

1987. 328. 269

1000 Manukau Harb.
General.



Manukau Harbour gen.

incl Survey of Harbour Entrance
- Wairopa channel.

incl. definition. H.W. Level.

From Jan. 1916

To Dec 1982

Previous No

1117

Memorandum

To: THE CHIEF ENGINEER

Date: 9 December 1982

From: THE HYDROGRAPHER

REPORT OF SURVEY - PURAKAU CHANNEL

SPOIL GROUND

A resurvey was carried out on 30 November 1982. (plan H5/16/4) the previous survey being 13 October 1981 (plan H5/16/3).

Apart from the change in position and colour of the buoys little change in depths is apparent and little or no dumping has taken place in the past year.

In the 1981 survey lines of sounding were run longitudinally along the channel because of the draught and lack of manoeuvrability of Tug "Manukau" as on the western side of the channel Te Tau Bank rises very steeply.

The recent survey was carried out in "Arahi" with the sounding lines running correctly across the channel to give more accurate cross sectional profiles.



J. Reith
HYDROGRAPHER

JHR:VLH

Enc. H5/16/3 and 4

File
JB
10/12

691 000 N

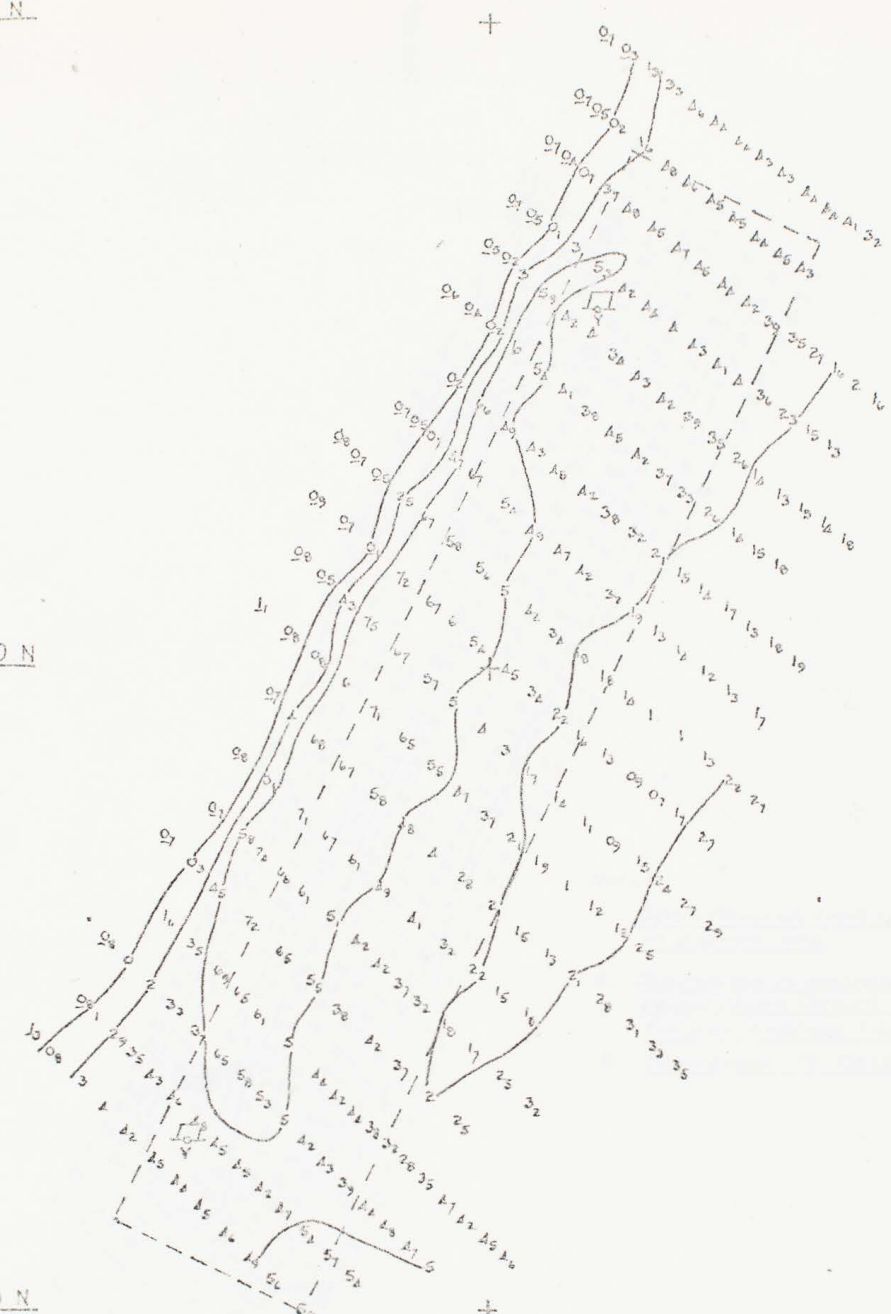
691 000 N

690 500 N

690 500 N

690 000 N

690 000 N



SPOIL GROUND LIMITS SHOWN IN PECKED LINE

SOUNDINGS IN METRES & DECIMETRES BELOW CHART DATUM. UNDERLINED FIGURES EXPRESS HEIGHTS ABOVE C.D.

SURVEYED 30 NOVEMBER 1982



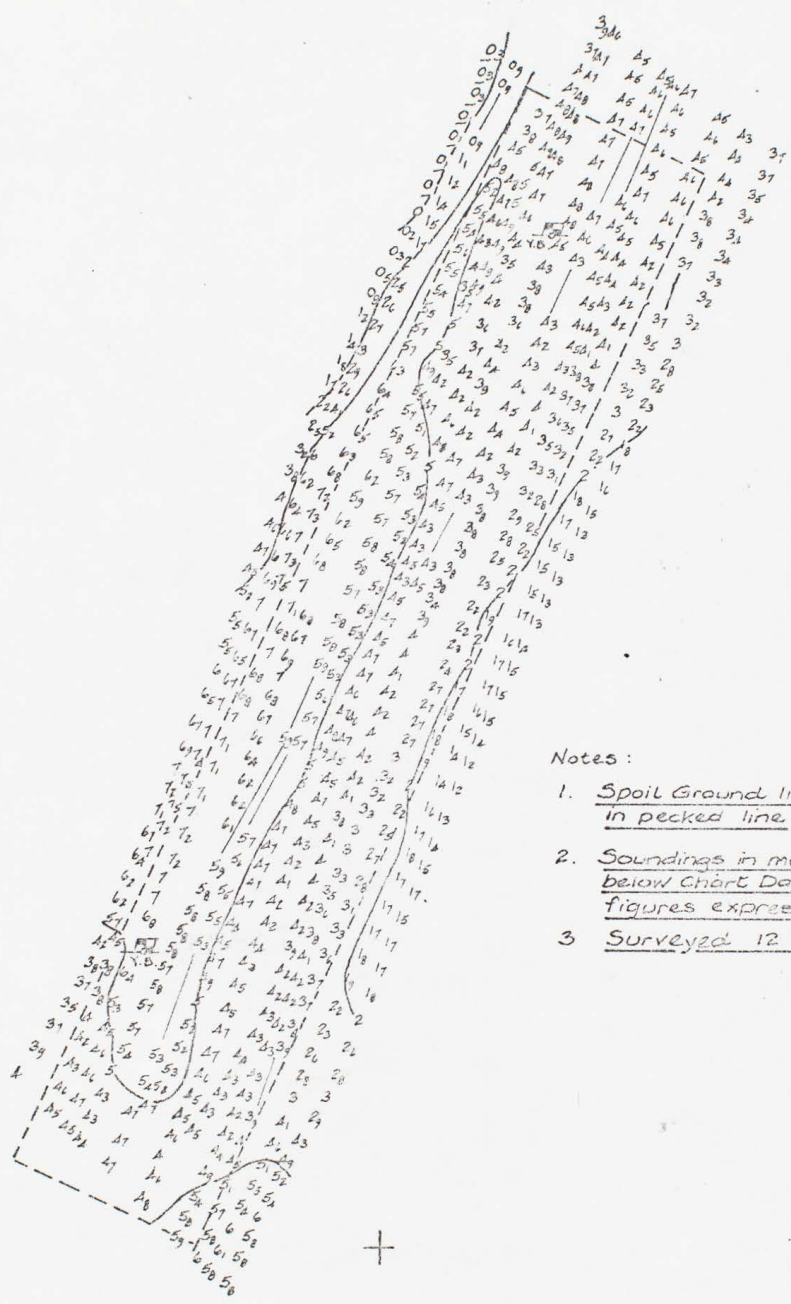
MANUKAU HARBOUR
 ONEHUNGA DREDGING SPOIL GROUND
 PURAKAU CHANNEL

DRAWN C.T.
 DATE 7.12.82
 SCALE 1:5000

DRAWING
 H 5/16/4

236 000 E

691 000 N



690 500 N

690 000 N

236 000 E

236 000 E

Notes:

1. Spoil Ground limits shown in pecked line
2. Soundings in metres & decimetres below Chart Datum. Underlined figures express heights above C. D.
3. Surveyed 12 October 1981

[Handwritten signature]



MANUKAU HARBOUR
 ONEHUNGA DREDGING SPOIL
 GROUND - PUKAKAU CHANNEL

DRAWN J.H.R.
 DATE 13.10.81
 SCALE 1:5000

DRAWING
 H5/16/3



Memorandum

To: AS PER DISTRIBUTION LIST

Date: 27 September 1982

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A re-survey of the South Channel was carried out in very good sea conditions with negligible swell at half flood on 23 September 1982.

Amendment No.1 to H5/1/45 dated 27 September 1982 shows changes in the channel since the Navy Survey of March 1982 as follows:-

Whilst the 5 metre contour forming the eastern limit of the South Bank remains relatively unchanged there appear to be signs that the shoal lying athwart the Hill Leads S.W. of the Lighthouse is moving to the south.

The best approach is now 200m to the west of the Hill Leads with a least depth of 4.3m, 247°, 1620m from the Lighthouse and turning on to the Destruction Gully leads when in line. The least depths recorded were 3.4m lying on the Hill leads 237°, 1770m and 243°, 1380m from the lighthouse.

It is requested that arrangements be made with the signalman at South Head that both a listening watch on R/T and a visual watch on tug "Manukau" be kept during the course of the survey in future.

HYDROGRAPHER

Enc. Plant H5/1/45 Amendment No.1

DISTRIBUTION:

- Chief Engineer
- Harbourmaster
- Officer-in-Charge, Onehunga
- Operations Manager



Blel

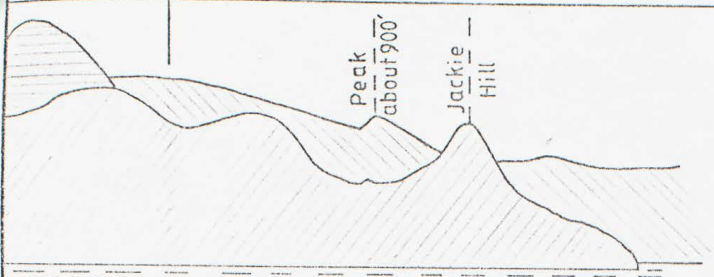
Mr Bray 27/9

31'

174°

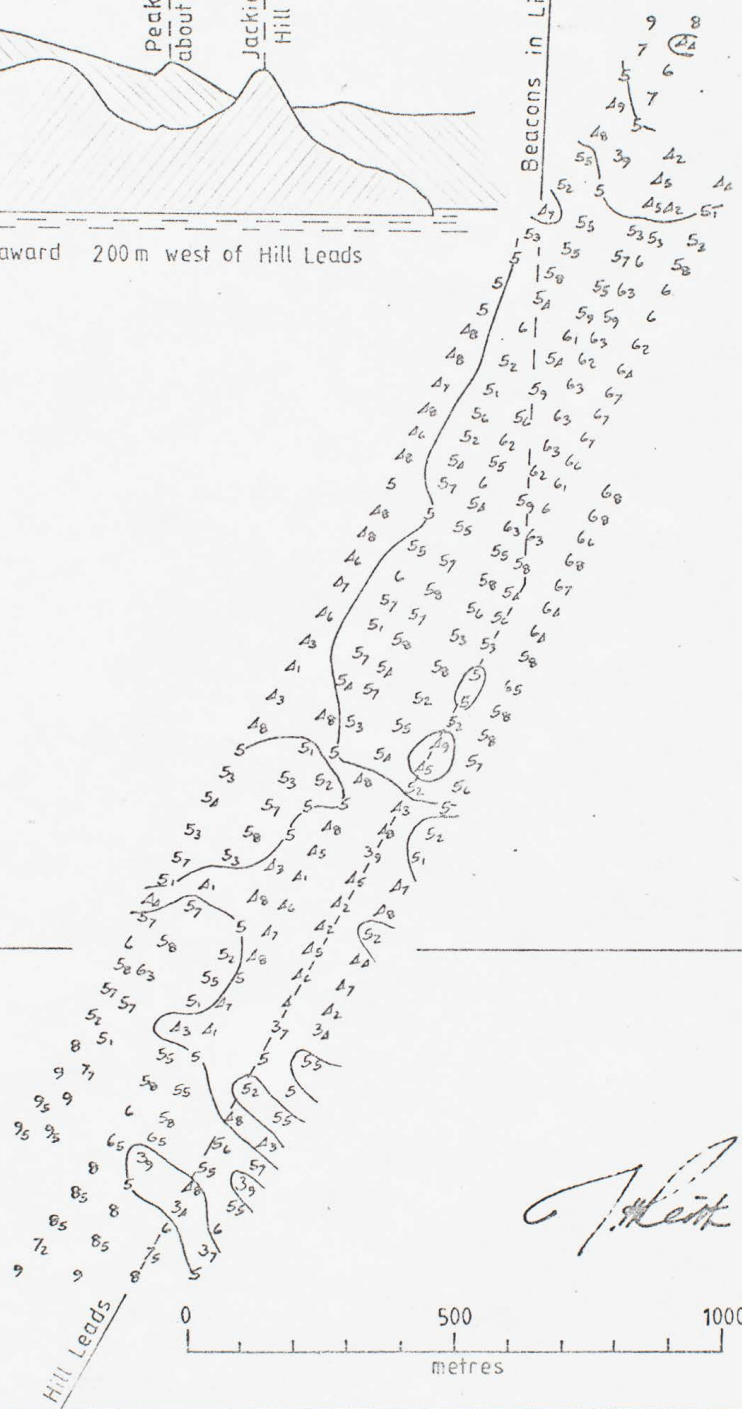
32' E

03'



View from seaward 200m west of Hill Leads

Beacons in Line 002°



Manukau Harbour Entrance-South Channel
 Surveyed 23 Sept 1982
 Soundings in metres and decimetres below C.D.

DRAWN RWB
 DATE 27-9-82
 SCALE 1:12,000

DRAWING
 H5/1/45
 Amendment 1

To: THE CHIEF ENGINEER

Date: 20 September 1982

From: THE HYDROGRAPHER

WAIROPA CHANNEL - VICINITY NOS. 1 and 3 BUOYS

REPORT OF SURVEY

Following reports that shoal depths were being found in Wairopa Channel between No.1 and No.3 buoys the area was resurveyed on 17 September 1982.

The resultant plan shown as an amendment to Plan H5/34 does indicate that Te Tau Bank is growing to the westward midway between these two buoys.

Immediate remedial action was taken by moving No.3 buoy 217^o, 200m from its charted position to a new position 182^o18' 2068m from Mill Point Light (Lat 36^o59'.53 S Long 174^o 37.01 E). An additional line of soundings was then run between the two buoys.

As this shows some instability of Te Tau Bank in this locality it is requested that the Master of Tug "Manukau" take the opportunity when passing these two buoys to run a line of soundings with his echo sounder. If possible a straight course between the buoys should be steered, passing close by each buoy and pressing the fix push as each buoy is abeam. Annotate the portion of echo trace with the time and date then forward to the Hydrographic Section.



J.H. Reith
HYDROGRAPHER

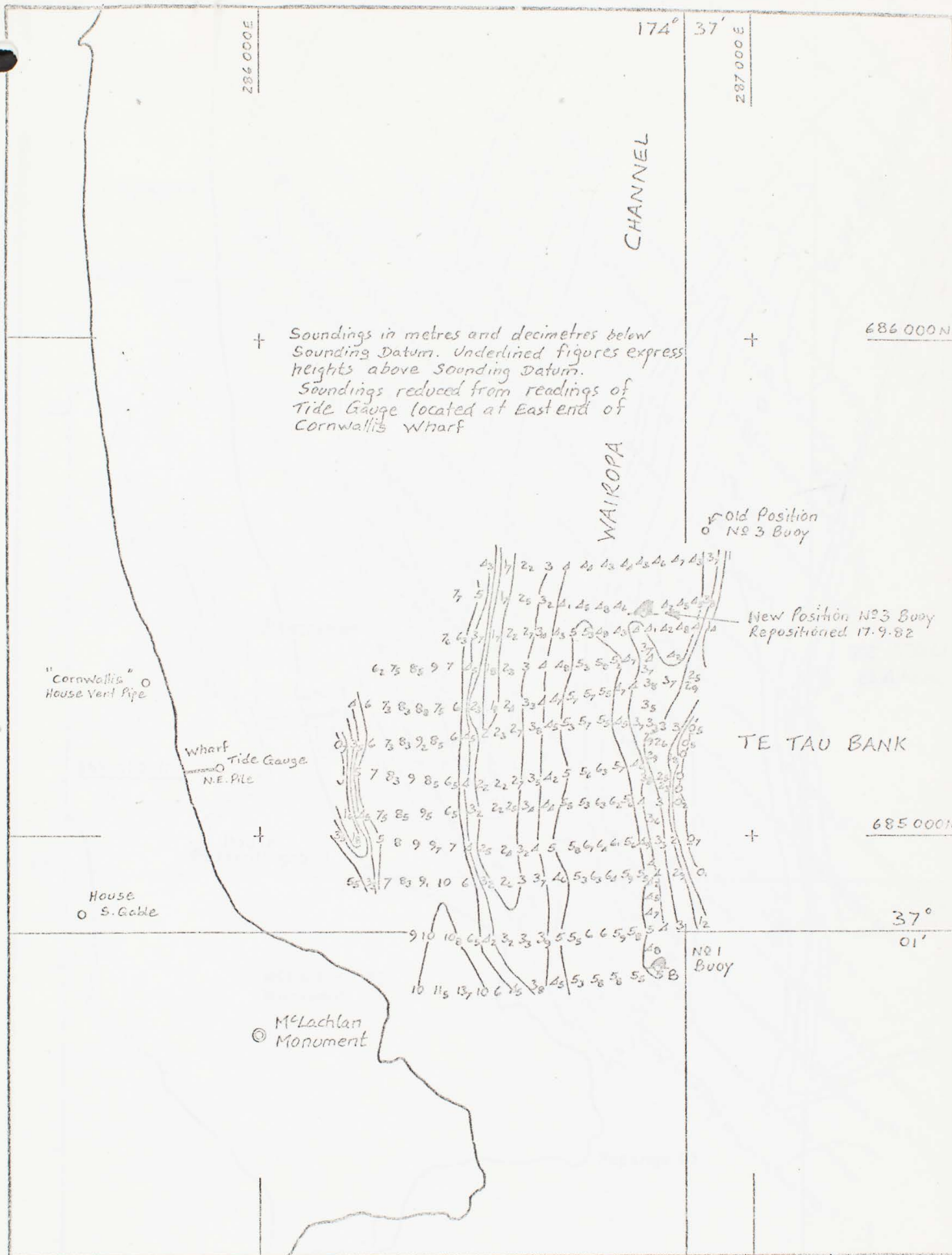
Enc. Portion of Plan H5/34
Amendment No.1 to H5/34

COPIES TO THE HARBOURMASTER
THE OPERATIONS MANAGER
THE OFFICER-IN-CHARGE ONEHUNGA
THE HYDROGRAPHIC FILE

See

Mr Bay to see

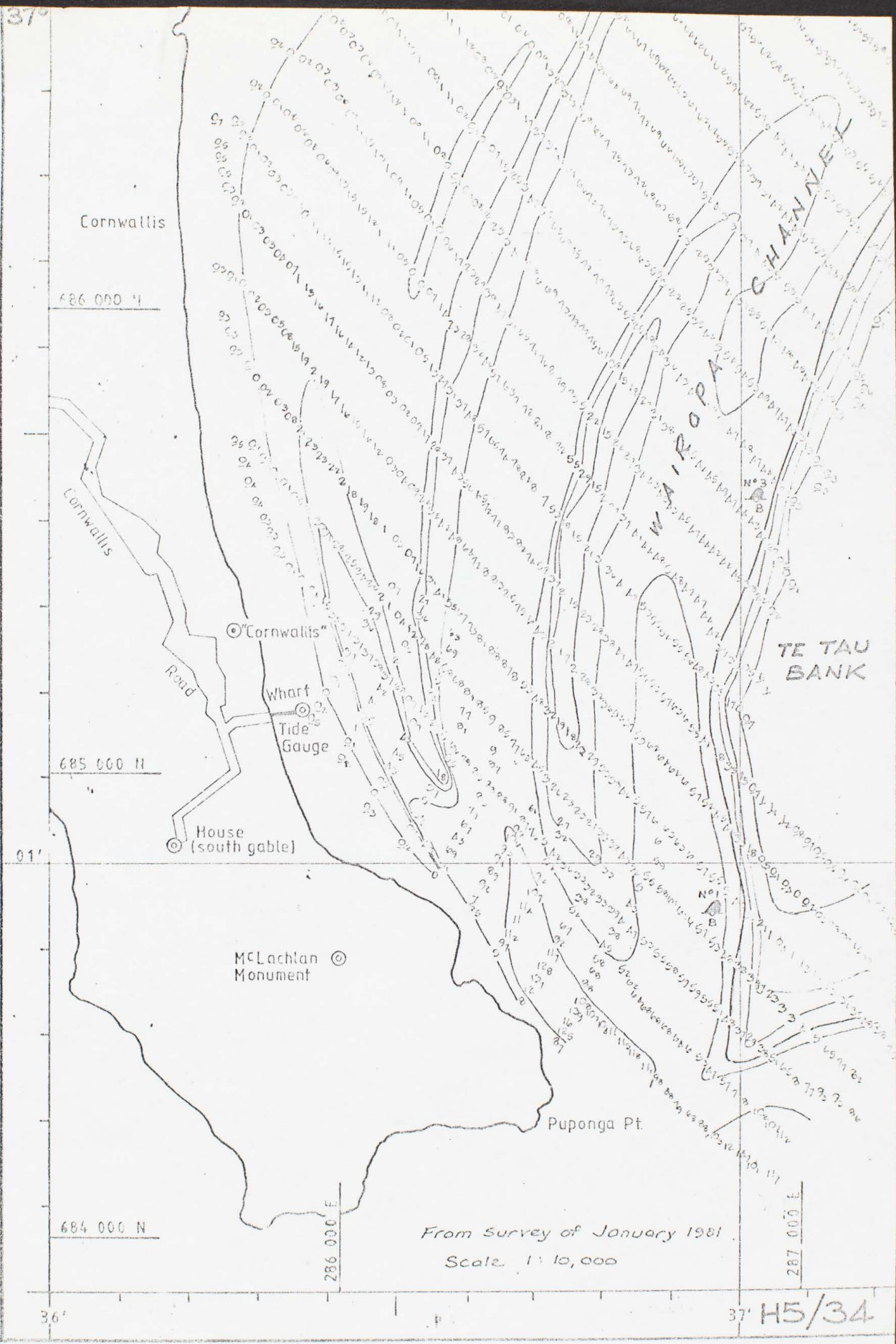
JR
2/9



MANUKAU HARBOUR—WAIROPA CHANNEL
 BETWEEN BOOYS 1+3
 surveyed 17 Sept. 1982

DRAWN RWB
 DATE 20.9.82
 SCALE 1:10,000

DRAWING
 H5/3A
 Amendment 1



Cornwallis

686 000 N

Cornwallis

Road

○ Cornwallis

Wharf

○ Tide Gauge

685 000 N

○ House (south gable)

01

MCLachlan Monument ○

Puponga Pt.

684 000 N

286 000 E

From Survey of January 1981
Scale 1:10,000

287 000 E

36

37 H5/34

624 12/ 54/1

EXTRACT FROM MINUTES
WORKS & TRAFFIC COMMITTEE
18 MAY 1982

10. MANUKAU HARBOUR - SEARCH AND RESCUE RADIO COMMUNICATIONS

In his report of 12 May 1982 the Acting General Manager referred to the sinking of a 5.5m cabin cruiser in the Manukau Harbour on 20 January 1982 with a resulting loss of life following which the Board had been involved in discussions with the search and rescue organisations in the Manukau.

In order to achieve a common radio frequency for communication in search and rescue operations the Civil Aviation Department (which operated the hovercraft and other rescue craft at the Airport) and the Coastguard units had agreed to use Marine V.H.F. Channel 68 for all maritime search and rescue. As all channels in the radio telephone equipment were now in use, it was proposed to replace Channel 10 with Channel 68 and the Chief Engineer had recommended that he be authorised to proceed with the purchase of parts and carry out the modifications at the estimated total cost of \$400.00.

The Acting General Manager had authorised the Chief Engineer to proceed as requested and in view of the Board's involvement and of the widespread interest in the particular subject the matter was reported for the information of Members.

It was RESOLVED to recommend that the report be received.

Electrical Engr.

to arrange for alterations to R/T sets as soon as possible.

ADOPTED BY BOARD

25 MAY 1982

C/E, P/SO, OM, T



Auckland Harbour Board

12 May 1982

The Chairman
Works and Traffic Committee
AUCKLAND HARBOUR BOARD

ITEM 10

MANUKAU HARBOUR - SEARCH AND RESCUE RADIO COMMUNICATIONS

Members will recall that following the sinking of a 5.5m cabin cruiser in the Manukau Harbour on 20 January 1982 and resulting loss of life the Board has been involved in discussions with the search and rescue organisations in the Manukau.

The Officer-in-Charge, Onehunga, as the Board's representative in these discussions, has advised that in order to achieve a common radio frequency for communication in search and rescue operations the Civil Aviation Department (which operates the hovercraft and other rescue craft at the Airport) and the Coastguard units have agreed to use Marine V.H.F. Channel 68 for all maritime search and rescue. Similarly the Police Department has asked that this same frequency be fitted to the various Auckland Harbour Board installations used on the Manukau Harbour.

The Chief Engineer reports that "radio telephone equipment in the following installations would be affected:-

Manukau Heads Signal Station - 2 sets
Onehunga Wharf Signal Station - 1 set
Launch "Manukau" - 1 set
Officer-in-Charge - Hand held portable Radio Telephone

In all the above installations, except the hand held portable which is four channel equipped, the radio installations have six channels.

The Officer-in-Charge has advised me, as all channels are now in use, that No.10 which is one of the two Port working channels fitted in all the above equipment could be replaced with Channel No.68. Further the loss of Channel No.10 would not affect present or future operations in the Port.

As the above substitution is the only way of equipping the Board's V.H.F. radio equipment with Channel No.68, other than replacing all four radios at an estimated total cost of \$20,000 I recommend that I be authorised to proceed with the purchase of parts and carry out the modifications at the estimated total cost of \$400.00."

I have authorised the Chief Engineer to proceed as requested and in view of the Board's involvement and of the widespread interest in this particular subject the matter is reported for the information of Members.

R. Cooper
ACTING GENERAL MANAGER



ALAND NAVY

HIC OFFICE

TAKAPUNA

AND

P.O. BOX 33341
AUCKLAND 9
TELEPHONE
495 062
CHART SALES
495 063

Chief Engineer

To: *Harbourmaster*

Date: *20/4/82*

From:

OUR REFERENCE HNZ 3/4314

PLEASE ACKNOWLEDGE

PLEASE REPLY DIRECT
SUBMITTING COPY TO
HEAD OFFICE

PLEASE REPORT

FOR YOUR INFORMATION
AND RETURN PLEASE

FOR NECESSARY ACTION
PLEASE



6th March 1982



Y - MARCH 1982

au Bar Channels was undertaken
APU during February and early
survey was 1:12,000 (as for
position fixing system was

J4038/6

J.B.
GENERAL MANAGER
CHIEF ADMINISTRATIVE
OFFICER & SECRETARY
OPERATIONS MANAGER

of the six standard sounding
enclosed.

The following extracts from the Officer in Charge's
Report of Survey are included for information:

"Sounding

Soundings were obtained using the ship fitted AD 10
Echo Sounders, checked daily by bar. Lines of sounding
were run at standard 5mm apart on paper, being 60 metres
apart on the scale of the survey. As was found during the
previous 1977 Survey, discrepancies were found when checking
or overlapping previous work. Huge volumes of sand appear
to be continually on the move, which is more apparent after
a period of Westerly gales. Sand movement is clearly visible
during calm weather from an elevated vantage point at South
Head. For this reason the critical shoal patches on the
Jackie Hill and Destruction Gully leads were sounded on the
last day of the survey, the 15th March, thereby presenting
the most up to date situation in this area. In view of
the instability of the Bar no investigations were carried
out even where in a regular survey the need would have been
clearly indicated. The task of obtaining accurate sounding
was further aggravated by the fact that a large majority of
sounding took place in 2 to 3 metre swells.

Mr Bray Keith has a copy. Please arrange reply ref last para.

Mr Bray, This has been discussed with H.M. who is replying with answers to last para. direct.

*CE?
HMS*

File

*Hydrographer.
John comes as directed but discuss letter with H/M.*

22/4



ROYAL NEW ZEALAND NAVY

HYDROGRAPHIC OFFICE

BURNS AVENUE . TAKAPUNA
AUCKLAND

P.O. BOX 33341
AUCKLAND 9
TELEPHONE
495 062
CHART SALES
495 063

YOUR REFERENCE

OUR REFERENCE HNZ 3/4314

The General Manager,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.



Dear Sir,

MANUKAU BAR SURVEY - MARCH 1982

A resurvey of the Manukau Bar Channels was undertaken by HMNZ Ships TARAPUNGA and TAKAPU during February and early March 1982. The scale of the survey was 1:12,000 (as for the 1977 survey) and the prime position fixing system was Trisponder throughout.

Ammo-permatrace copies of the six standard sounding sheets and the index sheet are enclosed.

The following extracts from the Officer in Charge's Report of Survey are included for information:

"Sounding

Soundings were obtained using the ship fitted AD 10 Echo Sounders, checked daily by bar. Lines of sounding were run at standard 5mm apart on paper, being 60 metres apart on the scale of the survey. As was found during the previous 1977 Survey, discrepancies were found when checking or overlapping previous work. Huge volumes of sand appear to be continually on the move, which is more apparent after a period of Westerly gales. Sand movement is clearly visible during calm weather from an elevated vantage point at South Head. For this reason the critical shoal patches on the Jackie Hill and Destruction Gully leads were sounded on the last day of the survey, the 15th March, thereby presenting the most up to date situation in this area. In view of the instability of the Bar no investigations were carried out even where in a regular survey the need would have been clearly indicated. The task of obtaining accurate sounding was further aggravated by the fact that a large majority of sounding took place in 2 to 3 metre swells.

*Mr Bray Keith has a copy.
Please arrange reply
ref last para.*

*CEJ
HMS*

File

Hydrographer.

*John answer as directed
back enclosure letter with H/M.*

*Mr Bray, This has been
discussed with H.M. who
is replying with answers
to last para. direct.*

24/4

22/4

Comparison with Previous Sounding

- a. AHB Sounding carried out 24th November 1981. This covers the Destruction Gully and Jackie Hill leads area close west of the Lighthouse on South Head. The 5 metre contour remains much in the same position in all but the area adjacent to the drying sand bank extending out from South Head. Depths of less than 5 metres now extend further towards this bank, which itself has receded back to the Eastward. A least depth of 3.4 metres exists on the Destruction Gully leads with shoaler depths close west.
- b. 1977 RNZN survey carried out by HMNZS TARAPUNGA and TAKAPU.

Main Channel

Shoals having less than 5 metres have moved several hundred metres mainly to seaward. This occurs mainly at the western extremity of the main channel (so called) on and both north and south of a line summit Paratutai Island transit Ninepin Rock. These 5 metre shoals extend right across the entrance to this channel, the seabed being very unstable in this area. Heavy and steep breakers build up right across the entrance to the main channel in any westerly swell condition, when it becomes most dangerous to enter the port from this direction. The deeper water inside this channel remains much the same as in 1977. The Main Channel is now used only by fishermen with local knowledge, and only in fine weather.

South Channel

The critical area across the Bar in the vicinity of Destruction Gully and Jackie Hill/900ft peak leads is kept under surveillance by AHB Hydrographic Survey Department, who issue regular notices of the movements in this area. Comparison with the 1977 survey shows much change in areas of shallow water. Suffice to say that the Bar remains most unstable. In deeper water towards the southern extremity of the channel in and near the Jackie Hill leads, the channel remains much the same as in 1977 and shows little change. The 20 metre contour at the western extremity of the whole Bar also remains in much the same position.

Northwest Channel

The HI called for investigation into the existence of this channel, which has not been in evidence for many years. Some sounding was carried out to the north of the Main Channel but it was not possible to sound closer inshore where this channel is said to have existed. Heavy and dangerous breakers build up to the north of the main channel in all but the calmest of weather and on the few occasions of calm weather when it would have been possible to investigate this area, other areas of higher priority were given attention. However, from observation of this area over the period that the survey was conducted it is my opinion that it is most unlikely that much deep water worthy of being called a channel exists, and if it does it would doubtless be narrow and tortuous and therefore be of little value to the mariner without local knowledge."

Since early 1977 the South Channel has been the preferred channel and from early 1978 has been the channel recommended by the Harbour Board to all mariners using the Manukau Harbour. The 1982 RNZN survey indicates that the South Channel, although still very unstable, does continue to provide the best passage into the port. During the course of the survey it was evident that all commercial users of the port, with the exception of a few fishing vessels, do in fact use the South Channel.

For the initial leading line into the South Channel use of Jackie Hill and the charted 900 feet hill further inland in line (bearing 029°T) or open to the NW or SE as defined by Notice to Mariners is recommended. The use of these hill tops, both of the smooth rounded top variety, do not provide good line of bearing control and it is considered that a set of suitable leading beacons should be erected.

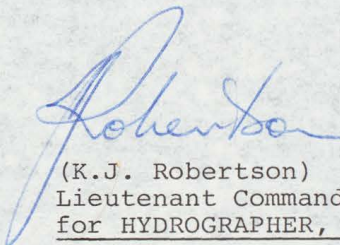
The course alteration on to the Destruction Gully Leading Beacons is made when approximately due west of South Head Light at a range of about 1.75nm from the lower of the two beacons. These beacons are considered to be of inferior standard in both their separation for good line of bearing control and clarity for sighting and identification. The beacons are approximately 130 yards apart and this distance needs to be at least 350 yards i.e. a tenth of the range at which they are used. Noting the difficult terrain in Destruction Gully this separation could best be achieved by erecting a third beacon about 250 yards above and behind the present upper beacon. Identifying the beacons from seaward, particularly the lower beacon in its present colour, is difficult when there is direct sunlight on Destruction Gully and in the early morning haze and moisture laden air common to harbour entrances and where heavy surf is prevalent.

It is considered that the use of the term "Main Channel" in its present position on chart NZ 4314 is misleading in that this area of deep navigable water is part of the harbour entrance. The following is proposed:

- a. "Main Channel" be deleted from the chart and "South West Channel" be inserted further to seaward to indicate the area of deepest water through this part of the bar (although for the past five years this has followed a more westerly direction).
- b. "South Channel" be retained as presently shown on chart NZ 4314.

Your comments and concurrence to the use of "South West" and "South" Channels as the most appropriate and commonly used descriptions is requested.

Yours faithfully,



(K.J. Robertson)
Lieutenant Commander, RNZN,
for HYDROGRAPHER, RNZN.

Enclosure: Ammo Permatrace copies of Standard Survey Sheets
4314/82-88.

To: AS PER DISTRIBUTION LIST

Date: 25 November 1981

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A re-survey of the South Channel was carried out in very good sea conditions with negligible swell over the high water period between 0900 and 1000 on 24 November 1981.

Amendment No. 8 to H5/1S/44 attached shows the following changes in the channel since the previous survey on 15 October 1981 (Amendment No. 7).

The various shoals located in October have now gone and the best approach is now directly on the Hill Leads with a least depth of 3.7 metres in position 238° 1700 m from the Lighthouse. Shoals with depths of 3 metres or less were located as follows:- (Bearings and distances from the Lighthouse)

- (a) Depth 2.8 metres 270° 1350 m.
- (b) " 2.8 " 279° 1350 m.
- (c) " 3.0 " 290° 1290 m.

The drying sandspit at the northern end of the channel has its western extremity about 150 metres to the east of the Destruction Gully leads, a depth of 1.5 metres was located in position 328° 1200 m from the Lighthouse at the western end of the spit. Mariners should be advised against being set to the eastward of the Destruction Gully Lead Line.

I would like to express my appreciation of the performance of the Tug "Manukau's" crew during these surveys. The enthusiasm and skill displayed by the Tugmaster, Mr Ray Gibson and his Engineer, Mr Kelvin Sullivan, does much to assist in the satisfactory execution of this particular task.



HYDROGRAPHER

JHR:JMH

Mr Bray please ensure that comments in last para are made known to the crew and noted in their records. BLS

Enc. Plans H5/1S/44 -- Amendments Nos. 7 & 8

DISTRIBUTION LIST

Chief Engineer
Harbourmaster
Officer-in-Charge, Onehunga
Assistant Operations Manager

date 26/11/81

*Engineers Office
Note C/E remarks re Sullivan
Copy to Works Manager for information*

JB 26/11

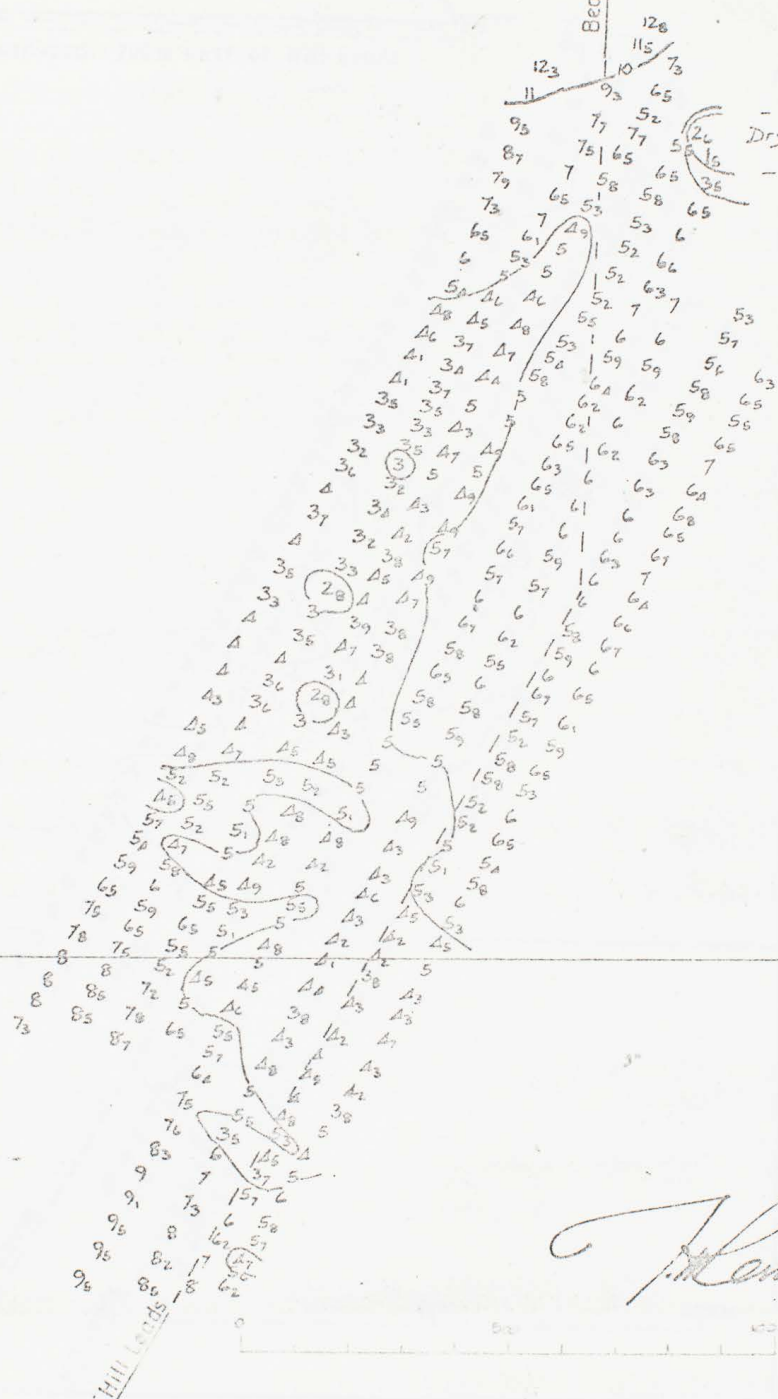
Beacons in line 002°

174° 32' E

Drying Sand Spit

Lt. Ho

37° 04' S



MANUKAU HARBOUR ENTRANCE
 SOUTH CHANNEL
 Surveyed 24. 11. 81
 Sounding in metres & decimetres below C.D.

DRAWN R.W.B.
 DATE 24. 11. 81
 SCALE 1: 12 000

DRAWING
 H5 / 15 / 44
 Amendment No. 8

To: AS PER DISTRIBUTION LIST

Date: 16 October 1981

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

An unsuccessful attempt to survey the South Channel was made on 13 October, aborted due to unsuitable sea state. On 15 October 1981 a survey was carried out in marginal conditions over the high water period between 1030 and 1200.

Amendment No. 7 to H5/1S/44 is attached showing the following changes in the channel since the previous survey (Amendment No. 6) in April 1981.

It is evident that the long period of strong westerlies that have prevailed over the past three months have caused a migration of sand now deposited on the shoal lying athwart the channel on the Hill leads to the west of the lighthouse. In general this shoal is in the same position as found in surveys since July 1980, major changes are as follows:-

1. A drying sandspit has appeared at the northern end of the channel to the east of Destruction Gully leads line.
2. Shoals with depths of less than 3 metres were found in the following positions:- (Bearings and distances from the lighthouse)
 - (a) Depth 2.1 metres 272° 1400 m.
 - (b) " 3.0 " 253° 1350 m.
 - (c) " 2.5 " 242° 1700 m.

The best approach would still appear to be 200 m to the west of the Hill Leads although this line is closely flanked by the above shoals.


HYDROGRAPHER

JHR:JMH

Enc. Plans H5/1S/44
Amendments Nos. 6 & 7

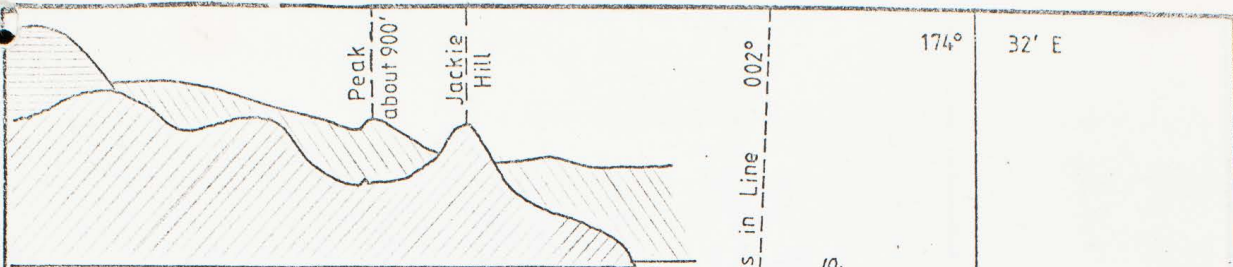
DISTRIBUTION LIST:

Chief Engineer
Harbourmaster
Officer-in-Charge, Onehunga
Assistant Operations Manager

C/E to see

JHR 16/10

Blk 18/10

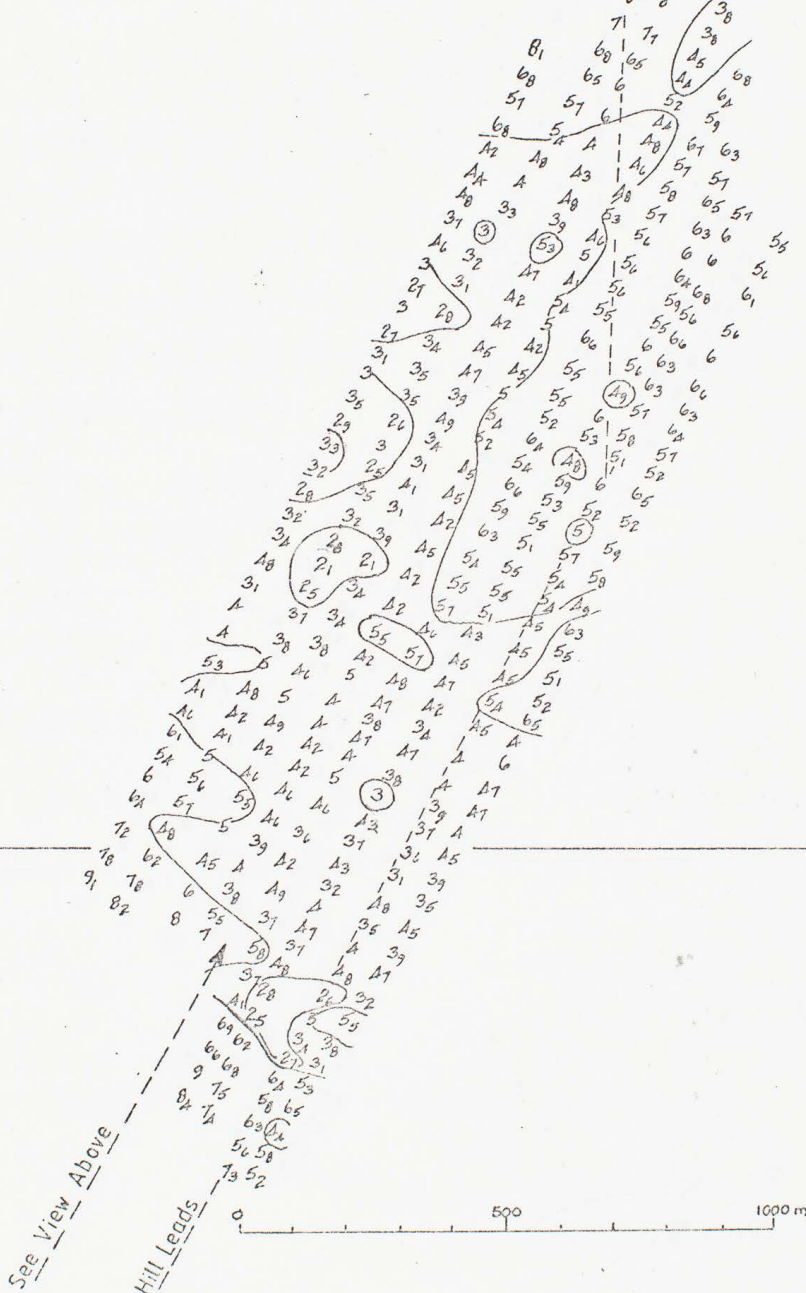


View from seaward 200m west of Hill Leads

174° 32' E

Bns in Line 002°

Drying Sand Spit



Lt. Ho.
○

37° 04' S



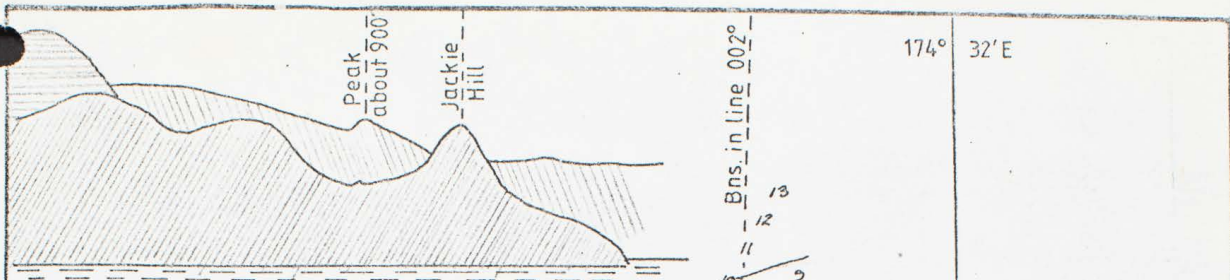
See View Above
Hill Leads



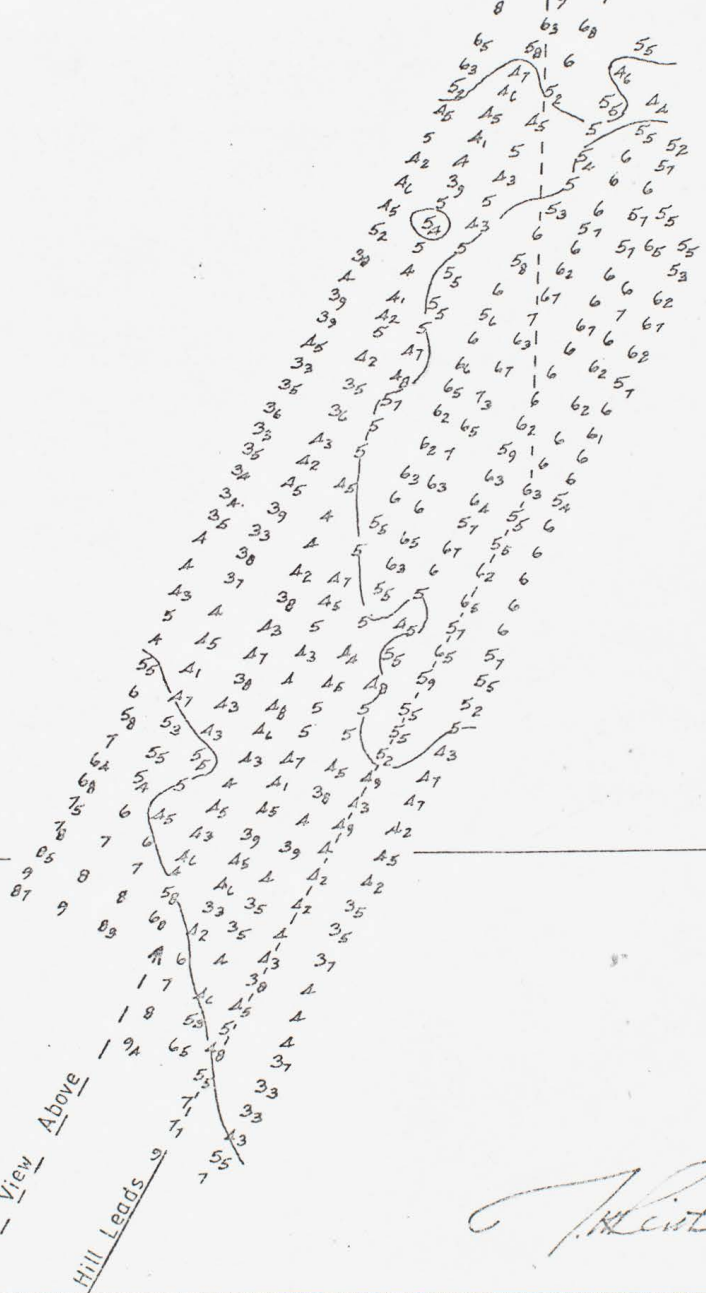
Manukau Harbour Entrance
SOUTH CHANNEL
Surveyed 15 Oct. 1981
Soundings in metres & decimetres below C. D.

