medium draft, into an efficient deep-sea berth at a total cost of, ... .. £37,000.

Progress to 22.6.1938:

Dredging - 90% completed.

Three new cranes completed by makers and shipped to Auckland.

Two existing cranes - new jibs and alterations in hand in Board's workshops.

Crane-girder - nearing completion in Board's workshops.

2. HOBSON WHARF:

Reinforced concrete Wharf 500ft. x 100ft. with three steel frame and concrete panel sheds each 100ft. x 40ft., to provide berthage with shed accommodation for small coastal vessels.

Total estimated cost, ... .. £45,150.

Progress to 22.6.1938:

Wharf - 90% completed.

Sheds - delayed through non-arrival of steel which is now coming to hand and being fabricated in Board's workshops.

Concrete panels being constructed.

3. ROOFING OVER PRINCE'S WHARF ROADWAY:

To provide cover for carriers taking delivery of cargo from sheds and delivering to sheds.

Total cost .. ... .. £12,450.

Progress to 22.6.1938: Completed.

4. NELSON RECLAMATION AND BREASTWORK:

First section of re-modelling of waterfront from Nelson Street to Freeman's Bay.

Completed and all sections leased in November, 1937.

Total cost .. ... .. £9,550.

5. SHEET-PILE BREASTWORK AND QUAY - VIADUCT TO MARKET LANDING:

This modern structure replaces a decayed and dangerous wooden breastwork adjacent to the Board's workshops and provides very necessary additional area for workshops and yard.

Estimated cost . . . . . £9,200.

Progress to 22.6.1938: 85% completed.

6. ST. MARY'S BAY BOAT HARBOUR:

Dredging and reclamation for roadway, hauling up areas and club and boat house sites.

Estimated cost . . . . . £33,000.  
of which £10,000 is provided as grant from the Employment Promotion Fund.

Progress to 22.6.1938: 60% completed.

7. EXPORT WHARF AND CONTINGENT WORKS:

Estimated cost . . . . . £483,000.

Progress to 22.6.1938:

Just commenced work on pile making for Breastwork and reclamation.

8. BUILDING UP EASTERN BREAKWATER AND CONSTRUCTION OF ROADWAY:

Total estimated cost . . . . . (£40,000)  
First section only authorised 21.6.1938, at cost  
of . . . . . £10,000.

Progress to 22.6.1938: Preparatory work only.

9. CALLIOPE DOCK - WORKS UNDER NEW NAVAL AGREEMENT:

New Reinforced concrete Training Pier, (Completed).	Cost	£19,100.
Calliope Wharf Extension	"	£20,330.
Bollards, Fairleads & Capstans	"	£4,850.
Boat Pound	"	£1,300.
Repairs to old Sheerlegs Wharf	"	£2,450.

Alterations to 3-ton crane undercarriage and crane track, purchase and installation of two 110-ton turntables, roading round dock, etc.

Estimated cost of work still to do £17,000.

Awaiting delivery of 110-ton turntables.

10. INSTALLATION OF NEW DIESEL ENGINE FOR PILOT LAUNCH "WAITEMATA":

Progress to 22.6.1938: Engine ordered and shipped.  
Will be installed immediately on arrival.



Other works pending, but not yet authorised for prosecution:-

- |   |          |
|---|----------|
| (a) New Workshops and Store   | £40,000. |
| First section only,   | £10,000. |
| (b) Repairs, renovation and installation of central heating to Ferry Building | £6,000.  |
| (c) Completion of Port Building and accommodation for H.M. Customs, etc.      | £70,000. |
| (d) Provision of gear stores for shipping companies and stevedores.           | £40,000. |
| (e) Eastern Boat Harbour (wave-break only)                                    | £13,000. |
| (f) Provision (extent not yet known) for Overseas Air Services.               |          |

1937 EMPOWERING ACT.

This act empowers the Board to raise ... £1,000,000 for the following three works:-

Export Wharf	...	...	...	£483,000.
Provision of special facilities for passengers and tourists	...	...	...	£275,000.
Reclamation and deep water quay			...	£432,000.

Of these, the first item only has been authorised by the Board.

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