DRAWN J.H.R.
DATE 16 Oct 1981
SCALE 1:12000

DRAWING
H5/1S/44
Amendment No. 7



View from seaward 200 m west of Hill Leads.




Lt. Ho.
○

37°04' S

Plot

— See View Above —
Hill Leads

	MANUKAU HARBOUR ENTRANCE	DRAWN J.H.R.	DRAWING
	SOUTH CHANNEL	DATE 9-4-81	H5/1S/44
	Surveyed 8-4-81	SCALE 1:12000	Amendment No. 6
Soundings in metres & decimetres below C. D.			



To: CHIEF ENGINEER
HARBOURMASTER

Date: 18 November 1981

From: CHIEF ADMINISTRATIVE OFFICER AND SECRETARY

RESURVEY OF MANUKAU BAR

We have received as per the attached advice from the Royal N.Z. Navy that they are to resurvey the Manukau Bar in February 1982.

Please liaise and prepare an information report for the Board's consideration at the December series of meetings.


J.M. Halling
CHIEF ADMINISTRATIVE OFFICER
AND SECRETARY



Mr Bray please arrange. Plec

Hydrographer.

Please note and prepare draft Board report for December meetings.

SB 20/11

Asst. Chief Engineer,

*Draft Board Report and sketch attached.
Copies of signals flown will be made available to us.*

J. 25/11



ROYAL NEW ZEALAND NAVY

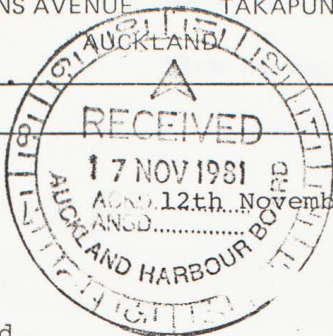
HYDROGRAPHIC OFFICE

BURNS AVENUE TAKAPUNA

P.O. BOX 33341
AUCKLAND 9
TELEPHONE
495 062
CHART SALES
495 063

YOUR REFERENCE

OUR REFERENCE HNZ 2/6



17 NOV 1981

NOV 12th November 1981

The General Manager,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Attention: Mr John Reath
Port Surveyor

Dear Sir,

MANUKAU BAR CHANNELS - RE-SURVEY

1. Enclosed is a copy of the Hydrographic Instruction for the re-survey of the Manukau Bar Channels for your information.
2. It is envisaged that the survey will be undertaken by the Inshore Survey Craft HMNZ Ship's TARAPUNGA and TAKAPU in early February 1982.

Yours faithfully,

(W.F. Jaques)
Commander, RNZN,
HYDROGRAPHER, RNZN.

Enclosure: Hydrographic Instruction 102.

CEJ
HMS

HNZ 2/6

Hydrographic Office,
Burns Avenue,
TAKAPUNA.

12th November 1981

The Senior Officer,
Inshore Survey Craft,
HMNZS TARAPUNGA.

Copy to:

The Commanding Officer,
HMNZS TAKAPU.

Lieutenant Commander J.A. Stoakes, RNZN,
HMNZS MONOWAI.

For Information:

The Chief of Naval Staff,
WELLINGTON.

The Commodore,
AUCKLAND.

The Commanding Officer,
HMNZS MONOWAI.

HYDROGRAPHIC INSTRUCTION FOR
THE SENIOR OFFICER, INSHORE SURVEY CRAFT

H.I. 102 - Manukau Bar Channels

1. The last survey of the Manukau Harbour Entrance was carried out in 1977 and it is now considered timely to re-survey the channels in order to up-date the present published chart and also in the interest of shipping using the port. It is envisaged that the channels will continue to be re-surveyed on a five yearly basis.
2. Accordingly, you are to re-survey the navigable channels contained by the following limits on a scale of 1/12,000 in your first deployment in 1982 before proceeding south to Nelson (H.I. 103) and resuming the Approaches to Bluff Survey (H.I. 090).
 - a. The coast at 37°01'55S;
 - b. the 10 fathom line at 37°01'55S thence along the 10 fathom line to;
 - c. 10 fathom line at 37°08'00S;
 - d. the coast at 37°08.'00S.
 - e. The inner limit of sounding is to be the line between Destruction Gully and South Head Signal Station.

3. The requirement' is to:-
- a. Complete survey to establish least depths in and limits of the entire South Channel (within the above limits).
 - b. Survey to establish the navigable limits of and depths in the Main Channel and the existence or otherwise of a passage to seaward.
 - c. Survey or soundings to identify any trends in navigable depths or significant shifts of banks in the old North West Channel.

Beyond these objectives sounding is to be undertaken only as necessary to achieve agreement with previous soundings or at your discretion.

4. All documentation, plotting sheets and lattices etc., should be planned and constructed, with the five yearly re-survey requirement borne in mind. The re-survey requirement is also to be borne in mind when selecting Trisponder control stations and sounding marks.

5. Relevant trig and tidal data is enclosed.

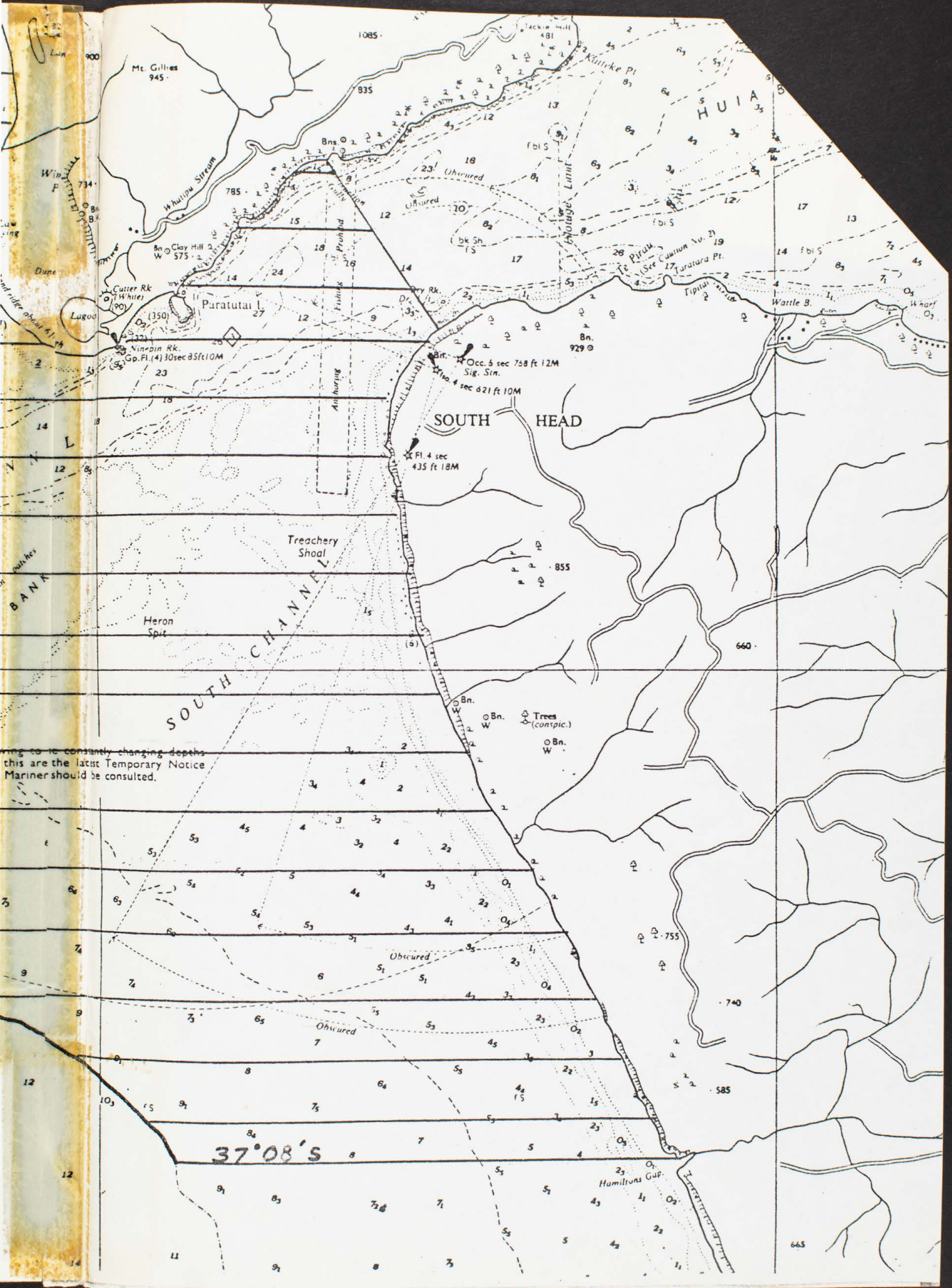
6. Lands & Survey have been requested to have the area flown on a scale of 1:25,000 at low water. Photographs, prints and data will be forwarded in due course.

7. The survey is to be drawn and rendered prior to taking up your next task.

W.F. Jaques
(W.F. JAQUES)
Commander, RNZN,
HYDROGRAPHER.

Enclosures:

1. H.I. 102 - Portion of Chart NZ 4314
2. Paper prints of previous survey (2 copies))
3. NZ 4314 (area indicated)) (Senior Officer,
4. Tidal and Benchmark data) ISC only.



Due to its constantly changing depths this is the latest Temporary Notice Mariner should be consulted.

37°08'S

To: AS PER DISTRIBUTION LIST Date: 16 October 1981

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - SEARCH FOR SUNKEN TRAWLER

Since the 6 October 1981 when the trawler "The Brothers" sank to the east of the Hill leads in the South Channel conflicting reports as to her position have been received and this may be due to the fact that she was still partially afloat.

The last reported sighting was of an oil slick in position 190° 3.90 miles from the Lighthouse (Lat. 37° 03.75S. 174° 32.30E) from the present owner of the wreck Mr Lee Sutherland. This sighting was made from a light aircraft at an altitude of 300 feet and the position was considered to be reasonably accurate by reference to a Lands and Survey Map and bearings to farm buildings in the vicinity.

On completion of the South Channel survey at 1200 on 15 October a visual search of the area was made in Tug "Manukau". The attached photocopy of portion of Chart N.Z. 4314 indicates the last reported position of the wreck and the area covered by the search during which nothing was sighted that gave any indication of the presence of a wreck.

During the search sea conditions deteriorated from a 1m sea and swell to 2 metres. At 1430 the search was abandoned.



HYDROGRAPHER

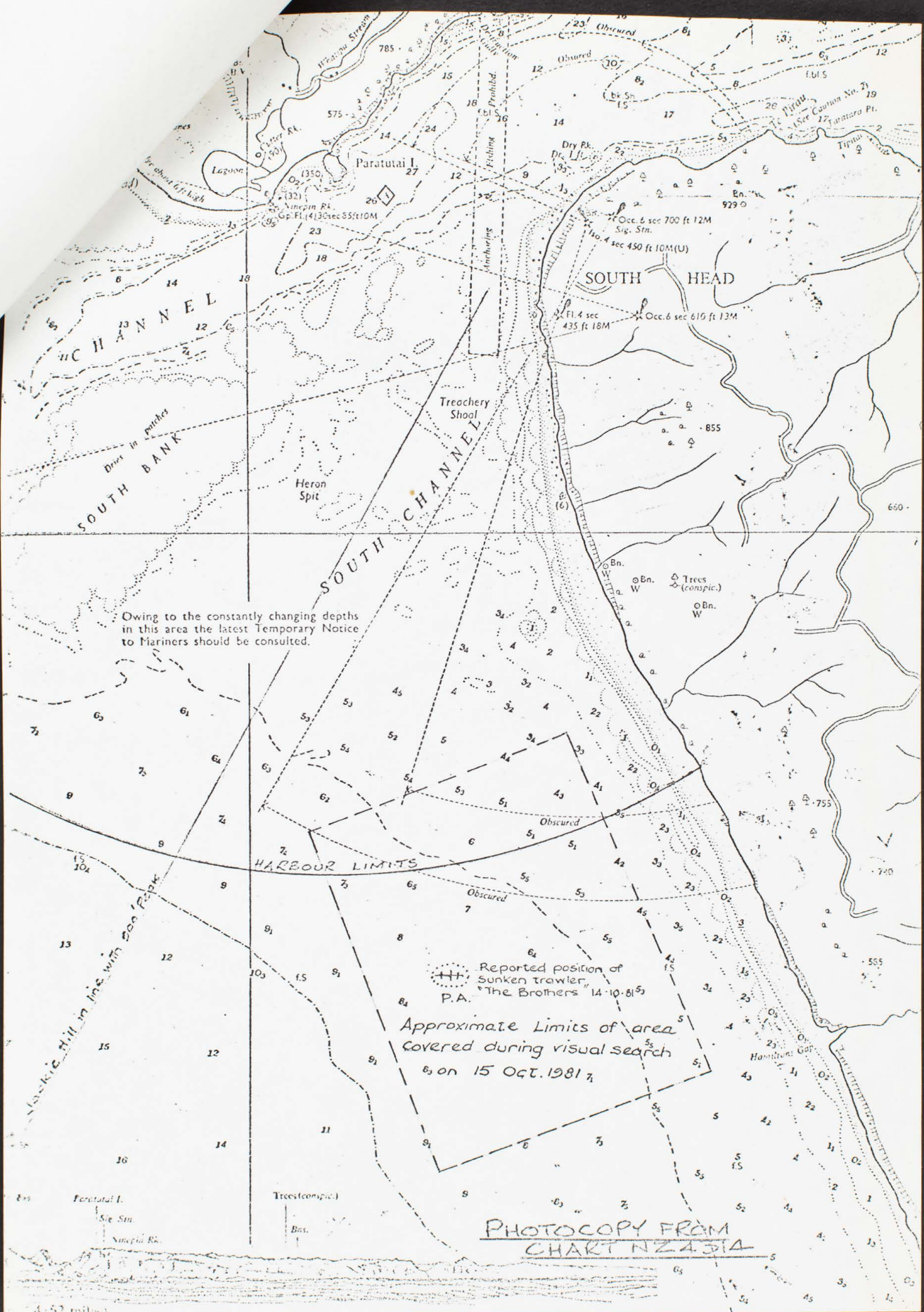
JHR:JMH

Enc. Photocopy from Chart NZ.4314

DISTRIBUTION LIST:

Chief Engineer
Harbourmaster
Officer-in-Charge, Onehunga
Assistant Operations Manager





PHOTOCOPY FROM
CHART NZ4314

To: AS PER DISTRIBUTION LIST Date: 16 October 1981

From: THE HYDROGRAPHER

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HYDROGRAPHER

JHR:JMH

Enc. Photocopy from Chart NZ.4314

DISTRIBUTION LIST:

Chief Engineer
Harbourmaster
Officer-in-Charge, Onehunga
Assistant Operations Manager

File

EXTRACT FROM MINUTES
WORKS & TRAFFIC COMMITTEE
14 APR 1981

517/1
52/5

~~26~~

12. MANUKAU HARBOUR - HYDROGRAPHIC SURVEY NOVEMBER 1980 TO
FEBRUARY 1981

In submitting the report of the Chief Engineer dated 1 April 1981 for the information of the Committee, the General Manager advised that the work had provided an updated survey of the Huia Banks and Wairoa and Papakura Channels at a total cost of approximately \$32,800 of which some \$12,000 was repayable by Shell Manufacturing Ltd for the survey of the Papakura Channel. The latter work was carried out to assist the Company in connection with its planning for the location of an L.P.G. storage site.

It was RESOLVED to recommend that the reports be received.

Hydrographer
Asst. Chief Engineer } to note

ADOPTED BY BOARD

28 APR 1981

GM, C/E, HM, OM & TV



Auckland Harbour Board

517/1

1 April 1981
Engr's file

The General Manager
AUCKLAND HARBOUR BOARD

ITEM 12

MANUKAU HARBOUR - HYDROGRAPHIC SURVEY
NOVEMBER 1980 TO FEBRUARY 1981

In November 1980 the Survey Launch "Arahi" was transported to Onehunga and engaged on resurveying the Wairopa Channel from Onehunga to Puoponga Point. In addition the Huia Banks were sounded and the Papakura Channel as far as Pukaki Creek. Refer to Appendix A for the areas sounded.

Decca Trisponder positioning equipment was hired from Timaru Harbour Board. Unfortunately, due to malfunctioning, downtime of 54% was experienced resulting in an inability within the available time to obtain soundings of other areas than the channels.

Summary of Results

The Wairopa Channel has remained constant since the R.N.Z.N. survey of 1961 except at the extension to the south of the southern extremity of Te Tau Bank.


The Huia Banks have shown an extensive migration to the south-west consistent with the harbour bed material (fine sand) and the strong tidal currents. The buoy marking the bank is being moved to the western end of the bank.

Papakura Channel exhibits little change since 1961.

The new soundings provide sufficient information to assist in planning for channel marking leads or further buoys or beacons, in both the Wairopa and Papakura Channels.

Work was completed within the intended time and cost budgets despite the setbacks of poor weather and plant failures.

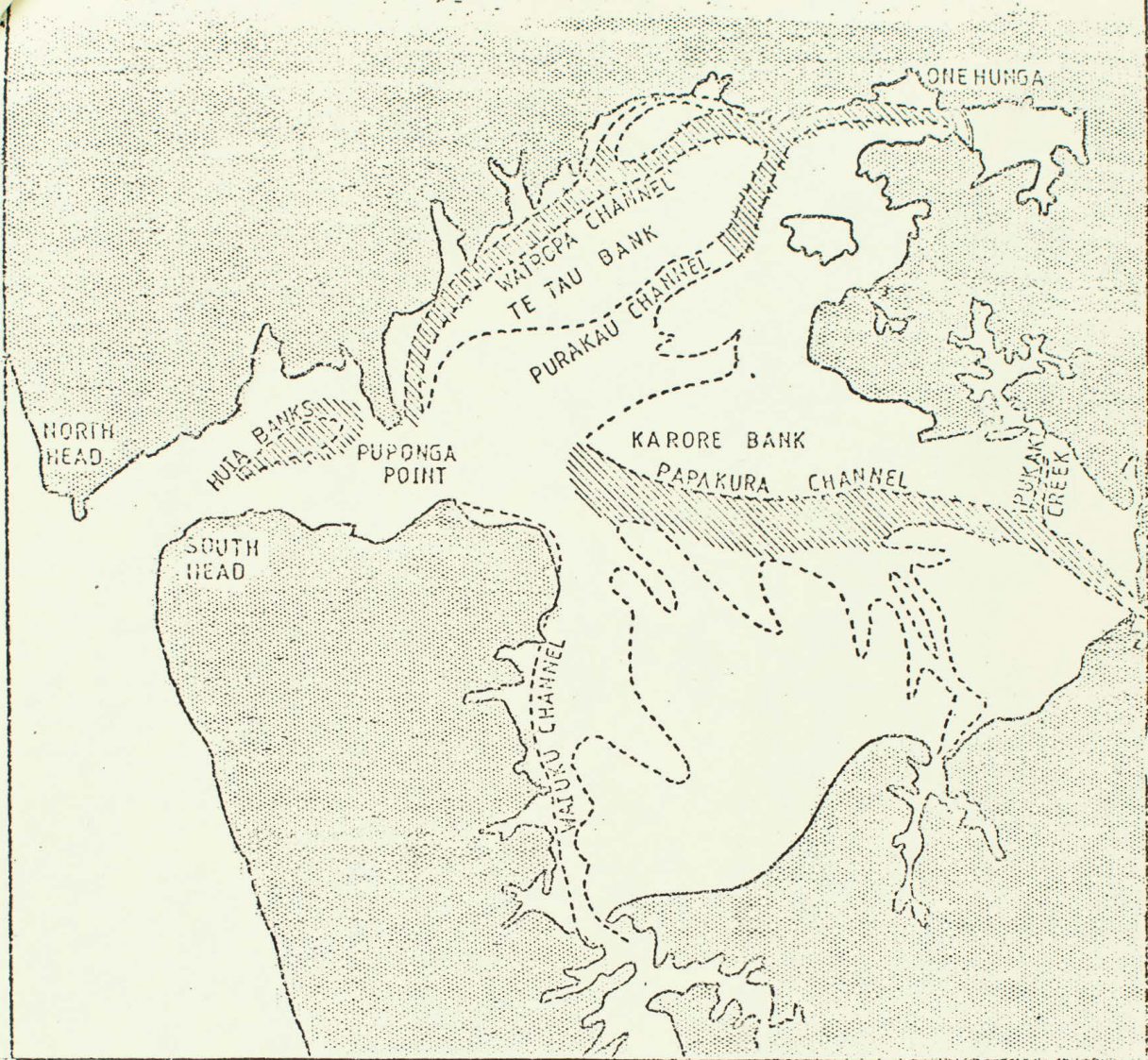
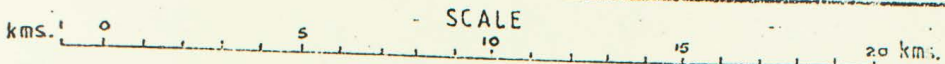
The Chairman
Works and Traffic Committee
AUCKLAND HARBOUR BOARD


CHIEF ENGINEER TO THE BOARD

This work has provided an updated survey of the Huia Banks and Wairopa and Papakura Channels at a total cost of approximately \$32,800 of which some \$12,000 is repayable by Shell Manufacturing Ltd for the survey of the Papakura Channel. This latter work was carried out to assist the Company in connection with its planning for the location of an LPG storage site. Submitted for information.

8 April 1981


R.T. Lorimer
GENERAL MANAGER



SURVEY OPERATIONS DURING PERIOD NOV.1980 TO FEB.1981

WAIROPA CHANNEL 20kms surveyed

PAPAKURA CHANNEL 16kms surveyed

HUIA BANKS 4kms surveyed



MANUKAU HARBOUR

DRAWN

DATE

SCALE

DRAWING

Appendix A



Auckland Harbour Board

THESE REPORTS ARE FOR THE INFORMATION OF COMMITTEE MEMBERS AND DO NOT CONSTITUTE BOARD POLICY UNTIL ACCEPTED

BY THE BOARD
1 April 1981

Engr's file

105 1000

517/1

The General Manager
AUCKLAND HARBOUR BOARD

ITEM 12

MANUKAU HARBOUR - HYDROGRAPHIC SURVEY
NOVEMBER 1980 TO FEBRUARY 1981

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The Chairman
Works and Traffic Committee
AUCKLAND HARBOUR BOARD

CHIEF ENGINEER TO THE BOARD

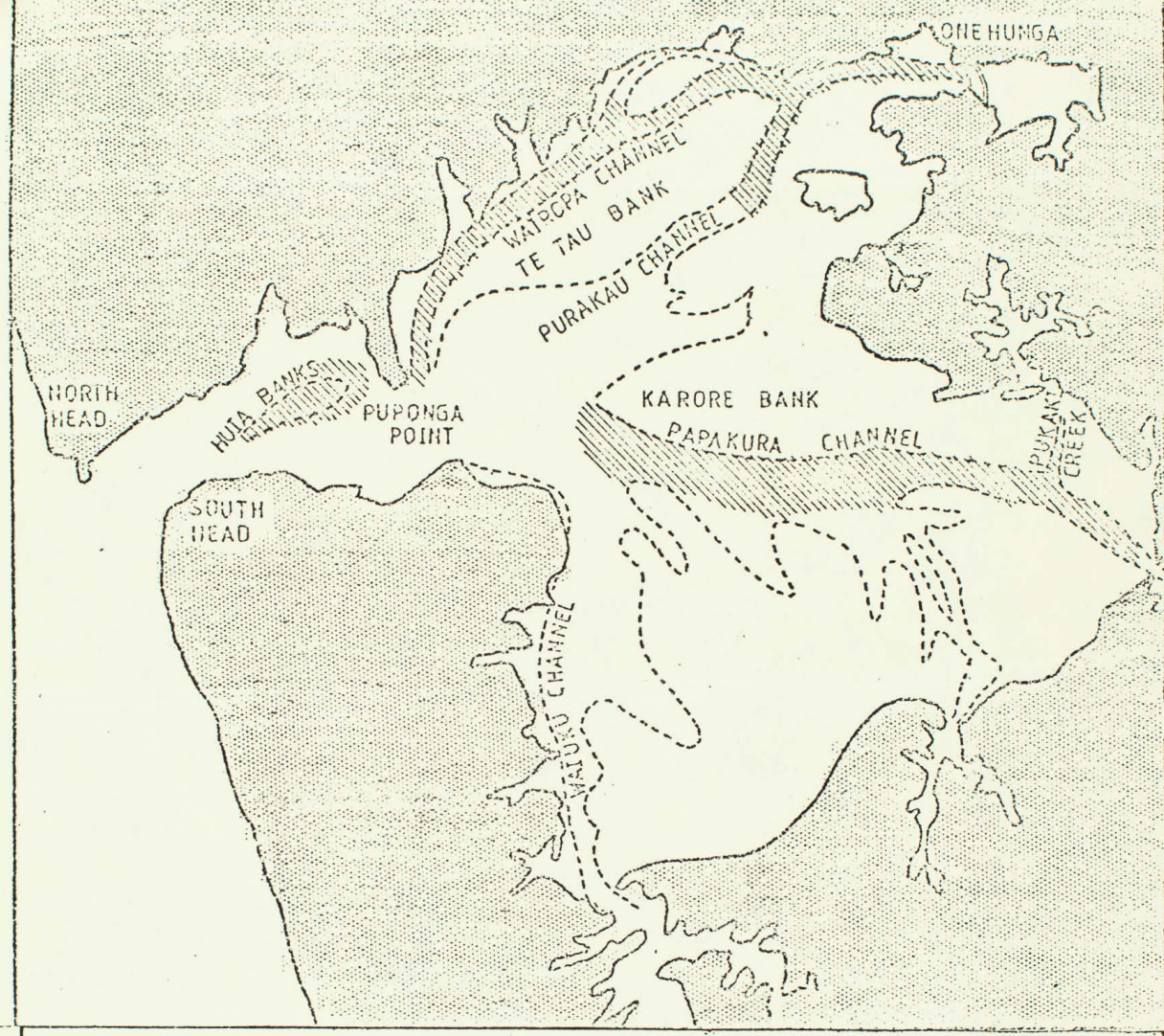
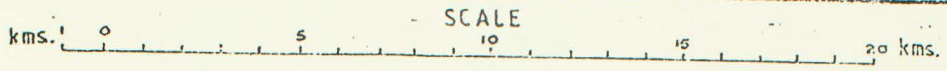
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Sent to the Hydrographer.

J. 20/4 P 1/5

R.T. Lorimer
GENERAL MANAGER

8 April 1981



SURVEY OPERATIONS DURING PERIOD NOV.1980 TO FEB.1981

- WAIROPA CHANNEL 20kms. surveyed
- PAPA KURA CHANNEL 16kms. surveyed
- HUIA BANKS 6kms. surveyed



MANUKAU HARBOUR

DRAWN
DATE
SCALE

DRAWING
Appendix A

THE GENERAL MANAGER

13 April 1981

THE CHIEF ENGINEER

On Friday, 10 April the R.N.Z.N. Hydrographer telephoned the Board's Hydrographer to advise that a submission for a "survey of the channels through the Manukau Bar" be made to the Harbours Association as soon as possible.

He notes that during recent discussion with the Assistant Secretary of the Harbours Association concerning the forthcoming hydrographic working party due to meet on 27 May that no such submission has been made by A.H.B. and although he agreed with the Board's Hydrographer that this survey would proceed in 1982 he would prefer that it be included in the list of requirements forwarded annually by individual harbour boards.

CHIEF ENGINEER TO THE BOARD

JHR:JMH



To: AS PER DISTRIBUTION LIST

Date: 9 April 1981

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A survey of the South Channel was carried out in good sea conditions just prior to High Water on 8 April 1981.

Amendment No. 6 to H5/1S/44 is attached showing the following changes in the Channel since the previous survey (Amendment No. 5) in October 1980.

1. The Sandspit at the northern end of the channel on Destruction Gully leads has become re-established with depths averaging 4.5 metres.
2. The shoal lying athwart the channel on the Hill leads is still in the same position as found in the last two surveys, i.e. since July 1980.
3. The best approach would now appear to be on the Hill leads where a least depth of 3.8 metres exists in position 242½°, 1,550 metres from the Lighthouse. Good water also can be found on the previously recommended approach 200 m west of the Hill leads. (See Sketch of view from seaward on plan.)

HYDROGRAPHER

JHR:JMH

Enc. Plans H5/1S/44
Amendments Nos. 5 & 6

DISTRIBUTION LIST:

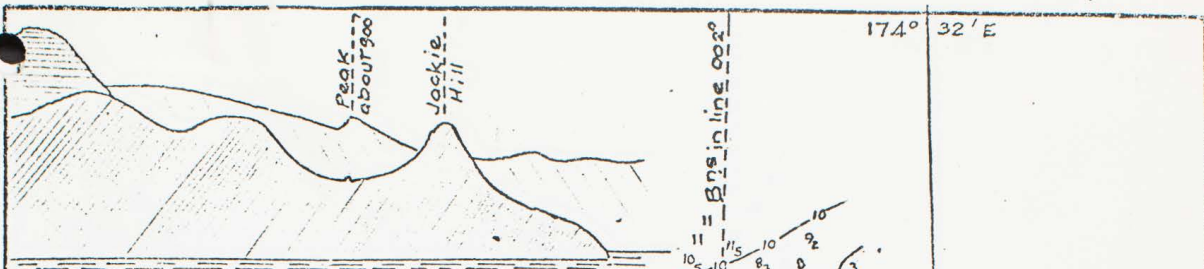
CHIEF ENGINEER
HARBOURMASTER
OFFICER-IN-CHARGE, ONEHUNGA
ASSISTANT OPERATIONS MANAGER

McGray, then file

Bee

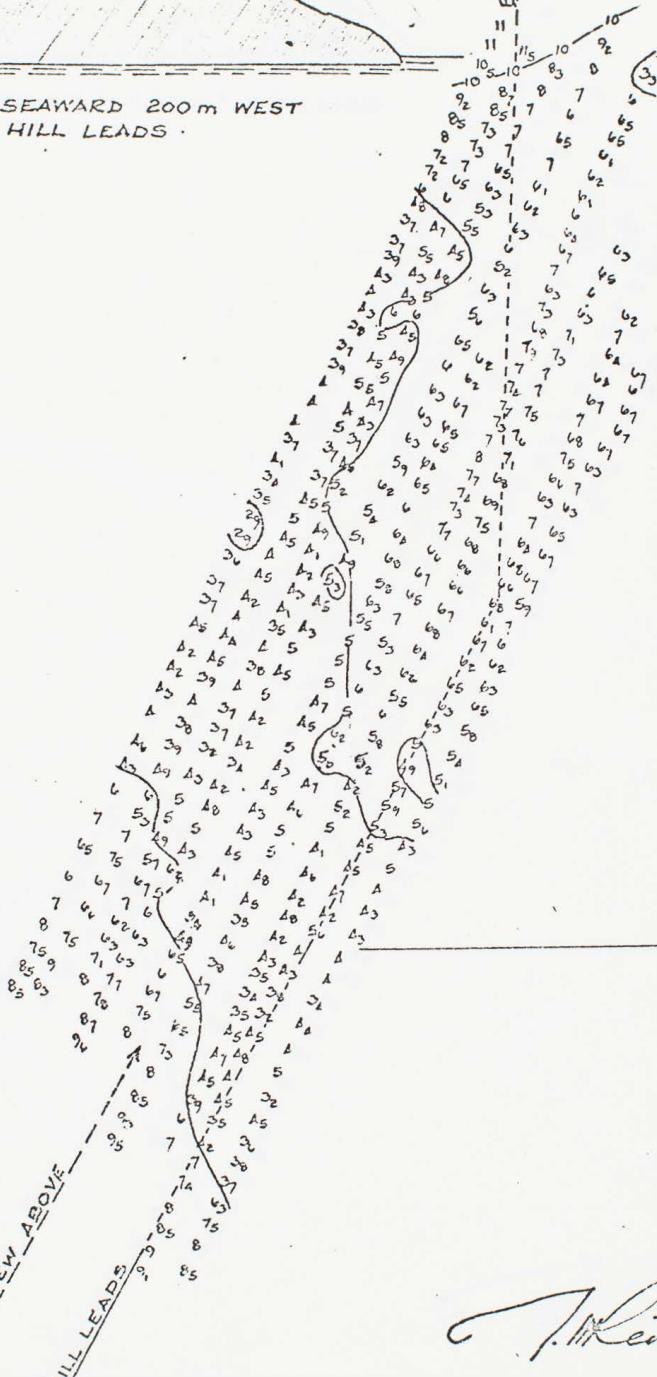
JHR/4





174° 32' E

VIEW FROM SEAWARD 200m WEST OF HILL LEADS.



LT. HO.

37° 04' S

SEE VIEW ABOVE
HILL LEADS

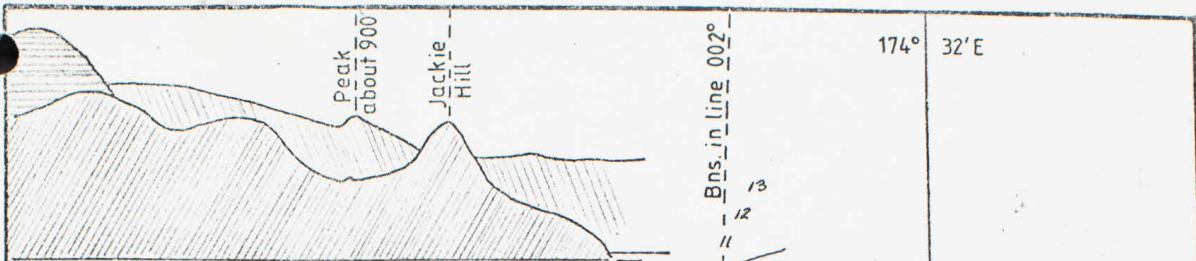
J. Reid



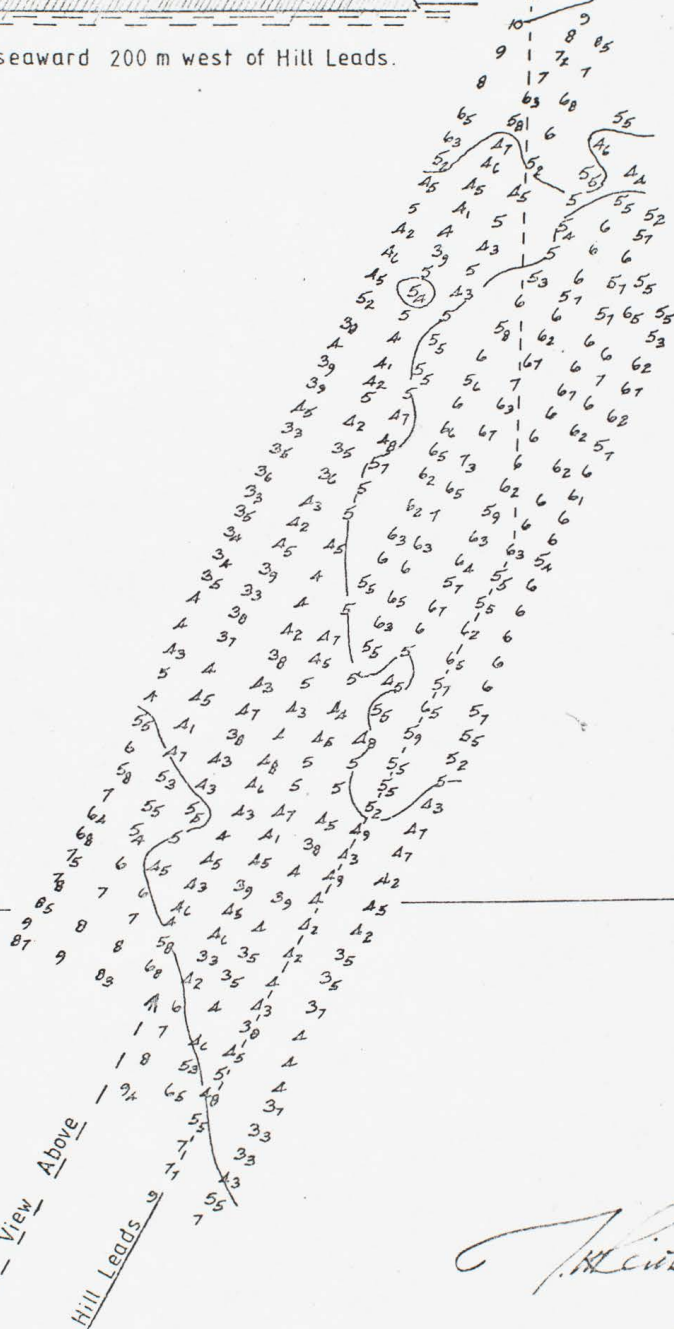
MANUKAU HARBOUR ENTRANCE
SOUTH CHANNEL
SURVEYED 24.10.80
Soundings in metres & decimals below C.D.

DRAWN J.H.E & C.T.
DATE 28.10.80
SCALE 1 : 12 000

DRAWING
H5/18/44
Amendment No 5



View from seaward 200 m west of Hill Leads.



— See — View — Above —
Hill Leads

J. Hunt



MANUKAU HARBOUR ENTRANCE
SOUTH CHANNEL
Surveyed 8.4.81
Soundings in metres & decimetres below C. D.

DRAWN J.H.R.
DATE 9.4.81
SCALE 1:12000

DRAWING
H5/1S/44
Amendment No. 6

THE GENERAL MANAGER

10 April 1981

THE CHIEF ENGINEER

MANUKAU BAR SURVEY*(also refer to Chief Engineer memorandum of 13 April 1981)*

Following advice from the Harbours Association in their memorandum dated 30 May 1980 that no navel survey of the Manukau Bar would be undertaken as requested, the Board's Hydrographer discussed this matter with Commander Jaques in June last year who reaffirmed this decision.

In October 1980 Mr Reith again discussed this issue with Commander Jaques to explain the necessity for an exploratory type survey in order to find an alternative to the South Channel in the Manukau Entrance. This time Commander Jaques agreed and stated that he would provide the services of one inshore survey craft equipped with Trisponder to carry out a survey in 1982.

CHIEF ENGINEER TO THE BOARD

JHR:TK

THE CHIEF ENGINEER

13 October 1980

THE HYDROGRAPHER

MANUKAU BAR - R.N.Z.N. HYDROGRAPHIC RESPONSIBILITIES

(See attached File Note (File 1117))

At a meeting with Commander Jaques, R.N.Z.N. Hydrographer on 13/10/80, I explained the reasons for our request to the Hydrographic Committee in 1978 that the five yearly resurvey of the Manukau Bar take the form of a reconnaissance survey to outline the principle features of the area in order to give us an indication of the probable location of an alternative to the South Channel.

Commander Jaques now has a better understanding of our position and has agreed to send an inshore survey craft to carry out such a survey in 1982, subject to approval from the Chief of Naval Staff.

In the meantime he will request that monthly photographic flights be carried out by Orions of No. 5 Squadron and that these should commence as soon as possible.

The present situation in regard to vessels entering or leaving the Manukau Harbour is that the South Channel is still the only one in use and remains stable according to the last survey on 30 July 1980.

HYDROGRAPHER

JHR:TK

LE NOTEMANUKAU BAR - R.N.Z.N. HYDROGRAPHIC RESPONSIBILITIESReference

- (a) Harbour Association Memo 30 May 1980.
- (b) Hydrographer - Chief Engineer 9 June 1980.
- (a) Somewhere about 1968-69, the Navy made a commitment to survey the bar and entrances every 5 years.
- (b) The Board then accepted the Commitment to survey the channels as required, and to obtain such other information as the bar, that safe operations of our hydrographic vessels permit.
- (c) The Navy intention to re-survey in 1970 did not occur until 1977 (February).
- (d) At the present time only south channel operates. South west closed up some two years ago.
- (e) Both Navy Hydrographer and my Hydrographer agree it is pointless doing a complete survey or even general checks. Possibly R.N.Z.A.F. aerials at appropriate times could be more useful.
- (f) Both above have an agreement to meet in September^{*} and discuss further.
- (g) Provided the problem of weather and availability of Manukau complement we have the resources to maintain adequate checking.
- (h) The question of 5 yearly survey commitments by Navy is now 10 years old. They were 7 years late with their survey and having regards the commitments today and in the future it appears unlikely that any positive answer would be given.
- (i) Accordingly I recommend the Statements be accepted for this year and after discussions by the two Hydrographers in September we will review the situation.

* Finally met on 13 October '80
 report of discussions attached

N. Saagar
CHIEF ENGINEER TO THE BOARD

NS/TK

Hydrographer

To: THE CHIEF ENGINEER

Date: 18 March 1981

From: THE HYDROGRAPHER

MANUKAU HARBOUR - WAIROPA AND PAKAKURA CHANNELS
REPORT OF SURVEY NOVEMBER 1980 TO FEBRUARY 1981

Objectives

1. To determine any changes that may have occurred in the main navigational channel to Onehunga since the R.N.Z.N. survey of 1961 and to provide relatively large scale survey plans of this channel to assist in realigning channel marker buoys or in replacing these with fixed beacons.
2. To provide the Hydrographic Branch, R.N.Z.N. with updated information for the recompilation of charts N.Z. 4314 and N.Z. 4315 due to be metricated.
3. At the request of Shell (N.Z.) Ltd to survey a section of the Papakura Channel south of Wiri for a proposed L.P.G. tanker terminal and, in the event of future use of this channel, to resurvey that portion of the Papakura Channel which would require marking with navigational aids.

Chronological Sequence of Events

6 November 1980: Transported survey Launch "Arahi" to Onehunga for both survey operations and pilotage duties.

10 November to 22 December 1980: Engaged in survey of Wairopa Chan. from No. 41 buoy westward to a point 700 metres west of Cape Horn using sextant fixing techniques.

Resultant Survey Plans for this period are as follows:-

H5/28 Sheets 1, 2 & 3: Scale 1:1,000. Examination of Wairopa Channel from No. 41 buoy westward to a point midway between Nos. 33 & 35 buoys. From No. 41 buoy eastward to Onehunga Wharf the survey of May 1978 carried out to assist in the construction of the hydraulic model is shown on Sheets 1 & 2.

H5/15/2: Scale 1:5,000. An update of H5/15/1 extended to the east to include the new Mangere Bridge with soundings obtained in May 1978 between the two bridges. Channel contours amended from Plans H5/28 Sheets 1 to 3 and present buoy positions shown. Some drying shoals to the south of the channel along the line of the sewer from White Bluff have been added from the post construction survey of July 1961, Plan Z.11/27, these are formed by the rock backfill into the trench and are not indicated on the chart.

... ..

H5/15/2

File Rec.

H5/36: Scale 1:5,000. Wairopa Channel from a point 700 m west of Cape Horn to White Bluff and includes the entrance to Purakau Channel. The 1971 survey over the Karore Bank was replotted to 1:5,000 and soundings added to this plan.

H5/37: Scale 1:10,000. Huia Banks: originally issued as H5/31 to Chart scale 1:48,000. All sextant fixes were calculated and replotted to 1:10,000 and this plan produced with a view to future monitoring of the movement of the bank.

23 December 1980

Collected hired Decca Trisponder equipment (ex Timaru Harbour Board).

5 January to 4 February 1981

Engaged in surveys of Wairopa Channel from Cape Horn to Puponga Point and on repayment work to Shell N.Z. Ltd in Papakura Channel (13 to 29 January 1981).

Decca trisponder was used for positioning but the high incidence of malfunction of this particular equipment resulted in a down-time of 54%. As a consequence time only allowed the required surveys of Wairopa and Papakura Channels from low water line with no opportunity for further examination of other areas. All buoys were fixed and are plotted on their appropriate plans. No tidal streams were observed and no bottom samples taken.

Resultant Survey Plans for this period are as follows:-

H5/34: Scale 1:10,000. Puponga Point to Taumatarea Point. A survey of Wairopa Channel from L.W. line to L.W. line with sounding lines at 100 m centres. Buoys are shown in mean positions from flood and ebb fixing.

H5/35: Scale 1:10,000. Tokaroa Point to Blockhouse Bay. A survey of Wairopa Channel as above. Time did not allow a survey of the secondary channel north of Motukaraka Bank.

H5/33: Scale 1:25,000. Papakura Channel from the Swashway buoy to the proposed terminal site south of Wiri. Sounding lines at 200 m centres from L.W. to L.W. line. Data on tidal streams at three locations are reproduced with the permission of the R.N.Z.N. Hydrographer.

H5/32: Scale 1:5,000. A survey of a section of Papakura Channel in the vicinity of Pukaki Creek. A preliminary site investigation survey to assist Shell N.Z. Ltd in locating a suitable site for a proposed L.P.G. tanker terminal. Both Decca Trisponder and sextant fixing were used to complete this survey.

5 February 1981: Field operations completed and arrangements made for return of "Arahi" to Auckland and Trisponder equipment to Timaru.

... ..

Survey Control

(a) Sextant Fixing

A number of circle plots (arcs of constant angle) were constructed for the area between Onehunga Wharf and Cape Horn. A location plan of these is shown on Plan H.Misc.15. Plan H.Misc.16 is a co-ordinate list of all survey marks in the Manukau Harbour.

(b) Decca Trisponder

Four stations were selected for Trisponder Remotes giving coverage for both Wairopa and Papakura Channels. Their positions were fixed by Mr A. Pausler and co-ordinates given on Plan H.Misc.16. Appendix 1 is a location plan showing the positions of these stations with the layout of the Range Plots drawn for the various surveys.

No correction for slope was required. Range calibrations were carried out at Cornwallis Wharf and the Western Stake, the co-ordinates of which are given in Plan H.Misc.16.

Tides

Tide gauges at the following locations were used for reduction of soundings to Chart Datum:-

- (a) Onehunga Wharf (standard automatic tide gauge).
- (b) Cornwallis Wharf (portable automatic tide gauge).
- (c) Weymouth: visual gauge at jetty.

See Plans HT.5/5 & 5A for details of (b) above and HT.5/6 & 6A for details of (c).

Note: At both these gauges the low water readings during Datum transfer were obtained by levelling.

Future Monitoring

The survey techniques used during the course of this survey involved either steering along a constant angle with sextant fixing or along a constant range during Trisponder fixing. In both cases it is therefore relatively easy to repeat the same line of soundings at some future date. Additionally, it is possible to convert either sextant or Trisponder fixes to co-ordinate values to enable larger scale profiles of the channel bed to be drawn which may be of use in further studies, particularly in the siting of navigational beacons at channel's edge. With this in mind a record of all fixes is kept in the A.H.B. Hydrographic Office together with the echo sounder traces.

The following personnel both assisted in the survey and were

... ..

largely responsible for the subsequent compilation of the survey plans:-

Mr C. Tubbs & Mr R.W. Blakemore.

CONCLUSIONS

Wairoa Channel:

With the exception of the extension to the south of the southern extremity of Te Tau Bank this channel has remained stable since the R.N.Z.N. survey of 1961.

A least depth of 3.2 m exists 40 m north of No. 37 buoy and the 3 m contour lies 25 metres north of No. 39 buoy (H5/28 Sheet 3). Minimum Channel width of 62 metres occurs midway between Nos. 37 & 39 buoys (H5/28 Sheet 3). H5/28 Sheet 1 shows a shoal of 2.8 m extending from the bank south of Onehunga Wharf to a point 65 m N.E. of the Reef beacon.

Approximately 600 m south of Shag Point (H5/35) there is evidence of a swashway into the Te Tau Bank. This feature does not appear on the 1961 survey and has the effect of slightly narrowing the channel at this point.

To assist in future planning for channel marker realignment, either buoys or beacons, a separate series of plans with existing buoys deleted have been produced as follows:-

H5/34A, H5/35A, H5/36A and H5/15/2A.

Huia Banks: (H5/37)

The approximate outline of the 5 m contour extracted from the 1961 R.N.Z.N. survey shows extensive migration to the S.W.. This instability is consistent with the nature of the harbour bed material here (fine sands) and the strong tidal currents.

Papakura Channel: (H5/33)

Little change evident since 1961. The larger scale provides more detail for future planning of navigational aids.

Survey of Proposed L.P.G. Tanker Terminal Site: (H5/32)

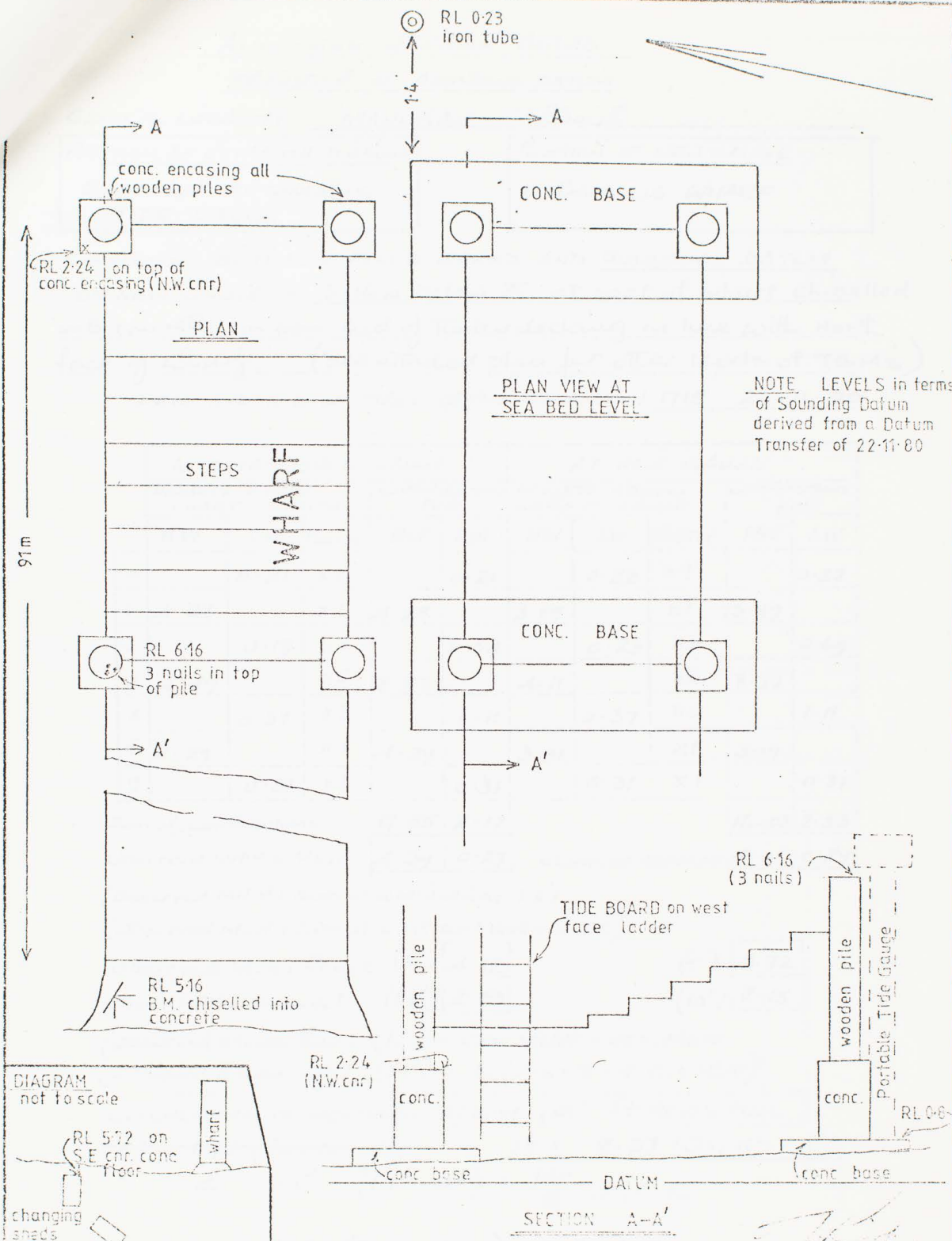
Depths in excess of 5 m exist along the channel width of approximately 320 m in the two mile length of channel surveyed. This area is therefore considered suitable from the navigational aspect for the proposed tanker terminal.



HYDROGRAPHER

JHR:JHM

Enc. Appendix 1
Plans HT 5/5 & 5A,
HT 5/6 & 6A,
H.Misc.15



CORNWALLIS WHARF— MANUKAU HARBOUR
BENCH MARKS

BRWN R W B
DATE 2-12-80
SCALE 1:50
vert. 1:20

DRAWING
HT 5/5



AUCKLAND HARBOUR BOARD

TRANSFER OF SOUNDING DATUM.

GENERAL LOCALITY MANUKAU HARBOUR

POSITION OF ESTABLISHED GAUGE

ONEHUNGA AUTOMATIC
TIDE GAUGE

POSITION OF NEW GAUGE

CORNWALLIS WHARF

CONNECTION BETWEEN FIXED MARKS AND SOUNDING DATUM

ON NEW GAUGE :- 5.16 m below T_K at root of wharf chiselled into concrete 1m from end of timber decking in line with North face of wharf. (See attached plan for other levels of T.B.M.'s)

DATE AND TIME OF FIRST H/LW OBSERVATION: 1715 22.11.80

	AT ESTABLISHED GAUGE					AT NEW GAUGE				
	HEIGHTS ABOVE CHART DATUM			CONTRIBUTIONS FOR		HEIGHTS ABOVE ZERO OF GAUGE			CONTRIBUTIONS FOR	
	HW	LW	Factor	HW	LW	HW	LW	Factor	HW	LW
a		0.21	x1		0.21		0.22	x1		0.22
b	1.28		x1	1.28		3.89		x1	3.89	
c		0.18	x3		0.54		0.23	x3		0.69
d	1.49		x2	8.98		4.11		x2	8.22	
e		0.37	x3		1.11		0.37	x3		1.11
f	1.29		x1	1.29		3.91		x1	3.91	
g		0.31	x1		0.31		0.31	x1		0.31

Sum of contributions: 17.55 2.17 16.02 2.33

Observed MHW & MLW: 4.39 0.27 Observed MHW & MLW: 4.01 0.29

(Observed MHW = Sum of contributions ÷ 4)

(Observed MLW = Sum of L.W. contributions ÷ 8)

Observed Mean Range (R) 4.12

(r) 3.72

Observed Mean Level (M') 2.33

(m') 2.15

(Observed Mean Range (R) = Obs. MHW - Obs. MLW)

(Observed Mean Level (M') = $\frac{1}{2}$ (Obs. MHW + Obs. MLW))

CALCULATION OF SOUNDING DATUM (d) AT NEW GAUGE

$M = 1.75$ (Chart datum)

$M = 2.37$ (Obs. M.H.W.)

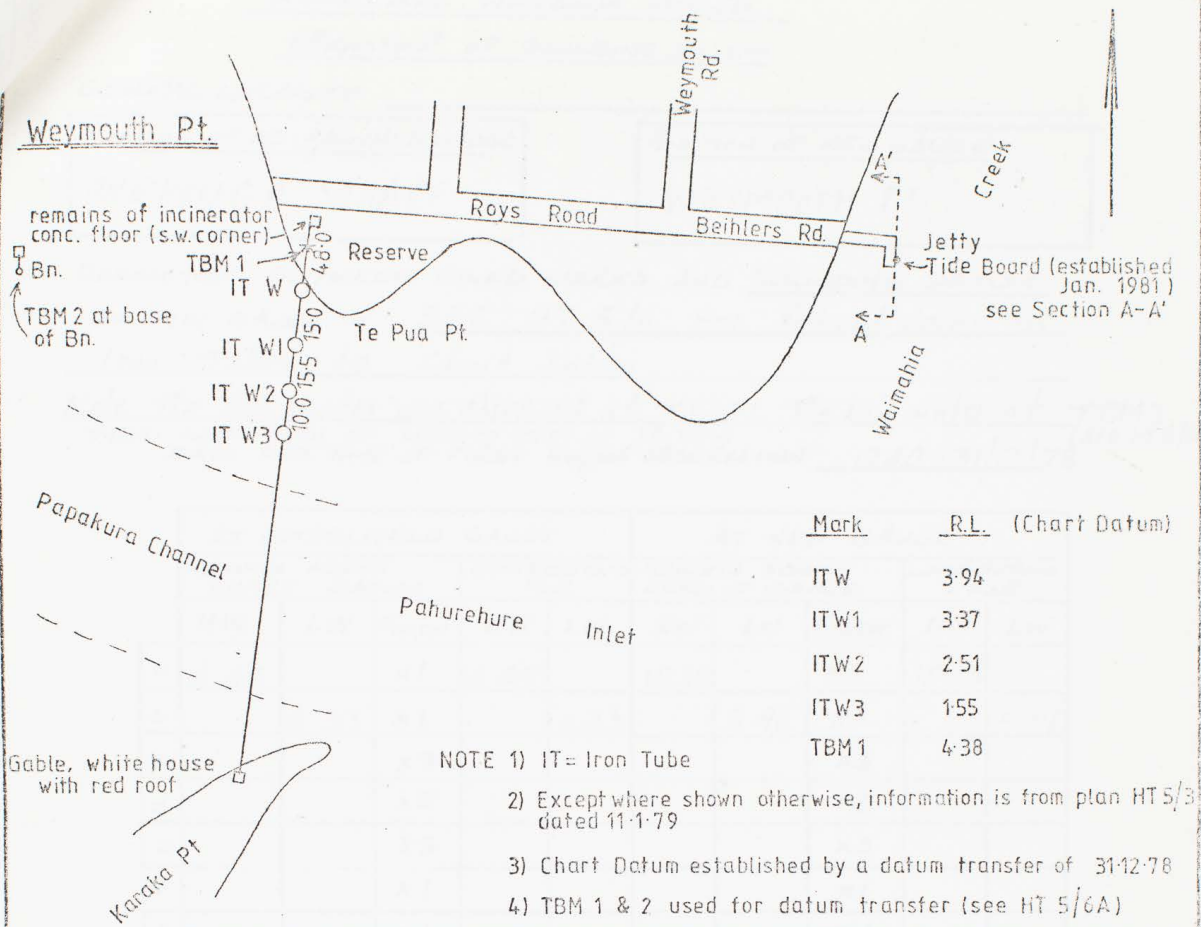
$$d = m' + (M' - M) - \frac{M'r}{R}$$

$$= 2.15 - (2.33 - 2.37) - 2.37 \times \frac{3.72}{4.12}$$

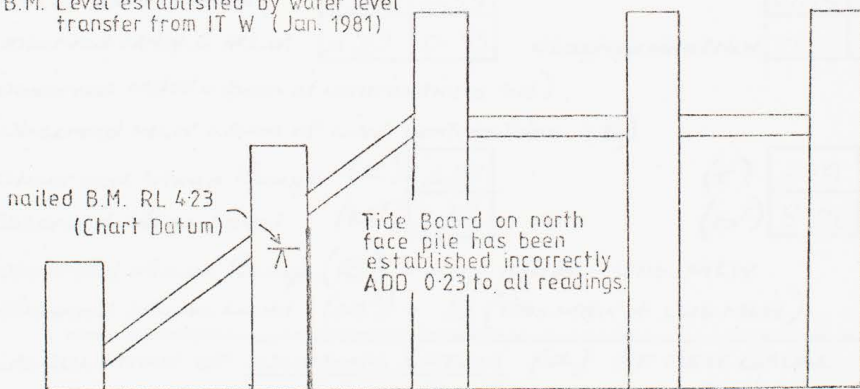
$$= + 0.05 \text{ m}$$

$$= 0.05$$

HT 5/5A



NOTE B.M. Level established by water level transfer from IT W (Jan. 1981)



JETTY Section A-A'



WEYMOUTH POINT
BENCH MARKS

DRAWN R W B
DATE 17.3.81
SCALE No Scale

DRAWING
HT 5/6

AUCKLAND HARBOUR BOARD

TRANSFER OF SOUNDING DATUM.

GENERAL LOCALITY _____

POSITION OF ESTABLISHED GAUGE

ONEHUNGA WHARF

POSITION OF NEW GAUGE

WEYMOUTH PT.

CONNECTION BETWEEN FIXED MARKS AND SOUNDING DATUM

ON NEW GAUGE :- SEE HT 5/6 For Reduced Levels of
Iron Tubes to Chart Datum.

Note The High water was observed at TBM1 The low water at TBM2
TBM1 was given an assumed level of 10.00m. (SEE HTS/6)
DATE AND TIME OF FIRST HW/LW OBSERVATION 12.00 31/12/78

	AT ESTABLISHED GAUGE					AT NEW GAUGE				
	HEIGHTS ABOVE CHART DATUM			CONTRIBUTIONS FOR		HEIGHTS ABOVE ZERO OF GAUGE			CONTRIBUTIONS FOR	
	HW	LW	Factor	HW	LW	HW	LW	Factor	HW	LW
a	1.10		x1	1.10		10.15		x1	10.15	
b		0.33	x1		0.33		5.96	x1		5.96
c			x3					x3		
d			x2					x2		
e			x3					x3		
f			x1					x1		
g			x1					x1		
Sum of contributions				1.10	0.33				10.15	5.96
Observed M.H.W. & M.L.W.				1.10	0.33	Observed M.H.W. & M.L.W.			10.15	5.96

(Observed M.H.W. = Sum of contributions ÷ 4)

(Observed M.L.W. = Sum of L.W. contributions ÷ 8)

Observed Mean Range (R) 4.07

(r) 4.19

Observed Mean Level (M') 2.37

(m') 8.06

(Observed Mean Range (R) = Obs. M.H.W. - Obs. M.L.W.)

(Observed Mean Level (M') = 1/2 (Obs. M.H.W. + Obs. M.L.W.))

CALCULATION OF SOUNDING DATUM (d) AT NEW GAUGE

M = 1.78 (AUCKLAND)

M = 2.37 (ONEHUNGA)

$$d = m' - (M' - M) - \frac{Mr}{R}$$

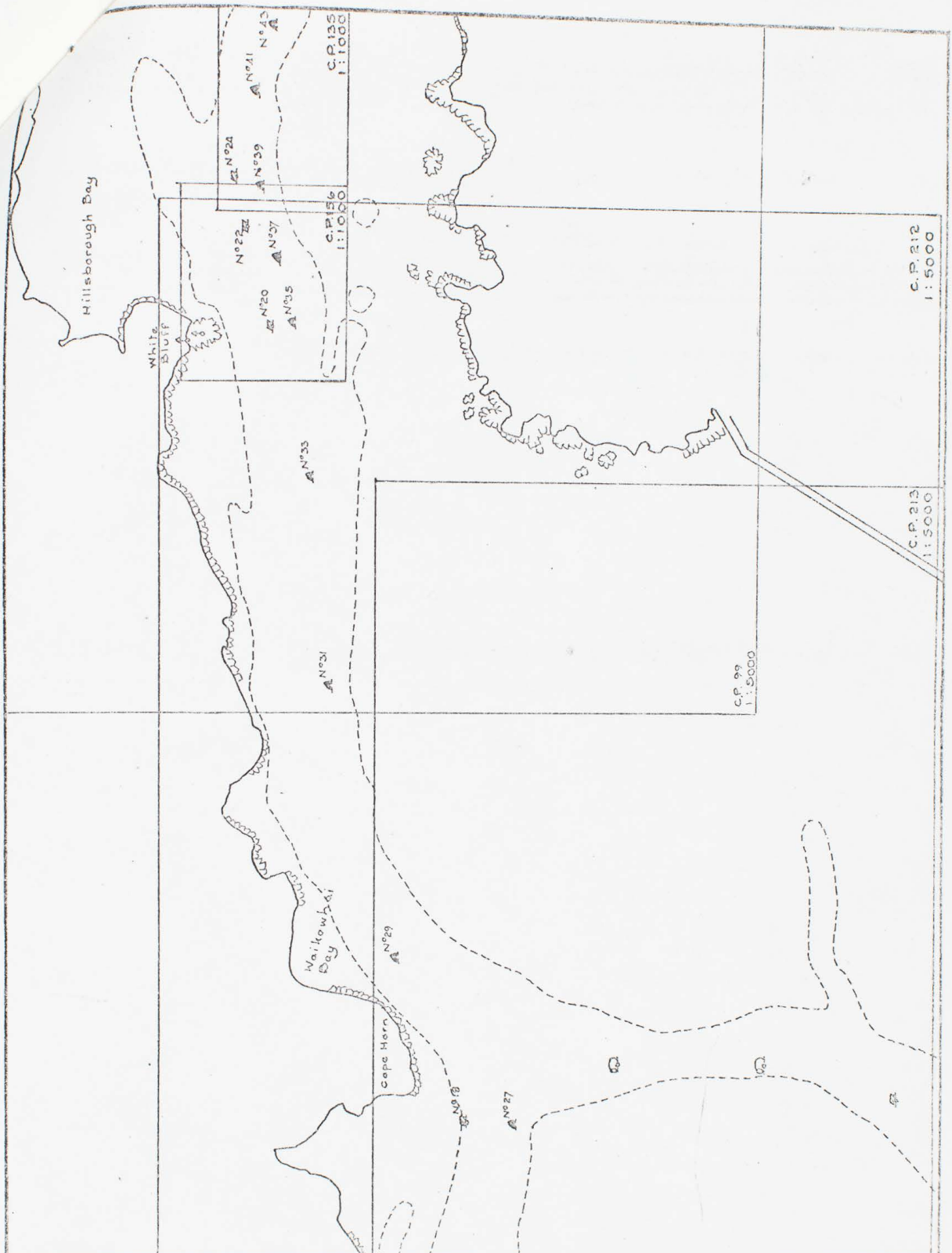
$$= \frac{8.06 - (2.37 - 1.78) - 2.37 \times 4.19}{4.07}$$

$$= +5.67$$

$$= \underline{5.67} \quad \text{ABOVE / ~~BELOW~~ ZERO OF GAUGE}$$

10.00 - 5.67 = 4.33 C.D. = R.L. TBM1

HT 5/6A



C.P. 99
1:15000

C.P. 212
1:5000

C.P. 213
1:5000



LOCATION PLAN OF CIRCLE PLOTS USED IN
SURVEY OF WAIROA CHANNEL DEC. 1980.

DRAWN C.T.
DATE 18-3-81
SCALE 1:15000

DRAWING
H MISC. 15

Letter Sent To:

Mr & Mrs Alan Hogan
51 Roys Road
WEYMOUTH

Mr & Mrs Gordon Surgenor
Cornwallis Road
HUIA

Mr Alan King
Telecommunications Technical Officer
Auckland Airport Radio Centre
P.O. Box 73-005
AUCKLAND AIRPORT

24 March 1981

Mr & Mrs John Salter
28 Himalaya Crescent
LYNFIELD

Dear Mr & Mrs Salter

The navigational survey of the Manukau Harbour has now been completed and results will be used by the Hydrographic Branch, R.N.Z.N. in the compilation of new metric charts.

My Hydrographer, Mr J.H. Reith, has informed me of the assistance and willing co-operation given by you during the period of the survey when Decca Trisponder equipment was in use. I would like personally to thank you and express my appreciation on behalf of the Board for your help in bringing this survey to a successful conclusion.

Yours faithfully

B.R. Le Clerc
CHIEF ENGINEER TO THE BOARD

JHR:JMH

AUCKLAND HARBOUR BOARD

AUCKLAND HARBOUR BOARD
P.O. BOX 1259
Engineer's Department

DATE 17 March 1981

Dr. to

Timaru Harbour Board
P.O. Box 76
TIMARU

For the undermentioned:

(Name of Claimant)

Order No. Date Supplied	PARTICULARS IN FULL	Signature (A.H.B.)	Rate		TOTAL
	<p><i>Repay of Shell Manufactures and</i> <u>MANUKAU HARBOUR SURVEY</u></p> <p>To cost of hiring Decca Trisponder:-</p> <p>Rate per week - \$1,300 @ 4½ Weeks Less Discount of 34.5%</p> <p>One week's credit @ \$850.00</p> <p>Packing & Freight</p>	<i>[Signature]</i>			
				5,850 00	
				2,020. 00	
				3,830 00	
				850. 00	
				2,980 00	
				120 00	
					3,100 00

DUPLICATE

Costing Code			Amount	Costing Code			Amount	
Dept.	Clas.	H.E.		Dept.	Clas.	H.E.		
				B/Fwd.				\$
				4305	36	19	1,612 00	Disc.
				4146	36	59	1,488 00	NET
								TOTAL \$
							3,100 00	3,100 00
C/Fwd.								Signature of Claimant
								Address

Cheque Countersigned

I CERTIFY, that to the best of my belief and knowledge the foregoing account is true and correct in every particular

CHIEF ENGINEER TO THE BOARD

TIMARU HARBOUR BOARD

P.O. BOX 76

TIMARU, N.Z.

TELEPHONE 4100

TELEPHONE 44-195

All communications to
be addressed to
The General Manager.

10th March 1981

Our Ref. RLM/LY

The Chief Engineer,
Auckland Harbour Board,
P.O.Box 1259,
AUCKLAND



Dear Sir,

On rendering our account to you for the hire of the Decca Trisponder, I firstly apologise for the failure you experienced but I must point out that the equipment left here in full working order. It had been in use for over 4 weeks at Bluff with no malfunctions at all.

The rate we hired out at was well below our normal hire rate and much lower than any other similar equipment.

The account is as follows -

Rate per week - \$1,300 @ 4½ weeks	5,850.00
Less Discount of 34.5%	2,020.00
	<hr/>
	3,830.00
One week's credit @ \$850	850.00
	<hr/>
	2,980.00
Packing & Freight	120.00
	<hr/>
	\$3,100.00
	<hr/>

Yours faithfully,

B.W. Tierney
Chief Engineer

Blel

Hydrography

Do you agree with this

12/3

Agreed *-17/3*

7305.36.19 \$1,612.00

9146.36.59 1,488.00

\$3,100.00

1117

10 March 1981

Gas Liquids Project Engineer
Shell Manufacturing N.Z. Ltd
Box 2091
WELLINGTON

ATTENTION: MR G. HEWITT

Dear Sir

MANUKAU HARBOUR - REPORT OF HYDROGRAPHIC SURVEY

In compliance with your instructions the survey of Papakura Channel was commenced on 13 January 1981 and field work completed on 29 January 1981. A preliminary plan of the proposed site area was drawn on 30 January and two copies despatched to you immediately in view of the urgency of your requirements.

A plastic copy and one print of each of the following final plans if forwarded herewith:-

- H5/32 PAPAKURA CHANNEL IN VICINITY OF PUKAKI CREEK
Scale 1:5000
- H5/33 PAPAKURA CHANNEL
Scale 1:25000

Photostat copies of current meter observations taken by the R.N.Z.N. in 1964 are attached, velocities given can be taken as applying to a depth of 12 feet below surface. At your request no further observations were taken by us.

The survey embrace by Plan H5/33 was considered necessary for the planning of future channel marking should the scheme for a Tanker Terminal off Wiri finally eventuate. This information will also be forwarded to the Hydrographic Branch, R.N.Z.N. for inclusion in the new metric charts currently being compiled.

Survey Control

Decca Trisponder position fixing equipment was hired from the Timaru Harbour Board and used for positioning the survey launch during the course of the survey. Appendix "A" shows the layout of the stations used for both the Wairopa and Papakura Channel

... ..

Although this equipment functioned satisfactorily along the initial seven mile stretch of the Papakura Channel some serious faults occurred during the survey at the terminal site area and this survey was completed using sextant fixing techniques, each sextant resection calculated for co-ordinates. Although the scale of the survey is 1:5000 it is possible to reconstruct any of the sounding lines run to a horizontal scale of 1:1000 and a vertical scale of 1:100 from the above fixes and the echo sounder track. Two such profiles have been produced at the northern end of the lines indicated on Plan H5/32 and are shown on Plan H5/32A attached. When a proposed site is selected it is thus possible to provide harbour bed profiles to these scales in the immediate vicinity which would be of use for engineering purposes.

Tides

Tidal stations at Cornwallis Wharf and at Weymouth were established and datum transferred from the standard gauge at Onehunga. Soundings were reduced to Chart Datum assuming an even Tidal gradient between the stations. At the conclusion of the survey it was noted that tidal heights at the Wiri site were almost identical with those at Onehunga. For all practical purposes therefore Onehunga Tide levels would apply also at the proposed site (see S90/26) attached).

No information on wave heights is available but the site area is obviously at the end of a very long fetch from winds in the westerly quarter, with a strong ebb tide against wind short steep seas of up to two metres could be expected to be generated.

Yours faithfully

B.R. LeClerc
CHIEF ENGINEER TO THE BOARD

JHR:TK

Enc. H5/32 & H5/33 (1 transparency and 1 print of each)
Three non harmonic analyses of Tidal Stream observations
Appendix "A"
H5/32A
S90/26

2 March 1981

The Chief Engineer
Timaru Harbour Board
P.O. Box 76
TIMARU

Dear Sir

HIRE OF DECCA TRISPONDER FROM 5/1/81 to 4/2/81

The above equipment was returned by air freight after servicing by the Naval Dockyard on 10/2/81 minus the Distance Measuring Unit for which the Dockyard is awaiting the arrival of parts from Australia. On advice from the Dockyard this unit will be collected for despatch by air to Timaru.

During the period 5/1/81 to 4/2/81 involving 24 working days the equipment failed on 13 days for a variety of reasons giving a downtime of 54%. As explained in my letter of 29/12/80 the D.M.W. and remotes were bench tested on 24/12/80 immediately after receipt but throughout the course of the survey the Hydrographic Section were continuously plagued with equipment malfunctions.

Fortunately excellent service was afforded by Mr Auger of the Dockyard Radio Centre without whom downtime would have been considerably higher.

As discussed with your Mr Van Tilborg repairs were carried out through Murray North, Monro, Partners who will, in due course, be forwarding to you an itemised account.

In view of the loss of time due to equipment malfunction it is requested that this be taken into consideration when rendering you account for hire charges.

Yours faithfully

B.R. LeClerc
CHIEF ENGINEER TO THE BOARD

Copy to: THE HYDROGRAHPER
Mr J. BRAY



Zealand Limited



1117-

Date: 12/1/81 1981

Telex NZ 3331
Telegraphic Address "Shell"
P.O. Box 2091

To: *Chief Engineer*
From: *Secretary*

PLEASE ACKNOWLEDGE

PLEASE REPLY DIRECT
SUBMITTING COPY TO
HEAD OFFICE

PLEASE REPORT

FOR YOUR INFORMATION
AND RETURN PLEASE

FOR NECESSARY ACTION
PLEASE



Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

JHQ 38. *[Signature]* *For.*
GENERAL MANAGER
SECRETARY
OPERATIONS MANAGER

Your ref

Our ref GRH/MF/EF

Date 9 January 1981



MANUKAU HARBOUR SURVEY

Thank you for your letter dated 23 December 1980 in which the work involved in surveying the Papakura Channel was outlined. We take the point that the last survey of the channel was made in 1961 and that major changes have recently been found in the Wairoa Channel.

The ability to bring LPG tankers down the Papakura Channel is obviously one of the key factors in selecting a Wiri site so it is desirable to have this confirmed. We are guided by yourselves as to the extent of the survey and are therefore in accordance with the outline proposed. However, because the changes will be based on actual costs plus percentages the right to vary the survey is reserved, particularly if consistent bad weather eventuates. Under these adverse circumstances the \$12,400 estimated could increase substantially and obviously costs are always a significant consideration.

A telephone discussion has been held with Mr Reith and the use of Drogue floats to achieve a tidal stream pattern at the proposed mooring site is concurred with.

Thank you for your prompt attention.

Yours faithfully,
for SHELL MANUFACTURING NEW ZEALAND LTD

[Signature]

G.R. HEWITT,
Gas Liquids Project Engineer

JB 13/1
Send a copy to Dave 20/1
Mr Reith - Hydrographer.

ce.s

5

Shell Manufacturing New Zealand Limited



1117-

Shell House, The Terrace
Wellington 1.

Telephone 720-080

STD Code 4

RECEIVED	12 JAN 1981
COB	
ANSD.	

Telex NZ 3331

Telegraphic Address "Shell"

P.O. Box 2091

Your ref

Our ref GRH/MF/EF

Date 9 January 1981

Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Attention: Mr Le Clerc



Dear Sir,

MANUKAU HARBOUR SURVEY

Thank you for your letter dated 23 December 1980 in which the work involved in surveying the Papakura Channel was outlined. We take the point that the last survey of the channel was made in 1961 and that major changes have recently been found in the Wairoa Channel.

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A telephone discussion has been held with Mr Reith and the use of Drogue floats to achieve a tidal stream pattern at the proposed mooring site is concurred with.

Thank you for your prompt attention.

Yours faithfully,
for SHELL MANUFACTURING NEW ZEALAND LTD

G.R. HEWITT,
Gas Liquids Project Engineer

*JB 13/1
Send a copy to Dave.
Mr Reith - Hydrographer.*

ce-5

5

29 December 1980

The Chief Engineer
Timaru Harbour Board
P.O. Box 76
TIMARU

Dear Sir

MANUKAU HARBOUR SURVEY
TRISPONDER EQUIPMENT

Your Trisponder equipment was collected from Auckland Airport on 23 December 1980.

With the assistance of Commander Monro, who is familiar with the instrument, it was tested and found to be unserviceable. This information was relayed to your Mr Van Tilborg who agreed that the equipment be taken to the Dockyard Radio Centre for testing and repair at your expense.

Mr Auger of the Radio Centre tested the equipment on 24 December and found the following faults in the D.M.U.:-

1. The power supply board had been repaired in an amateur fashion using incorrect components with signs of scorching. This board was replaced with a spare from the dockyard which will be removed before the D.M.U. is returned. Mr Auger stated that he would require your authorisation before repairing your power supply board.
2. A board adjacent to the P.C.13 slot containing under/over voltage circuitry was removed as being unnecessary.
3. The interior of the D.M.U. shows evidence of corrosion due to entry of salt water.

The D.M.U. was finally tested with both remotes on the R.F. Link Simulator and functioned correctly. It will go into service as planned on 5 January 1981.

Yours faithfully

Copy to: HYDROGRAPHER
ASSISTANT CHIEF ENGINEER

B.R. LeClerc
CHIEF ENGINEER TO THE BOARD

BRLeC:TK

23 December 1980

Gas Liquids Project Engineer
Shell Manufacturing N.Z. Ltd
P.O. Box 2091
WELLINGTON 1

ATTENTION: MR G.R. HEWITT

Dear Sir

MANUKAU HARBOUR SURVEY

(Ref. your enquiries dated 16.12.80
addressed to the General Manager.)

The present survey work in progress on the Manukau Harbour is intended to update information on the full extent of Wairopa Channel from Cornwallis to Onehunga Wharf. A hired electronic positioning system will be used from 5 January 1981, and, subject to weather conditions, the survey should be completed by 12 January. No financial provision has been made for other work.

The Board would be prepared to carry out at your cost soundings of the Papakura Channel as a continuation of the Wairopa Channel work. If the Papakura Channel is being considered for the passage of L.P.G. Tankers this would be advisable as the last survey of this channel was in 1961 by the Hydrographic Branch of the Navy for the compilation of the present chart. The current Wairopa Channel survey is being carried out due to major changes found recently at its entrance and to assist the Hydrographic Branch in their compilation of a new metric version of the chart.

The siting arrangements made for the Decca Trisponder stations due to be positioned on 5 January are very suitable for both a resurvey of the Papakura Channel and for a larger scale examination of the proposed area for the Terminal off Wiri. To attempt to survey either by conventional methods using sextant fixing would be impracticable.

... ..

A resurvey of the Papakura Channel involves a survey over some 18.5 kms with lines of soundings across the channel at 200 m centres averaging 1,000 m in length. Soundings would be plotted to a scale of 1:25,000. In favourable weather conditions this could be completed in five working days.

The area outlined in your letter for the proposed Terminal site could be sounded at 50 m centres and plotted on 1:5,000. The use of trisponder equipment enables any part of this area to be replotted to larger scale if required. Two working days would be required.

Tidal flow observations by current meter in channel centre at spring conditions over flood and ebb in the centre of proposed site area could be undertaken by our Hydrographic Section during the course of the survey which would involve one additional day.

Approximate costing based on favourable site conditions:-

Survey of Papakura Channel (5 days)	\$ 7,750
Survey of Terminal Site (2 days)	3,250
Tidal Observations (1 day)	1,400
	<hr/>
	\$12,400
	<hr/>

Should you decide to proceed with these works the Board's charges would be based on actual costs plus percentages to cover overheads etc., and in accordance with the Board's normal practice.

It is stressed that in the event that adverse conditions such as weather or tide are encountered the actual charge may increase significantly.

To mount these surveys will require some preliminary work and co-ordination with our own commitments and therefore an early decision is necessary. The Board's Hydrographic Surveyor, Mr John Reith, is available should you require any further information.

Yours faithfully

B.R. Le Clerc
CHIEF ENGINEER TO THE BOARD

JHR:JMH

Copy To: THE GENERAL MANAGER: for information

CHIEF ENGINEER TO THE BOARD

Shell Manufacturing New Zealand Limited



Shell House, The Terrace
Wellington 1.

Telephone 720-080

STD Code 4



Telex NZ 3331

Telegraphic Address "Shell"

P.O. Box 2091

Your ref

Our ref GRH/MF/GL

Date 16 December 1980

The General Manager,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.



Attention: General Manager

Dear Sir,

HARBOUR SURVEY

Contact has been established with several of your staff with respect to alternative sitings of the proposed LPG bulk storage facility in Auckland. An approach has been made to Mr Burgess re the Pikes Point East area and discussions have also been held with Mr Smythe indicating our interest in a site at Wiri.

With respect to the latter it is envisaged that a tanker will be brought down the Papakura Channel and moored in the channel at a suitable location to enable discharging operations to be undertaken. A sub-sea pipeline will be installed leading back to the depot.

It is understood that the hydrographers are currently working in the Manukau Harbour and the purpose of this enquiry is to establish

- (a) The extent of survey work required for this operation
- (b) The timing of such work.

Find enclosed a map indicating a tentative route for the pipeline and a suggested area of the channel for mooring purposes. It is stressed that this pipeline route is tentative only and is dependent upon several factors. Any suggestions with respect to mooring locations etc. would be welcome.

The proposal for a depot in Wiri consists of one only sub-sea pipeline i.e. there is no provision for a vapour return so the requirements at the berthing operation are simplified. This has been achieved by incorporating a reliquifier at the depot to liquify the displaced vapour. All other

1
2
3
Blec
OHT
CEJ's copy
to work
E.W.

principles are similar as described in the letter to Mr Burgess ref GRH/MF/GL and dated 5/11/80 outlining the Pikes Point proposal.

The coastal tanker envisaged for the LPG operation has not yet been defined so firm dimensions cannot unfortunately be stated. Approximate dimensions however are:

Capacity: 1000 tonnes LPG
Length Lpp: 85 metres
Beam: 12 metres
Draft: 4.9 metres
Gross weight: 2000 tonnes

It is intended to fit bow thrusters to assist in manoeuvring the vessel.

4
It would be appreciated if any data relevant to this mooring position, e.g. tidal flow, tidal levels etc. could be forwarded to assist in the evaluation.

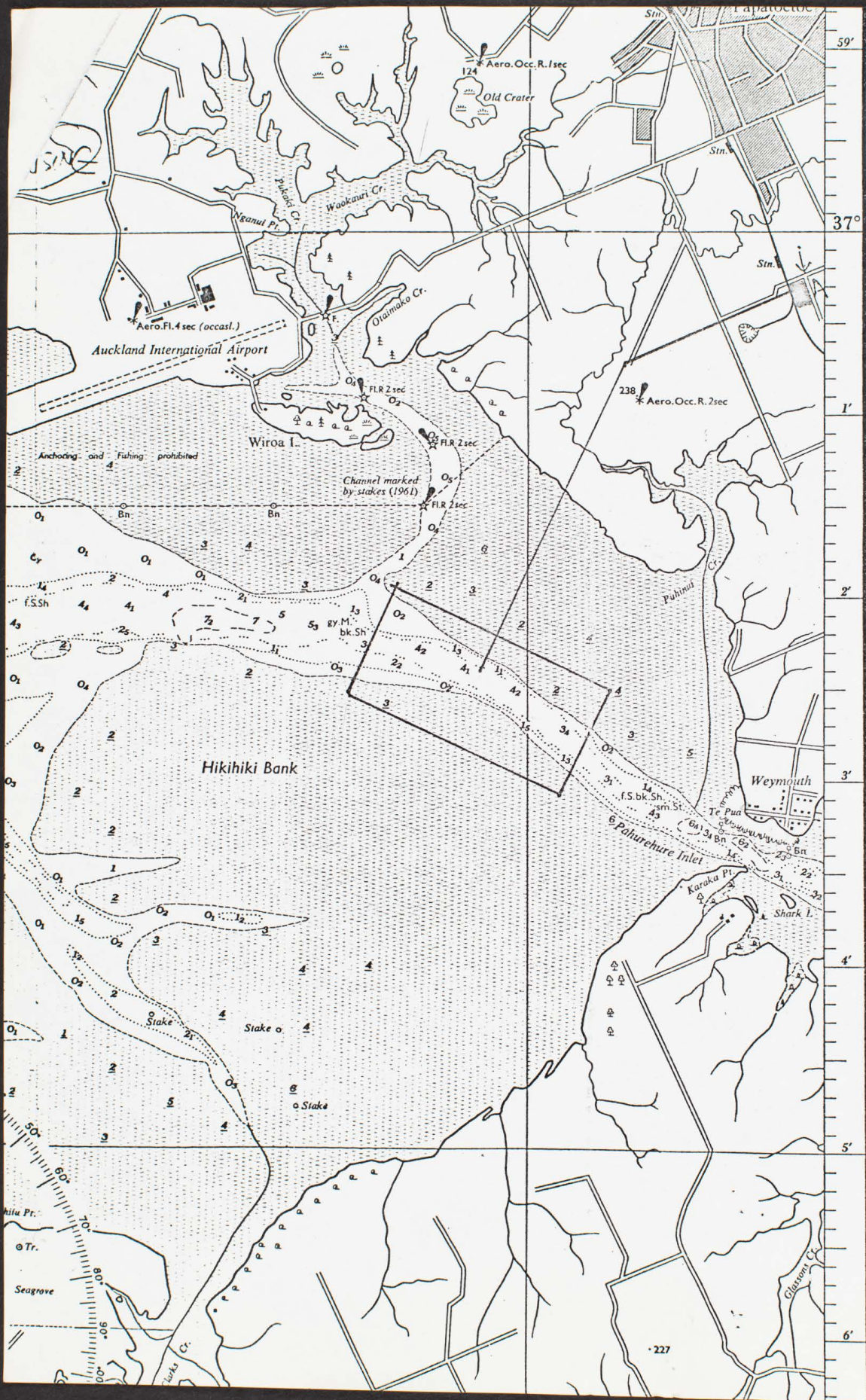
Thank you for your assistance.

Yours faithfully,
for SHELL MANUFACTURING NEW ZEALAND LTD



G.R. HEWITT,
Gas Liquids Project Engineer

Encl.





Memorandum

To: THE CHIEF ENGINEER, THE HARBOUR-
MASTER, OFFICER-IN-CHARGE *Onehunga* Date: 19 December 1980

From: HYDROGRAPHER

HUIA BANK

Plan H5/31 shows results of a survey undertaken on 17 December 1980. Soundings are in fathoms and the scale is that of Chart NZ4314.

For purposes of future monitoring it is proposed to reproduce the Survey to 1:10,000 and give soundings in metres; this will also be given to the Hydrographic Branch for the metric compilation of the above chart.

The Survey reveals that the shoal has narrowed and its western limit has both extended westwards and swung to the south, effectively narrowing the gap between Taratara Point and the bank to about 4 cables. In view of this I would recommend that the buoy be repositioned about 7½ cables to the W.S.W. of its charted position, or 5 cables from its actual position.

J. Reith
HYDROGRAPHER

JHR:TK

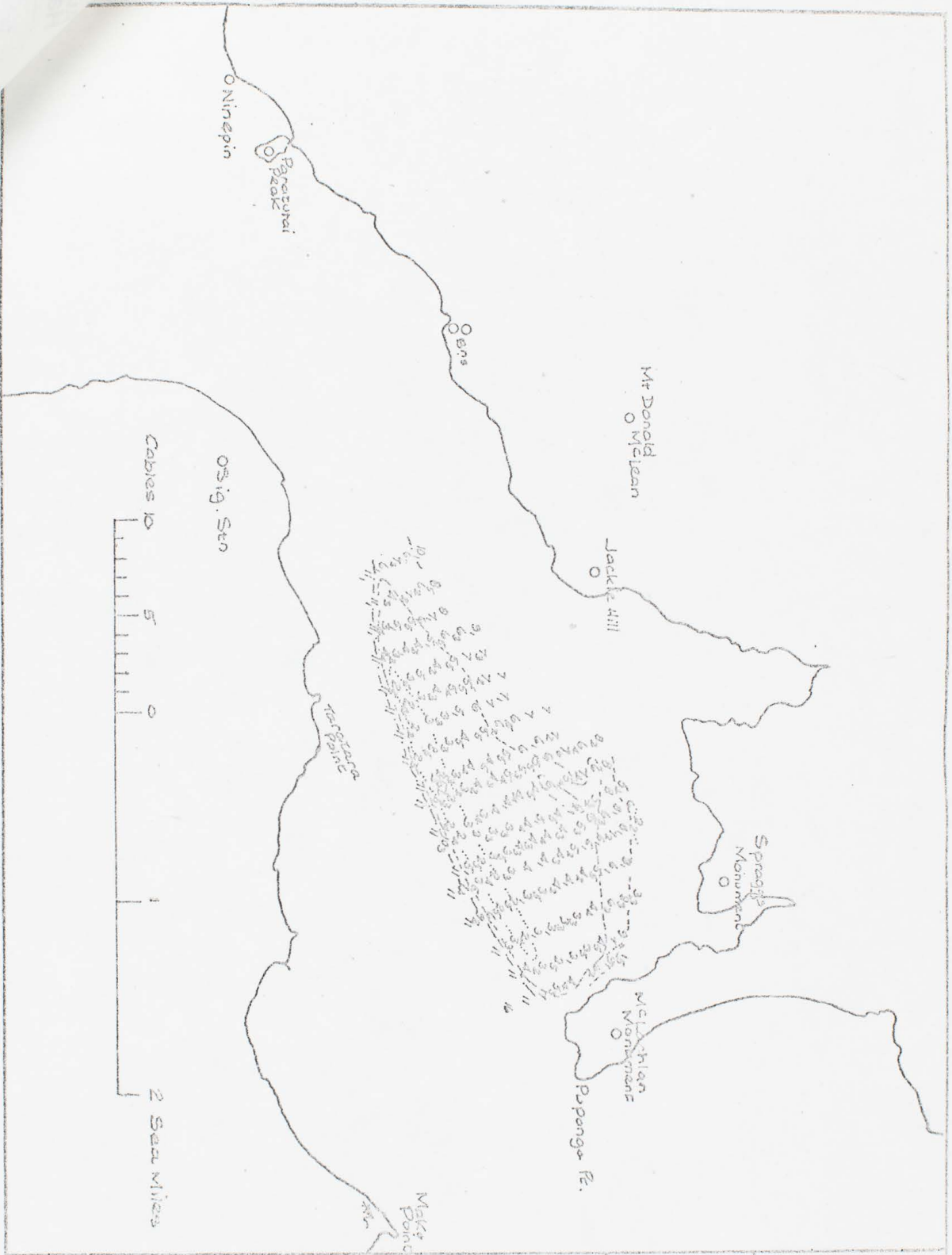
Enc. H5/31

Chief Engineer to see

& file

JR
19/12

Blc



HUIA BANKS
 17.12.80
 Soundings in fathoms & feet below
 Chart Datum

DRAWN J.H.R.
 DATE 18.12.80
 SCALE 1:48 000

DRAWING
 H5/31

18. Manukau Harbour - Wairopa Channel

The Chief Engineer in his report of 2 October 1980 referred to the request from the Harbourmaster to investigate possibly replacing some of the buoys marking the Wairopa Channel with fixed beacons. This had been studied and his advice to the Harbourmaster was that it would be prudent to first re-survey the channel to determine what changes, other than those known, had taken place since it was last surveyed in 1961 by the R.N.Z.N. Hydrographic Branch. The report dealt with the manner in which the Chief Engineer proposed to undertake the survey and the equipment required and concluded by recommending that he be authorised to proceed - 1. Carry out a re-survey of the Wairopa Channel in the Manukau Harbour, 2. Hire 'Trisponder' electronic positioning equipment from the Timaru Harbour Board at a time to be arranged during January and February 1981, and 3. A total sum of \$3,000 be allowed for the survey to cover hire of equipment, launch transport and other incidental expenses.

In endorsing the recommendation the General Manager stated that in view of the time that had elapsed since the Wairopa Channel was last surveyed, it was desirable that a re-survey was completed before any replacement of buoys. The cost of the work was an operating expense.

The Chairman moved, Mr Julian seconded -

That the reports be adopted.

CARRIED

Chief Asst. Engr }
Hydrographer } to note & proceed as reported

ADOPTED BY BOARD

11 NOV 1980

copies to ; C/E, MM & TV



Auckland Harbour Board

517/1

2 October 1980
Engr's file
1117

The General Manager
AUCKLAND HARBOUR BOARD

ITEM 18

MANUKAU HARBOUR -
WAIROPA CHANNEL

The Harbourmaster has requested that my department investigate possibly replacing some of the buoys marking the Wairopa Channel with fixed beacons. This has been studied and my advice to the Harbourmaster included that before any decision was made it would be prudent to first re-survey the channel to determine what changes, other than those known, have taken place since it was last surveyed in 1961 by the R.N.Z.N. Hydrographic Branch.

It has been established that the survey branch of the Navy is at the present time fully committed and therefore they could not attempt a re-survey of this area for some considerable period.

Advice has also been received from the R.N.Z.N. Hydrographic Office that they are considering producing new metric versions of N.Z.4314 and 4315 embracing the Manukau Harbour and Onehunga. The Navy has requested information as to what surveys of the Manukau the Board intend to carry out in future. They state that any new hydrographic information could be incorporated in the charts up to about October 1981.

Extent of Re-survey

From the entrance to the Wairopa Channel at Puponga Point to Onehunga Wharf is a distance of 20km, this width varying from 1000 to 300m. To resurvey this channel would involve steaming 100km (54 nautical miles) and it is estimated would take approximately 10 working days, the time scale being based on using electronic positioning equipment.

Electronic survey equipment is obtainable for hire from two sources, the least costly being from the Timaru Harbour Board at \$2,000.00, including air freight and insurance, this equipment only being available next year during the months of January and February.

Additional cost which would be incurred to complete a survey of the Wairopa Channel are the road transport both ways of the Hydrographic launch 'Arahi' to the Manukau, manning the electronic positioning stations and laying a suitable mooring at Onehunga for 'Arahi'.

The cost of re-survey of the Channel, excluding the Board's hydrographic staff wages but including for the hire of equipment, launch transport and other incidentals is estimated to be in the order of \$3,000.00.

... ..

Conclusions

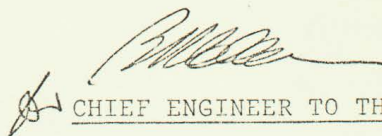
1. The Wairopa Channel has not been re-surveyed since 1961. We have had one occurrence of a channel shift this year when ships went aground due to a movement of the Te Tau Bank.
2. The quickest and least expensive method of carrying out this survey is to utilise electronic positioning equipment. The Timaru Harbour Board has a "Decca Trisponder System" available for hire early next year. In contrast, conventional techniques normally used in the Waitemata Harbour surveys would involve a protracted period of time in establishing the necessary visual control positions and would increase the time scale to complete work from two to at least twelve weeks.
3. As the Navy is proposing to metricate the Manukau Charts and has asked if the Board intend carrying out any surveys in this area it would be an opportune time to re-survey the Wairopa Channel early next year so that the information can be incorporated in the proposed new charts.
4. The Harbourmaster considers it would be advantageous and cost saving to replace some of the channel buoys with fixed beacons but it is my opinion that before any further investigations are carried out the channel should be re-surveyed.

Recommendations

Accordingly it is recommended that I be authorised to proceed as follows:

1. Carry out a re-survey of the Wairopa Channel in the Manukau Harbour.
2. Hire 'Trisponder' electronic positioning equipment from the Timaru Harbour Board at a time to be arranged during January and February 1981.
3. A total sum of \$3,000.00 be allowed for the survey to cover hire of equipment, launch transport and other incidental expenses.

The Chairman
AUCKLAND HARBOUR BOARD


CHIEF ENGINEER TO THE BOARD

In view of the time that has elapsed since the Wairopa Channel was last surveyed, it is desirable that a resurvey is completed before any replacement of buoys. Accordingly I endorse the Chief Engineer's recommendations 1 to 3. The cost of the work is an operating expense.


R.T. Lorimer
GENERAL MANAGER

23 October 1980

THE GENERAL MANAGER

31 October 1980

THE CHIEF ENGINEER

MANUKAU HARBOUR HYDROGRAPHIC SURVEY

LEASE/PURCHASE OF EQUIPMENT

- 1. VHF RADIO TELEPHONES
- 2. BATTERIES - 8-12 VOLT

1. The Hydrographer has requested that two VHF radio telephone units be available for his use during the January/February 1981 Manukau Harbour Hydrographic Survey. One for use in Van 27 and the other a portable unit for use at the tide gauge, trisponder marker transmitters etc.

A written request to H/M for release of two Pilot portable units has met with a reply that the two spare units held by the H/M are for use at oil spills and emergencies and could not be released for the two months required.

I would therefore propose that a new Tait T198 VHF FM radio telephone be purchased for Van 27 and permanently installed.

No Radio Telephone rental company will lease radio telephones for less than a 5 year contract to comply with Inland Revenue requirements regarding tax relief.

Those rented are not compatible with Maritime F.M. equipment.

I would consider it reasonable in these circumstances to ask the H/M to release one of his VHF Pilot Portables to meet the portable unit requirement.

Costs:- Tait VHF unit F.M.	\$735.00
A.H.B. Labour - installation	\$ 25.00
	<u> </u>
Total	<u>\$760.00</u>

- 2. BATTERIES

To operate the two trisponder units requires a 24v supply at each remote site.

This can be achieved by using 2 - 12v 9 Plate standard car batteries for each unit, Sub-Total 4.

... ..

Each 24v supply would have enough capacity to last 24 hours so that two complete units of 4 would be required and be alternated from charging to discharging each 24 hour period.

Short term leases - 2/3 days cost 60 - 70¢ per day - batteries are generally not available for longer term lease and total costs would equate with new purchase price of \$46.61. These batteries would be absorbed into plant on completion.

Accordingly I would seek authority to purchase:-

8 only Code 27 batteries at \$38.84 + 20% each
= \$372.88

CHIEF ENGINEER TO THE BOARD

SJC:TK

COPY TO: J. REITH
H/M

THE SECRETARY

24 October 1980

THE CHIEF ENGINEER

HYDROGRAPHIC SURVEY OF WAIROPA CHANNEL

Arrangements are being made to carry out a hydrographic survey of the Wairopa Channel from Onehunga Wharf to the entrance at Puponga Point and if time permits Papakura Channel.

In order to complete the survey electronic positioning equipment, 'Decca Trisponder' is being hired from the Timaru Harbour Board and the Board's hydrographic survey launch 'Arahi' will be transferred to the Manukau Harbour.

Timaru have advised us that the hire charge for their equipment includes full insurance cover but I would be obliged if you would arrange cover on 'Arahi' during the transport (both ways) and for a period of one month from the 5 January while this launch is on Manukau Harbour.

Please find attached information with regard to the transfer.

CHIEF ENGINEER TO THE BOARD

JMB:TK

Enc. Works Instruction No. 4694

COPY TO: THE MECHANICAL ENGINEER FOR INFORMATION
THE HYDROGRAPHER FOR INFORMATION
THE FOREMAN OF WORKS FOR INFORMATION



To: THE FOREMAN OF WORKS

Date: 15 October 1980

Subject: HYDROGRAPHIC SURVEY OF WAIROPA CHANNEL
MANUKAU HARBOUR

Authority: Board/General Manager/Routine Maintenance

Date

Estimate of Cost: \$

Expenditure Code

9146/01/40-49

50-59

Target Completion Date:

Description: Commencing 5 January 1981 a hydrographic survey of the Wairopa Channel from Onehunga Wharf to the entrance at Puonga Point is being carried out by the Hydrographic Section.

Survey launch 'Arahi' will be engaged on this survey using electronic positioning equipment, Decca Trisponder, hired from Timaru.

To enable soundings to commence on Monday 5 January 1981 please arrange the following:-

1. Transport by road of 'Arahi' from the launching ramp at Westhaven to the public launching ramp at Mangere opposite Onehunga Wharf on Tuesday 30 December 1980.
2. Two sets of moorings (head and stern) suitable for 'Arahi' to be laid in 3 metre depth due east of the reef beacon SW of Onehunga Wharf. Allow for a maximum water depth of 8 metres. Required to be in position before 1. above.
3. Hire of eight 12v car batteries for one month commencing 5 January 1981.
4. As complete mobility will be required during this survey Van 27 has been booked by the Hydrographic Section for each working day during January 1981. Should this prove inconvenient to other sections a suitable van should be hired for the period.

JHR:TK

Copy to: The Chief Assistant Engineer
 The Supervisor Gear & Tools
 The Foreman Shipwright
 The Supervisor Transport Pool
 The Officer-in-charge Onehunga
 The Hydrographer

Chief Engineer to the Board

Immediately works completed detach slip, enter completion date, sign and forward to Chief Clerk.

Works Completed Signature Date

117

THE FOREMAN OF WORKS

20 October 1980

THE CHIEF ENGINEER

HYDROGRAPHIC SURVEY OF WAIROPA CHANNEL
AMENDMENT TO WORKS INSTRUCTION NO. 4694

1. Please amend the date for transporting "Arahi" from Auckland to Onehunga to 5 January 1981 when the tides are more favourable.

5.1.81 Auckland H.W. 0754 2.8

" Onehunga H.W. 1050 3.8

2. As the old Mangere Bridge is not suitable for this load and to avoid the long route through Otahuhu, the "Arahi" is to be launched at the new concrete ramp off Seacliff Road (see plan attached).

CHIEF ENGINEER TO THE BOARD

JHR:JMH

Enc. Map 30

Copy To: THE CHIEF ASSISTANT ENGINEER
THE FOREMAN SHIPWRIGHT
THE HYDROGRAPHER
MR N. NAYLOR

CHIEF ENGINEER TO THE BOARD

THE HARBOURMASTER

15 October 1980

THE CHIEF ENGINEER

HYDROGRAPHIC SURVEY - WAIROPA CHANNEL

PORTABLE RADIOS

During the forthcoming survey of Wairopa Channel being planned for January 1981 an essential requirement will be satisfactory voice communication between the survey launch and personnel ashore attending to the Decca Slave Stations at ranges of up to 20 km.

It is therefore requested that two portable V.H.F. radios from the establishment held by you be made available for the use of the survey section during the period of the above survey.

CHIEF ENGINEER TO THE BOARD

JHR:TK

COPY TO: The Chief Assistant Engineer
The Hydrographer

117.

THE OFFICER-IN-CHARGE ONEHUNGA

15 October 1980

THE CHIEF ENGINEER

MANUKAU HARBOUR -

WAIROPA CHANNEL

Arrangements are being made to carry out a complete survey of the Wairopa Channel commencing 5 January 1981.

Survey launch 'Arahi' will be transported from Auckland to the launching ramp at Mangere on Tuesday 30 December 1980 and secured to head and stern moorings immediately eastward of the reef beacon.

Initially your assistance is requested in laying these moorings prior to the above date and it is further requested that security personnel at Onehunga be instructed to keep the vessel under surveillance during her stay there, which will probably be one month.

The Decca Trisponder equipment to be used for this survey is powered by four 12v batteries. Four batteries will be held in reserve and kept on charge in your garage workshop.

The hydrographer requests that, during the period of the survey, office facilities be made available for one or two staff at Onehunga in the vicinity of the V.H.F. radio. When not required for servicing the shore Decca Stations and the tide gauges at Cornwallis and possibly Weymouth they can be engaged in plotting field work.

CHIEF ENGINEER TO THE BOARD

JHR:TK

COPY TO: The Chief Assistant Engineer
The Hydrographer

CHIEF ENGINEER TO THE BOARD

494.
1117.

10 October 1980

The Regional Engineer
Radio Division
N.Z. Post Office
86 Federal Street
AUCKLAND

ATTENTION: MR P.D. SCOTT

Dear Sir

DECCA TRISPONDER: TEMPORARY
RADIO LICENCE

Further to discussions last week with Mr S. Collins, I would ask for Post Office approval and the licencing of a master and two slave units of a Decca Trisponder Survey System to be used in the Manukau Harbour as detailed on the attached plan.

The Board has leased this equipment for use during January/February 1981 and would also advise you that the master station transmission frequency is 9480 MHz and the two slave stations 9325 MHz. Tests have been undertaken with Ministry of Transport Civil Aviation Radio Centre, Auckland Airport and no interference was recorded.

Would you please advise me at your earliest convenience regarding Post Office authority and licence costs etc., so that we may proceed to negotiate use of this equipment.

Yours faithfully



O.P. Franklin
ELECTRICAL ENGINEER

SJC:JMH

Enc. - Drawing
- Technical Data

Copy To: THE CHIEF ENGINEER; THE HYDROGRAPHER; THE HARBOURMASTER
THE OFFICER-IN-CHARGE, ONEHUNGA.

File
Blac

U17
183

8 October 1980

The Chief Engineer
Timaru Harbour Board
P.O. Box 76
TIMARU

Dear Sir

DECCA TRISPONDER EQUIPMENT

*Hire of Equipment for
Manukau Harbour Waikopa Channel
survey.*

In reply to your letter of 3 October 1980 the conditions of hire of the above equipment are acceptable to us.

The hire of this equipment is therefore confirmed and it is requested that arrangements be made for its despatch by air freight.

In order to make the best of the tides it is desirable to commence this survey on Monday, 5 January 1981 for which reason it is further requested that the equipment be sent on Monday, 29 December for pick up at Auckland Airport on Tuesday or Wednesday as this is in the middle of the Christmas - New Year holiday period.

Yours faithfully

N. Seagar
CHIEF ENGINEER TO THE BOARD

JHR:JMH

Copy To: THE CHIEF ASSISTANT ENGINEER
THE HYDROGRAPHER

CHIEF ENGINEER TO THE BOARD

TIMARU HARBOUR BOARD

P.O. BOX

76

TIMARU, N.Z.

TELEPHONE 44199

TELEPHONE 44199
All communications to
be addressed to
The General Manager.

3rd October 1980



Our Ref. RLM/LY

The Chief Engineer,
Auckland Harbour Board,
P.O.Box 1259,
AUCKLAND

Dear Sir,

The trisponder equipment will be available for hire between the dates requested.

As you wish to hire the equipment for a period longer than a week, the hire charges will be weekly at \$850.

1. If there are prolonged periods of unfavourable weather, the Timaru Harbour Board would reassess the hire charges.
2. The Timaru Harbour Board's own all purpose insurance will cover the equipment.
3. All transport costs of the equipment from and to Timaru will be at your expense.
4. All repairs to be carried out at the Devonport Dockyard, the spares box will only be sent under these conditions. The cost of repairs due to malfunction will be at our expense. The repair costs of any damage due to negligence on the part of the Auckland Harbour Board will be to your expense.

If required, the equipment would be available for hire for a longer period than requested.

Any further enquires, do not hesitate to contact us.

Yours faithfully,

B.W. Tierney
Chief Engineer

Mr Faith
Drawn letter attached
8/10/80

are these terms the ones expected?
Please prepare a requisition for a
Works Order to secure the plant. *Step*

To: THE CHIEF ENGINEER

Date: 1 October 1980

From: THE GENERAL MANAGER



MANUKAU HARBOUR, WAIROPA CHANNEL

Your memorandum 23 September 1980 refers.

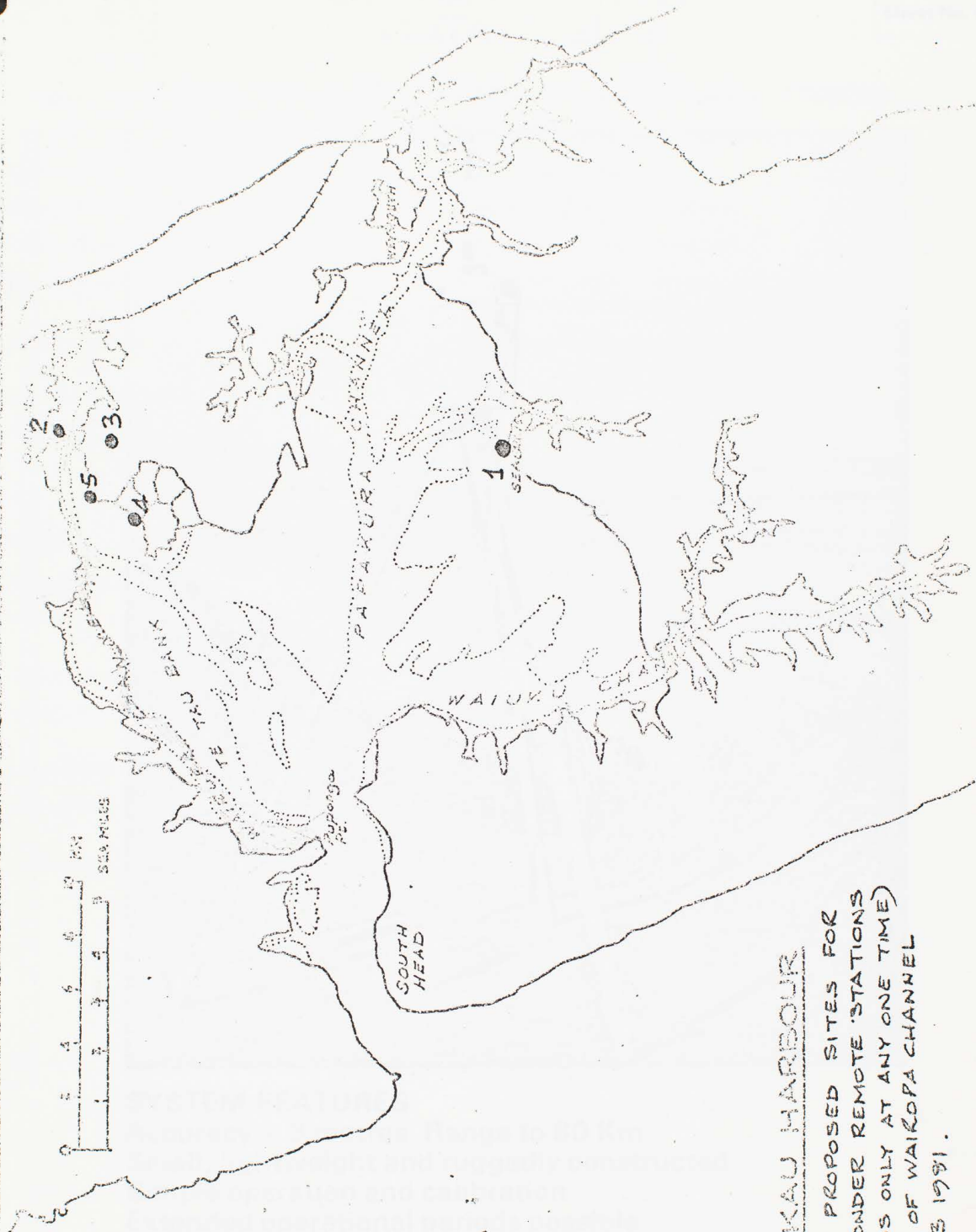
The recommendations in the above report are endorsed and authority is given to arrange the hire of equipment from the Timaru Harbour Board.

X The matter will be reported to the Board for information at its next meeting. Please arrange for the memorandum to be retyped as a Board report.

R.T. Lorimer
GENERAL MANAGER

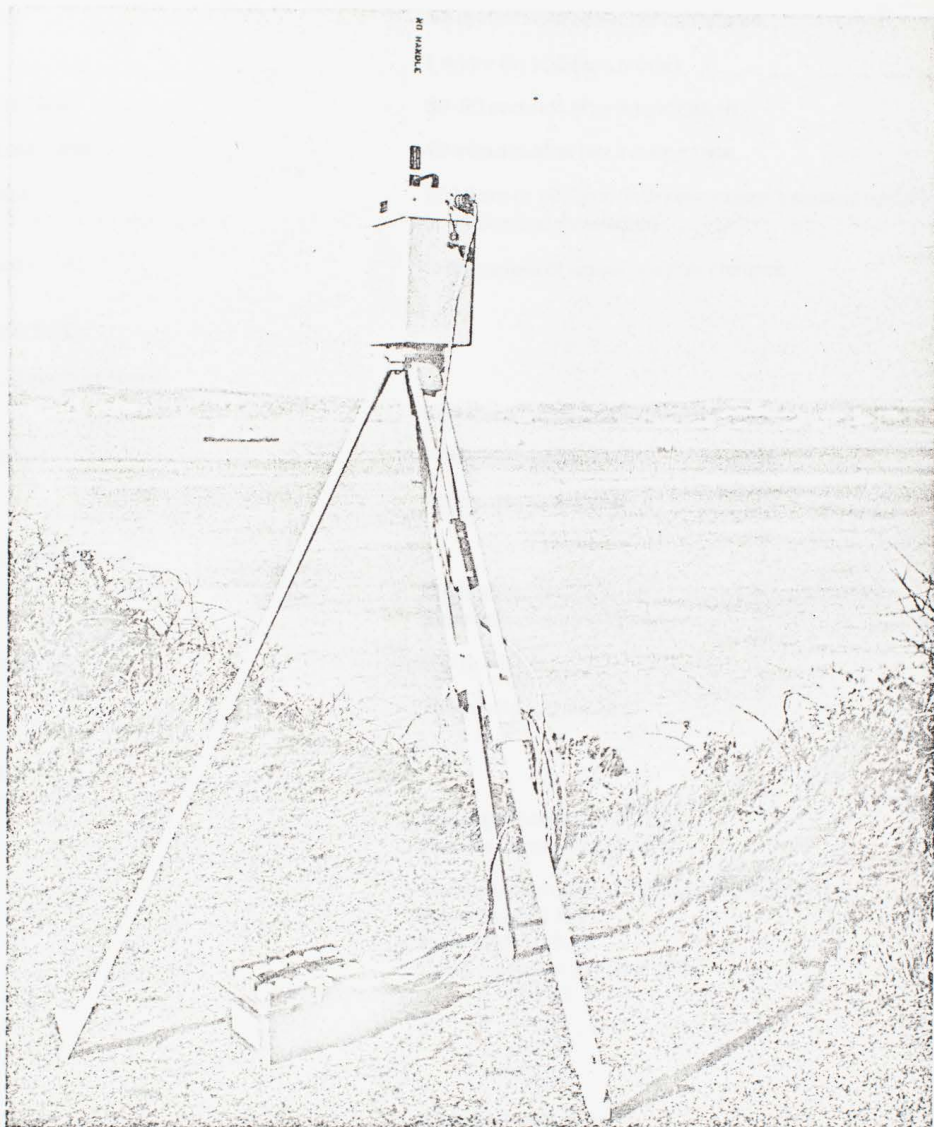
per L.M. Morgan.

Mr Carr - please arrange - as ^{arranged RLB} X using copy from file 1117.
Mr Reith - please confirm hire arrangements. 2.8/1980
Mr Bray - to note *plac.*



MANUKAU HARBOUR

LOCATION OF PROPOSED SITES FOR
DECCA TRIPSONDER REMOTE STATIONS
(TWO STATIONS ONLY AT ANY ONE TIME)
FOR SURVEY OF WAIKOPĀ CHANNEL
IN JAN - FEB 1991.



SYSTEM FEATURES

- Accuracy ± 3 metres. Range to 80 Km
- Small, lightweight and ruggedly constructed
- Simple operation and calibration
- Extended operational periods possible
- Modern electronic design techniques

DECCA SURVEY TRISPONDER, THE BASIC SYSTEM

TECHNICAL DATA SUMMARY

PERFORMANCE

<i>Range:</i>	100 metres—80Km
<i>Range Accuracy:</i>	±3 metres with corrected calibration.
<i>Resolution:</i>	1 metre (in 100 Sum mode)
<i>Remote Activate Time:</i>	30-90 seconds after interrogation.
<i>Remote Shutdown Time:</i>	40 minutes after last interrogation.
<i>Operating Modes:</i>	100 Sum or 10 Sum, with continuous 1 second updates, or on demand as selected.
<i>Alarm Indicators:</i>	Indicate loss of signal in either channel.

ENVIRONMENTAL

Transmitter /Receiver Units

<i>General:</i>	Weatherproofed for marine use.
<i>Temperature Range:</i>	-30°C to +70°C.
<i>Altitude:</i>	760mmHg to 1mmHg.

Distance Measuring Unit

<i>General:</i>	Weatherproof with cover in place and vent closed. Splashproof during operation.
<i>Temperature Range:</i>	0°C to +67°C
<i>Altitude:</i>	760mmHg to 1mmHg

ELECTRICAL

<i>Frequencies:</i>	Mobile transmit 9480 MHz. Remote transmit 9325 MHz.
<i>Transmitter:</i>	Tunable magnetron 9300 MHz to 9480 MHz. Pulse power 1 kW. Pulse width 0.5 µS Pulse repetition intervals (PRI) E 724 µS F 744 µS G 764 µS H 784 µS
<i>Receiver:</i>	Superheterodyne. Frequency range 9300 MHz to 9500 MHz. Intermediate frequency 60 MHz ± 5 MHz. Bandwidth 12 MHz. Pulse sensitivity 74dB/m.
<i>Power Supply:</i>	Operating range 23 Volts to 32 Volts. Mobile min current 2.4 amp, max current 5.0 amp. Remote min current 0.8 amp, max current 3.5 amp.
<i>Antennas:</i>	Mobile: Omnidirectional horizontal beamwidth, 30° vertical beamwidth, 16dB gain. Remote: 87.5° horizontal beamwidth, 5° vertical beamwidth, 16dB gain.

Decca Survey Australia Limited
96 Reserve Road Artarmon
Postal Address: PO Box 355
Artarmon Sydney NSW 2064
Telex: 25441 Telephone: 439-1533
Cabies: DECSURVEY SYDNEY

Leatherhead, Surrey
EY LEATHERHEAD Telex: 928437

Publication Reference: J44

To: THE CHIEF ENGINEER

Date: 13 October 1980

From: THE HYDROGRAPHER

MANUKAU BAR - R.N.Z.N. HYDROGRAPHIC RESPONSIBILITIES

(See attached File Note (File 1117))

At a meeting with Commander Jaques, R.N.Z.N. Hydrographer on 13/10/80, I explained the reasons for our request to the Hydrographic Committee in 1978 that the five yearly resurvey of the Manukau Bar take the form of a reconnaissance survey to outline the principle features of the area in order to give us an indication of the probable location of an alternative to the South Channel.

Commander Jaques now has a better understanding of our position and has agreed to send an inshore survey craft to carry out such a survey in 1982, subject to approval from the Chief of Naval Staff.

In the meantime he will request that monthly photographic flights be carried out by Orions of No. 5 Squadron and that these should commence as soon as possible.

The present situation in regard to vessels entering or leaving the Manukau Harbour is that the South Channel is still the only one in use and remains stable according to the last survey on 30 July 1980.



HYDROGRAPHER

JHR:TK

Lisa Blue

Blup. Nav. 81.

FILE 1117

FILE NOTE

MANUKAU BAR - R.N.Z.N. HYDROGRAPHIC RESPONSIBILITIES

Reference

- (a) Harbour Association Memo 30 May 1980.
- (b) Hydrographer - Chief Engineer 9 June 1980.

- (a) Somewhere about 1968-69, the Navy made a commitment to survey the bar and entrances every 5 years.
- (b) The Board then accepted the Commitment to survey the channels as required, and to obtain such other information at the bar, that safe operations of our hydrographic vessels permit.
- (c) The Navy intention to re-survey in 1970 did not occur until 1977 (February).
- (d) At the present time only south channel operates. South west closed up some two years ago.
- (e) Both Navy Hydrographer and my Hydrographer agree it is pointless doing a complete survey or even general checks. Possibly R.N.Z.A.F. aeriels at appropriate times could be more useful.
- (f) Both above have an agreement to meet in September^{*} and discuss further.
- (g) Provided the problem of weather and availability of Manukau complement we have the resources to maintain adequate checking.
- (h) The question of 5 yearly survey commitments by Navy is now 10 years old. They were 7 years late with their survey and having regards the commitments today and in the future it appears unlikely that any positive answer would be given.
- (i) Accordingly I recommend the Statements be accepted for this year and after discussions by the two Hydrographers in September we will review the situation.

* Finally met on 13 October '80
report of discussions attached

N. Seagar
CHIEF ENGINEER TO THE BOARD

NS/TK

Hydrographer

29 September 1980

Chief Engineer
Timaru Harbour Board
Box 76
Timaru

Sir

Decca TRISPOUNDER EQUIPMENT -
Hire ARRANGEMENTS

It is requested that arrangements be made for the hire of the following Decca Trisponder units for the period 5/1/81 to 19/1/81

- One Master Station
- Two Remote Stations
- One Distance Measuring Unit
- One Data Printer
- One Spares Box

This equipment is for use in a resurvey of the Wairopa Channel, Manukau Harbour, which, subject to favourable weather conditions, should be completed in the time limit outlined above.

A hiring charge of \$175 per working day was quoted to my Hydrographer on his initial enquiry recently. Should the equipment be available for hire during the above period it is requested that, in your reply the following points concerning the hiring arrangements be clarified:-

- 1 Does the term "per working day" exclude those days not worked due to unfavourable weather conditions or malfunction of the Trisponder equipment?
- 2 Is insurance for the equipment from time of despatch to return to Timaru included in the above hire charge?
- 3 Air freight charges from Timaru to Auckland and the return to Timaru will be at the expense of the Auckland Harbour Board.

... ..

To: THE GENERAL MANAGER

Date: 23 September 1980

From: THE CHIEF ENGINEER

MANUKAU HARBOUR -
WAIROPA CHANNEL

The Harbourmaster has requested that my department investigate possibly replacing some of the buoys marking the Wairopa Channel with fixed beacons. This has been studied and my advice to the Harbourmaster included that before any decision was made it would be prudent to first re-survey the channel to determine what changes, other than those known, have taken place since it was last surveyed in 1961 by the R.N.Z.N. Hydrographic Branch.

It has been established that the survey branch of the Navy is at the present time fully committed and therefore they could not attempt a re-survey of this area for some considerable period.

Advice has also been received from the R.N.Z.N. Hydrographic Office that they are considering producing new metric versions of N.Z.4314 and 4315 embracing the Manukau Harbour and Onehunga. The Navy have requested information as to what surveys of the Manukau the Board intend to carry out in future. ^{They} state any new hydrographic information could be incorporated in the charts up to about October 1981.

EXTENT OF RESURVEY

From the entrance to the Wairopa Channel at Puponga Point to Onehunga Wharf is a distance of 20km, this width varying from 1000 to 300m. To resurvey this channel would involve steaming 100 km (54 nautical miles) and it is estimated would take approximately 10 working days, the time scale being based on using electronic positioning equipment.

Electronic survey equipment is obtainable for hire from two sources, the least costly being from the Timaru Harbour Board at \$2,000.00, including air freight and insurance, this equipment only being available next year during the months of January and February.

Additional costs which would be incurred to complete a survey of the Wairopa Channel are the road transport both ways of the Hydrographic launch 'Arahi' to the Manukau, manning the electronic positioning stations and laying a suitable mooring at Onehunga for 'Arahi'.

The cost of re-survey of the Channel, excluding the Board's hydrographic staff wages but including for the hire of equipment, launch transport and other incidentals is estimated to be in the order of \$3,000.00.

Conclusions

1. The Wairopa Channel has not been re-surveyed since 1961. We have had one occurrence of a channel shift this year when ships went aground due to a movement of the Te Tau Bank.
2. The quickest and ~~therefore the~~ least expensive method of carrying out this survey is to utilise electronic positioning equipment. The Timaru Harbour Board have a "Decca Trisponder System" available for hire early next year. In contrast, conventional techniques normally used in the Waitemata Harbour surveys would involve a protracted period of time in establishing the necessary visual control positions and would increase the time scale to complete the work from two to at least twelve weeks.
3. As the Navy is proposing to metricate the Manukau Charts and have asked if the Board intend carrying out any surveys in this area, would be an opportune time to re-survey the Wairopa Channel early next year so that the information ~~to~~ be incorporated in the proposed new charts.
4. The Harbourmaster considers it would be advantageous and cost saving to replace some of the channel buoys with fixed beacons but it is my opinion that before any further investigations are carried out the channel should be re-surveyed.

Recommendations

Accordingly it is recommended that I be authorised to proceed as follows:-

1. Carry out a re-survey of the Wairopa Channel in the Manukau Harbour.
2. Hire 'Trisponder' electronic positioning equipment from the Timaru Harbour Board at a time to be arranged during January and February 1981.
3. A total sum of \$3,000.00 be allowed for the survey to cover hire of equipment, launch transport and other incidental expenses.

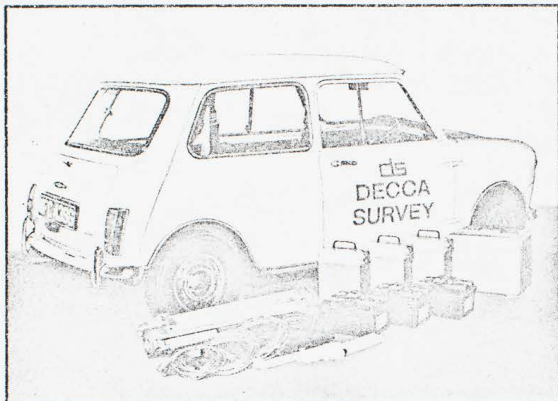
CHIEF ENGINEER TO THE BOARD

JMB:TK

Encl. Plans of Manukau Harbour
Trisponder Information

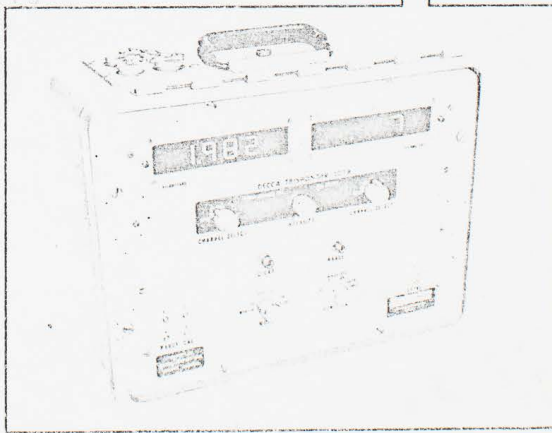
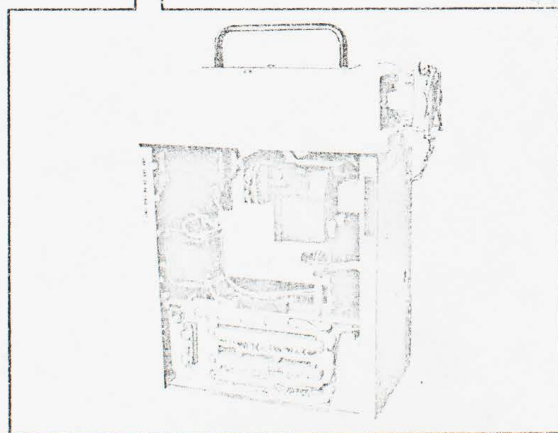
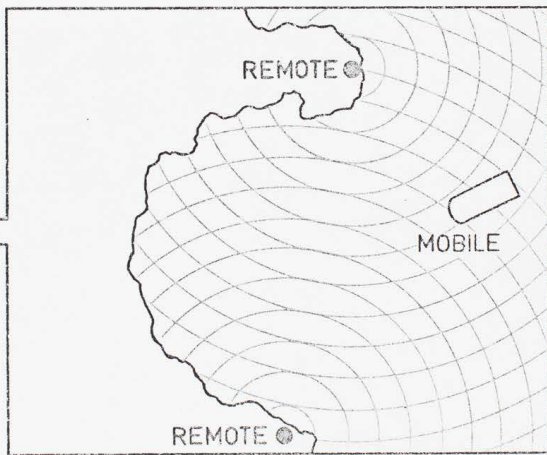
COPY TO: HYDROGRAPHER, THE CHIEF ASSISTANT ENGINEER, THE
HARBOURMASTER for information.

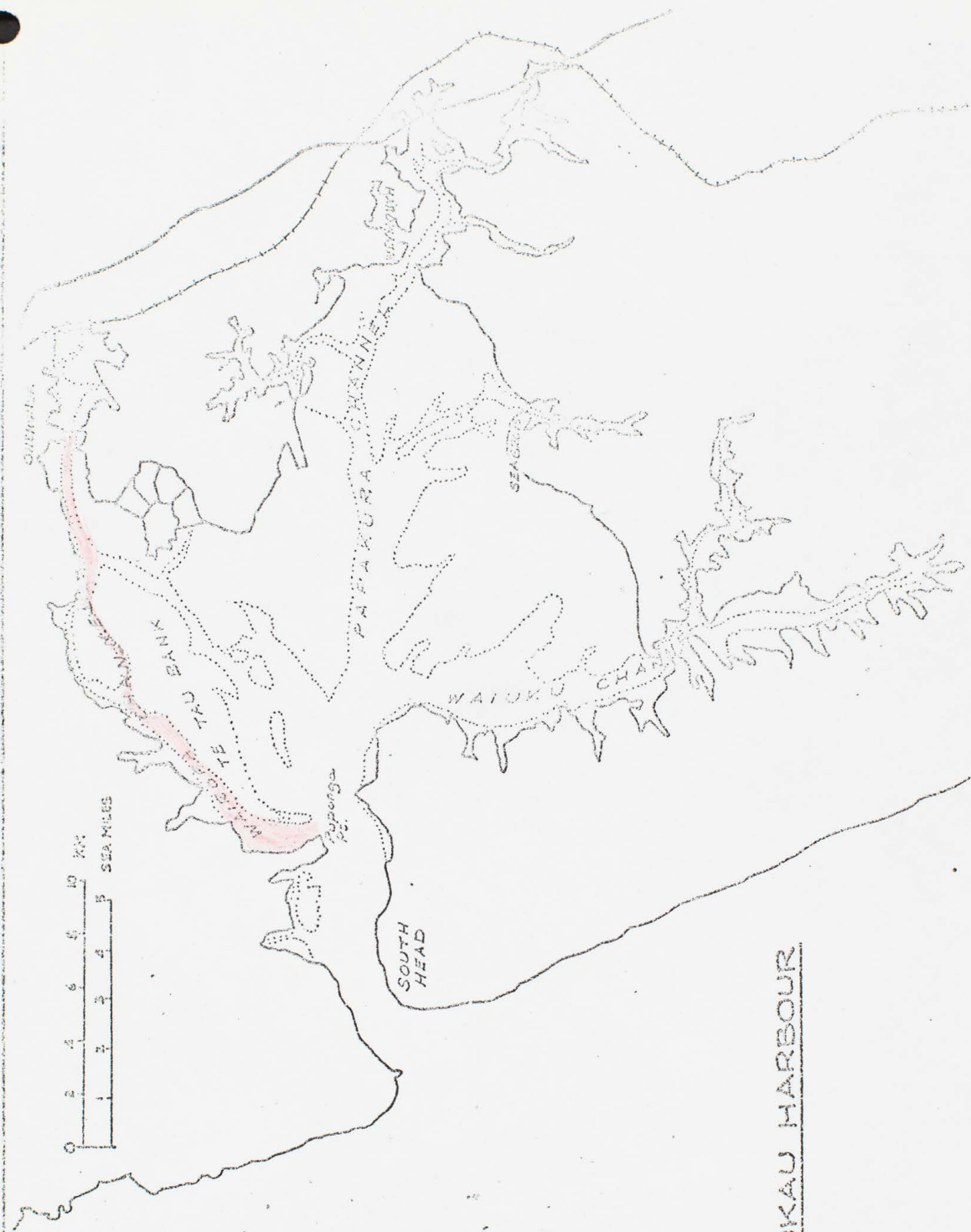
TRISPONDER



EQUIPMENT

- 1 A complete system is easily transported
- 2 A typical Remote Station
- 3 A small survey launch rigged as a Mobile Station
- 4 Transmitter/Receiver Unit
- 5 Mobile station Distance Measuring Unit





MANUKAU HARBOUR

To: THE CHIEF ENGINEER

Date: 11 September 1980

From: THE HYDROGRAPHER

MANUKAU HARBOUR - WAIROPA CHANNEL
REPLACEMENT OF BUOYS BY FIXED BEACONS

(Refer your memorandum of 10 September 1980)

From the entrance to Wairopa Channel at Puponga Point to Onehunga Wharf is a distance of 20 km. Its width varies from 1,000 m at its western limit to 300 m approximately half way, the average width being 500 m.

To resurvey this channel with lines at 100 m intervals involves a total of 100 km (54 nautical miles) of sounding plus examinations and interlines where necessary. The 35 channel buoys would be fixed for position plus a number of stakes placed by yacht clubs.

To determine the drying line sounding would need to be confined to half tide and above (using Launch "Arahi"). Allowing for a sounding speed of 8 knots, steaming time to and from site, time spent in calibrating equipment and other factors, it is estimated that 7 working days would be required. This estimate is based on using electronic positioning equipment.

A resurvey using conventional visual methods would take considerably longer, almost all the beacons erected for the R.N.Z.N. survey of 1961 have gone including their own survey marks erected on drying banks. Of 20 survey marks used by the two M.L.'s in the Wairopa Channel only 3 remain. With the resources available to us it would be expected to take at least three months to establish stations for visual control and carry out this survey by conventional methods.

Costs Using Decca Trisponder

Timaru Harbour Board have this equipment available for hire for the months of January and February 1981 only. Their hiring charge is \$175 per working day. Air freight charge would be \$60 each way.

Transportation of "Arahi" to Manukau Harbour

Messrs James Davern Ltd quote \$160 each way.

Additional Costs

1. Provision of 4 12v batteries to power shore stations.
2. Road transport to convey the shore equipment to site each

... ..

JB
22/9/80

day (one site at Seagrove 50 km from Auckland, the other in vicinity of Onehunga).

3. Provision of tide watcher at Cornwallis Wharf which is unsuitable for installation of automatic tide gauge.
4. Laying of suitable moorings at Onehunga for "Arahi".

Summary of Costs

1. Hire of Trisponder 7 working days	\$1,225
2. Air Freight from and to Timaru	120
3. Road Transport "Arahi"	320
4. Batteries	240
	<u>\$1,905</u>

Personnel

A minimum of three crew would be required in the survey launch as follows:- Launchmaster, Surveyor and one hand to attend to echosounder and dataprinter.

Ashore one hand would be required to attend to each remote station (for the outer half of the survey one station could be left unmanned at Onehunga Wharf).

One person would be required to read and record the tidal heights at Cornwallis Wharf. Should, for any reason, the survey section be understaffed during this period it would become necessary to make up the deficiency from other Departments.



HYDROGRAPHER

JHR:JMH



To: THE CHIEF ENGINEER

Date: 11 September 1980

From: THE HYDROGRAPHER

DECCA TRISPONDER SURVEY EQUIPMENT

Further to my memorandum of today's date the following information on the hire and purchase of the above equipment is forwarded for your information:-

Hire Charges from Decca, (Australia) Ltd

The following charges are for the basic equipment consisting of 1 master station (afloat), 2 remote stations (ashore), one data printer and one D.M.U. (Distance Measuring Unit).

Under one week	\$440 per day
Under one month	\$314 per day
Under three months	\$207 per day
Under twelve months	\$190 per day
Over 12 months	\$108 per day

The above figures are quoted in Australian dollars.

Purchase Price

The above equipment can be purchased through Decca (Aust.) Ltd for NZ\$39,000, an additional and necessary item would be a systems spares kit for NZ\$5,000. Delivery is 40 days from date of order.

In reliability and accuracy the various systems appear to be very similar. An advantage in selecting Decca Trisponder, apart from the fact that it is the one most widely used in New Zealand, is that the Naval Dockyard have undertaken to service this equipment and this arrangement (on a repayment basis) is conducted through Murray North, Monro & Partners, acting as agents for Decca (Aust.) Ltd.

HYDROGRAPHER

JHR:JMH

JB
22/9/80



ROYAL NEW ZEALAND NAVY
HYDROGRAPHIC OFFICE
BURNS AVENUE . TAKAPUNA
AUCKLAND

P.O. BOX 33341
AUCKLAND 9
TELEPHONE
495 062
CHART SALES
495 063

PLEASE REPLY TO THE HYDROGRAPHER QUOTING HNZ 3/4315

2nd September 1980

The Harbourmaster,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Sir,

This office is preparing two new metric charts covering the area from Cape Maria van Diemen to Cape Egmont. They will be on a scale of 1:300,000, based on provisional data and scheduled to be published within the next six months.

As a consequence of this it would seem to be opportune to examine the possibility of producing new metric versions of existing fathoms charts of ports and harbours in the same area. In most cases it is likely that existing survey data can be used without the necessity of significant new survey work. In some areas however there are indications of change that have been revealed through recent check soundings. In particular that part of the Manukau Harbour north east of Puponga Point for which we intend to issue a block correction.

It may be that other changes have occurred along the Wairopa Channel and I wonder whether you have any plans for new surveys in the near future that would influence our cartographic work programme.

It would be logical to metricate both NZ 4314 and 4315 with the objective of publishing them at the same time as far as possible. Because of our stock situation and staff capacity it is unlikely that these two new metric charts would be available before March 1982 but work on them would need to start early next year in order to accomplish this. New hydrographic surveys could be incorporated up to about October 1981.

It would greatly assist our planning if you could inform us of any intended surveys in the Manukau Harbour area in terms of the time scale outlined above.

Yours faithfully,

R. Evins

(R. Evins)
for HYDROGRAPHER, RNZN.

B
22/9/80
COPY TO: Mr J. Reith.

10 September 1980

The Naval Hydrographer
Naval Hydrographic Office
P.O. Box 33341
Takapuna
AUCKLAND 9

Attn. Mr R. Evins

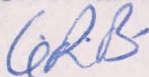
Dear Sir

PROPOSED METRICATION OF CHARTS N.Z. 4314 AND N.Z. 4315

Thank you for your recent letter outlining your time scale for the metrication of N.Z. charts 4314 and 4315.

The Board has no immediate plans to re-survey the whole of the Manukau Harbour. However, should changed circumstances require additional surveys to be carried out you will be informed.

Yours faithfully



C. Ross Blair
HARBOURMASTER

✓ c.c. Mr J. Reith, AHB Hydrographer

To: THE CHIEF ENGINEER, HARBOURMASTER, O.I.C.
ONEHUNGA, ASSIST. OPERATIONS MANAGER Date: 31 July 1980

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A survey of the South Channel was carried out in very calm sea conditions over the high water period on 30 July 1980.

Resultant plan, Amendment No. 4 to H5/1S/44, is attached and shows the following changes in the channel since the previous survey (see Amendment No. 3) in February 1980.

1. The breach in the spit at the northern end of the channel on Destruction Gully leads has widened further with some movement of sand bank to the west of the leads to the northward.
2. The shoal lying athwart the channel on the Hill leads to the west of the Light House remains relatively stable but has increased in width by about 100 metres to the south. Inside this shoal a patch with a least depth of 2.9 metres exists close eastward of the leads in position 243° 1460 m from the Light House.

The least depth on the Hill leads is now 3.3 m (11 ft) 244° 1510 m from the Light House. The better water is still to the westward of the leads with the saddle of the two hills in line with the 900 ft peak for the best approach.


HYDROGRAPHER

JHR:JMH

Enc. Plans H5/1S/44,
Amendments Nos. 3 & 4

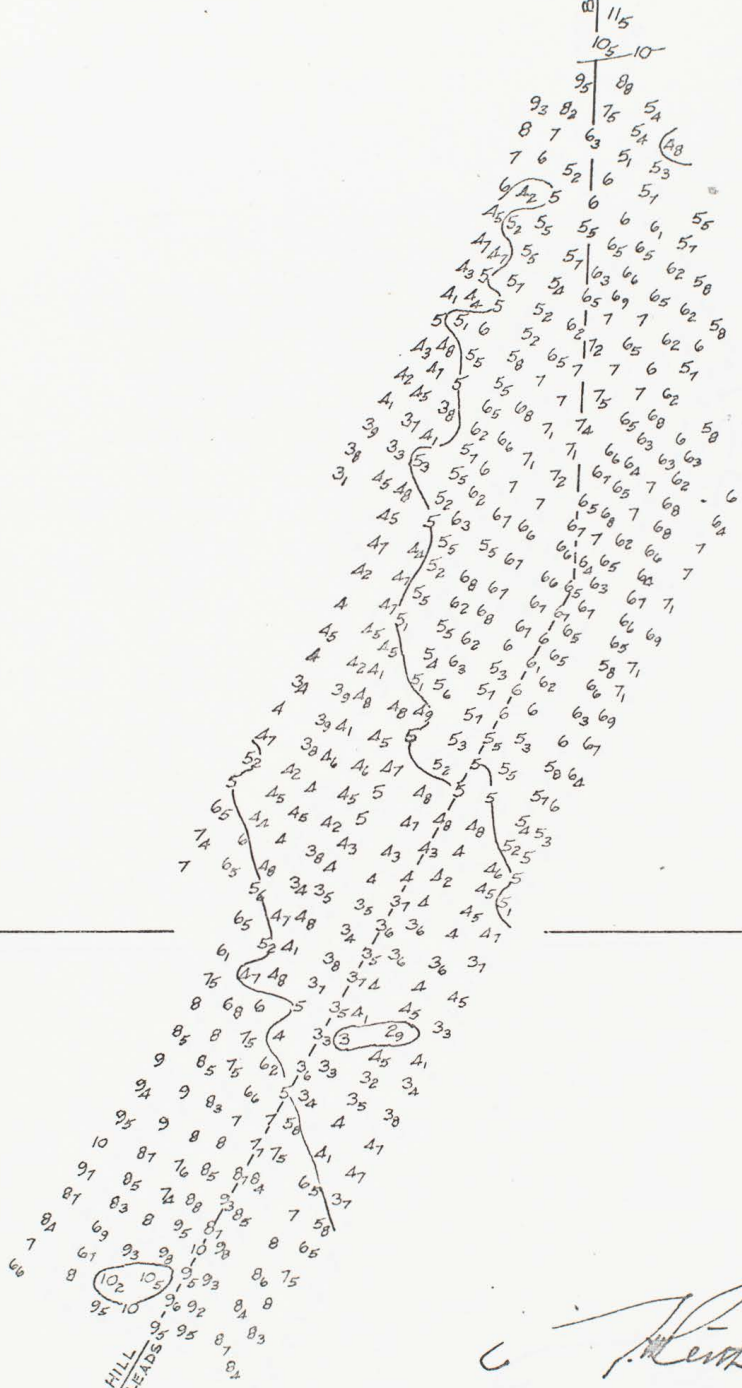
*Goody
HS*

Rec.

Brs in line 002°

174°

32'E



LT. HO.
⊙

37° 00' S

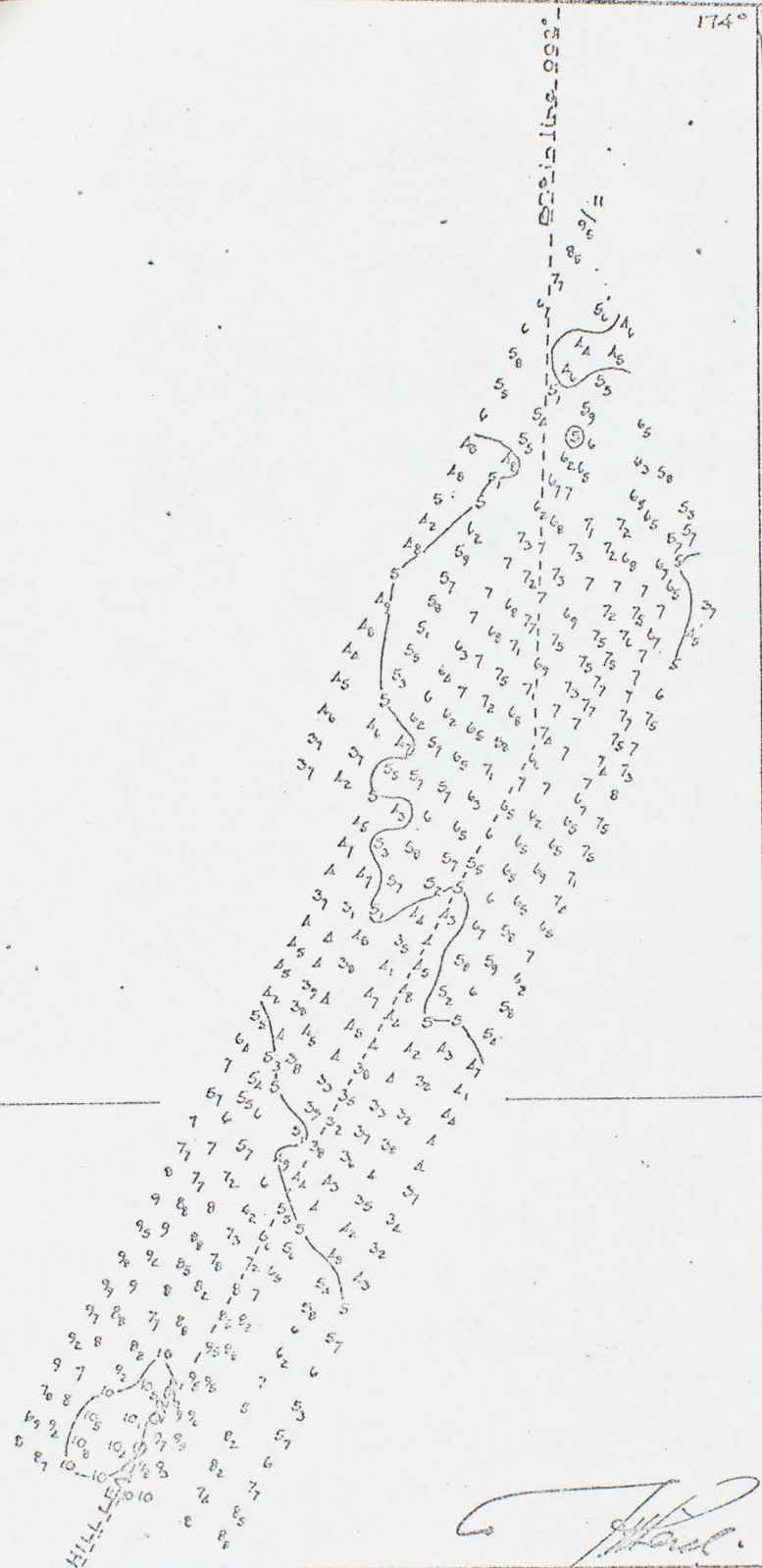


MANUKAU HARBOUR ENTRANCE
 SOUTH CHANNEL
 SURVEYED 30.7.80
 Soundings in metres & decimetres below C.D.

DRAWN J.H.R.
 DATE 31.7.80
 SCALE 1 : 12000

DRAWING
 H5/13/44
 Amendment No. 4

174° 32' E



LT. HQ
⊙

37° at S



MANUKAU HARBOUR ENTRANCE
SOUTH CHANNEL
SURVEYED 20.2.80
Soundings in metres & decimetres - C.D.

DRAWN C.T.
DATE 20.2.80
SCALE 1:12000

DRAWING
H5/15/44
Amendment n.3

1117/1

FILE 1117

FILE NOTE

MANUKAU BAR - R.N.Z.N. HYDROGRAPHIC RESPONSIBILITIES

Reference

- (a) Harbour Association Memo 30 May 1980.
- (b) Hydrographer - Chief Engineer 9 June 1980.
- (a) Somewhere about 1968-69, the Navy made a commitment to survey the bar and entrances every 5 years.
- (b) The Board then accepted the Commitment to survey the channels as required, and to obtain such other information as the bar, that safe operations of our hydrographic vessels permit.
- (c) The Navy intention to re-survey in 1970 did not occur until 1977 (February).
- (d) At the present time only south channel operates. South west closed up some two years ago.
- (e) Both Navy Hydrographer and my Hydrographer agree it is pointless doing a complete survey or even general checks. Possibly R.N.Z.A.F. aerials at appropriate times could be more useful.
- (f) Both above have an agreement to meet in September and discuss further.
- (g) Provided the problem of weather and availability of Manukau complement we have the resources to maintain adequate checking.
- (h) The question of 5 yearly survey commitments by Navy is now 10 years old. They were 7 years late with their survey and having regards the commitments today and in the future it appears unlikely that any positive answer would be given.
- (i) Accordingly I recommend the Statements be accepted for this year and after discussions by the two Hydrographers in September we will review the situation.

N. Seagar
CHIEF ENGINEER TO THE BOARD

NS/TK

Send to Sec. & Reeth'

File



To: THE CHIEF ENGINEER

Date: 2 July 1980



From: THE HARBOURMASTER

REPORTED VESSEL GROUNDINGS VICINITY NO.1 BUOY MANUKAU HARBOUR

The two Pacific Islands vessels M.V. "Ile De Lumiere" and M.V. "Fijian" recently grounded, without any apparent damage, in the vicinity of No.1 buoy, Manukau Harbour.

This is to confirm my previous request that :-

- (a) The position of No.1 buoy be checked.
- (b) That soundings be taken in the area south of the buoy to detect any change from the charted depth.

Robert Blair

HARBOURMASTER

*Hydrographer - presume that original request
to you. X.*

*MS
3/7/80*

Surveyed 2.27.80

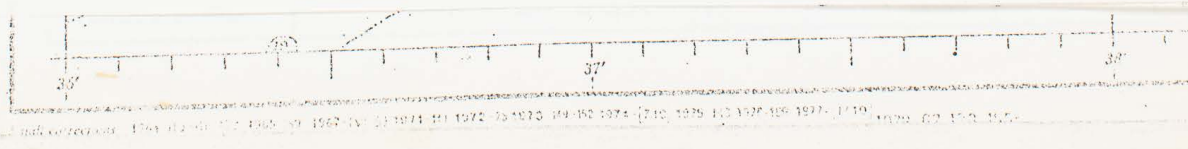
memo attached

3.7.80

*X. I have no recollection of being asked to do this
previously except for a request to fix all Manukau
buoys in 1978*

MS

[Signature]



To: THE CHIEF ENGINEER
THE HARBOUR MASTER

Date: 3 July 1980

From: HYDROGRAPHER

WAIROPA CHANNEL - VICINITY NOS. 1 & 3 BUOYS

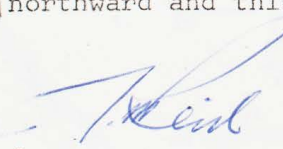
REPORT OF SURVEY

As a result of a report of the grounding of M.V. "FIJIAN" on 30/6/80 in a position south of No. 1 buoy, received on 1/6/80, a survey of the area was carried out by the hydrographic Section on 2/6/80.

The attached plan H5/30 shows the results of the survey (in Fathoms and feet) and it is clear that the southern point of Te Tau Bank has extended to the south by about 400 metres since the R.N.Z.N. survey in 1961. As a consequence of this vessels entering Wairopa Channel from the S.E. after anchoring in Big Bay and making to round No. 1 buoy are being led into shoal water. It is therefore recommended that No. 1 buoy be moved to a position 110° , 850 metres from the Memorial on Puponga Point, approximately 183° , 420 metres from its present charted position. As a precautionary measure a marker buoy was laid in this position and, taking the track of a vessel entering from Big Bay anchorage, a line of soundings was run from this point in a direct line to No. 3 buoy, this giving a least depth of ⁴²11 feet.

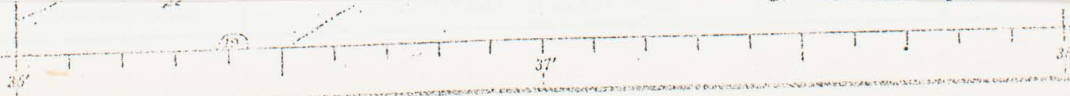
No. 1 buoy is 170 m south of its charted position and consideration was given to dragging it further south to the recommended position above, but the buoy has not been changed since October 1977 and the risk of parting the chain was considered too great.

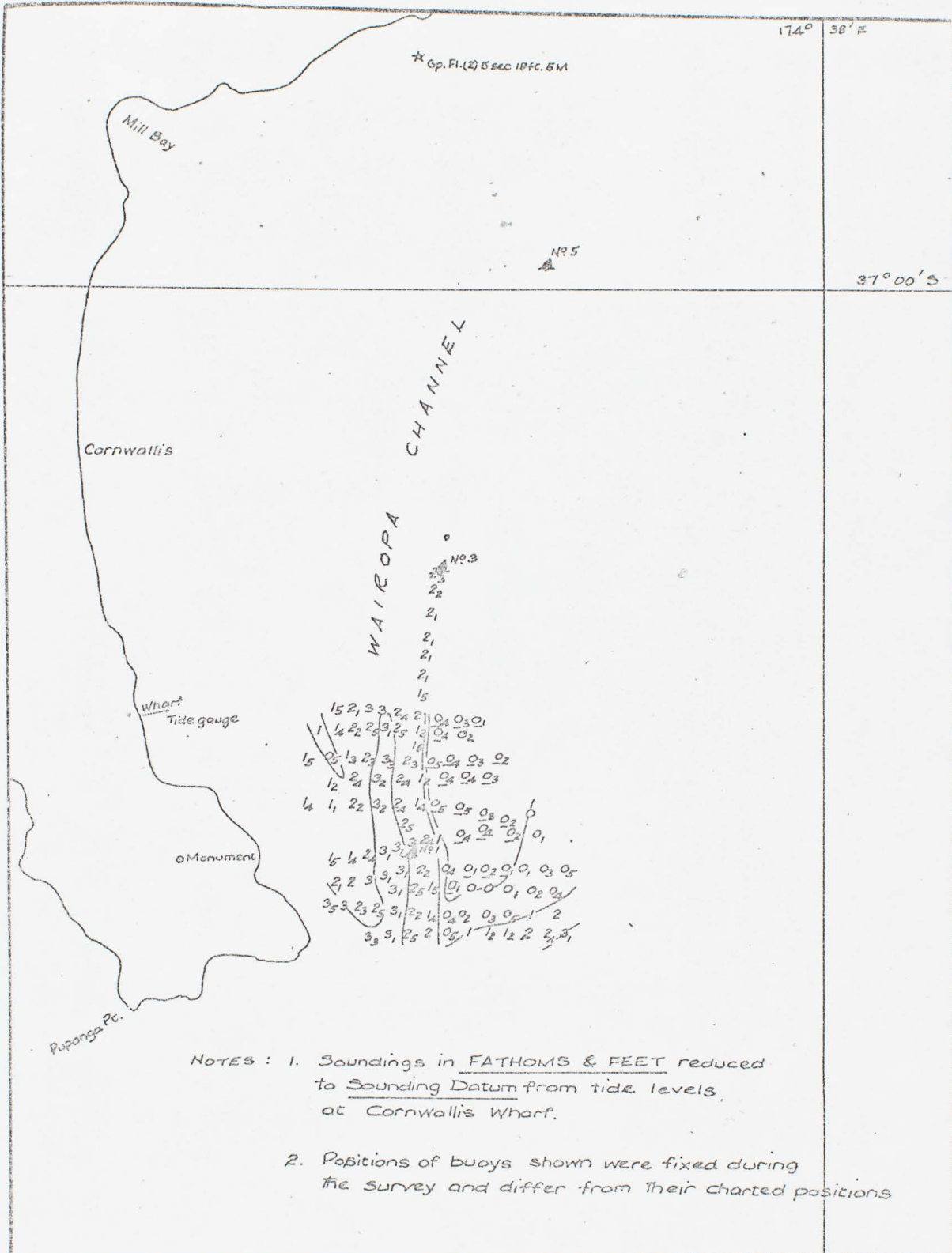
The extent of change in channel alignment and depths in the area from those of 1961 would appear to warrant additional survey work at least along the Wairopa Channel to No. 5 buoy. There is, however, a shortage of survey marks in this locality and only the area surveyed yesterday was possible with the control available. The establishment of at least one, or preferably two coordinated survey marks along the foreshore between Cornwallis Wharf and Mill Bay is required to continue this survey to the northward and this will be undertaken as other duties permit.


J. H. Reith
HYDROGRAPHER

Enc: H5/30
Portion of Chart N.Z. 4315

JHR:TK





- NOTES : 1. Soundings in FATHOMS & FEET reduced to Sounding Datum from tide levels at Cornwallis Wharf.
2. Positions of buoys shown were fixed during the survey and differ from their charted positions



MANUKAU HARBOUR
 WAIROPA CHANNEL
 SURVEYED 2 JULY 1980

DRAWN J. H. R.
 DATE 3. 7. 80
 SCALE 1:18000

DRAWING
 H 5 / 30

To: THE CHIEF ENGINEER

Date: 9 June 1980

From: THE HYDROGRAPHER



MANUKAU BAR SURVEY

I have discussed this matter with Cdr. Jaques, the new RNZN Hydrographer, who was on the Hydrographic Working Party that has vetoed the original decision to carry out a sketch, or reconnaissance survey of the Approaches to Manukau in 1982. Their primary reason, of course, is the work load for the new inshore survey craft and the fact that even a sketch survey (which he does not approve of) can tie one of the craft up for a long period while waiting for suitable weather conditions.

I can see his point and in fact consider the matter of little import as a sketch survey, as I had proposed, would only have given us a general idea of the movement of certain features such as the layout of the South Bank and the general direction of the Main Channel. It may have given me an idea where to look for the alternative to the South Channel, but in general could only be considered of academic interest.

The present situation therefore is that the South Channel is being used by all ships other than trawlers and has retained a relative stability since July 1976 and six monthly surveys now appear to be adequate for shipping needs. Regular surveys of the S.W. channel between the period July 1976 to January 1978 indicated marked instability and this channel has not been re-surveyed since, neither is it used by shipping.

I would propose that, subject to the availability of the Tug "Manukau", we spend some time next summer in exploring the perimeter of the Bar for the existence of the second channel and define the present course of the Main Channel. It is, however, stressed that ships always prefer to work the South Channel because of the better sea conditions to be found there and that even if a reasonably deep S.W., W or NW channel is discovered we know from past experience that it will be subject to change with all the attendant problems of continuous monitoring and provision of suitable leading marks for safe navigation.

The problem is a perpetual one and as I see it our only course is:-

- (a) To continue to monitor the South Channel at a frequency governed by its stability.
- (b) At longer intervals to study the overall Bar movement so that in the event of the South Channel closing up we know where to seek an alternative channel across the Bar.

US
10/6/80

HYDROGRAPHER

JHR:LB

original returned H.O.
10/6/80

54/1
copy for
549

HARBOURS ASSOCIATION OF NEW ZEALAND
PANAMA HOUSE (SECOND FLOOR), 22/24 PANAMA STREET
WELLINGTON, 1.

Telegraphic Address:
"HARUNION"
WELLINGTON

TELEPHONE 728-051

All Correspondence to be
Addressed to:
P.O. Box 1765
WELLINGTON, 1

HARBOURS AND HARBOUR BOARD
3-JUN 1980
18



30 May 1980

MEMORANDUM to:

The General Manager

AUCKLAND, BAY OF PLENTY, HAWKES BAY, LYTTTELTON, SOUTHLAND
AND WELLINGTON HARBOUR BOARDS

HYDROGRAPHIC SURVEYS

The following is the advice contained in a letter dated 27 May 1980 received from the Ministry of Transport concerning decisions of the Hydrographic Working Party.

"Auckland Harbour Board
Manukau Harbour Bar

It was decided that as the Auckland Harbour Board had the full facilities for a survey that they could undertake the survey of the Manukau Harbour Bar.

Bay of Plenty Harbour Board

As the survey work required for this area was reasonably simple it was decided that the Bay of Plenty Harbour Board could carry out any survey required.

Hawkes Bay Harbour Board

The proposed Hydrographers Survey Programme has the approaches to Napier listed as May-July 1980.

Lyttelton Harbour Board

This harbour was not scheduled for survey by the Navy in the near future mainly because the Board was yet to provide the details required before survey.

Southland Harbour Board

This area is within the area planned for a large scale survey in September/October 1980.

Wellington Harbour Board

This area is still on the schedule for survey but is not considered as a high priority."


R.E. Dawson
Acting Chief Executive Officer

Copy of Hydrographers
Committee re Manukau Bar
attached
HS 10/6/80



Memorandum

To: THE CHIEF ENGINEER
THE HARBOURMASTER

Date: 21 February 1980

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A survey of the South Channel was carried out in good sea conditions shortly before High Water on 20 February 1980.

Resultant plan, Amendment No 3 to H5/1S/44 is attached and shows the following changes in the channel since the previous survey (see Amendment No. 2) in July 1979.

1. At the northern end of the channel a breach has been made in the spit of less than 5 metres previously extending across the width of the channel.
2. The shoal lying athwart the channel on the Hill leads to the west of the Light House has moved about 100m to the S.W.

The least depth on the Hill leads is now 3.2m (10.5 ft) 247° 1360 m from the Light House. In general the better water appears to be to the Westward of the leads although the shoals indicated were very small peaks and, due to their migratory nature, could either disappear, or move elsewhere possibly even on the next tide.

HYDROGRAPHER

JHR:MG



Plans H5/1S/44 Amendments 2 & 3

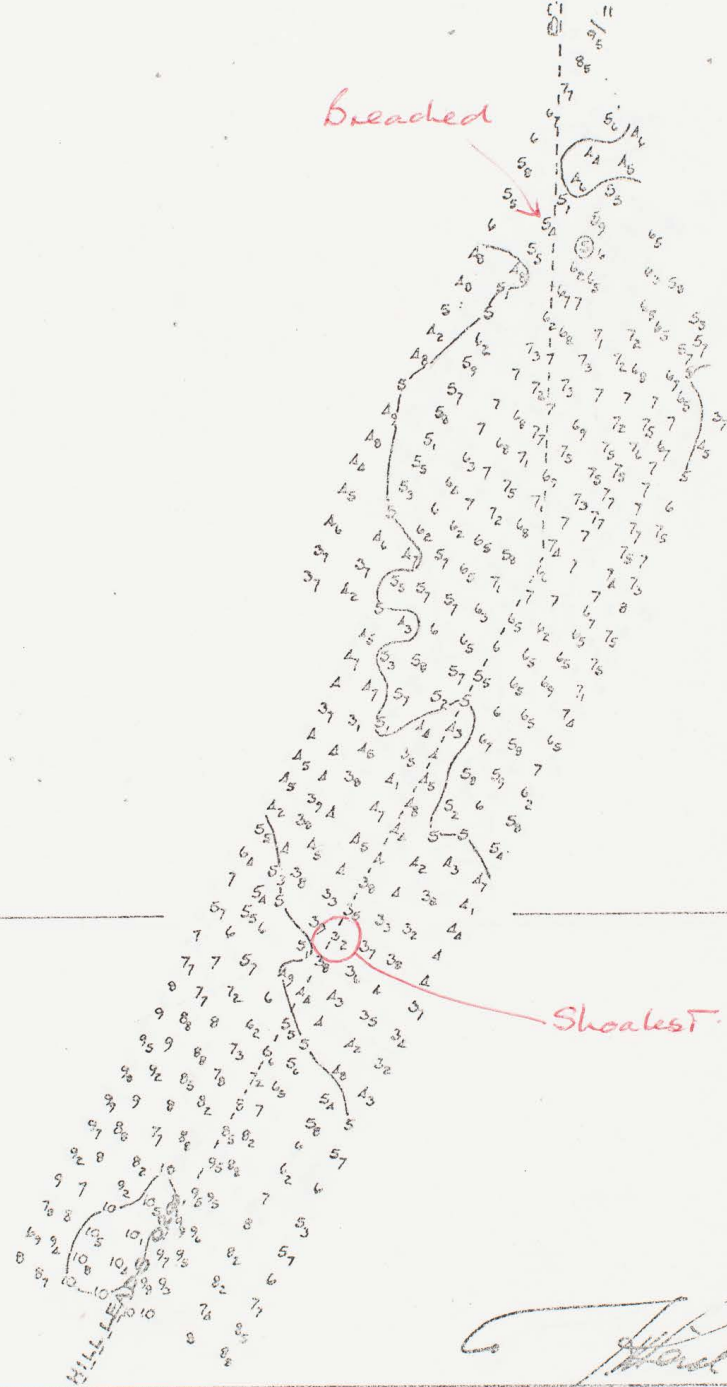
4/5 Mr. Leblond Blec.
Mr. Bray JB
Mr. Wells Green Rof.
File

copy sent to d/I/c Orehunga

174° 32' E

C/E.

Breaded



Lt. No
©

37° 04' S

Shoalest

J.P. Wood



MANUKAU HARBOUR ENTRANCE
 SOUTH CHANNEL
 SURVEYED 20.2.80
 Soundings in metres & decimetres - C.D.

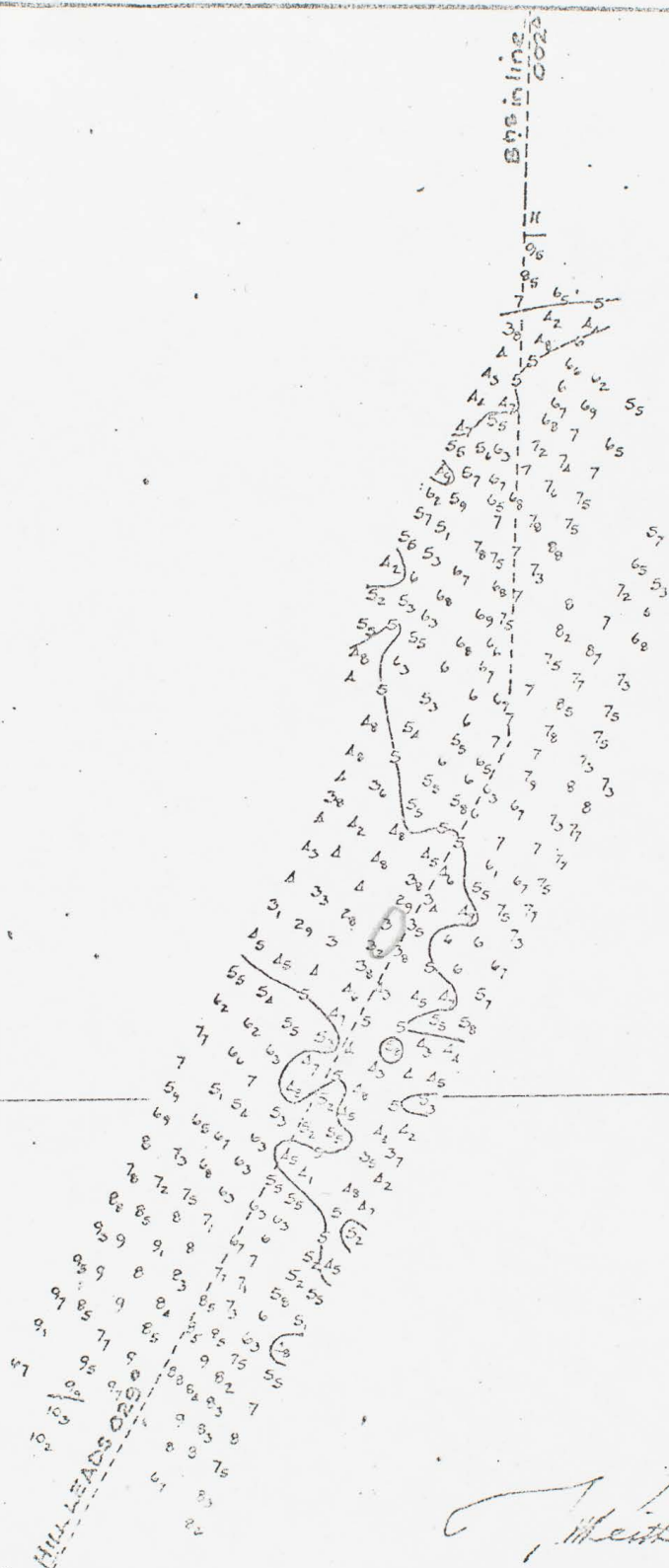
DRAWN C.T.
 DATE 20.2.80
 SCALE 1:12000

DRAWING
 H5/15/A4
 Amendment No 3

174° 32' E

~~H.M.~~
C/E

Base line
0022



LE 10

37° 04' S

J. Heath



MANUKAU HARBOUR ENTRANCE

SOUTH CHANNEL
SURVEYED 10.7.79

Soundings in metres & decimetres - C.D.

DRAWN C.T.

DATE 10.7.79

SCALE 1:12000

DRAWING

H5/13/44

AMENDMENT NO 7



To: THE CHIEF ENGINEER
THE HARBOURMASTER

Date: 11 July 1979

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A survey of the South Channel was carried out in average sea conditions shortly after High Water on 10 July 1979.

An abortive attempt to survey the South Channel was made on 7 June, but 25 knot southerly winds against a strong ebb tide created sea conditions which rendered the echo sounder inoperable. Consequently, this is the first survey for some six months and some changes in the area are evident from the results obtained.

On the Hill leads in position 264° 1030 m from the Light House a least depth of 3.4 m (11'3") now exists with a shoaler depth of 2.9 m (9'6") lying some 50 m to the westward. A shoal bank with a least depth of 3.8 m (12'6") has formed across the northern entrance on the Destruction Gully leads in position 320° 1290 m from the Light House.

Again, as in all the recent surveys, the better water is to be found to the eastward of both sets of leads.

HYDROGRAPHER

JRH:JMH



Resultant Plan H5/1S/44
Amendment No. 2

lls
11/7/79

File

174° 32' E

Bns in line
0023



LE HO

37° 04' S

Menth.



MANUKAU HARBOUR ENTRANCE
SOUTH CHANNEL
SURVEYED 10.7.79
Soundings in metres & decimetres - C.D.

DRAWN C.T.
DATE 10.7.79
SCALE 1:12000

DRAWING
H5/15/44
AMENDMENT NO 2



Memorandum

To: THE CHIEF ENGINEER
THE HARBOURMASTER

Date: 31 May 1978

From: THE HYDROGRAPHER

MANUKAU ENTRANCE - REPORT OF SURVEY

A survey of the south channel was carried out in good sea conditions over low water period on 30/5/78. Due to the tidal state seas were breaking along the western perimeter of the Bar and no survey of the south west channel was possible.

The south channel continues to remain stable, probably due to a long period of time with few strong south westerlies. The least depth on the Hill Leads was 4.0m (13'.2) in position 260° 1100m from the Lighthouse, with better water to be found slightly to the eastward of both sets of leads.

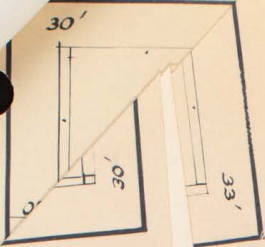
Resultant plan H5/1S/44 attached.

J.H. Reith
HYDROGRAPHER

JHR:MO'N



Blal
AS
The 4 leads
the 1100m
the file
JHR



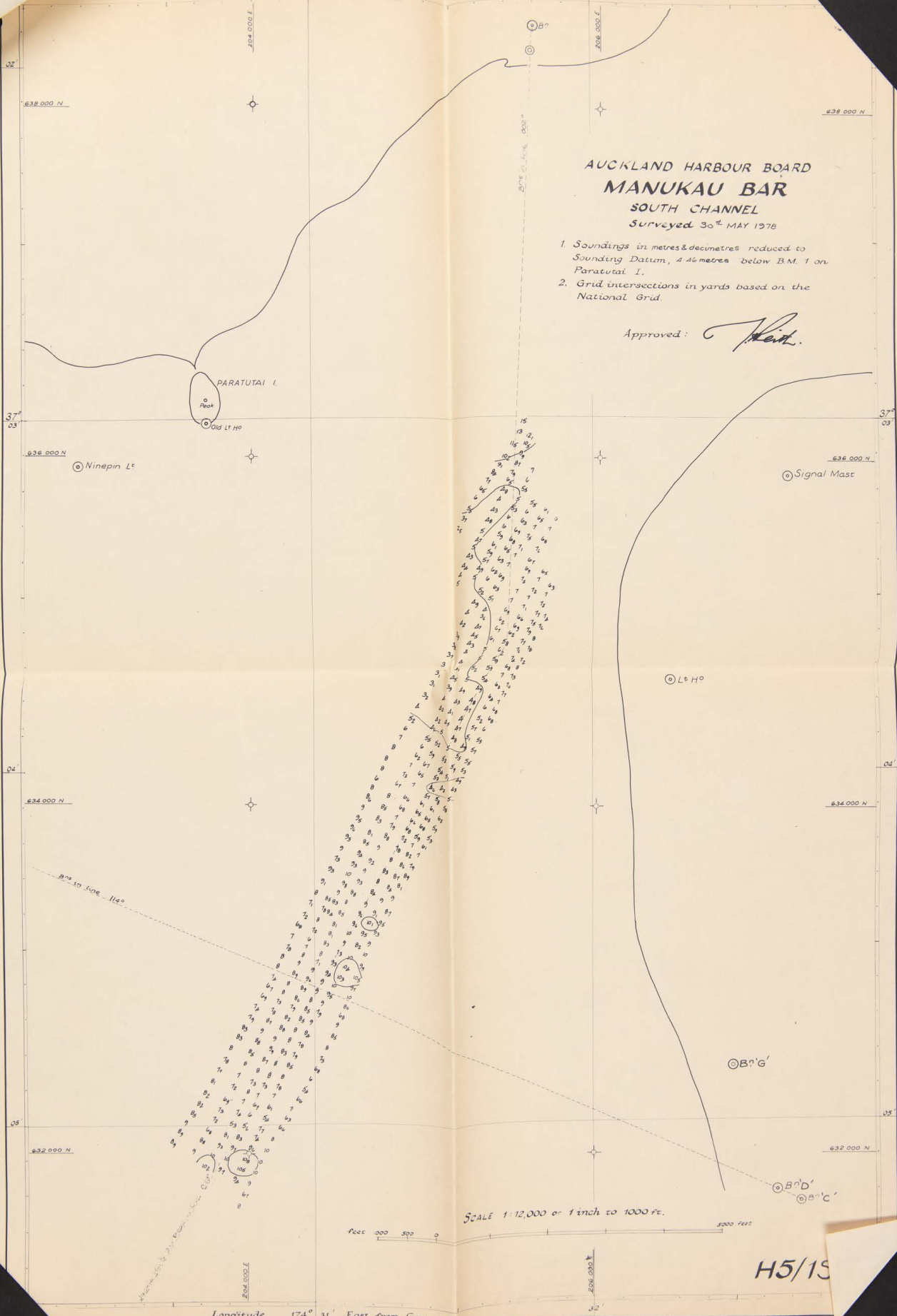
174° 31'

174° 31'

AUCKLAND HARBOUR BOARD
MANUKAU BAR
 SOUTH CHANNEL
 Surveyed 30th MAY 1978

1. Soundings in metres & decimetres reduced to Sounding Datum, 4.46 metres below B.M. 1 on Paratutai I.
2. Grid intersections in yards based on the National Grid.

Approved: *[Signature]*



SCALE 1:12,000 or 1 inch to 1000 ft.

feet 000 500 0 1000 feet

H5/15

Longitude 174° 31' East from Greenwich



To: THE CHIEF ENGINEER
THE HARBOURMASTER

Date: 7/10/77

From: HYDROGRAPHER

MANUKAU ENTRANCE - SOUTH & SOUTH WEST CHANNELS
REPORT OF SURVEY

A survey of both S. & S.W. Channels was carried out in moderate to good sea conditions on 6th October 1977; this being the first check survey since the R.N.Z.N. Survey of February 1977.

South Channel

→ A general improvement in depths is apparent, the best approach being directly on both sets of leads. A least depth of 4.4m (14' 6") was obtained on The Hill leads and 4.3m (14') on the Destruction Gully leads. (Resultant Plan H 5/1S/43 attached).

Note: The painting of the lower Destruction Gully Beacon in Orange Glare has not improved its visibility at a distance, rather the reverse appears to be the case.

Have done

I would suggest that the orange triangle be retained, but backed by a square of white, a combination I have found to be very effective.

South West Channel

This area was sounded at about two hours before High Water during a Neap Tide and 2.0 metres on the gauge. Breakers were in evidence along the whole perimeter of the Bar, but few in the region of the area surveyed.

→ Again, this survey shows better water than found in February, the best approach being about 1 cable to the north of the leads, which approximates to the leads being open to the north by one Cutter Rock width. Least depth on this approach 4.5m (14' 9").

Resultant Plan Amendment No. 1 to H5/1W/41.

J.H. REITH

Enclosures: H5/1S/43

H5/1W/41 Amendment No. 1

JH
16/10/77

Mr de Clare
Mr P.W. Green
Mr Lee
Sec.

30'



174° 27' E

37° 05' S

AUCKLAND HARBOUR BOARD

MANUKAU HARBOUR ENTRANCE
SOUTH WEST CHANNEL

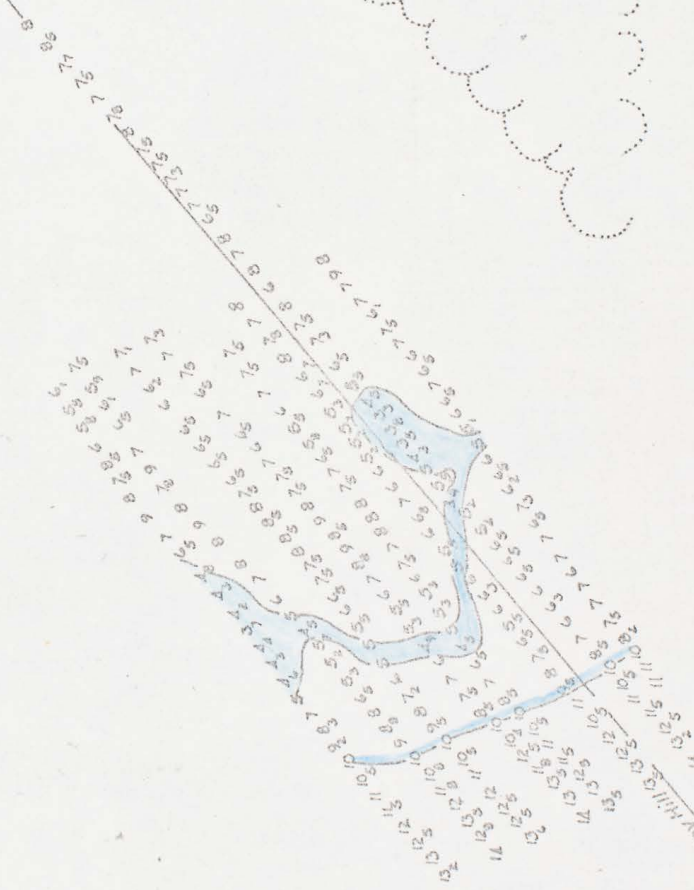
Scale 1:12000

Surveyed 6.10.77

Soundings in metres & diameters

AMENDMENT NO 1 TO PLAN H5/W/41

T. H. ...



Cutler Rock & Clay Hill
Bn in line OS 10

37° 05' S

174° 27' E

THE GENERAL MANAGER

3 May 1978

THE CHIEF ENGINEER

MANUKAU HARBOUR - GRACILARIA

LETTER FROM UNIVERSITY OF AUCKLAND DATED 30/4/78

The Auckland Regional Authority Works Division (Manukau Treatment Plant) have been researching the question of the use of the seaweed Gracilaria as a medium from cultivation for firstly the reduction of nutrient from treatment plant effluent and secondly the recovery of the nutrient enriched seagrass for processing to recover agar. Davis Gelatine have for some years been interested in this process as a commercial venture. The Regional Water Board has been approached by the Works Division A.R.A. to be involved particularly to seek a Government Subsidy towards the research.

I understand that there is presently a consortium working towards establishing the full research programme comprising the A.R.A., University and Davis Gelatine.

In respect of the question asked "Is there any way in which rights to the commercial exploitation could be gained to allow effective management".

As I see it, if it is intended to use the harbour for farming of the seaweed then

- (a) The Marine Farming Act 1971 is the applicable statutory process, which recognises marine vegetation or vegetation cultivation.
- (b) The Manukau Harbour is under the control of this Board. The tidal lands are vested in this Board but sea bed below tidal lands is vested in the Crown.
- (c) The Act deals with responsibility to approve a proposal to cultivate, and the issue of leases of licenses depending on the situation in (b) above.

The letter is specific as to purpose, but does not indicate any intended use of the harbour. I feel that the reply would simply be - "If it is intended to develop cultivation of Gracilaria in the harbour, then the proposal will be subject to the provisions of the Marine Farming Act 1971, and that having regard to control of the Manukau Harbour, the Auckland Harbour Board will be principally concerned in association with the Ministry of Transport in any approvals".

CHIEF ENGINEER TO THE BOARD

NS:JMH

1117

Auckland Harbour Board

MEMORANDUM

1 September 1977

FROM

THE HARBOURMASTER

TO

THE CHIEF ENGINEER

MANUKAU BAR CHANNELS

The channels of the Manukau Bar were last sounded by naval survey in February 1977 and since that time most vessels have used the south channel because of loss of water in the south west approach.

Because of the volume of shipping and changes in these channels it is necessary to check the surroundings in both channels.

Could you please arrange a survey to be carried out.

R. Ombler
HARBOURMASTER



US
Hydrographer

C/E. Both channels will be surveyed at the earliest opportunity

US
10/9.

P. 5. 9. 77.

1117

Auckland Harbour Board

MEMORANDUM

30 March 1977

FROM

THE HYDROGRAPHER

TO

THE CHIEF ENGINEER

MANUKAU BAR - REPORT OF SURVEY
BY H.M.N.Z.S. TARAPUNGA & TAKAPU.

The two survey M.L.s above with Lt.J.A. Stoakes, R.N.Z.N. in command, commenced their survey of the bar area on 22 January 1977 and completed on 24 February 1977. During this period 14 working days were achieved.

At our request the final survey plans were compiled into two charts suitable for use by the mariner using the format of separate plans for S. & S.W. channels recently adopted by us. Copies of these plans (H5/1W/41 and H5/1S/42) have been sent to the Harbourmaster for issue to Shipping Companies etc. and are appended to this report.

A copy of Lieut. Stoakes Report of Survey was forwarded to me from which this extract is quoted "Throughout the period it was noted that a considerable and unpredictable change in the depth over shoal areas takes place. Changes of up to 2 metres were noted over a 3 week period and for this reason no close investigations were carried out over the many shoals in the area where the need to do so would have been clearly indicated in a regular survey."

Examination of these soundings show that the S.W. channel remains unstable with shoal patches of less than 5 metres (16.5ft.) along the entire perimeter effectively barring the S.W. & W. approaches. South Channel has a limiting depth of 3.3m (11 feet) on the Hill Leads with better water to the westward. With the generally better sea conditions this channel is now in general use by the larger vessels using the port.



J.H. Reith
HYDROGRAPHER

JHR:JARP

Appendices H5/1W/41
H5/1S/42

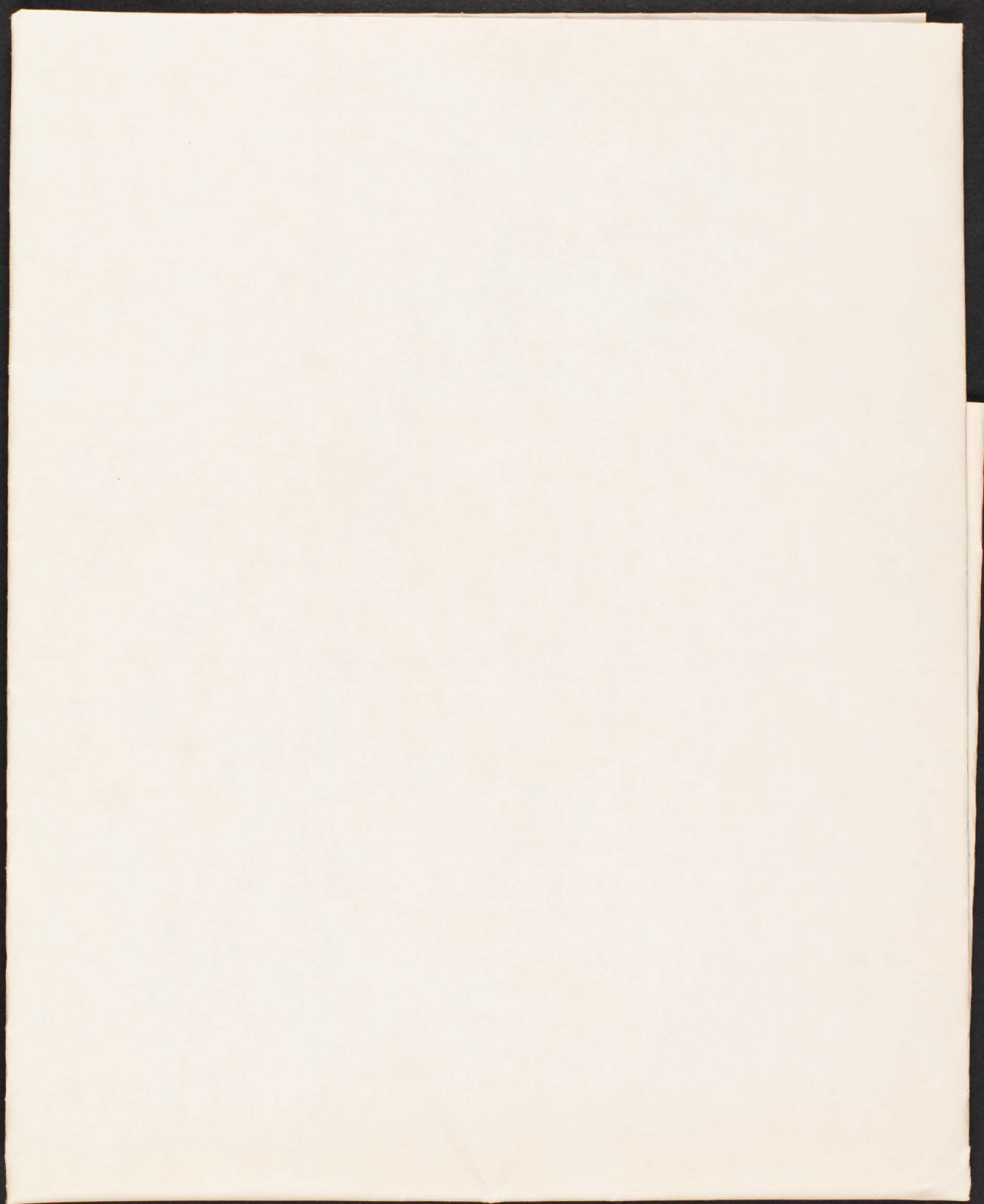
Copy to: HARBOURMASTER



Handwritten initials and date:
31/3/77

Handwritten notes:
Mr. Lyblair
Mr. Pembroke
Blc.
Lester
RVP
Please file!

Manukau Bar.
Report of Survey
Plans H5/1W/41
H5/15/42.



Auckland Harbour Board

MEMORANDUM

25 November 1976

FROM

THE HYDROGRAPHER

TO

THE CHIEF ENGINEER
THE HARBOURMASTER

MANUKAU ENTRANCE - SOUTH & SOUTH WEST CHANNELS
REPORT OF SURVEY

22.11.76 SOUTH CHANNEL

A survey of the South Channel was completed under perfect sea conditions and a start made on the S.W. channel.

Resultant Plan H5/1S/40 shows similar bathymetric features to the last survey in September although the ridge extending across the channel to the west of the lighthouse shows slight shoaling and the best water of 2 fathoms is now to be found on the Hill Leads.

A sandspit has formed and protrudes in a N.W. direction from South Head extending almost to the line of Destruction Gully Leads. Good water exists to the west of the leads. Additional soundings were made on 24.11.76 to determine the extent of this spit.


23.11.76 SOUTH WEST CHANNEL

Again in excellent sea conditions with little or no swell an extensive survey was executed in the S.W. channel. Resultant Plan H5/1W/39 indicates some instability in this area with the least depth on the existing Cutter Rock/Clay Hill Bn. leads now as little as 11 feet. Better water exists some quarter of a mile to the south, but an approach here leads on to the N.W. edge of the South Bank.

I would advise against altering the direction of the leads until this period of instability has passed.

The Hydrographic Department, R.N.Z.N. are detaching two survey M.L.'s to carry out a survey of the Manukau Approaches in late January 1977 of three weeks duration. The Officer-In-Charge of this survey, Lieut. J. Stokes RNZN accompanied us during the S.W. channel survey on 23.11.76 and is now familiar with the area and aware of our requirements.

JHR:JARP



HYDROGRAPHER



H5/1W/39 & H5/1S/40
for Chief Engineer only.

126

File
1117

Manukau Entrance Survey
Maps - 25/11/76.

6.5 7 11.2 6.6 3 7.3 8.2 8 8 4

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

⊙ Lt H°

04'

634 000 N

⊙ Bn'G'

05'

632 000 N

⊙ Bn'D'

⊙ Bn'C'

SCALE 1:12,000 or 1 inch to 1000 ft.

5000 feet

206 000

H5/1S/40

32'

33'

1117.
EXTRACT FROM MINUTES
PROPERTY COMMITTEE
21 SEP 1976

12. WINSTONE LTD - APPLICATION 31390 FOR A PROSPECTING
LICENCE AT SOUTH HEAD, MANUKAU HARBOUR

The report of the General Manager advised that the above company had applied in April 1976 to the Secretary of Mines for a prospecting licence over certain land at South Head, some of which was vested in the Board. The Board consequently lodged an objection, details of which were set out under paragraph 3(i)-(iv) in the report. The General Manager advised that the company had since satisfied these objections, and as the Board's interests were now safeguarded, the objection could be withdrawn subject to the four conditions listed. In view of the time that had elapsed since the objection had been lodged, the General Manager recommended the Secretary of Mines be given immediate advice of the Board's intention. The Chairman of the Board gave his approval on 13 September 1976.

Recommended -

That the action of the Chairman of the Board be confirmed.

Blec

ADOPTED BY BOARD
20 SEP 1976

Auckland Harbour Board

MEMORANDUM

6 September 1976

FROM

THE HYDROGRAPHER

TO

THE CHIEF ENGINEER
THE HARBOURMASTER

MANUKAU ENTRANCE - SOUTH AND SOUTH WEST CHANNELS

REPORT OF SURVEY

2.9.76

After five weeks of inoperable conditions on the Manukau Bar a wind change to S.E. only enabled the sea state to become workable for survey operations. Tug "Manukau" sailed for the bar at 0845 with L.W. at the Heads at 1000 and H.W. at 1620, returning to Onehunga at 1830.

SOUTH WEST CHANNEL

Moderate sea conditions were experienced in the S.W. channel due to low tidal state in the morning and a fresh S.E. wind giving a beam sea. A line of soundings was run to establish and confirm the direction of the Cutter Rock leads, moved to an 051° bearing on 28.7.76 and about half the survey completed in the morning. By 1130 the wind had freshened and it was decided to sound in the calmer waters of the South Channel. On completion of the S. Channel Survey, the S.W. Channel was found to have improved and the remainder of the work there carried out. In total an area of 2.5 by 0.4 nautical miles was surveyed to embrace both the outer bar and the S.W. limit of the Main Channel.

Resultant Plan H5/1W/38 shows that, whilst the outer shoal has remained fairly stable, the shoal about one quarter of a mile N.E. of this is spreading in a northerly direction. The least depth on the leads is still 16 feet but depths of 12 feet exist at a distance of 600 feet either side of the leads. Best water is still on the leads although the gap has narrowed since the last survey.

SOUTH CHANNEL

Survey carried out in good sea conditions between 1300 and 1500. An area of 1.9 by 0.3 nautical miles was covered with lines of sounding parallel to the 029° Hill leads. Resultant Plan H5/1S/37 shows some minor changes since the last survey, the best approach being 400 feet to the west of the Hill leads and 12 feet still being the controlling depth.

Leith

HYDROGRAPHER

JHR:JARP



H5/1W/38 & H5/1S/37
for Chief Engineer only.

*Discussed with
Leith & plans
on 6/9/76.*

AS

File

EXTRACT FROM MINUTES
WORKS & TRAFFIC COMMITTEE

20 JUL 1976

1. DEPARTMENTAL REPORTS

Consideration was given by the Committee to the reports of the Traffic Manager and Harbourmaster on the operations of their departments for the month of May 1976 as submitted by the General Manager.

During discussion on this item Members inquired as to the progress in respect of the soundings at the Manukau Harbour entrance. The Chief Engineer advised that conditions had only allowed soundings to be carried out on two occasions, from the tug "Manukau" and that arrangements had been made for the Board's Hydrographer to fly over the "bar" and make a visual check as soon as conditions allowed.

It was RESOLVED to recommend that the reports be received.

It was further AGREED that a record of soundings at the Manukau Harbour entrance be included in the Harbourmaster's monthly report.

ADOPTED BY BOARD

27 JUL 1976

Mr. Keith to note.

Auckland Harbour Board

MEMORANDUM

28 July 1976

FROM

HYDROGRAPHER

TO

CHIEF ENGINEER
HARBOURMASTER

MANUKAU ENTRANCE - SOUTH AND SOUTHWEST CHANNELS

REPORT OF SURVEY

27.7.76

After 19 days of protracted S.W. weather conditions the sea state on the Bar became workable for survey operations and the Tug "Manukau" sailed from Onehunga at 0630.

SOUTHWEST CHANNEL

In good sea conditions and at High Water a comprehensive survey was carried out in the South West channel to both North and South of the Cutter Rock $052\frac{1}{2}^{\circ}$ Leads and embracing an area of some 1.5 by 0.5 sea miles.

Resultant Plan H5/1/36 shows that a sandspit has formed close northward of the existing Leads with depths of 8 to 12 feet, its southern extremity being 250 feet north of the Leads. Consequently Clay Hill beacon is being moved Today (28 July) to provide a new Lead of 051° as shown on the above plan.

Vessels crossing the Bar on this Lead should find a minimum depth of 15 feet over a distance of 600 feet to the north and southward. In the close proximity of the Leads a least depth of 16 feet will be found.

It was observed during this survey that the Hook of the South Bank has grown to the westward in recent months.

The appendix to this report shows cross sections of the outer 2,000 feet of the Bar constructed from the last three surveys, covering a period of just over four months.

SOUTH CHANNEL

On the same day, the northern section of the South Channel was sounded, see resultant Plan H5/1/35. Apart from the shoals continuing their south westerly progression, little change is evidenced from this survey although the best approach now would be slightly to the west of the Hill Leads.



HYDROGRAPHER

JHR:JH

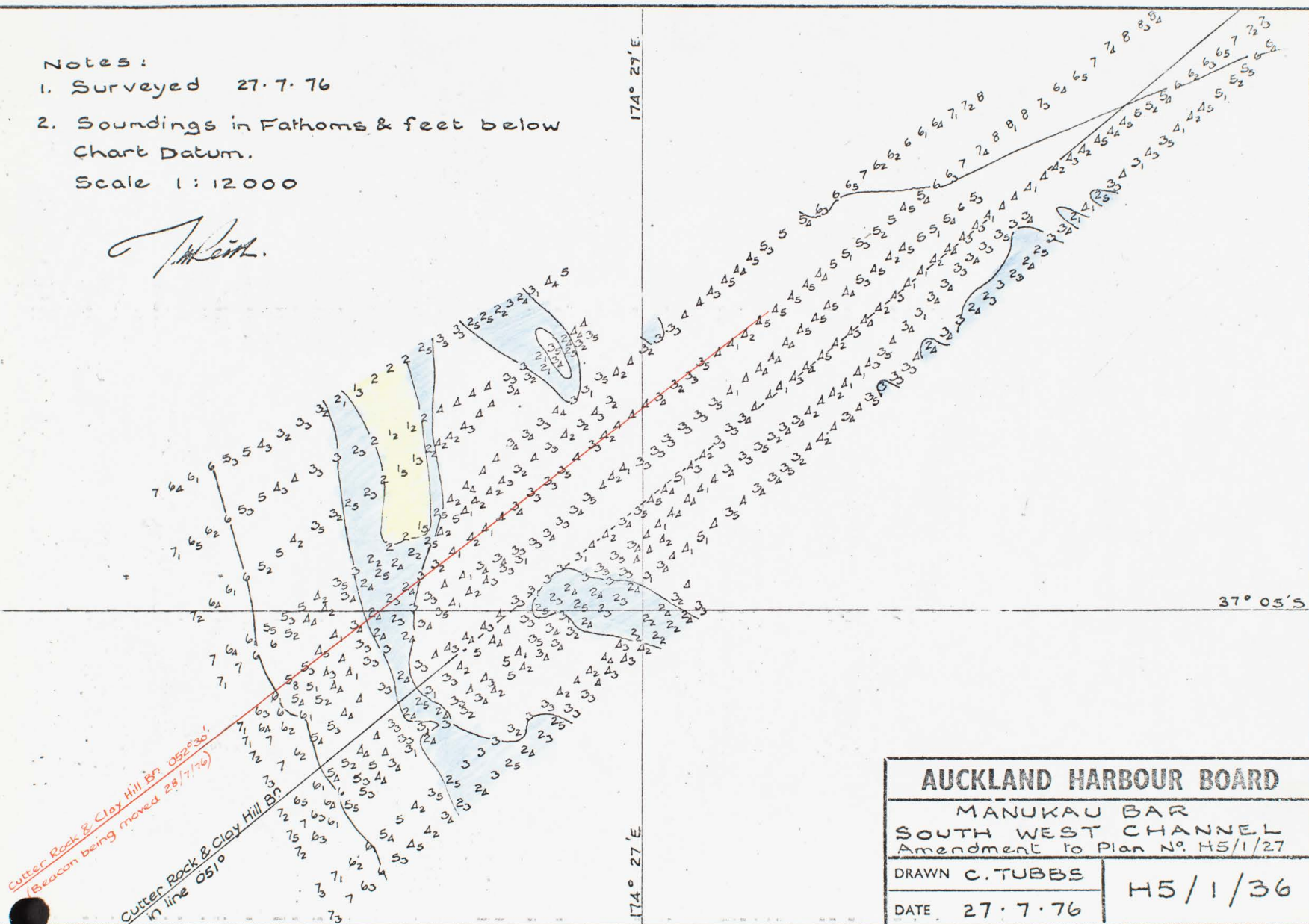
MS.
Ch. labelled to see Blc
then file.

*Helicopter gear
still to be done
when conditions
suitable MS. 28/7/76*

Notes:

1. Surveyed 27.7.76
 2. Soundings in Fathoms & feet below Chart Datum.
- Scale 1:12000

M. Kent.



AUCKLAND HARBOUR BOARD

MANUKAU BAR
SOUTH WEST CHANNEL
Amendment to Plan No. H5/1/27

DRAWN C. TUBBS

DATE 27.7.76

H5/1/36

174° 31'E

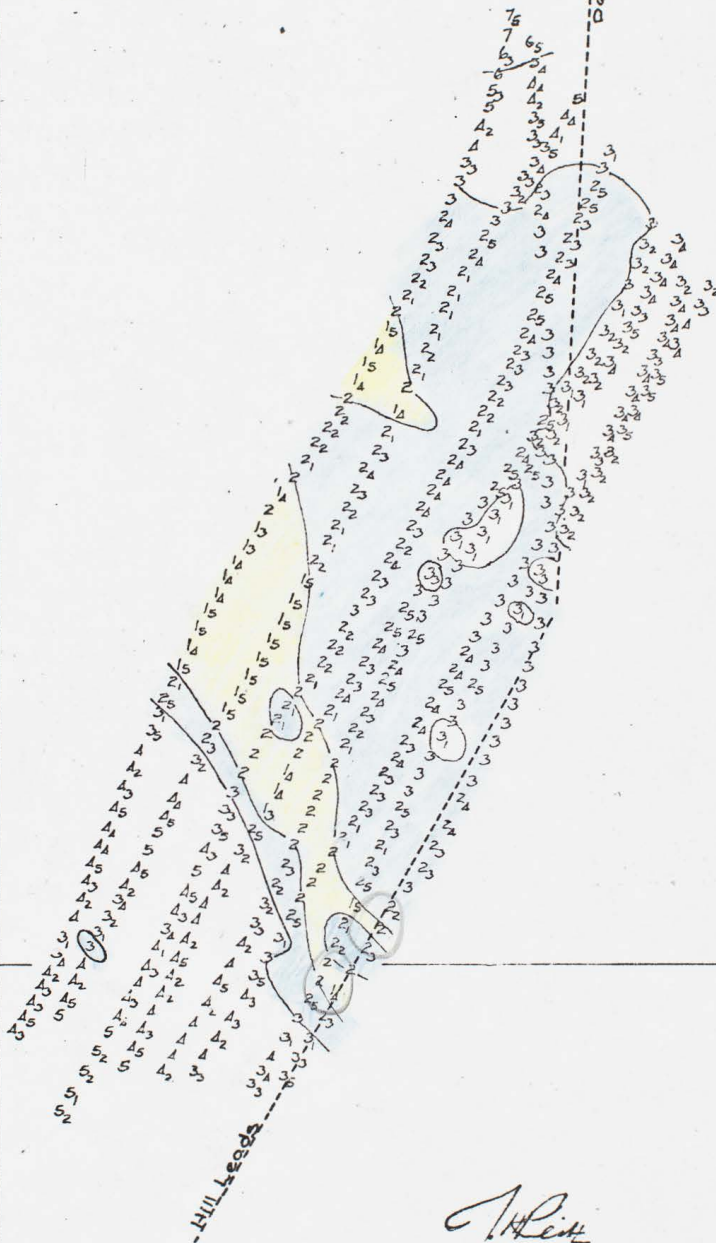
174° 32'E

37° 03'S

Lt. Ho (60)

37° 04'S

174° 32'E



A. Pitt

Notes :

Soundings in Fathoms & feet below Chart Datum.

Surveyed on 27.7.76

Scale 1:12000

174° 31'E

UCKLAND HARBOUR BOARD

MANUKAU BAR
SOUTH CHANNEL

DRAWN C. TUBBS

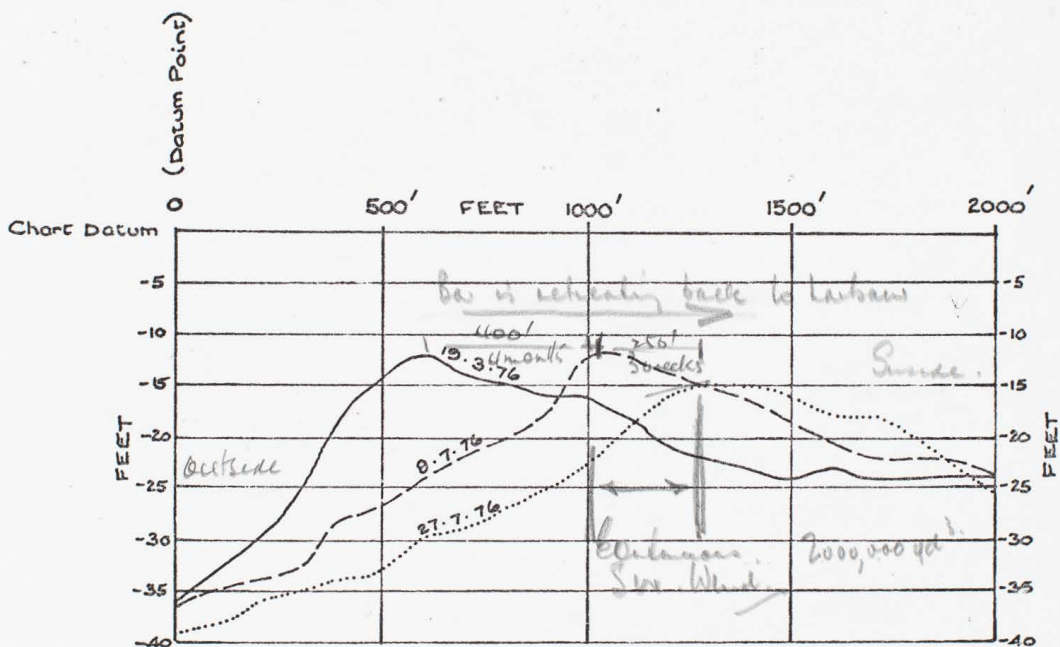
DATE 27.7.76

H5/1/35

MANUKA BAR - S.W. CHANNEL

CROSS SECTION SHOWING SEABED LEVELS
OBTAINED DURING PERIOD 19.3.76 to 27.7.76

CROSS SECTION ALONG CUTTER ROCK & CLAY HILL BN
TRANSIT (052°30') WITH DATUM POINT IN POSITION
232½°, 23,000 FEET FROM CUTTER ROCK.



AUCKLAND HARBOUR BOARD	
MANUKAU ENTRANCE REPORT OF SURVEY APPENDIX	
DRAWN <i>G.H. Cook</i>	
DATE 28.7.76	

19 July 1976

THE HARBOURMASTER

THE SECRETARY

MANUKAU BAR SURVEY.

Letter from Harbours' Association refers.

The Manukau Bar was last surveyed in its entirety by the Hydrographic Dept. R.N.Z.N. in 1965 and since 1967 the navigable channels have been monitored by Auckland Harbour Board's staff.

During the past year the south western approaches over the Bar have become critical in depth and major changes are apparent in this sector. The South Channel continues unstable with shifting sandbanks of two fathoms or less.

A repeat survey of the approaches to the Manukau Harbour is requested in order to determine the nature of the changed pattern of the Bar and to find a navigable channel for use of shipping using the Port of Onehunga.


HARBOURMASTER

The Chief Engineer

For your information.


Harbourmaster



Auckland Harbour Board

MEMORANDUM

9 July 1976

FROM

THE HYDROGRAPHER

TO

THE CHIEF ENGINEER
THE HARBOURMASTER

MANUKAU ENTRANCE - SOUTH AND SOUTH WEST CHANNEL REPORT OF SURVEY

7.7.76 Wed.

Sea conditions were good for sounding and an attempt was made to survey the S.W. channel. Unfortunately low cloud over the ranges obscured most of the survey marks, but, as the Cutter Rock leads were still visible, it was decided to run over the bar on these leads to confirm recent reports that this is now the best approach.

Some half mile from the Bar we entered an extensive fog bank coming in from seaward and visibility dropped to 100 metres. However, because of the excellent sea conditions and the fact that we had maintained a steady course along the leads prior to this, the survey run was continued, fixing by dead reckoning. On passing over the bar a reciprocal course was run some 300 ft. to the southward and, as we were now still in dense fog, we returned to Paratutai I jetty aided by radar. By 1500 hours the fog had still not lifted and we returned to Onehunga.

Soundings showed that a least depth of 13 feet existed on the Cutter Rock leads and 16 feet to the south of the leads.

8.7.76 Thurs

After berthing "Westport" at 0930, the tug sailed for the bar at 1000 and sounding commenced in the S.W. channel at 1140. Sea conditions had deteriorated markedly with N.W. winds and were marginal. The vessel's speed was reduced which improved the quality of the echo sounder trace and ^{fair} lines of sounding were run over and to the southward of the cutter rock leads. At this point all survey marks ashore became obscured by rain and further sounding had to be discontinued. We then proceeded to the South Channel where visibility was better and carried out an examination over the shoal areas detected during the previous survey of 27 June. See resultant Plan H5/1/33. ✓

S.W. Channel Plan H5/1/34

This is the first opportunity we have had to visit this area since the survey of 19 March. Apart from the soundings, the visual appearance of the bar shows a marked change. To the north of cutter rock leads continuous breaking water indicates much shoaling has taken place there and these breakers appear to extend completely over to the N.W. with no sign of a passage through. At the time of survey it was one hour to Low Water with 2 feet of tide on the gauge.

AS
b7/76

Ch. Leblond - for information
R. Leblond

BLC

See over

Although the six fathom line is still in the same place as four months ago the bar itself has moved about 500 feet to the N.E. From this we can conclude that the critical situation now existing on this approach is due to the unseasonal prevalence of S.W. winds piling up sand banks along the entire perimeter of the bar. From the limited soundings obtained it would seem possible that a channel with 15 feet least depth could exist some 700 feet south of the cutter rock leads but would be very narrow as the hook of the South Bank appears to be extending to the westward.

South Channel Plan H5/1/33

Sea conditions in the South Channel were excellent, with no swell. A closer examination of the shoal areas to the west of the Light House revealed slight changes to the banks and the best approach now would be to line up the 900 ft. peak with the centre of the saddle to the west of Jackie Hill.



HYDROGRAPHER

JHR:JARP

Enc : Plan H5/1/33 & 34.

Seages Keith 9a 18/7/76.

After Keith explained his problems agreed that usual search for helicopter as reasonable approach to apply.

Seages saw H/H + S/A/M - S/A/M agreed leads to proceed

MS

Although the six fathom line is still in the same place as four months ago the bar itself has moved about 500 feet to the N.E. From this we can conclude that the critical situation now existing on this approach is due to the unseasonal prevalence of S.W. winds piling up sand banks along the entire perimeter of the bar. From the limited soundings obtained it would seem possible that a channel with 15 feet least depth could exist some 700 feet south of the cutter rock leads but would be very narrow as the hook of the South Bank appears to be extending to the westward.

South Channel Plan H5/1/33

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HYDROGRAPHER

JHR:JARP

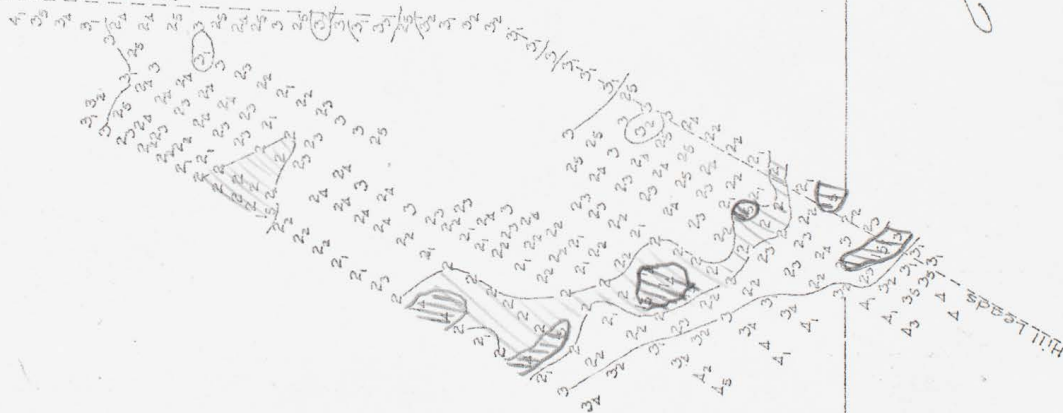
Enc : Plan H5/1/33 & 34.

47 P/O. 0.

174° 31' E

174° 32' E

Destruction Gully Leads



Handwritten signature

© Sig F.S.

© Lt. Hq.

Notes:

1. Amendment to Plan H5/1/32
2. Examination of shoal areas shown on above survey.
3. Surveyed on 8.7.76

Scale 1:12000

37°04'S

AUCKLAND HARBOUR BOARD

MANUKAU BAR
SOUTH CHANNEL

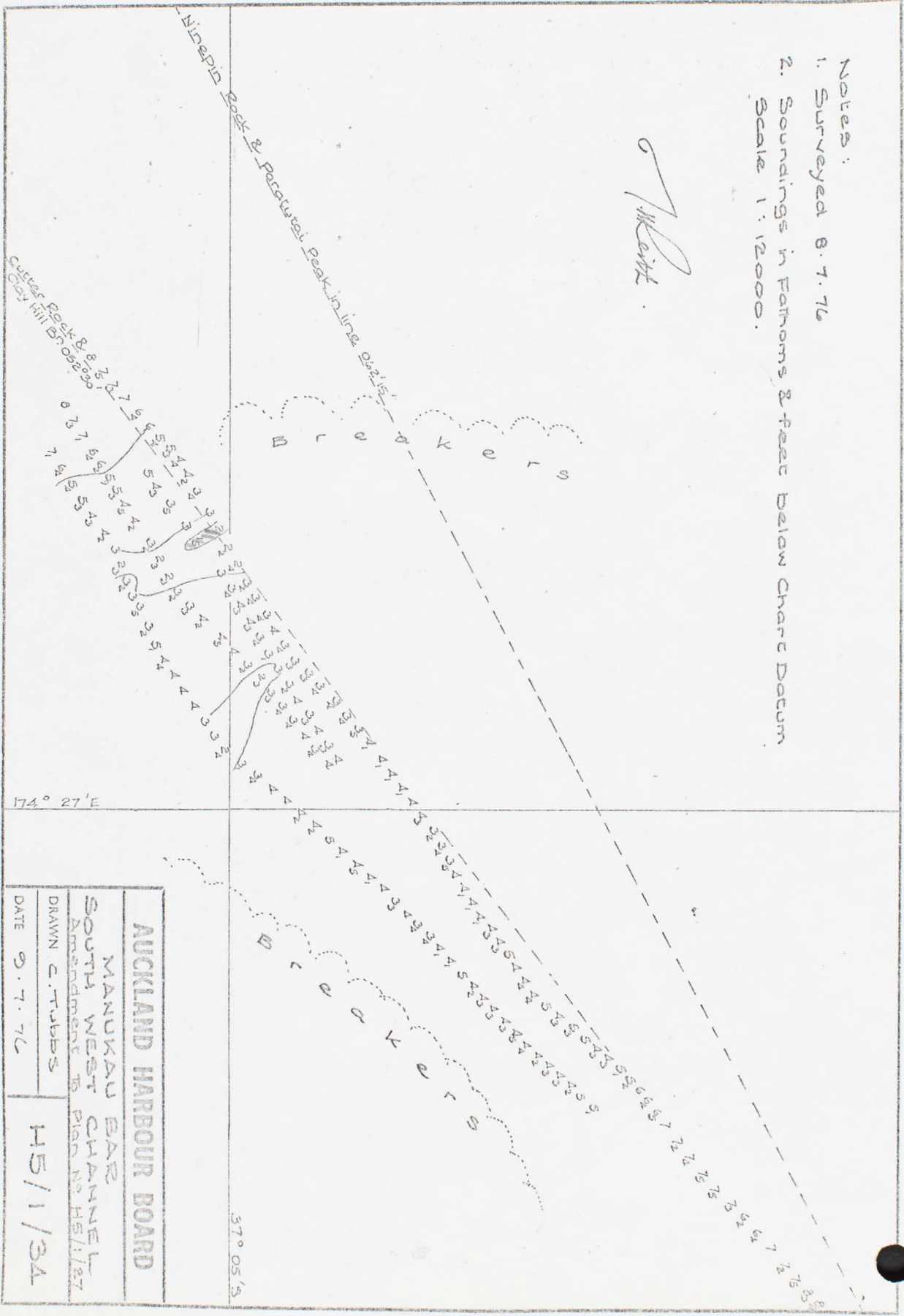
DRAWN C. TUBBS.

DATE 9.7.76

H5/1/33

- Notes:
1. Surveyed 8.7.76
 2. Soundings in Fathoms & Feet Below Chart Datum
- Scale 1:12000.

M. Reith



Auckland Harbour Board

MEMORANDUM

28 June 1976

FROM

THE HYDROGRAPHER

TO

THE CHIEF ENGINEER
THE HARBOURMASTER

MANUKAU BAR - REPORT OF SURVEY

After an abortive attempt to sound the South Channel on 25 June due to sea conditions, a successful survey was carried out on Sunday 27 June. An area to the westward of the soundings obtained on 16 June was covered in order to examine the route being used recently by both "Totara" and "Westport". Resultant survey plan H5/1/32 indicates that an approach with the 900 ft. peak bearing 031^o would give the best water, still only 11 ft. below C.D. although reportedly more than maximum depths in the S.W. Channel which still has to be explored to find a deeper passage.

An attempt to survey the S.W. Channel was made today but 20 knot N.W. winds raised sufficient seas to render the echo sounder inoperable through heavy rolling and aeration under the hull. To achieve results to be of any worth much better weather conditions are necessary.

Examination of the soundings obtained in the South Channel in March this year against the recent survey would indicate that this Channel is still unstable, with shoals moving as much as a quarter of a mile during the three month interval. For this reason I would suggest that when the Tug "Manukau" is free from other duties and weather conditions allow, that she makes a run along the current leads, using the echo sounder, fixing on just two transits and logging the time.

If the tide gauge at Whatipu can be read immediately before and after the run and the echo sounder traces sent to me with this information I feel this would be an effective method of monitoring the depths along the lead line being currently used. The Master of "Manukau" who now knows the Bar extremely well would also detect and report on obvious changes which would be of assistance in subsequent surveys.



HYDROGRAPHER

JHR:JARP



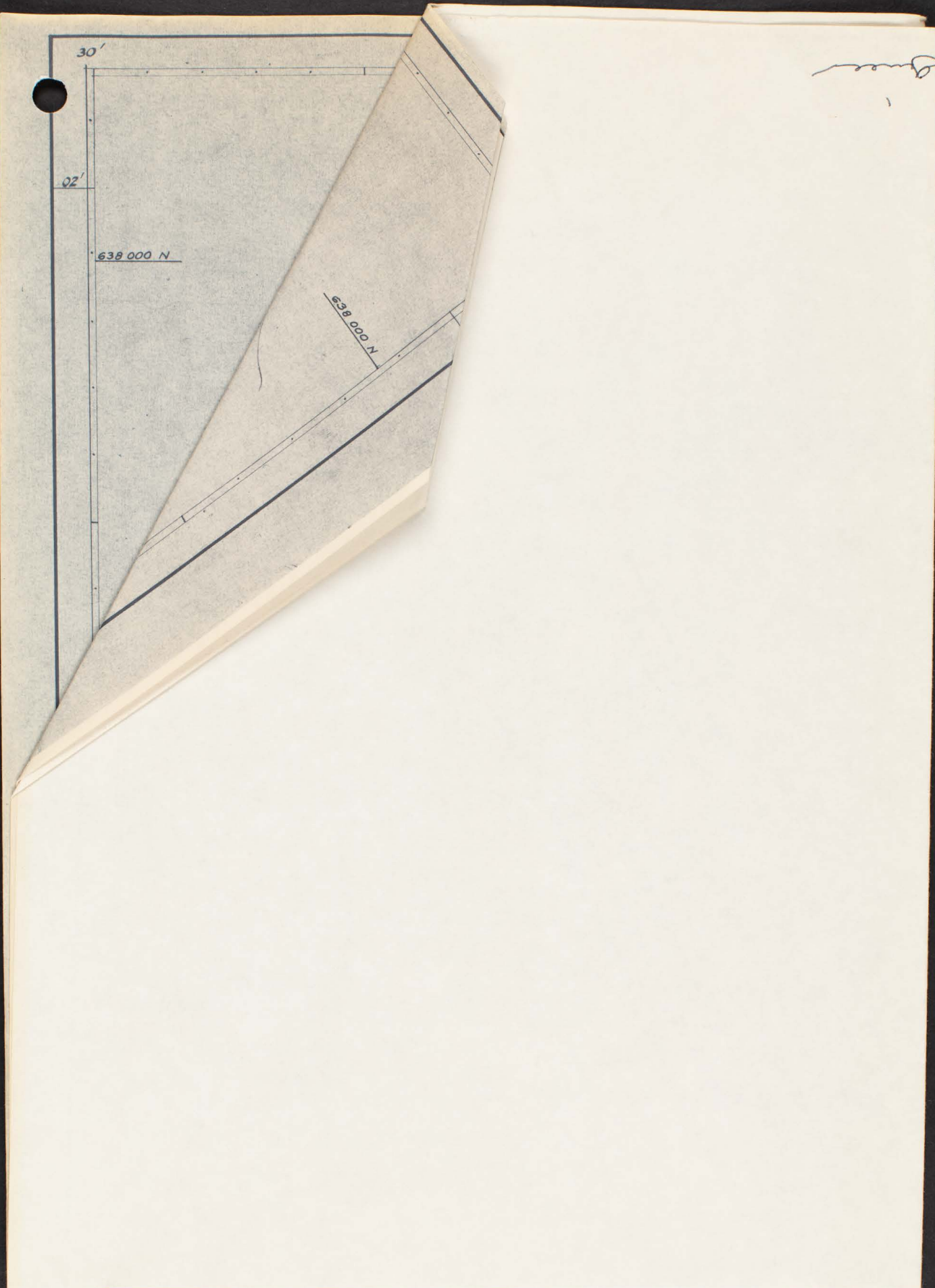
Blue

30'

02'

638 000 N

638 000 N



Auckland Harbour Board

MEMORANDUM

17 June 1976

FROM

THE HYDROGRAPHER

TO

THE CHIEF ENGINEER
THE HARBOURMASTER

MANUKAU BAR - SURVEY

1. Report of Survey

A survey of the South Channel, Manukau Entrance, was executed yesterday under marginal sea conditions, see resultant plan H5/1/31. After four lines had been sounded the survey was terminated due to an increase in the height of the swell which was beginning to break at the southern end of the area.

Conditions in the South West Channel were bad, with breakers along the entire perimeter of the Bar - This at High Water with some 10 feet of tide and a moderate swell of 6 to 8 feet. The general appearance of the S.W. Channel tends to confirm recent reports of continuing shoaling on this approach.

The last survey of the S.W. Channel was on 19 March 1976 when a search for best water was made along the western limit of the bar and covered an area of 1.2 miles by 0.4 miles. To both north and south of the area at this time, continuous breakers indicated shoaler water and no possibility of a passage.

This survey confirmed the findings of 1 March that continuous shoaling is taking place in the S.W. Channel.

2. Conclusions and Action Required

Since regular surveys over the present S.W. Channel were commenced in November 1968 the western limit of the Bar, delineated by the 6 fathom line has steadily advanced to seaward and is now 1000 feet to the S.W. of its position at that time, see plan H5/17/1.

From these facts it must be concluded that the western approach to the Manukau Entrance is now going through one of its periodic changes during which depths over the perimeter of the Bar will remain critical until a new channel is formed by the exiting waters of the Manukau Harbour.

Arrangements have therefore been made with the Officer-in-Charge, Onehunga, that, when tidal and sea conditions are favourable and the Tug "Manukau" not engaged in other duties, continuing surveys to find the best water in both channels will be carried out with all despatch.

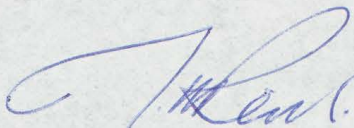
D 2/6/76 see over
Blec

File

... ..

*Plans sighted
but not filed*

Unfortunately at this present time the Hydrographic Section is heavily engaged in necessary work connected with the construction of the Bledisloe Terminal and with insufficient staff to undertake both this and more frequent Bar surveys some guidance on priorities is requested.



HYDROGRAPHER

JR:JARP



Plans H5/1/31 and
H5/17/1 for C/E only.

Discussed with Capt: 20/6/76.

In the matter of priorities I cannot be specific
The Hawaiian Entrance must receive attention
when deemed desirable and subject to weather
and wave conditions permitting.

The Despatching power to send the bar
man and Hydrographer and if weather
work is held up to be it.



Auckland Harbour Board.

2.7.75

Mr Pemberton

The cannalicious
news of F.B.S.
closure today pushes
this matter further
away than ever.

It seems Mr Lipscombe
has summarized the
situation, and to save
time I pass on his
report to me, to you
unabridged

Thanks
Ted Suabo.

Mr. ~~Pemberlan~~. Mech Engineer

Ouelinger Side Gauge

File

Ouelinger

pp

Low advises me that float is sticking in tube. Inside of tube corroding.

We cannot shift this gauge or recover the pipe to carry out usual clearing.

Please consult with Mech Eng to develop a sleeve lined or something. May be with a slightly smaller diameter float.

Makes is ORCOST.

MS 19/6/75

Mech Eng Please look into this matter. Can the float be removed & the inside of the pipe be scraped with a purpose made tool? pp 20/2/75

Auckland Harbour Board

MEMORANDUM

25 June 1975

FROM

R. LIPSCOMB
MECHANICAL DRAWING OFFICE

TO

MECHANICAL ENGINEER

ONEHUNGA TIDE GAUGE.

1. I visited Onehunga to inspect tide gauge to establish cause of sticking at about one hour before low tide.

I inspected the gauge and found that considerable corrosion had taken place in the tube but not sufficient to influence the action of the float. I spoke to the tugmaster who looked after the tide gauge until quite recently and he said that due to the reclamation work on the wharf an increase in the rate of silting has occurred.

It was noted that the manual gauge which is used to check the automatic gauge was almost totally silted and therefore useless. To check the automatic gauge in its present position the Hydrographers have to station a man at water level, sometimes between a ship and the wharf, to take a reading from the visual gauge. This has proved both dangerous and inaccurate.

Taking into account the advanced state of corrosion in the main tube and the uselessness of the manual gauge I checked the old location of the tide gauge. The tubes were found to be still in position but rusted beyond repair. They were also capped off with concrete where they penetrated the floor in 'A' shed. It was also found from talking to the tugmaster that due to the reclamation work, this site now has a good flow of water and minimal silting problems.

The Hydrographers telephoned me on Monday 23rd June to say that their efforts to flush the silt out of the tube and the extension tube with a 3" fire hose has been successful.

2. CONCLUSION:

Although the present site is now operational again and possibly could remain so with regular flushing. I think the facts indicate that a new site should be considered. The main tube is badly rusted and would need renewing fairly soon. The manual gauge is useless and the method now employed in checking the automatic gauge is dangerous and inaccurate. It is considered that the silt problem at the present site will never improve and with the gauge being situated 50' from the edge of the wharf it is not possible for the ~~tinge~~^{tug} to scour the silt with its screws.

The advantages of moving the gauge to 'A' shed are that it is situated only 30' from the edge of the wharf and it is

possible for the tug to free the area of silt. There are also steps down to water level at this point for any reading of water level indicators. This site is also much more convenient for any maintenance work.

3. An estimate of costs involved to resite the tide gauge in Shed 'A' would be as follows:

Labour :	\$	600.00
Material		660.00
Plant		200.00
		<hr/>
		\$1,460.00

MECHANICAL DRAWING OFFICE.

RL:gra

R Lipscombe

60/6/19

18 March 1975

Messrs Russell McVeagh McKenzie
Bartleet & Co
Barristers and Solicitors
P.O. BBox 8
AUCKLAND, 1

Attention: Mr R.L. Macky

Dear Sir,

re : LICENSE OVER SITE OF PREHISTORIC LOGS -
MANUKAU HARBOUR - MANUKAU CITY COUNCIL

The Board at its July meeting 1974 considered an application from the Manukau City Council in regard to the existence of a number of petrified Kauri logs on Board's foreshore which Council considered to be of unique scientific interest.

The Board resolved that while it recognised that the logs have scientific interest and their preservation would be desirable, the Board would oppose any application by Council to extend its Planning District over foreshore of the Manukau Harbour. The Board was prepared, subject to the provisions of the Harbours Act, to issue a license to occupy a defined portion of the foreshore for the purpose of preserving the logs as objects of scientific interest.

The Director, Marine Division by letter of 4 March 1975 advised that pursuant to Section 178 (b) of the Harbours Act 1950 approval was given to the grant of a license to Manukau City Council to occupy 16 acres of the Manukau Harbour. The plan defining the area on which the logs are located has been endorsed M.D. 15509.

Please prepare a license in the Board's standard form. The license to be for a 14 year term at a fee of 10 cents per annum if demanded commencing 1 April 1975.

Three copies each of a locality plan and a site plan suitably endorsed are enclosed for attachment to the documents.

Yours faithfully,



PROPERTY OFFICER

WKB:REW
Encl.

The Chief Engineer
Copy for information.

PROPERTY OFFICER

Plan F485 in Engineers Plan Room
for Microfilming.

21 October 1974

TO: INTERESTED PARTIES

ONEHUNGA TIDE LEVELS

The Lands & Survey Department as a result of recent analyses of tides at Onehunga have published amended values for the following tide levels at that port.

M.H.W.S.	+	4.08	Metres	Chart	Datum
M.L.W.S.	+	0.66	"	"	"
M.H.W.N.	+	3.36	"	"	"
M.L.W.N.	+	1.38	"	"	"
M.S.L.	+	2.37	"	"	"

These levels are published in the 1975 edition of the N.Z. Tide Tables and your attention is drawn to the relatively large (+0.18m) change in the value of M.H.W.S.

A copy of form S90/26 incorporating these new levels and superceding previous S90 forms for Onehunga is attached herewith.

Chapman for

CHIEF ENGINEER TO THE BOARD

COMPARISON OF DATUMS.

ONEHUNGA - MANUKAU HARBOUR.

LEVELLING DATUMS.

SOUNDING DATUMS.

	Feet	Metres	Metres	Feet	
L.S. B.M. C.C. 65	11.129	3.392	5.593	18.349	L.S. B.M. C.C. 65.
	2.00	2.74	4.24	16.22	Highest recorded tide 21-6-47
Old Auckland Tramway Datum	5.76	1.756			
	6.17	1.88	4.00	13.39	Mean High Water Springs *
	4.9	1.49	3.7	12.1	Mean High Water
Old A.R.A. & A.C.C. Datum	3.90	1.189			
	3.80	1.16	3.36	11.02	Mean High Water Neaps *
	0.56	0.17	2.37	7.78	Mean Sea Level *
L.S. AUCKLAND DATUM 1946	0.00	0.00	2.201	7.22	
COMMON DATUM 1-1-1973					
	2.69	0.82	1.38	4.53	Mean Low Water Neaps *
	4.9	1.5	0.7	2.3	Mean Low Water
	3.05	1.54	0.66	2.17	Mean Low Water Springs *
ZERO on AUTOMATIC TIDE GAUGE 1-1-1973	7.22	2.201	0.000	0.00	A.H.B. SOUNDING DATUM NAVY DEPT. CHART DATUM
Old zero on automatic Tide gauge. L.W.S.T. obsolete	8.22	2.505	0.305	1.00	Old A.H.B. Sounding Datum.
	8.79	2.63	0.48	1.57	Lowest Recorded tide
Auckland Dock Sill	9.22	2.810	0.610	2.00	Auckland Dock Sill.

* Values from N.Z. Tide Tables.

From 1-1-73, the A.H.B. & most Auckland Local Bodies have adopted the L.S. Auckland Datum 1946 as their COMMON DATUM. This is the datum for L.S. precise levelling used also by the M of W & the Railway Dept.

AUCKLAND HARBOUR BOARD

DATUMS.

DRAWN J.H.R.

DATE 18.10.74

S.90/26

S.90/26

60/6/19



21 October 1974

The Regional Secretary
Ministry of Transport
Private Bag
AUCKLAND, 1

Attention: Regional Marine Officer

Dear Sir,

re : PREHISTORIC KAURI LOGS OFF RENTON ROAD -
MANGERE, MANUKAW HARBOUR - MANUKAU CITY COUNCIL

The Board at its July meeting 1974 considered an application from the Manukau City Council in regard to the existence of a number of petrified kauri logs on Board's foreshore which Council considers to be of unique scientific interest. Council requested that Board agree to the inclusion of the logs in the schedule of Objects and Places of Historic or Scientific Interest which is contained in the City of Manukau District Planning Scheme.

The Board resolved that while it recognised that the logs have scientific interest and their preservation would be desirable, the Board would oppose any application by the Council to extend its Planning District over foreshore of the Manukau Harbour. The Board would be prepared, subject to the provisions of the Harbours Act, to issue a License to occupy a defined portion of the foreshore for the purpose of preserving the logs as objects of scientific interest.

Three copies of A.H.B. - B.2558/1 locality plan and B.2558/2 showing the proposed 16 acre area to be licensed to Manukau City Council are enclosed for approval under Section 156 (e) of the Harbours Act 1950.

Yours faithfully,

The Director
Marine Division
Ministry of Transport
Private Bag
WELLINGTON

V.A.C. Christiansen
SECRETARY

Copy for information.

The Chief Engineer
Copy for information.

SECRETARY

SECRETARY

Indice to be filed.

28/10/74

60/6/19

21 October 1974

The City Manager
City of Manukau
Private Bag
MANUREWA

Attention: Mr D. Holmes
ref. BO/40

Dear Sir,

re : PREHISTORIC KAURI LOGS OFF RENTON ROAD
- MANUKAU HARBOUR

I thank you for your letter of 27 September 1974 together with five copies of your Plan B.2/50 - (AHB B.2558/2) illustrating the 16 acres of Board's harbour bed title on which the logs are located. The plans have been forwarded to the Marine Division for approval under the Harbours Act 1950. On receipt of this approval the Board's solicitors will be instructed to draw up the documents giving your Council a license to occupy this area of foreshore to ensure controlled preservation of the logs. However it is pointed out that your Council's resolution as stated in your letter of 27 September to include the area in your Council's District Scheme is contrary to the terms of license stated in the Board's letter of 29 July 1974 as the area is Board's foreshore outside City boundaries and its District Scheme.

Yours faithfully,

The Chief Engineer

Copy for information with Copy
of Manukau City Council's
letters of 2 August, 27 September 1974.

V.A.C. Christiansen
SECRETARY


SECRETARY

CITY OF



MANUKAU

60/6/19
IN YOUR REPLY PLEASE QUOTE
BO/40
D. Holmes

ADDRESS ALL CORRESPONDENCE:-

THE CITY MANAGER,
PRIVATE BAG,
MANUREWA.

27 September 1974

30 SEP 1974

Your Ref. 60/6/19

The Property Officer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Sir,

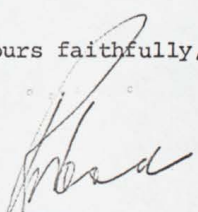
Prehistoric Kauri Logs on Foreshore -
off Renton Road - Ihumatao

I refer to our previous correspondence in this matter and advise that at its meeting on 26 September 1974 Council formally resolved as follows:-

"That application be made to the Auckland Harbour Board in terms of Section 156 (e) of the Harbours Act for a licence to occupy a relevant area of the foreshore of the Manukau Harbour off Renton Road, Ihumatao, such area to be shown on a plan to be prepared, for the sole purpose of including the logs in the Register of Objects of Scientific Interest in the Council's District Scheme."

I enclose five copies of the plan requested in your letter of 13 August 1974 (Ref. B2/50).

Yours faithfully,


R. WOOD
CITY MANAGER

Minute No. 1873

DH.aew
Encls.

AUCKLAND HARBOUR BOARD
PROPERTY
REC'D. 1 OCT 1974
ACK'D.

WKB

Please discuss
SH.

Pls.S

MANUREWA OFFICES:

David Nathan Park, Hill Road.
CITY MANAGER, CITY PLANNER,
SECRETARY, CITY INSPECTOR
(Health, Building, By-laws
Social Services).
Hall Road
CITY TREASURER
Telephones: Manurewa 65-199
Papatoetoe 89-189.

EAST TAMAKI OFFICES:

CITY ENGINEER AND ALL ENGINEERING
SERVICES, DEPOT, PROPERTY MANAGER
(Properties, Parks & Reserves),
GARAGE and LABORATORY,
East Tamaki Road.
Telephone: Papatoetoe 48-115.

OTARA OFFICES:

COUNCIL CHAMBERS,
CIVIL DEFENCE, HYDATIDS CONTROL
and DOG RANGERS,
Otaru Road.
Telephone: Papatoetoe 48-119

CITY OF



MANUKAU

60/6/10

IN YOUR REPLY PLEASE QUOTE
BO/40
K. Brehmer

CD. - 8 AUG 1974
ANSD.

ADDRESS ALL CORRESPONDENCE TO:
THE CITY MANAGER,
PRIVATE BAG,
MANUREWA.
2 August 1974

The Secretary,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Your Ref. 60/6/19

Dear Sir,

Prehistoric Kauri Logs off Renton Road -
Manukau Harbour

I thank you for your letter dated 29 July 1974. We accept your suggestion that the Harbour Board issue a Licence to Council to occupy the relevant portion of the foreshore, and we will forward relevant plans in due course.

Yours faithfully,

E.A. BILLSON
ACTING CITY PLANNER

KB.aew

AUCKLAND HARBOUR BOARD
PROPERTY COMMITTEE
RECD. 12 AUG 1974
ACKD.
ANSD.

WKRB

Board report 8 July 74. Chief Engineers Report matter of license. Cannot be dealt with until relevant plans and specific proposals received. WKRB.

*2/07 4 P0 to secy.
1E5*

Ask City to define locality of logs in plan form with some survey reference

MANUREWA OFFICES:

David Nathan Park, Hill Road.
CITY MANAGER, CITY PLANNER,
SECRETARY, CITY INSPECTOR
(Health, Building, By-laws
Social Services).
Hill Road
CITY TREASURER
Telephones: Manurewa 65-199
Papatoetoe 89-189.

EAST TAMAKI OFFICES:

CITY ENGINEER AND ALL ENGINEERING
SERVICES, DEPOT, PROPERTY MANAGER
(Properties, Parks & Reserves),
GARAGE and LABORATORY,
East Tamaki Road.
Telephone: Papatoetoe 48-115.

OTARA OFFICES:

COUNCIL CHAMBERS,
CIVIL DEFENCE, HYDATIDS CONTROL
and DOG RANGERS,
Otara Road
Telephone: Papatoetoe 48-119

27/3/8

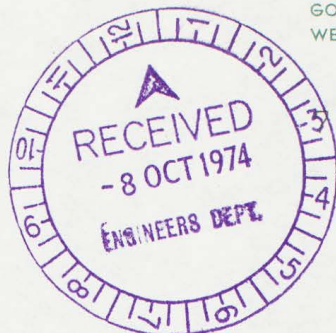


Department of Lands & Survey

TELEGRAPHIC ADDRESS: "HEADLANDS" TELEPHONE 44 435

HEAD OFFICE,
P.O. BOX 8003,
GOVERNMENT BUILDINGS,
WELLINGTON I.

OUR REFERENCE: 17/133
YOUR REFERENCE:
PERSON TO CONTACT:



October 1974

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND

Dear Sir,

ONEHUNGA - TIDE LEVELS

As there is no page 17 in the 1975 New Zealand Tide Tables, I assume you are referring to sections 1 and 2 of Tide Levels and Datums on page 10, and the values shown at the end of the list of Secondary Ports.

I confirm that all these values are correct and that they are in terms of your drawing number S. 90/22 dated February 1973 and based on the analysis of the tide charts supplied by you.

A copy of our record card for the Port of Onehunga showing all the Tidal Harmonic Constants derived from ... your tidal records is also enclosed.

Yours faithfully,

I.F. STIRLING
Surveyor-General

Per: *J. Hall*

Encl.

Hydrographer. J.F. 14/10.

Photo stat held in Hydrographic Office.

TIDAL HARMONIC CONSTANTS

Time Zone -1200

Port:

ONEHUNGA

Lat. 36° 56' S		Long. 174° 47' E		Analysis by L. & S.				Period 1972 (1)			
	H	g		H	g		H	g		H	g
	m	°		m	°		m	°		m	°
A_0			$2Q_1$	0.0041	105.62	OQ_2	0.0029	130.24	MO_3	0.0053	195.97
Z_0	2.3702		σ_1	0.0010	325.13	MNS_2	0.0261	347.27	M_3	0.0048	240.96
Sa	0.0921	25.94	Q_1	0.0042	40.54	$2N_2$	0.0219	216.91	SO_3	0.0020	198.63
Ssa	0.0202	160.47	ρ_1	0.0050	350.31	μ_2	0.0638	327.86	MK_3	0.0012	269.21
Mm	0.0252	101.58	O_1	0.0174	111.04	N_2	0.2690	284.02	SK_3	0.0007	191.36
MSf	0.0399	64.61	MP_1	0.0047	334.29	ν_2	0.0502	276.35	MN_4	0.0240	33.58
Mf	0.0031	162.36	M_1	0.0019	179.51	OP_2	0.0089	171.47	M_4	0.0554	42.67
Datum: Zero of the automatic tide gauge (from 1973 Jan 1); 5.590 m (18.34 ft) below BM CC65.			X_1	0.0026	158.18	M_2	1.3516	300.72	SN_4	0.0078	141.34
			π_1	0.0031	162.34	MKS_2	0.0140	142.64	MS_4	0.0305	103.73
			P_1	0.0169	193.22	λ_2	0.0275	286.77	MK_4	0.0091	97.99
			S_1	0.0108	106.53	L_2	0.0613	273.38	S_4	0.0023	149.28
			K_1	0.0598	207.47	T_2	0.0304	12.45	SK_4	0.0064	84.27
			ψ_1	0.0031	269.88	S_2	0.3570	355.03	$2MN_6$	0.0260	159.14
			ϕ_1	0.0049	110.35	R_2	0.0016	29.27	M_6	0.0422	174.53
			θ_1	0.0014	128.28	K_2	0.0976	348.14	MSN_6	0.0117	207.48
			J_1	0.0038	219.13	MSN_2	0.0240	149.55	$2MS_6$	0.0314	226.67
			SO_1	0.0008	337.82	KJ_2	0.0078	107.15	$2MK_6$	0.0083	200.80
			OO_1	0.0019	338.98	$2SM_2$	0.0166	194.33	$2SM_6$	0.0122	264.05
									MSK_6	0.0060	260.19

2 October 1974

Surveyor General,
Department of Lands & Survey,
P.O. Box 8003,
Government Buildings,
WELLINGTON C.1.

Dear Sir,

ONEHUNGA - TIDE LEVELS

The New Zealand Tide Tables for the year 1975 include Onehunga in the Standard Ports List for the first time and it is noted that the levels of M.H.W.S. etc. referred to on Page 17 differ from those published in previous years.

It is presumed that these levels have been established from analyses of our tide charts issued to you for this purpose some time ago.

As it is our practice to inform other Local Bodies and interested parties of changes in such levels it would be appreciated if confirmation of this could be supplied plus values of the main tidal constituents arrived at in the analysis.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

JR:GMW

Draft ~~Off~~ 1/10/74.

From Chief Engineer to Surveyor General
Department of Lands & Survey
P.O. Box 8003
Government Buildings
Wellington C. 1.

Onehunga - Tide levels.

The New Zealand Tide Tables for the year 1975 include Onehunga in the Standard Ports list for the first time and it is noted that the levels of M.H.W.S etc referred to on page 17 differ from those published in previous years.

It is presumed that these levels have been established from analyses of our tide charts issued to you for this purpose ~~at~~ same time ago.

As it is our practice to inform other local Bodies and interested parties of changes in such levels it would be appreciated if confirmation of ~~the~~ this could be supplied plus values of the main tidal constituents arrived at in the analysis.

of and etc.

OK

C/E.

(for C.E.).

Note: differences in published levels as follows: -

	M.H.W.S.	M.H.W.M.	M. ^L .W. ^S	MLWN	M.S.L.
1974 metres	3.9	3.3	0.6	1.3	2.3
1975	4.08	3.36	0.66	1.38	2.

1974 values given in secondary ports list to one place of decimal even so by rounding off there is a general raising of

60/6/19

13 August 1974

The City Manager
Manukau City Council
Private Bag
MANUREWA

Attention: Mr K. Brehmer
ref B040

Dear Sir,

re: PREHISTORIC LOGS OFF RENTON ROAD
- MANUKAU HARBOUR

I thank you for your letter of 2 August 1974.

Could you please arrange for the locality of the logs to be defined in plan form with some survey reference, and forward five copies of the plan when available to Board in order that approval under the Harbours Act may be obtained.

Yours faithfully,

PROPERTY OFFICER

WKB:REW

The Chief Engineer
Copy for information.

PROPERTY OFFICER

As per letter

16.8.74

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE FOREMAN OF WORKS

Date 5 March, 19 74

Subject ONEHUNGA WHARF - SILTATION INVESTIGATION

CODE NUMBER
91461 07 150.59

Please arrange to have the launch "Kupe" taken to Onehunga to enable this investigation to be continued. Mr. Wells-Green of this office will be responsible for the launch at Onehunga and should be contacted when it is ready to go.

Firm arrangements should also be made for use of a crane at Onehunga for unloading.

CLP:JARP

Copy to: MR. WELLS-GREEN

[Handwritten signature]

CHIEF ENGINEER TO THE BOARD.

(This Form to be filled up & returned to Engineer's Office immediately on completion of Work)

This work was completed on _____ at a cost of:—

Labour	-	-	:
Material	-	-	:
Total \$	_____		:

REMARKS: _____

Signature _____



Department of Lands & Survey

TELEGRAPHIC ADDRESS: 'HEADLANDS' TELEPHONE 44 435

OUR REFERENCE: 17/133
YOUR REFERENCE:

HEAD OFFICE,
P.O. BOX 8003,
GOVERNMENT BUILDINGS,
WELLINGTON I.

10 September 1973

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

ONEHUNGA TIDE RECORDS

Dear Sir,

I am returning to you under separate cover the Onehunga tide charts for 1972, with my apologies for having kept them longer than I had expected.

Analyses for 1971 and 1972 have been made and compared, and predictions for 1975 have been completed. They will be included, I hope, in the N.Z. Nautical Almanac for 1975.

Mean levels in metres, based on the M_2 and S_2 constituents only, are as follows.

MHWS	4.1
MHW	3.7
MHWN	3.4
MSL	2.4
MLWN	1.4
MLW	1.0
MLWS	0.7

These values are in general agreement with those already printed in the N.Z. Nautical Almanac.

Yours faithfully,

I. F. STIRLING
Surveyor-General

Enc. U.S.C.

per 

117

L. & S.-F-138



Department of Lands & Survey

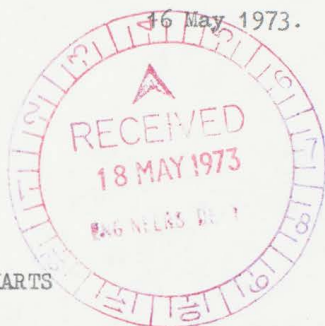
TELEGRAPHIC ADDRESS: 'HEADLANDS' TELEPHONE No. 44-435

HEAD OFFICE,
P.O. BOX 8003,
GOVERNMENT BUILDINGS,
WELLINGTON C.I.

OUR REFERENCE: 17/133
YOUR REFERENCE:

16 May 1973.

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.



ONEHUNGA TIDE CHARTS

Dear Sir,

In spite of my assurance that I should not need the Onehunga tide charts for more than a month, we have again run into trouble. The Ministry of Works digitizer broke down for a while, and there is now such a backlog of work there that we are able to use the digitizer only in the lunch hours.

At this rate it will take about another two weeks to extract the readings from the charts. The charts will be returned to you as soon as possible.

Yours faithfully,

I. F. STIRLING
Surveyor-General

per

11 May, 1973

The General Manager,
Davis Gelatine (N.Z.) Ltd.,
P.O. Box 19542,
Woolston,
CHRISTCHURCH

Dear Sir,

MANUKAU HARBOUR - SEAWEED

I refer to your letter of 4 May 1973 advising of your interest in the possible commercial use of Gracilaria seaweed.

I see no objection to the collection of small quantities for laboratory investigation purposes.

As to the question of proceeding to large scale collections for semi-plant scale investigations, I feel it could be premature to make any commitment to you in this regard.

The matter of Gracilaria and its biological and ecological significance in the Manukau Harbour is not well known to us. The Board is very aware of the need to be understanding of such matters today in terms of harbour planning and particularly so, as presumably this seaweed can be located on tidal lands in the ownership of the Board.

I would therefore suggest, that if the matter is to progress beyond the laboratory stage, then more particular information should be forthcoming to move to any approval for larger scale harvesting.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

NS:JARP



DAVIS GELATINE (N.Z.) LIMITED

A DIVISION OF DAVIS CONSOLIDATED INDUSTRIES LIMITED

CONNAL STREET, CHRISTCHURCH, NEW ZEALAND
Postal Address: P.O. Box 19542, Woolston, Christchurch
Telegraphic Address: "Gelatine", Christchurch. Tel. 843-093

May 4, 1973.



The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Attention - Mr. N. Seagar

Dear Sir,

As mentioned in a phone conversation yesterday, we are interested in the possible commercial use of Gracilaria seaweed from the Manakau Harbour. This could be used as an additional source of raw material for agar manufacture.

Initially we will be considering small quantities only for laboratory scale investigations, but if these are successful we will conduct slightly larger tests on a semi-plant scale. These will involve the use of several hundred pounds of dried weed. This will probably be gathered for us by research students of the Botany Department, University of Auckland.

Yours faithfully,
DAVIS GELATINE (N.Z.) LTD.

J.R. McGimpsey
(J.R. McGimpsey)
GENERAL MANAGER.

:JW

Mr. Seagar

2 April 1973

The Manager,
Dept. of Lands & Survey,
P.O. Box 8003,
WELLINGTON

ATTENTION: Mr L. Lee

Dear Sir,

ONEHUNGA TIDE RECORDS

In reply to your letter of 29 March 1973 reference 17/133,
forwarded herewith Tide Level Records of Onehunga for the year
1972 as requested.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

CLC:GJG



Department of Lands & Survey

TELEGRAPHIC ADDRESS: 'HEADLANDS' TELEPHONE 44 435

OUR REFERENCE: 17/133
YOUR REFERENCE:

HEAD OFFICE,
P.O. BOX 8003,
GOVERNMENT BUILDINGS,
WELLINGTON I.

29 March 1973

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.



ONEHUNGA TIDES

Dear Sir,

I am returning under separate cover the tide charts for 1971 for Onehunga, with my apologies for having kept them a great deal longer than I had expected.

Reading of the height at every hour (8520 values) was done with an electronic digitiser, in which a cursor is moved over the chart and coordinates at any desired point are punched on a card. This equipment is not under my control but was used by courtesy of the Ministry of Works, and it was not always possible to get access to it when we wanted to. Most of the delay was due to this cause, but there ^{were} other frustrations, including a computer fault which developed in the later stages of the work.

However, a full analysis of the tide at Onehunga has now been completed. The results confirm the harmonic constants for four constituents given in the Admiralty Tide Tables, and also confirm the values of mean sea level and mean high and low at springs and at neaps as printed in the N.Z. Nautical Almanac.

The derived constants have been used to "predict" the highs and lows for 1971. Comparison with the actual record shows good agreement for much of the year, but there are periods when the disagreements are unexpectedly large. In extreme cases they reach 1 ft in height and 25 minutes in time.

Examination of the charts shows several cases of flat-topped or deformed peaks, and it is possible that some fault in the recording equipment has led to false readings at these times. For this reason I would like to make an analysis of another year.

Would you please forward the Onehunga charts for 1972? I am confident that the causes of delay have now been overcome and that I should not need to keep these charts for more than one month.

Yours faithfully,

I. F. STIRLING
Surveyor-General

per 

Charts forwarded under
separate cover.



16 March 1973

The Manager,
Dept. of Lands & Survey,
Head Office,
P.O. Box 8003,
WELLINGTON

ATTENTION: Mr L. Lee

Dear Sir,

ONEHUNGA TIDE RECORDS

It is requested that the above records for 1971 forwarded to you for analysis may be returned to us when finished with.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

JHR:GJG

The Secretary,
Auckland Regional Authority,
Private Bag,
AUCKLAND 1.

21 December, 1972

The Medical Officer of Health,
Takapuna Health District,
State Fire Building,
Hurstmere Rd.,
Takapuna,
AUCKLAND 9

Dear Sir,

MANUKAU HARBOUR

You will find attached a copy of a letter received by the Chairman of the Board from the Titirangi Ratepayers & Residents Association.

The Chairman has asked that the matters raised therein be given some investigation in order that a reply can be made.

Could you kindly provide an opinion or if suitable to you, Mr.N.Seagar Deputy Chief Engineer would be available to discuss the matters with appropriate Officers.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

NS:JARP

Enc : Copy of letter.

Copy to: SECRETARY
DEPTY CHIEF ENGINEER

EXTRACT FROM MINUTES
WORKS & TRAFFIC COMMITTEE

12 DEC 1972

8. ADOPTION OF CHART DATUM AS SOUNDING DATUM AT ONEHUNGA

The General Manager's report advised that in June 1970 the Chief Engineer when reporting on the application of the metric system to the Board's hydrographic service and adoption of Admiralty Chart Datum as the Sounding Datum for the Port of Auckland, advised that the datum change for the Manukau Harbour would be subject to a further report. It was now intended that Navy Department Chart Datum be adopted as the Sounding Datum at Onehunga to coincide with the change to metrication being affected on 1st January 1973. Accordingly the General Manager recommended that the Board proceed with the adoption of the Admiralty Chart Datum as set out in the report and that the Navy Hydrographer, appropriate Government Departments, and interested Local Authorities be notified.

Recommended

That the report be adopted.

ADOPTED BY BOARD
19 DEC 1972

C O P Y

TITIRANGI RATEPAYERS' & RESIDENTS' ASSOCIATION
(INCORPORATED)

12 Ridge Rd.,
TITIRANGI

THE CHAIRMAN

12 December 1972

Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Sir,

MANUKAU HARBOUR STUDY

At the Annual General Meeting of this Association
the following motion was passed:-

"THAT a request be made to the Auckland
Harbour Board that this Association be
informed regarding the future of the
purification plant in the Manukau. It
is noticed that substantial growth of
black weed is evident, causing pollution
and effecting Commercial and private
fishing.
Mullet would appear to be dying of algae
poisoning, possibly through enrichment
of Harbour medium assisting the growth of
weed".

We would be glad to receive your comments at your
earliest convenience.

Yours faithfully,

(Mrs) Z. B. NEWBY
Hon. Secretary

Auckland Harbour Board

13

44/21/1

1 December 1972

The Chairman,
Works & Traffic Committee,
AUCKLAND HARBOUR BOARD.

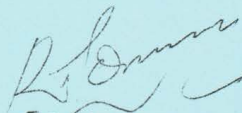
ITEM 8

ADOPTION OF CHART DATUM AS SOUNDING DATUM
AT ONEHUNGA

In June 1970 the Chief Engineer when reporting on application of the metric system to the Board's hydrographic services and adoption of Admiralty Chart Datum as the Sounding Datum for the Port of Auckland, advised that the datum change for the Manukau Harbour would be the subject of a further report.

The Chief Engineer now advises it is intended that Navy Department Chart Datum be adopted as the Sounding Datum at Onehunga to coincide with the change to metrication being effected on 1 January 1973. As navigational surveys of the Manukau Bar into the main channels are already shown in relation to Chart Datum, only wharf soundings at Onehunga will be affected. The latter are for Auckland Harbour Board use and the change will standardise recorded sounding information for the Manukau Harbour. As reported in June 1970 in relation to the Waitemata Harbour the new datum level will mean an apparent minor increase in berth depths shown on charts. The Harbourmaster concurs with the intention.

Accordingly it is recommended that the Board proceed with adoption of Admiralty Chart Datum as its Sounding Datum for the Port of Onehunga, with effect from 1 January 1973 and that the Navy Hydrographer, appropriate Government Departments and interested Local Authorities be notified.


R. T. Lorimer
GENERAL MANAGER

24 November, 1972

THE CHIEF ENGINEER

THE GENERAL MANAGER

ADOPTION OF CHART DATUM AS
SOUNDING DATUM AT ONEHUNGA

It is intended that Navy Department Chart Datum be adopted as the Sounding Datum at Onehunga to coincide with the change to metrication being effected on 1 January 1973. The Port of Auckland was brought onto Chart Datum with effect from 1 August 1970.

At present any navigational surveys undertaken from the Manukau Bar into the main channels are already shown in relation to Chart Datum due to the extensive tidal gradient existing and the necessity to tie in with Naval Surveys. Wharf soundings at Onehunga will therefore only be affected, these being for A.H.B. use only to determine dredging requirements, berthing and briefing.

The Harbourmaster concurs with this intention.

Accordingly I propose that the matter proceed to be effective from 1 January 1973 and that the Hydrographer of the Navy, appropriate Crown Departments and interested Local Authorities be informed.

NS:JARP

CHIEF ENGINEER TO THE BOARD.

Copy to: HARBOURMASTER
:For Information

CHIEF ENGINEER TO THE BOARD.

Auckland Harbour Board

MEMORANDUM

23 November, 1972

FROM *C/E*
HYDROGRAPHER

TO

GENERAL MANAGER
~~THE DEPUTY CHIEF ENGINEER~~

ADOPTION OF CHART DATUM AS
SOUNDING DATUM AT ONEHUNGA

intended
It is proposed that Navy Department Chart Datum be adopted as the Sounding Datum at Onehunga to coincide with the change to metrication being effected on 1 January 1973. *The Port of Auckland was brought onto Chart Datum with effect from 1 August 1970*

At present any navigational surveys undertaken from the Bar into the main channels are already shown in relation to Chart Datum due to the extensive tidal gradient existing and the necessity to tie in with Naval Surveys. Wharf soundings at Onehunga will therefore only be affected, these being for A.H.B. use only to determine dredging requirements, berthing etc. *and briefing,*

Should agreement be given to this proposal it is suggested that the Hydrographer of the Navy and interested Local Bodies be informed.

The Harbourmaster concurs with this intention. Accordingly I propose that the matter proceed, and that the Hydrographer of the Navy, appropriate Civil Departments and interested local authorities be informed.

M. J. [Signature]
HYDROGRAPHER

JHR:JARP

Copy to: HARBOUR MASTER

DRAFT.

From Hydrographer

to Deputy Chief Engineer
copy to Harbour Master.

Adoption of Chart Datum as Sounding Datum at Onehunga.

It is proposed that Navy Department Chart Datum be adopted as the Sounding Datum at Onehunga to coincide with the change to metrication being effected on 1st Jan 1973.

At present any navigational surveys undertaken from the Bar into the main channels are already shown in relation to chart Datum due to the extensive tidal gradient existing and the necessity to tie in with Naval surveys. Wharf soundings at Onehunga will therefore only be affected, these being for A.H.B. use only to determine dredging requirements, berthing etc.

Should agreement be given to this proposal it is suggested that the Hydrographer of the Navy and interested Local Bodies be informed.

M. Reid.

N.B



Chief Eng

He should tell the Board that this will
take place on the 1st Jan 1973

M

EXTRACT FROM MINUTES
GENERAL PURPOSES COMMITTEE
15 AUG 1972

14. MANUKAU HARBOUR STUDY

Consideration was given to the report of the General Manager dated 10th August 1972 advising of request from the City of Manukau that the Board and the Auckland Regional Authority give consideration to undertaking a study of the Manukau Harbour similar in scope to the Waitemata Harbour Study. The report detailed the planning groups which were likely to be involved in such a study and recommended that the Board accept that the Manukau Harbour Study is a desirable objective and that commencement of such a study should be considered when progress on the Waitemata Harbour Study has reached a stage where the results and resources of staff in the organisation indicate a reasonable opportunity for a Manukau Harbour Study to proceed.

Recommended -
That the report be adopted.

*In Sugar
to hold*

ADOPTED BY BOARD
22 AUG 1972

Auckland Harbour Board

36

ITEM 16

10 August 1972

The Chairman,
General Purposes Committee,
AUCKLAND HARBOUR BOARD.

MANUKAU HARBOUR STUDY

A request has been received from the City of Manukau asking the Board and Auckland Regional Authority to give consideration to the undertaking of a study of the Manukau Harbour similar in scope to the Waitemata Harbour Study.

The planning groups likely to be involved in a study of the Manukau Harbour would include -

- (a) The Harbour Board as the owner of all tidal lands which were vested under the Manukau Harbour Control Act 1911 and its jurisdiction over all harbour waters pursuant to the Harbours Act 1950.
- (b) The Auckland Regional Authority which has prerogatives to plan over the adjoining land and the harbour.
- (c) The Counties of Waitemata and Franklin, the Cities of Manukau and Auckland, the Boroughs of Mt. Wellington, One Tree Hill, Onehunga, Mt. Roskill, Papakura and Waiuku.
- (d) In due course, the Auckland Regional Water Board.
- (e) Government Agencies.

At various times in recent years there have been discussions regarding the need for such a Study and the establishment of an appropriate plan for the Manukau Harbour as being desirable in terms of regional and district planning. Investigations of particular aspects or areas of the Harbour have been undertaken as required in the past. A current example is the investigation initiated by the Board, after discussions with the Ministry of Works, Regional Authority and City of Manukau, and related to the need for understanding of the consequential effects of various reclamation and public works on the hydraulics and regime of the Mangere Inlet and Onehunga beach. This work is still in progress.

The broad principles of planning objectives and policies applicable to the Manukau Harbour and its shorelines are enunciated in the Auckland Regional Planning Scheme which is yet to become operative. A more specific study and plan for the Harbour should desirably follow at an appropriate time.

The Waitemata Harbour Study should be progressed to some finality before commencing a further study. The question as to whether Harbour Boards should or should not become planning authorities has some relevance in any future consideration of such a study.

I would recommend that the Board accept that a Manukau Harbour Study is a desirable objective. The commencement of such a Study should be considered when progress on the Waitemata Harbour Study has reached a

... ..

37

stage where the results of the Study and the resources of staff under the present Study organisation indicate a reasonable opportunity for a Manukau Harbour Study to proceed.



R.T. Lorimer
GENERAL MANAGER

TONKIN & TAYLOR



CONSULTING CIVIL &
FOUNDATION ENGINEERS

PRINCIPALS:
RALPH M. TONKIN, B.E., F.N.Z.I.E., M.I.C.E., M.A.S.C.E.
DONALD K. TAYLOR, B.SC., D.I.C., F.N.Z.I.E., M.I.C.E.
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ASSOCIATES:
PETER B. NISSEN, B.E., B.SC., D.I.C., M.N.Z.I.E., M.I.C.E.
FRANK BARTLEY, B.E., M.N.Z.I.E.
JEEN OOSTENRIJK, M.N.Z.I.E., ING. (Netherlands)

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PETER W. TAYLOR, B.SC., B.E., M.N.Z.I.E., M.I.C.E., M.A.S.C.E.
GEOFFREY R. MARTIN, M.E., PH.D. (Calif.), M.N.Z.I.E.

100 ANZAC AVENUE
P.O. BOX 5271
AUCKLAND
NEW ZEALAND
PHONE 361-784

Ref. 2182.

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
Auckland.

13th May 1972.

TIDAL FLOW RECORDS - MANUKAU HARBOUR

To Fees:

Professional services:-

1 hour @ \$7.00	\$7.00	
83½ hours @ \$6.00	501.00	
1 hour @ \$4.00	4.00	
3 hours @ \$3.00	<u>9.00</u>	\$521.00

Mileage 225 @ 13c. 29.25

Disbursements:-

Xerox copies 5.60

\$555.85

2222 22

RECEIVED
MAY 15 1972

100

Auckland Harbour Board

MEMORANDUM

17th March 1972

FROM

THE HARBOURMASTER

TO

THE CHIEF ENGINEER

MANUKAU ENTRANCE SURVEY



The last survey of the Manukau entrance was carried out 5th and 6th November 1971.

Owing to the time elapsed and the approach of the season of unfavourable weather it is essential that the first opportunity should be taken to carry out a further

Auckland Harbour Board.

*Mr. Leith
Could we discuss
at your earliest
convenience*

[Signature]
HARBOURMASTER

Mr Secgor
*discussed matter with H.M. &
agreed to carry out survey at first
opportunity*

*Advised
Yr please*

[Signature]
22/3/72

Auckland Harbour Board

MEMORANDUM

17th March 1972

FROM

THE HARBOURMASTER

TO THE CHIEF ENGINEER

MANUKAU ENTRANCE SURVEY



The last survey of the Manukau entrance was carried out 5th and 6th November 1971.

Owing to the time elapsed and the approach of the season of unfavourable weather it is essential that the first opportunity should be taken to carry out a further

Auckland Harbour Board.

Mr Alexander

Please discuss with
Mr Seagar & his little

Is this really essential?



Mr Seagar - your baby, I think!
R/S

A. H. ...
HARBOURMASTER

Advised
Yes please

MS
22/3/72

Auckland Harbour Board

MEMORANDUM

17th March 1972

FROM

THE HARBOURMASTER

TO

THE CHIEF ENGINEER

MANUKAU ENTRANCE SURVEY



The last survey of the Manukau entrance was carried out 5th and 6th November 1971.

Owing to the time elapsed and the approach of the season of unfavourable weather it is essential that the first opportunity should be taken to carry out a further survey.


HARBOURMASTER

*Advised
Yr please*

*MS
22/3/72*

25 January, 1972

Department of Lands & Survey,
P.O. Box 8003,
Government Buildings,
WELLINGTON 1.

Dear Sir,

TIDE PREDICTION, ONEHUNGA

With reference to your letter 17/133 of 21 January 1972 we have pleasure in forwarding tide charts for Onehunga covering the period 29 December 1970 to 30 December 1971.

An early return of these charts would be appreciated as we are frequently asked for tidal information by other interested parties.

Microfilms of earlier observations than those above are held by The Navy Office, Wellington.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

JHR:JARP

Enc : Tide Charts.



Department of Lands & Survey

TELEGRAPHIC ADDRESS: 'HEADLANDS' TELEPHONE 44 435

OUR REFERENCE: 17/133
YOUR REFERENCE:



HEAD OFFICE,
P.O. BOX 8003,
GOVERNMENT BUILDINGS,
WELLINGTON I.
21 January 1972

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Tide Prediction, Onehunga

Dear Sir,

Your letter of 1 December 1970 stated that a whole year's observation of the tide at Onehunga would not be available before August 1971. If a whole year of observation is now available, will you please send me the charts. They will be returned to you as soon as the necessary data have been extracted.

I enclose a summary of levelling at Onehunga. I propose to adopt the definition of the zero of predictions:

5.590 m (18.34 ft) below B.M. CC 65, stainless steel pin in concrete block near easternmost corner of Shed B, Onehunga Wharf; being also the zero of the automatic tide gauge.

Yours faithfully,

W. S. BOYES
Surveyor-General

Enc.

per

ONEHUNGA

Feet	Metres	
18.34	5.590	BM CC 65, stainless steel pin in concrete block near easternmost corner of Shed B, Onehunga Wharf
18.09	5.514	"M" on bollard above pile 3A, Onehunga Wharf
14.00	4.267	15 ft mark on visual tide gauge
7.55	2.301	Mean Sea Level [Analysis by A.H.B.]
0.00	0.000	Zero of predictions; zero of automatic tide gauge (1972-)
-1.00	-0.305	A.H.B. Sounding Datum (-1971)
-2.00	-0.610	Auckland Dock Sill (covered 1915)



AUCKLAND REGIONAL AUTHORITY

Regional House, 121 Hobson St, Auckland 1, New Zealand.

Telephone: 364-420 Telegrams: Regional

All Correspondence to:
The Secretary,
ARA Private Bag
Auckland 1, N.Z.

Please quote

10/10/28 CCC:CBOH

in your reply

30 June 1971



Chief Engineer to the Board,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Sir,

Manukau Harbour - Investigations

I thank you for your letter dated 25 June and much appreciate your very considerable assistance.

Yours faithfully,

G.A. Tait
Director of Works

Per:

C.C. Collom
Chief Engineer Drainage

The Chief Engineer,
Drainage Division,
Auckland Regional Authority,
Private Bag,
AUCKLAND

Dear Sir,

MANUKAU HARBOUR - INVESTIGATIONS

Further to my letter of 20 May a copy of Plan H5/12 showing soundings obtained in the areas north and south of Puketutu Island is forwarded herewith. As requested the southern area has been plotted to a scale of 400' to 1" and the plan inset shows the northern area to chart scale 1 : 18,000.

To attempt sounding over the drying sandbanks to the south of Puketutu Island involves the risk of grounding the survey launch and this appears to be unnecessary as these sandbanks are firm enough to be walked over and cross-sections obtained by levelling. Some spot heights obtained by walking along the waterline in this area are included on the plan.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

JHR:JARP

Enc : Copy of Plan H5/12.

Auckland Harbour Board

MEMORANDUM

FROM

TO

1 December, 1970

Surveyor General,
Dept., of Lands & Survey,
P.O. Box 8003,
WELLINGTON, C.1.

Dear Sir,

TIDE PREDICTION, ONEHUNGA

The following details of datums etc. are forwarded in reply to your letter ref. 17/133 dated 23 November, 1970 :-

1. Zero of the Automatic Tide Gauge at Onehunga is at present set to both Auckland Dock Sill and A.H.B. Sounding Datum (1 ft. above A.D.S.), both values being printed on the tide charts.
2. It is confirmed that Chart Datum (2 ft. above A.D.S.) will be the new Zero of the tide gauge at Onehunga when the present Tide Charts are replaced with metric charts on 1 January, 1972.
3. With reference to the last paragraph of your letter, it is presumed that the most recent tidal observations will be used for your analysis. Unfortunately the Automatic Tide Gauge at Onehunga has had a long history of being affected by silting under the wharf. This has now been remedied by running an extension tube to deeper water and the problem appears to have been solved. The situation then is that tide readings after 1 August 1970 are checked at least weekly and accurately record the tide to within 0.04 ft. Readings taken prior to this cannot be guaranteed accurate enough as a basis for analysis, therefore it will not be until August 1971 that a full years observations will be available. Should you consider that a shorter period would suffice for your analysis we would be pleased to send, at your request, the Tide Charts.

Yours faithfully,

JHR:NKR


CHIEF ENGINEER TO THE BOARD.

Copies to : MR. REITH : MR. SEAGAR : For Information.

Auckland Harbour Board

MEMORANDUM

31st August 1970

FROM THE HARBOURMASTER

TO THE CHIEF ENGINEER

Attention of Mr. Seagar

MANUKAU BAR

Attached are two letters concerning surveying of the Manukau Bar, Holm & Co.'s letter asking for advice of our summer programme, and my reply.

I have no intention of providing Holm & Co. with a programme of survey work, but have given them all the up to date information.


W. Seagar
HARBOURMASTER

xxx 74-610

28th August 1970

Captain R. Jackson,
Marine Superintendent,
Holm & Co. Ltd.,
P.O. Box 1372,
AUCKLAND 1.

Dear Sir,


I acknowledge receipt of your letter of 19th August. Thank you for your comments, written and by 'phone, relative to the Hydrographic Committee Meeting. I too consider that there should be adequate Harbour Board representation.

As you now know a further survey of the Manukau entrance was made on 26th August. You will be pleased to note that the southwest channel still shows a good degree of stability, and I am cautiously optimistic of an even greater improved channel developing.

The South Channel however is still very unstable and for that reason I cannot advise its use.


I intend to continue checking the channel as circumstances permit and feel that your directive to Masters is prudent.

Yours faithfully,


R.H. Carter
HARBOURMASTER

The Chief Engineer

For your information.


Harbourmaster

HOLM SHIPPING COMPANY LIMITED

SHIP OWNERS
SHIP AGENTS
SHIP BROKERS
STEVEDORES



P.O. Box 10
JOHN BAY
10 CUSTOMERS
TELEPHONE 5
CODE ADDRESS: 1
TELEX N.Z. 2534

19th August, 1970

The Harbour Master,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Sir,

You will be aware that I recently attended the Hydrographic Committee Meeting in Wellington and it was noted in the review of work supplied by the R.N.Z.N. Item 2, page 3, the Manakau Bar is mentioned and the Navy of course have acknowledged receipt of your Boards information on this particular area.

You have already advised me in previous correspondence that the winter weather has delayed your programme somewhat and you will also be aware that various vessels have reported touching on the S.W. channel recently.

In the circumstances would you therefore advise me on your tentative summer surveying programme for this area and in the meantime I will again remind our various Masters to confine their crossing times of the Bar to within two hours of highwater depending on draught etc.

Yours faithfully,
HOLM SHIPPING COMPANY LIMITED

AUCKLAND HARBOUR BOARD HARBOUR DEPT.	
REC'D 20 AUG 1970	
ACKD.	8-70
ANSD.	28-8-70

R. Jackson
R. JACKSON
MARINE SUPERINTENDENT

61
115

c.c. Master, 'PATEKE'
" 'PUKEKO'
" 'HOLMWOOD'
" 'HOLMDALE'
" 'HOLMBURN'

OFFICES: AT ONEHUNGA WELLINGTON LYTTTELTON
AGENTS THROUGHOUT NEW ZEALAND

"JURY'S" MAR.

H.M. [Signature]
J.O.W. [Signature]
Tell Jackson we will be doing a survey of the port [unclear] [unclear]
OK.

XXXX 74-610

The Naval Hydrographer, Wellington.
Secretary for Marine, Wellington
Marine Supt. N.S.S. Co.
Holm & Co. Ltd.
Anchor Shipping & Foundry Ltd. Nelson
NZ Cement Co. Ltd., Westport
N.Z. Export Line Ltd.

31 March 1970



Dear Sir,

NAUTICAL SURVEY

I enclose plan H5/18 showing soundings taken on 12th and 13th March 1970.

South Channel once again shows instability while the Southwest Channel shows little if any change.

The general weather conditions in the area will deteriorate with the approach of winter and render the possibility of monthly surveys remote. However I intend to avail myself of favourable conditions in the area.

In the meantime I intend to improve the visibility of both Cutter Rock and Clay Hill Beacon.

Yours faithfully,

[Signature]
for N.H. Carter
HARBOURMASTER

HHC/AG

The Chief Engineer

For your information.

Who is down this?
Small up.
Mr. Sgayer *[Signature]* Harbourmaster
New Boston *[Signature]*

10 November 1969

THE CHIEF ENGINEER

THE GENERAL MANAGERMANUKAU ENTRANCE(YOUR MEMORANDUM 16.10.69 REVER)

A copy of the Harbourmaster's report of 24th October 1969 has been received with the matters of defining responsibilities and the essential requirements related to hydrographic services and shipping safety.

In summary it appears that the situation now, would be:-

1. Surveys:

(a) Continuous surveys are desirable to determine the depth and location for the best courses through the channels (south and south west).

(b) Sufficient Surveys are necessary to apply vigilance at the operable channel to be aware of changes which could be detrimental to shipping safety. This requirement is related to the knowledge that it is not always feasible or practical to complete a constant interval arrangement.

(c) Requirement Surveys at this time are now stated to be every four weeks and will cover the:-

- | | |
|------------------------|---|
| (i) South West Channel | Operable |
| (ii) South Channel | Not recommended except under certain circumstances. |

This work is to be continued for 6 - 9 months and if it is established that stability has come to the South West Channel, then the interval can be increased to four months or such interval as deemed appropriate at the time. (I am not clear what happens at the South Channel in event that the channel may again show some stability and adequate water depth, particularly as this is the preferred channel).

(d) Additional Surveys will be required to suit some unforeseen circumstances or a particularly prolonged spell of unfavourable weather. Again I am not clear, is this concurrent with (c) above or to take effect after).

(e) Conclusions:

For the next year it could be necessary to devote considerable time to accede to paras. (c) and (d) as understood at this stage.

2. Survey Work Capability:

(a) The Board has one survey group full time under the Hydrographer J. Reith. The Hydrographer's opinions on the ability to meet all requirements of Waitemata and Manukau total are set out in his submissions dated 22.9.69.

(b) Navy have a commitment to survey the whole entrance every five years. Next check is 1970.

... ..

(c) With the new echo sounder fitted to "Arahi", field work will be accelerated in the Waitemata, so that any effect from additional work at Manukau can to some degree be offset. Plotting work will have to be dealt with more promptly to keep pace.

(d) The provision of a second survey team is now agreed to be unwarranted having regard to two facts:-

(i) Unless a further launch is provided on the Waitemata they cannot be used when not required at the Manukau. Additional staff and accommodation problems.

(ii) A separate team for the Manukau only requires another competent Hydrographer.

3. Recommendations:

(a) The Hydrographer will check the S.W. and South Channels at monthly intervals (weather conditions permitting) as from now for a period of six months.

(b) At the end of this period the matter to be reviewed and survey intervals agreed for the S.W. and South Channels.

(c) This work to be undertaken with the present hydrographic section, supplemented by additional labour from our existing staff as may be necessary to call upon to meet all requirements in the Waitemata and Manukau.

(d) Commander Smith, Navy Hydrographic Office be asked to Auckland for discussions with the Harbourmaster and Chief Engineer concerning the impending Navy Survey of the Bar, matters of consequence stemming from the Hydrographic Committee, Harbours Association and the Manukau Entrance and such other matters relevant to the accepted practice and responsibilities for hydrographic surveys at the entrance channels and shipping needs.

The South West and South Channels were surveyed on the 3rd and 4th November.

Further consideration on this matter will no doubt be arranged on the Harbourmaster's return from leave.

CHIEF ENGINEER TO THE BOARD.

NS:RB

COPY TO : Harbourmaster

Auckland

Auckland Harbour Board

MEMORANDUM

31st October 1969

FROM THE HARBOURMASTER

TO THE CHIEF ENGINEER

MANUKAU SOUTHWESTERN CHANNEL

I attach a copy of a report from Captain E.R. Warner, whose vessel the "Holmwood", was the first to officially use the newly opened channel.

Commenting on the final paragraph, a further survey should be carried out at the first opportunity and if reasonable stability of depth is found consideration must be given to improving the visibility of leading marks as soon as possible.

I have replied to the Marine Superintendent of Holm and Co. along these lines.

N. Barber
HARBOURMASTER

JOW/HG

1. Surveys completed on
3rd & 4th November

Gen. Seager

2. Butler Rock & Reef
marks to be investigated.
- a. Butler Rock - Helicopter & Paint
- b. Reef mark - Large beacons to
use light.

HOLM SHIPPING COMPANY LIMITED

SHIPWHARF
SHIPPERS
SHIPROCKERS
STEVEDORES

PAK. DIST. BUILDING, N.Z.
17 OXFORD STREET
TELEPHONE 5159
CABLE ADDRESS: HOLMSHIP
TELEX N.Z. 4205

M.V. "Holmwood"

At Sea.

2.10.69.

Captain R. Jackson,
Marine Superintendent,
Holm & Co. Ltd.,
AUCKLAND.

Dear Sir,

I wish to inform you that when departing from Manukau Harbour today, I worked the new channel which has broken out through the middle of the South Bank.

As you know, prior to leaving Onehunga, I discussed this with Captain Berry and also the Auckland Harbour Board Hydrographic Officer, who gave me the findings of his survey of the area on 30.9.69.

There appears to be ample width in the channel and also plenty of water (17 ft at L.W.). I was unable to take accurate soundings as there was a very big S.W. roll with some heavy rakes of breakers at times; the ship scending six or seven feet.

We crossed the bar two hours before H.W. and there appeared to be at least 30 feet of water in the channel.

From Paratutai abeam I steered 242° (T), approximately S.W. (mag) until in a position where the bearings of Windy Pt. beacons (in line), Ninepin Rk. and the peak of Paratutai (in transit), and the 3 white beacons south of Sth. Hd. Light (in line), all intersect.

This puts you on the line of leads for working the bar (Cutter Rk and a white beacon on a clay hill brg 049° (T)).

I suggested to Mt. Victoria Signal Station, who said that Captain Carter was interested in our progress, that in my opinion if a larger beacon could be erected and a splash of paint be placed on Cutter Rk., it would help a lot in picking up these marks from four or five miles to sea ward.

I remain,

Yours faithfully,

E.R. WARNER, Master.

OFFICES AT AUCKLAND ONEHUNGA WELLINGTON
AGENTS THROUGHOUT NEW ZEALAND

110
68

Mr. Seagar

Is it practicable for Keith to survey this place every four weeks without seriously affecting other work?

Since the "middle" channel now provides 18 ft at low water is such a "flap" really warranted?

~~J~~

30.10.69

24th October 1969

THE HARBOURMASTER

THE GENERAL MANAGER

MANUKAU ENTRANCE

Full consideration has been given to the programming involved with surveying at the Manukau Entrance and the only real answer is to continually sound the area to determine where there is sufficient water in the channel.

When?

However, as it is not feasible or practical to make a continuous survey of the area we must ensure that we are keeping it under sufficient vigilance to maintain a safe warning of sand movement in the operable entrance.

we have stated lake

*11/10
X*

My requirements of the Hydrographic Section at the present time is to survey the bar; the S and S.W. channel, every four weeks. If after six or nine months it is established that a stability has come to the S.W. or main channel, then the time between surveys could be lengthened to say four months or whatever is decided at that time. After all, the ships using the channel can, and do keep us informed of every noticeable change that takes place within the scope of their course.

If through some unforeseen circumstances or a particularly prolonged spell of unfavourable weather, I consider it advisable, I would order the Hydrographic Section through the Chief Engineer, to make an immediate survey.

To summarize -

1. The Board's responsibilities are to maintain a signalman at South Head who is sufficiently conversant with the area to advise to the best of his ability, considering his remote position, of the sea conditions at any point of time.
2. All other precautions have been taken. Notices are immediately promulgated following a survey.
3. Cautionary notices are printed on all Marine Department charts of the area.
4. The Port Information Manual covers this aspect very clearly.
5. Navigational aids provided by the Board are well placed and adjusted as circumstances demand.
6. The Marine Department and the Navy's Hydrographic Department are kept fully informed.

The Chief Engineer

For your information.

[Signature]
Harbourmaster
per JOW

[Signature]
HARBOURMASTER
per JOW.

RHC/HG

Mr. Seagar

*⊗ c/s Please give consideration to the's
requirement and to ways in which this could
be satisfied RTh/Dm. 1/11/69.*

Auckland Harbour Board

MEMORANDUM

16 October 1969

FROM

THE GENERAL MANAGER

TO

THE HARBOURMASTER

MANUKAU ENTRANCE
(Your memorandum of 7 October 1969
refers)



- In order that full consideration can be given to the way in which we can best meet our responsibilities for surveying the entrance to produce the information that you consider essential for the safety of shipping, please prepare for me a report defining our responsibilities and listing your essential requirements to satisfy these.
- ①
 - ②
- On receipt of your report it is my intention that, in conjunction with the Chief Engineer, we examine the matter with a view to arriving at the most practicable way of meeting the requirement.

R.T. Lorimer
R. T. Lorimer
GENERAL MANAGER

h
c. c. THE CHIEF ENGINEER

Mr. Seager
File

On receipt of ① proceed with ②.

7th October 1969

THE HARBOURMASTER

THE GENERAL MANAGER

MANUKAU ENTRANCE

This confirms my verbal report of 2nd October 1969.

A very serious and sudden deterioration in the depth of water in the South Channel from 13 feet to 7 feet was disclosed by a survey on 30th September 1969. Although this channel has for some time been unstable the drastic loss of 6 feet occurred in the last two weeks.

Fortunately, conditions on this date permitted an examination of the suspected southwestern approach, and this showed a somewhat similar position to that found last November, with a minimum depth of 15 feet, with 2 reasonable shore marks indicating the best line of approach. This channel is about the position of the main entrance at the turn of the century and until the 1930s or later, and is where natural conditions would indicate. In those days adequate water and width of bar prevailed.

Consequently I immediately directed that all vessels be advised to use the new bar entrance, with extreme caution. The Marine Department was informed by telegram and I discussed the situation fully with Captain H. Boyack. A temporary beacon was erected at Whatipu to assist Mariners in identification of leading marks. Captain Berry, who was aboard "Manukau" when the survey was made, personally delivered plans and my directions for entering to the signalman Manukau Heads and fully explained the position. He was at the signal station when three vessels made their first crossings of the bar. Captain Keyworth and Captain Blair, Manukau pilots, were also present at the heads to familiarise themselves with the situation which has arisen.

The Hydrographic Section is taking every opportunity to check both channels and to assist in establishing a safe and acceptable line of approach. In the meantime such action will be taken to provide the best possible assistance to Masters and as soon as it is deemed prudent more permanent beacons and marks will be established.

The Naval Hydrographer, Marine Department, Masters of ships and Shipping Company Marine Superintendents have been sent plans and directions for entering and are being kept fully advised of all developments.

Consequent upon the apparently accelerating changes of late, the drastic loss of water and a report of the Hydrographer reiterating the problems of effective surveying of the area, a meeting of the Deputy Chief Engineer, Hydrographer, Officer in Charge Onshunga, Survey Officer and myself was held. Here it was agreed that many factors associated with Manukau Entrance surveys were such that the Board's present Hydrographic Section was able to carry out the work necessary to reasonably produce all the information essential relative to the safety of shipping, but this can be done only at the expense of other Hydrographic requirements. With the rapid and unpredictable changes that take

... ..

M. S. Lengua

See over.

The General Manager

7th October 1969

MANUAKU ENTRANCE (Contd.)

place every opportunity be taken to check sound the channels and establish a more stable channel line. I am confident that the area will stabilise on the S.W. line but naturally it is imperative that the situation is closely watched.

x | Further submissions regarding the requirements of the Hydrographic Section in relation to this work will be supplied by the Chief Engineer.

J.M.C.

HARBOURMASTER

The Chief Engineer

For your information.

J.M.C.

Harbourmaster

x | Discussions have been taken with him on this matter. However until he has said that he considers such checks should be each week or less no decision can be made. Again the issue is somewhat clouded by the question of Navy Hydrographic bodies being available and using Manukau?

Wait until Board meeting where this report will be presented by C.E. *H.*

JOW/HG

3rd October 1969

The Secretary for Marine,
Marine Department,
P.O. Box 10142,
WELLINGTON C.1.

Dear Sir,

MANUKAU ENTRANCE

This is to cover survey plan of the area dated 30th September 1969, forwarded to you yesterday.

Plan H5/IH discloses a serious deterioration in the South Channel and a sudden worsening of the situation when compared with the survey of 15th and 16th September 1969 H5/IF.

The latest plan shows also the main or southwestern approach and when compared with the soundings taken 11th - 14th November 1968, H5/IE, indicates a degree of stability. Visual observations and reports from fishing vessels using this channel have long pointed to the possible existence of this channel. South Channel has always been looked upon as the most sheltered channel to work provided the depth was sufficient. Yesterday, with a moderate swell running, while the shoal area of South Channel was breaking continuously there were only occasional breaking seas in the southwestern approach. Our survey disclosed a maximum depth at low water of 15 feet.

Consequently as South Channel showed only 7 feet on the outer line of approach I am directing vessels to use the main or southwestern channel. I enclose a copy of my Directions for Entering which will be given to all Masters.

done / Cutter Rock and the conical clay hill with its small survey beacon are both easily distinguishable and immediate steps will be taken to improve their visibility.

I will continue to keep the area under constant observance and keep you informed of any marked changes and could in fact call for some assistance from the Naval Hydrographer.

Yours faithfully,

R.H.C.
R.H. Carter
HARBOURMASTER

The Chief Engineer

Encl.

For your information.

M. H. Mander
Harbourmaster

M. H. Mander *AS.*

Auckland Harbour Board

MEMORANDUM

FROM

THE HARBOURMASTER

TO

THE CHIEF ENGINEER

19th September

1969

ENGINEERS DEPT.

MANUKAU ENTRANCE

I attach a copy of a letter from the Master M.V. "Calm" to Marine Superintendent, Holm & Co., and my reply, both of which are self explanatory.

Captain Jackson, Holm & Co., will be attending the Hydrographic Committee meeting in Wellington and will emphasise the need for extensive surveying at the Manukau Entrance.

[Handwritten signature]

[Handwritten signature]
HARBOURMASTER

W/HG

COPY

M.V. Calm
Lyttelton,

15th Sept. 1969

The Marine Superintendent,
Holm & Company,
Auckland.

Dear Captain Jackson,

While crossing the Manukau Bar outward on the evening of 12th September, the vessel touched bottom several times over a 10 minute period.

At the time of touching the vessel was at a draft of 11-2 fwd. 12-1 aft. The Destruction Gully leads were open to the west approx. 1 to 1½ beacon widths. Low water was 1619 and the vessel touched at 1809. I was proceeding at slow speed at the time.

At no time did the vessel strike heavily as there was practically no swell. Soundings were taken of all tanks and bilges after clearing the bar, and showed no signs of water being made. I am quite confident that no damage has been sustained by the vessel.

I would stress the urgency of a proper survey being carried out on the Manukau bar, as it seems that the shoal under the signal tower now extends right across the south channel. Until soundings are taken on this area of the bar, I would suggest that our vessels only cross 3 hours before or after high water in good weather, and draught not more than 12 ft.

I regret this incident, but would point out that several other ships have touched around the same position recently and until a survey is conducted, ships Masters are crossing purely by guess work without an echo sounder.

Yours faithfully,

G.L. Porter, Master.

52
17th September 1969

The Marine Superintendent,
Holm & Co. Ltd.,
P.O. Box 1372,
AUCKLAND 1.

Dear Sir,

I acknowledge receipt of the copy of your letter from the Master, M.V. "Calm", relative to his touching bottom in Manukau South Channel on 12th September 1969. The passage was made less than 2 hours after low water at which time the rise of tide would not have been much. I also note his suggestion regarding passage being made within three hours of high water and would comment that this bears out my constant warnings regarding the Channel.

Recent weather and tidal conditions have enabled soundings of the South Channel to be made and I attach a copy of our findings of 15th and 16th September. This indicates that on those days the best water on both lines was slightly to the eastward of the leading marks. Being acquainted with the instability and unpredictability of the whole area adjacent to the Heads you will agree that it is impossible to state how long the indicated situation will continue and in what way it may alter.

It is my intention to re-examine the area at the first opportunity and you will be advised of our findings.

Both the Officer in charge at Onehunga and the Signaller at Manukau Heads pass on all relevant information to Masters using the port.

Yours faithfully,

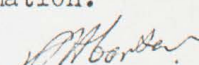

R.H. Carter
HARBOURMASTER

JOW/HG

The General Manager

For your information.

Encl.


Harbourmaster

23 September, 1969

DEPUTY CHIEF ENGINEER

THE HARBOURMASTER

MANUKAU ENTRANCE - HYDROGRAPHIC SURVEYS

You will find attached a Memorandum from the Hydrographer on the above subject and the consequential effects on all hydrographic work.

As I understand the submissions, the Hydrographer advises -

1. If the Board is accepting responsibility to advise shipping using the South Channel Manukau Entrance with information to assist in navigation, then there is a responsibility to maintain a current and adequate understanding of channel conditions as far as is practicable. The Hydrographer not only offers this opinion in the Board's interest, but permits one to consider his personal and professional association with a situation which, if there was a serious grounding or other problems, could be of some consequence.
2. As it concerns more regular surveys of the Channels at the Manukau Entrance, I would be the first to admit that in the last twelve months we have failed to perform due to other pressures of work. On the other hand, I ask myself as before, that even if more regular surveys of say the South Channel were completed, and having regard to the rapid changes that occur, would we be any more competent and responsible in supplying ships with reliable information.

I suggest that we arrange a meeting with the Hydrographer and Officer in Charge Onehunga to consider the Manukau requirements, more particularly to prepare firm recommendations on surveys at the entrance so that the total hydrographic situation as submitted by the Hydrographer can be resolved.

DEPUTY CHIEF ENGINEER

ENCL : Memorandum from Hydrographer.

Copy to : HYDROGRAPHER

NS:NEK

Auckland Harbour Board

MEMORANDUM

22 September, 1969

FROM THE HYDROGRAPHER

TO THE DEPUTY CHIEF ENGINEER
THE HARBOURMASTER

Submitted :

MANUKAU BAR SURVEY

The recent survey of the South Channel, Manukau Bar, carried out on 15th and 16th September 1969 is the seventh survey to be undertaken since the Tug "Manukau" was made available for this work early in 1967.

The nature of the Manukau Bar, and the South Channel in particular, is such that in order to effectively advise shipping of the best approaches this survey must be carried out more frequently.

As an example of the effectiveness of a recent survey the M.V. "Tawanui" entered the Manukau Harbour via the south channel two days after the above survey and from the soundings obtained advised to keep 250 feet to the eastward of both leads. As a result of following these directions her Master reported that he had found a least depth of 20 feet whilst navigating the south channel. Immediately prior to this survey shipping had been advised to keep to the westward of the leads and found very shoal water.

The frequency of surveys necessary is a matter yet to be decided although it is known that the south channel can change drastically from one week to the next. With occasional reports of ships touching bottom whilst navigating the South Channel it is merely a matter of conjecture as to when a more serious grounding will occur and what blame will be attached to the Harbour Board for not providing up-to-date hydrographic information.

Experience gained over the past 2½ years leads me to recommend that the current channel in use over the Bar be sounded at least once a month and this, by nature of the average sea conditions prevailing at the Manukau Heads, in reality means a survey on every occasion when the weather allows. As I see the situation to fail to do this is to advise mariners on obsolete information which is worse than not doing a survey at all.

The pressure of work on the Waitemata Harbour is more than enough to keep the Hydrographic Section fully occupied. Indeed no time is left available for such necessary programmes as study of tidal movement, investigation of silt problems etc. To carry out a survey programme on the Manukau Bar as outlined above with our present complement is, therefore, clearly impossible without sacrificing interests on the Waitemata Harbour.

The complement of the Hydrographic Section is as follows :-

One Tech. 7.	-	Hydrographer
One Tech. 2.	-	Plotting ashore & afloat, drawing plans etc.
Two R.G.H.'s.	-	Sextant Hands

additionally the Surveyors Chainman assists as a sextant hand when not employed by the Surveyor.

... ..

The minimum requirements for surveying the Manukau Bar are, in addition to normal tug's crew :-

Surveyor in charge
Two sextant Hands (experienced)
One unskilled hand (for recording)

Use of the automatic tide gauge at Paratutai would obviate the necessity for a tide gauge reader as used at present.

At this stage I would stress that the Manukau Bar calls for an experienced hydrographic surveyor to be in charge - the nature of this stretch of water allows for no mistakes.

Most work in the Waitemata Harbour requires a similar team to that above, it therefore follows that to satisfactorily conduct surveys on both harbours, and for this we have sufficient equipment, the engagement of another qualified Hydrographic Surveyor, and a full time sextant hand, plus the use of one unskilled hand would be necessary.

HYDROGRAPHER

JR:NKR

17th September 1969

The Marine Superintendent,
Holm & Co. Ltd.,
P.O. Box 1372,
AUCKLAND 1.

Dear Sir,

I acknowledge receipt of the copy of your letter from the Master, M.V. "Calm", relative to his touching bottom in Manukau South Channel on 12th September 1969. The passage was made less than 2 hours after low water at which time the rise of tide would not have been much. I also note his suggestion regarding passage being made within three hours of high water and would comment that this bears out my constant warnings regarding the Channel.

Recent weather and tidal conditions have enabled soundings of the South Channel to be made and I attach a copy of our findings of 15th and 16th September. This indicates that on those days the best water on both lines was slightly to the eastward of the leading marks. Being acquainted with the instability and unpredictability of the whole area adjacent to the Heads you will agree that it is impossible to state how long the indicated situation will continue and in what way it may alter.

It is my intention to re-examine the area at the first opportunity and you will be advised of our findings.

Both the Officer in charge at Onehunga and the Signalman at Manukau Heads pass on all relevant information to Masters using the port.

Yours faithfully,


R.H. Carter
HARBOURMASTER

JOW/HG

The Chief Engineer

Encl.

For your information.


Harbourmaster



COPY

M.V. Calm
Lyttelton,

15th Sept. 1969

The Marine Superintendent,
Holm & Company,
Auckland.

Dear Captain Jackson,

While crossing the Manukau Bar outward on the evening of 12th September, the vessel touched bottom several times over a 10 minute period.

At the time of touching the vessel was at a draft of 11-2 fwd. 12-1 aft. The Destruction Gully leads were open to the west approx. 1 to $1\frac{1}{2}$ beacon widths. Low water was 1619 and the vessel touched at 1809. I was proceeding at slow speed at the time.

At no time did the vessel strike heavily as there was practically no swell. Soundings were taken of all tanks and bilges after clearing the bar, and showed no signs of water being made. I am quite confident that no damage has been sustained by the vessel.

I would stress the urgency of a proper survey being carried out on the Manukau bar, as it seems that the shoal under the signal tower now extends right across the south channel. Until soundings are taken on this area of the bar, I would suggest that our vessels only cross 3 hours before or after high water in good weather, and draught not more than 12 ft.

I regret this incident, but would point out that several other ships have touched around the same position recently and until a survey is conducted, ships Masters are crossing purely by guess work without an echo sounder.

Yours faithfully,

G.L. Porter, Master.

21st August 1969

THE HARBOURMASTER

THE GENERAL MANAGER

MANUKAU BAR - SOUTH CHANNEL

INFORMATION

Enclosed is copy of a letter from New Zealand Cement Holdings Limited with my reply concerning shoaling in the South Channel Manukau Heads.

As you are aware every endeavour is made to have soundings taken at three monthly intervals and more frequently if considered warranted. However, during the winter difficulties are experienced in making surveys of any consequence due to unfavourable weather. Ships' masters confirm my view that there is reasonably good water in the area but its location is dependent upon an accurate survey. The Hydrographic section is fully aware of the problem and is endeavouring to proceed with a further survey when conditions are suitable.

I have just received a further report from the Master of M.V. "Tawanui" to the effect that with the Destruction Gully beacons slightly open to the westward he obtained approximately 16 feet of water shortly after L.W.

This information has been forwarded to all concerned.

ME

HARBOURMASTER

The Chief Engineer

For your information.

W. Gordon

Harbourmaster

RHC/HG

Chas. Seagar

15th August 1969

Mr. W.D. Benjamin,
N.Z. Cement Holdings Ltd.,
P.O. Box 111,
WESTPORT.

Dear Sir,

I acknowledge receipt of your letter of 7th August 1969. Naturally, I was perturbed when the Master of "Guardian Carrier" reported the apparant changes in the channel at Manukau Heads.

You must be aware that the instability and unpredictability of the South Channel and adjacent banks are a constant source of worry to all concerned. These undesirable but nevertheless ever present factors are emphasised by the Port Information Manual, Chart and Notices to Mariners.

In my letter of 24th October 1967 you were advised that no fixed time or height of tide above chart datum could be laid down as safe for negotiating the channel, and that such passage is dependent upon the Master's local knowledge, conditions of swell and visibility, height of tide and information available from the Signalman.

When conditions permit soundings are taken over the bar area and the information so gained is immediately forwarded direct to your Head Office and is communicated to all Masters by the Signalman. You will appreciate that weather conditions severely restrict sounding work in this area and it is only rarely that we are able to take soundings which are found to be sufficiently accurate for plotting purposes. However, all relevant information gained from such work is passed on to Masters concerned. Furthermore up to date information on bar conditions as observed by the Signalmen is communicated to Masters prior to sailing by the Officer in Charge Onehunga.

Your assertion that there are other leads which can be used with safety is open to question. I am not aware of any alternative and permanent line of approach and while I am not prepared to act on a single report on this matter your Company can be assured that immediate action will be taken should investigations show that a new safe and permanent channel is opening up.

However, I must again impress upon all concerned that this entrance must be used at the Master's discretion, in relation to swell conditions, ships' draught, state of tide, latest reports, local knowledge of the area and immediate visual observations.

I do appreciate all reports from Masters concerning navigation in the area.

Yours faithfully,

The Chief Engineer

For your information.

10/8/69
Harbourmaster

RHC
R.H. Carter
HARBOURMASTER

RHC/HG

Les. Seager

15th August 1969

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N.Z. Cement Holdings Ltd.,
P.O. Box 111,
WESTPORT.

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I do appreciate all reports from Masters concerning navigation in the area.

Yours faithfully,

The Chief Engineer
For your information.


R.H. Carter
HARBOURMASTER

RHC/HG

Harbourmaster



NEW ZEALAND CEMENT HOLDINGS LIMITED

SHIPPING DEPARTMENT

P.O. BOX 111, WESTPORT, NEW ZEALAND
TELEGRAPHIC ADDRESS: "NEWCEMENT"
TELEPHONES 7259 OFFICE
8728 PACKING PLANT

WDB/AB/F/470

AUCKLAND HARBOUR BOARD HARBOUR DIST.
RECD. 11 AUG 1969
ACKD.
AMSD.

7th August, 1969.

The Harbourmaster,
Auckland Harbour Board,
P.O.Box 1259,
AUCKLAND.

Dear Sir,

This company was perturbed to receive a report from the master of the m.v. "GUARDIAN CARRIER" re the shoaling of the chanel used by this vessel when entering Onehunga on the 6th August, 1969.

The m.v. "GUARDIAN CARRIER'S" draught on this voyage was 16' 6" and according to soundings taken by the vessel there was only 2' of water under the vessel when crossing the bar. This sounding was confirmed by two other vessels which left the port on the same tide.

In our letter WDB/MMcH/F/9042 of 10th October, 1967, we requested that this company be kept informed what height of water is being worked below datum on the leads and that our agents in Auckland (McCallum Bros. Ltd.), would be informed of regular soundings taken. Unfortunately this information has not been passed on to McCallum Bros, and it alarming to think that this matter has been allowed to be overlooked, which could eventuate in our vessels trading to your port being restricted to only working the bar when the sea is calm and at high water.

We have been informed that their is other leads at Onehunga giving a greater depth of water and we would appreciate an early reply confirming this and that your board would assure that this company be kept informed of regular soundings taken at Onehunga.

Yours faithfully,
for NEW ZEALAND CEMENT HOLDINGS LIMITED.

(Signature)
(W.D. BENJAMIN)
SHIPPING DEPARTMENT.



H.M. JOHN
J.W. AD

J.H.M.

116
51

COPY

NEW ZEALAND CEMENT HOLDINGS LIMITED

P.O. BOX 111

WESTPORT.

7th August 1969

The Harbourmaster,
Auckland Harbour Board,
AUCKLAND.

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Yours faithfully,
for NEW ZEALAND CEMENT HOLDINGS LIMITED

(signed) W.D. Benjamin
Shipping Department

11,500,000
53

Auckland
HarbourBoard

11,500,000
3,125,000

15,200,000

9,260,000
3,125,000

12,385,000
3,155

93

3,536

9,387,000
3,125

12,512,000

MINISTRY OF DEFENCE

Telegraphic Address
NAVAL WELLINGTON

Telephone 49-800
Extension



Correspondence to be
addressed to
THE DEPUTY SECRETARY
OF DEFENCE (NAVY)

PLEASE QUOTE
N.A.

NAVY OFFICE

2nd Floor, Departmental Building, Stout Street, Wellington

G.P.O. BOX 292, WELLINGTON

65/7/32 - 4315

6 DEC 1968

Captain R.H. Carter,
Harbourmaster,
Auckland Harbour Board,
Quay Street,
AUCKLAND.

AUCKLAND HARBOUR BOARD HARBOUR DEPT.	
RECD.	9 DEC 1968
ACKD.	
ANSD.	

Dear Captain Carter,

MANAKAU ENTRANCE

References: A. H 5/1 10/4/67 dated 24 October 1968.
B. Manakau Entrance Survey dated
22 November 1968.

Your letter at reference A has been considered fully and it is appreciated that certain changes are taking place at the Manakau Entrance. These changes are inevitable as one knows and it is only by regular examinations that changes can be detected.

The request for assistance has been carefully considered by the Chief of Naval Staff and myself. As you are aware we are fully committed and could only carry out a re-survey of the Manakau Entrance at the expense of other work which has certain priority.

It is appreciated that naval survey craft are designed for the task but a bar entrance can only be worked under ideal conditions both tidal and meteorological. Our chances of working a bar entrance are similar to those of your hydrographic unit.

Your letter at reference B bears out the fact that given ideal conditions your hydrographic unit can do the task to standards acceptable to any hydrographic authority. I believe it is necessary that a more philosophical attitude be adopted in regard to the Manakau Bar and Entrance and, above all, patience is required.

JOW
J Reel

HM DM

DH.M.

Chief Eng to see. * H.S. PO

114
/ 50

6 DEC 1968

✓ The results of your recent survey have been examined and as a result Temporary Notice to Mariners 23(T)68 has been cancelled and a new Temporary Notice to Mariners 175(T)68 issued. This notice incorporates your suggested route and points out certain shoal patches. It is not considered necessary at this point of time to issue a large correction and it is felt that, in future, the present chart would be better amended by successive Temporary Notice to Mariners similar to that being now issued.



(W.J.L. Smith)
Commander,

Hydrographer of the Royal New Zealand Navy

22nd November 1968

Commander W.J.L. Smith, D.S.O., R.N.Z.N.,
Naval Hydrographer,
Navy Office,
WELLINGTON C.1.

Dear Sir,

MANUKAU ENTRANCE SURVEY

During the period 11th to 14th November, exceptionally calm conditions and neap tides enabled our survey team to sound the South Channel and investigate an area near the position of the middle channel of many years ago. I attach a copy of survey plan H5/IE showing the results.

This follows the suspected changes indicated by Masters of coastal and fishing vessels, that the outer 029° leg of the South Channel was altering and moving east, and that a middle channel existed and was in fact being used by fishermen drawing up to 12 feet.

I make the following comments on the survey -

SOUTH CHANNEL - 029° or seaward leg

This shows considerable changes, a general trend towards shoaling and the startling effect of large banks breaking up, leaving isolated small shoal patches. The best line of approach seemed to be about 1.5 cables to the east of and parallel to the previously recommended line.

SOUTH CHANNEL - 002° or inner leg

This portion of the channel appears to have reasonable water with the South Head spit having receded to the eastwards. However the tip of the spit lies less than 100 feet from the line of leads. With the lack of definition of the beacons in Destruction Gully this presents a hazard.

After studying and discussing this part of the survey plan I have advised Masters to keep to the eastwards 800 to 1000 feet while on the 029° line, and to maintain the 002° line taking care not to deviate to the east, repeating previous warnings regarding the unpredictable nature of the whole area.

MIDDLE CHANNEL

The absence of breakers in this vicinity during moderate weather, and the increasing number of reports from fishing vessels using this passage during the last few weeks, indicated the possibility of reasonable water. Conditions being ideal an examination disclosed the information shown on the plan.

... ..

W. Seagar *WJL*

Commander W.J.L. Smith, D.S.O., RNZN.

22nd November 1968

MANUKAU ENTRANCE SURVEY (Contd.)

The transit marks, Cutter Rock and conspicuous clay hill give a line of approach with not less than 3 fathoms. This is an improvement on the depth shown on the Naval survey of 1965. The area thereon indicated as a breaking bank, close southeastward of the transit line in Lat. 37° 5' S., appears to have either deepened or moved. It is proposed to examine this area thoroughly and check sound that already done, at the first opportunity, as I feel that there is a distinct possibility of the existence of a satisfactory approach in this vicinity. The bank or bar, between the six fathom contours, seems to have narrowed slightly as well as moved about 2 cables southwestward, in the way of our transit line. It would appear that on our transit line the inner 6 fathom line of the bank has moved progressively southwestward since the 1961 survey, while the outer 6 fathom line was about the same 1961 and 1965 but is now about 2 cables further to seaward.

Although Masters will be shown the survey plan there will be no recommendation to use the centre channel until such time as its reliability can be established.

I will keep you informed as to the results of further work in the area and would appreciate your comments.

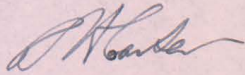
Yours faithfully,


R.H. Carter
HARBOURMASTER

The Chief Engineer

For your information.

JOW/HC


Harbourmaster

Auckland Harbour Board.

File problem
AS

See also file 194/3.

Auckland Harbour Board

MEMORANDUM

31st October 1968

FROM THE HARBOURMASTER

TO

THE CHIEF ENGINEER

SOUTH CHANNEL - MANUKAU ENTRANCE

The absence of adverse reports on depth earlier in the year and later the persistent bad weather have resulted in eleven months elapsing since this channel was last surveyed. Within the last fortnight some Masters have reported that the outer, 0290, leg of the approach seems to have shoaled or shifted. I am more concerned than usual with this state of affairs as it now appears certain from the reports of fishermen using the channels that the main bar is unusable to anything except the shallowest drafted vessels.

Consequently we must take the first available opportunity to check sound the area. Will you please advise your Mr. Reith so that the usual necessary arrangements may be made.

W. H. Carter

HARBOURMASTER

Mr. Seagar

Manukau Entrance.

1961. Navy undertook a complete re-survey of the entrance.
- 1963 Navy undertook a re-survey in the South Channel area and the entrance as the north side depths were critical.
1964. South Channel entrance check with fishing vessel from Smpeds.
1965. Fisheries Navy survey.
- 1967 marches N.W. entrance shoaling
" South Channel entrance shoaling or moving.
March differences of opinion H.M. Navy, C.C. on role of Manukau.
- 1967.
- | | | |
|----|---------------------------|-------------------------------------|
| 1 | 14/10 th march | South Channel checked with Manukau |
| 1a | below | middle channel + N.W. checked - - |
| 2 | 30/31 st " | South Channel checked with Manukau. |
- Chart H5/1 with explanation 1a + 2 prepared by Hydrographer.
3. 19th Oct. South Channel Well checked with Manukau
4. 6/7th Dec South Channel checked with Manukau.
- May, 1967. Laps letter from H.M. 4/5/67.
- August 1967 Navy Hydrographer to visit Auckland to discuss Manukau Entrance - vessel used by Engineer?
- December 1967 Letter from H.M. to Navy Hydrographer, reporting results surveys of South Channel in December. - no cause for concern expressed - H.M. accepting that changes are inevitable.

Oct 1968

H.M. Letter to Navy Hydrographer.

N.W. Entrance shallower - difficult
even for fishing boats.

"For some time no reports have been
received from ships concerning major
changes in the South Channel. Approach
to the Barkans etc. since December 1967
the vessels have reported no
particular concern re the South Channel
and therefore the port not as deep as
has any checks been instituted.

Every one reasonably happy with
South Channel which is the main require-
ment.

The H.M. states that he feels that the Board
is not in a position to undertake the investigation
of the area in an attempt to determine the
existence or otherwise of a usable main
approach of satisfactory depths. Question
of weather conditions being suitable is
accepted. Superiority of naval craft accepted.

Questions:

- a, Is the South Channel as good as it usually
is. If so, fishing boats should use it
also if there is any doubt re the N.W.
Entrance
- b, Again if the South Channel is operative,
then letters could check on Biddale re N.W.
leads as before in March 1967.
- c, If letters checks show the same as last
then I suggest Navy must be asked to
undertake their normal 5 yearly survey re 1970.
in 1969.
- d, What is the definition of Satisfactory depths

Auckland Harbour Board.

Neil Brogan is going to arrange a discussion on this - GM HM & Eng, in order to establish that we have done all we can in regard to investigation & survey before calling on the Navy.

Would you please prepare some notes on what we have done over the past 12 months

★

26.10.68.

Your

H 5/1 10/4/67

24th October 1963

Commander W.J.L. Smith, D.S.O., R.N.Z.N.,
Naval Hydrographer,
Navy Office,
WELLINGTON.

Dear Sir,

MANUKAU ENTRANCE

For some time no reports have been received from ships concerning major changes in the South Channel approach to the Harbour. However, fishing boats continue to report that the northwestern, main bar entrance, has continued to deteriorate to such an extent that even if bound for northern fishing grounds, they usually use the south channel. Our signalman at the Heads reports that his observations indicate that the N.W. passage is unusable by coastal shipping and that when flat calm, on the upper part of the tide, an occasional fishing boat literally "smells" her way out through gaps between banks.

The general consensus of opinion is that as this passage has shoaled another must have opened and deepened to accommodate the large volume of water flowing into and out of the Harbour. This possibility was mentioned in paragraph four of my letter of 10th April 1967, and was further suggested by Buia "A" buoy being swept from its position a second time, by strong spring ebb tide, to approximately the same position as before - about 062° 2.8 miles from Niuepin.

I feel that the Board is not in a position to undertake the investigation of the area in an attempt to determine the existence or otherwise of a usable main approach of satisfactory depth. At most we are able to make check soundings of known channels, and even then cannot hope to operate except in the best of tidal and weather conditions. Naval survey craft are much superior, and in all ways more satisfactory, for this work.

Thus, although I fully realise that the Hydrographic Branch of the Navy is heavily committed, I must request that serious consideration be given to an investigation of the Manukau entrance.

I would be grateful for your comments.

Yours faithfully,

R.H. Carter
R.H. Carter
HARBOURMASTER

The Chief Engineer

For your information.

R.H. Carter
Harbourmaster

Rev. Seagar

DEPARTMENT Engineers

MEMORANDUM OF INTERVIEW

NAME : M^r Seton
REPRESENTING: Contractor, Timaru.
telephoned B. J. Roberts. on 10 / 5 / 19 68 @ 10 a.m.
~~waited on~~ p.m.

SUBJECT OF INTERVIEW: Navigable depths in the
Timaru Harbour.

REMARKS:

M^r Seton has Japanese principles who have raised a proposal to ship timber from the South Auckland area out of the Timaru Harbour. His enquiry was for depths of water available in the harbour and over the bar with particular mention of 24 feet draught ships. I gave him the general navigation picture including depth restrictions on the bar and at White Bluffs.

From this general picture he has said ^{would} that he ~~contact~~ contact his Japanese sources again with a view to taking the feasibility investigation further. I advised him to make enquiries of this kind through the General Manager.

B.J.R.

H.
* Chief Engineer to see.

The Naval Hydrographer,
Navy Office,
WELLINGTON C.1.

Also to:-

13th December 1967

The Secretary for Marine,
Marine Dept.,
P.O. Box 2395,
WELLINGTON

Dear Sir,

SOUTH CHANNEL, MANUKAU ENTRANCE

I attach a plan of a survey made 6th and 7th December 1967. Comparison with plans submitted in March and October 1967 indicates many changes, and further strengthen the possibility of the spit off South Head growing to seaward during spells of easterly weather and receding with westerlies.

Apart from the bank having grown and shoaled, as shown on the plan about 244° 4750 feet from South Head lighthouse, giving a sounding of 9 feet elsewhere on both leading lines there was a minimum depth of 14 feet.

Masters of all vessels are being advised by the Signaller Manukau Heads and the Officer in Charge Onchunga to keep about 300 feet east of the 029° line in the vicinity of the shoal.

The Marine Superintendents of the various companies trading into the Manukau have been sent a copy of the survey plan.

With the possibility of some reasonable weather in 1968 it is hoped to carry out a more comprehensive survey the results of which I will forward to you.

Yours faithfully,

Mr. Deegan

R.H. Carter
R.H. Carter
HARBOURMASTER

Encl. The Chief Engineer
For your information.

JOW/HG

R.H. Carter
Harbourmaster

24th October 1967

The Secretary for Marine,
Marine Department,
P.O. Box 2395,
WELLINGTON, C.I.

Dear Sir,

SOUTH CHANNEL MANUKAU ENTRANCE

I enclose a plan of soundings taken in the South Channel adjacent to the spit off South Head on 19th October 1967. It appears that a similar situation to that which developed last March has arisen, and that the best water is about 500 feet to the westward of the Destruction Gully Beacons leading line. I feel that it is reasonable to assume that the long spell of calm weather with mainly easterly winds has some bearing on the position.

The Marine Superintendents of the various Companies trading to the Manukau have been advised and both my Signalman at the Heads and the Officer in Charge at Onehunga are able to advise all Masters in this matter. Reports from Masters indicate the possibility of minor changes in the outer or 029° approach and it is hoped to carry out a further check of both approach lines in a month's time.

For your information, my survey team noted a lack of breaking water along the south bank in the vicinity of the Ninepin-Paratutai line, which may indicate a satisfactory approach in this area.


I will keep you advised on any further work in the area.

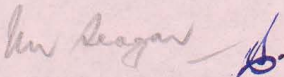
Yours faithfully,


R.H. CARTER
HARBOURMASTER

The Chief Engineer

For your information.


Harbourmaster



24th October 1967

The Naval Hydrographer,
Navy Office,
WELLINGTON C.1.

Dear Sir,

SOUTH CHANNEL MANUKAU ENTRANCE

I enclose a plan of soundings taken in the South Channel adjacent to the spit off South Head on 19th October 1967. It appears that a similar situation to that which developed last March has arisen, and that the best water is about 500 feet to the westward of the Destruction Gully Beacons leading line. I feel that it is reasonable to assume that the long spell of calm weather with mainly easterly winds has some bearing on the position.

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For your information, my survey team noted a lack of breaking water along the south bank in the vicinity of the Ninepin-Paratutai line, which may indicate a satisfactory approach in this area.

I will keep you advised on any further work in the area. I was under the impression that you would be paying me a call early this month.

Yours faithfully,

R.H. Carter
R.H. Carter
HARBOURMASTER

The Chief Engineer

For your information.

R.H. Carter
Harbourmaster

Mr. Reegan

25th August 1967

The City Engineer,
Manukau City Council,
Private Bag,
MANUREWA.

Dear Sir,

TIDE LEVEL DATA. YOUR REFERENCE I3.

Thank you for your letter dated 21st August regarding tidal levels in the Tamaki River. Enclosed for your information are three editions of S90 which is made available for engineering foreshore works in the Auckland area.

As you will see from the forms, this information has been available for many years prior to 1955 the date you mention. The form marked S90/2 is probably the original information and the form marked S90 superseded it in the 1950's and had some additional information. The form marked S90/9 is very recent and gives changed values arising from modern analysis methods.

It is worth pointing out that all the Waitemata tide levels relate to the gauge at Queen's Wharf and that long term values have not been established by the Board for the Tamaki River. Some gauge measurements by the Ministry of Works over short periods have been done at Panama Road Wharf but the general data on S90 has been published for many years and would have been made available on request in 1955.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

CP:CMc

CITY OF MANUKAU

IN YOUR REPLY PLEASE QUOTE:

I 3

D. T. Hackshaw

ADDRESS ALL CORRESPONDENCE:—

THE CITY MANAGER,
PRIVATE BAG,
MANUREWA.

The Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND, 1.

21st August 1967

Dear Sir,

Tide Level Data

An outstanding claim, resulting from the construction of the Tamaki River Bridge, is likely to be submitted to arbitration in the near future. To assist in this matter, would you please advise the date of publication of your original Tide Level Table S.90, and whether the chart was publicly available as from that date.

In the event of Table S.90 being published after 1955, it would be helpful if you would advise what data concerning Waitemata Tide Levels would have been available prior to that date, and whether this earlier data was available in printed form.

An early reply would be appreciated.

Yours faithfully,



(D. E. Cocks)
CITY ENGINEER

DTH/RA

Requing Copy.
DTH

DTH

MANUREWA OFFICES

CITY MANAGER }
CITY ENGINEER }
CITY TREASURER }

DAVID NATHAN PARK
HILL ROAD. }
HALL ROAD. }

TELEPHONES:
PAPATOETOE 89-189
MANUREWA 65-199

OTARA OFFICES

DEPUTY TOWN CLERK }
CITY ADMINISTRATION }
COUNCIL CHAMBERS }
CITY INSPECTOR }
HEALTH & BUILDING }

OTARA ROAD }
EAST TAMAKI ROAD }

TELEPHONE
PAPATOETOE 48-119

Auckland Harbour Board

MEMORANDUM

18th August 1967

FROM

THE GENERAL MANAGER

TO

THE HARBOURMASTER
THE CHIEF ENGINEER

HYDROGRAPHIC SURVEY : MANUKAU BAR

Attached is a copy of a memorandum from the Harbours Association of New Zealand concerning a recent meeting of the New Zealand Hydrographic Committee.

Would you please note comments made regarding the Manukau Bar and the intended visit of Commander Smith, and submit a joint memorandum covering the problem. This should provide information for basis of discussions with Commander Smith.

R. T. Lorimer

R. T. Lorimer
GENERAL MANAGER

W. Reegan

*Discussed with Harbourmaster,
Belief that the problems be discussed
with Cmdr. Smith as a report
prepared. He will advise when
Smith to arrive*

MS 29/8/67

ENCL.

Auckland Harbour Board.

1117

The berthing line is
interesting. Would
require extensive reclamation.

Do you want to try to
establish material off
Langinisi Creek some
time.

KS

P.O. Box 1765,
Wellington.

8th August 1967.

MEMORANDUM For all Members

Meeting of New Zealand Hydrographic Committee

Together with Captain Suckling, Harbourmaster at Wellington, I attended the meeting of the New Zealand Hydrographic Committee held in the Navy Office on Tuesday 1st August 1967 at 10.30 a.m.

The meeting was presided over by the Chief of Naval Staff, Rear-Admiral J.O.C. Ross and was attended by representatives of Shipping Companies, Merchant Service Guild, Marine Department, Lands and Survey Department and the Department of Island Territories as well as this Association's representatives. The principal matters discussed were :

1. Review of the work of the Surveying Ships and Hydrographic Branch since July 1966.
2. Proposed future programme of surveys.
3. Review of chart production and future developments.
4. Manukau Bar
5. Northeastern and Eastern approaches to Auckland.

and a number of other minor matters. The review of work done and the proposed future programme disclosed that the Hydrographic Branch is committed to three seasons ordinary work on the compilation of material for chart NZ41 of the area around Cape Reinga. In addition it has certain other work to do this season in the Fiordland area and around Kapiti Island. This leaves no room for additional work.

In connection with the Manukau Bar it was pointed out by the Hydrographic Branch that a survey had been done in 1960 and another in 1965 and its commitments would not permit another survey to be done at this stage. Mention was also made of the fact that the Board had recently engaged an experienced and qualified Hydrographic Officer and was in a better position than heretofore to undertake check surveys. ← However, it was agreed that arrangements would be made for the Hydrographer to visit Auckland in the near future to discuss this problem on the spot.

Regarding the request for a further survey of the Northeastern and Eastern approaches to Auckland the Hydrographer indicated that this was a comparatively small job which might be fitted in at suitable intervals during the carrying out of the Cape Reinga work and that he himself would like to have it completed. However, he could give no undertaking that it would be done this season.

Finally, reference was made to the condition of the "Iachlan" which is expected to reach the end of its useful economic life in 1970 and which will after that date require extensive maintenance. The meeting agreed that it would support the Navy Department's request for suitable replacement and the Chairman indicated that he would call another meeting of the Committee when he had further proposals, which are now being examined by the Hydrographer, to put before it.

Chairman will hope to be in a position to visit Auckland during the last week in August or early in September.

R. G. Dawson

Secretary

4th May 1967

THE HARBOURMASTER

THE GENERAL MANAGER

SURVEY - MANUKAU ENTRANCE

You are aware of the problems regarding the channels at the Manukau entrance. So far I have been able to meet the emergency and to keep the South Channel workable with restrictions as to permitted draught. An unusually calm day did allow some sounding to be done in the northwestern approach disclosing a most unsatisfactory position in this channel. Two lines were run to the northward of the Windy Point beacon line and although in this area no great changes were observed there are indications that the old main entrance may be re-forming.

With winter approaching and the chances of spells of weather suitable for the Tug "Manukau" to work in the entrance becoming less frequent, I feel that apart from occasional checks in the South Channel, I will be unable to work in other parts of the area.

Although I am well aware of the Navy's pressure of work, particularly after meeting Commander Smith at the Nelson conference, I feel that the situation warrants our requesting that the Naval Survey Branch consider re-examining the area of the North West channel and the Windy Point lead channel.

Should we be unable to get assistance in this respect it will be necessary to consider stationing Tug "Manukau" at the entrance for a period of some days in order to take every small opportunity of proceeding into the Bar area and so establish the pattern of events that have taken place over the past few years.

If action along these lines is not taken now we may be faced with an even bigger problem of draught restriction and danger to shipping as time progresses.

W.H.G.

HARBOURMASTER

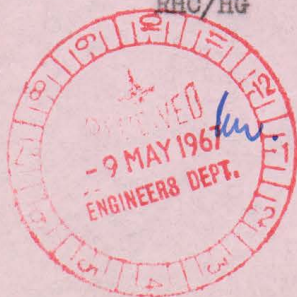
The Chief Engineer

For your information.

RHC/HG

J. H. Hender

Harbourmaster



Reagan
[Signature]



Auckland Harbour Board
Quay Street
Auckland, N.Z.

REFERENCE

10th April 1967

The Secretary for Marine,
Marine Department,
P.O. Box 2395,
WELLINGTON.

Attention of Captain Boyack

Dear Sir,

MANUKAU ENTRANCE

I attach to this report a copy of a plan of soundings at the Manukau Entrance. As indicated, information from the Naval survey plan dated 1965 has been blown up and our soundings superimposed for comparison purposes.

(1) South Channel. Inner or Destruction Gully 002° line:-

The shallow area presumed previously to be the outer end of the spit off South Head has deepened and may possibly have been a patch of moving sand. This deduction could be made from the plan. Where the soundings of 14th and 15th March show a minimum of 15 feet in this vicinity some 500 feet to the west of the beacon line, there now appears to be only 7 to 8 feet, with deeper water between here and the South Head and on Destruction Gully leads. Thus under these circumstances vessels are best to keep on the leads, 002°, as long as the depth maintains.

(2) South Channel. Outer or Jackies Hill, hill 900 029° line -

My notes suggest that since 1965 there is an indication of closing across.
M.S.

Here the change is not so marked. The inner of the two shoal patches previously determined has shoaled by 1 foot and appears to be an isolated patch rather than the tip of the bank.

(3) Northwestern, Main Bar Entrance -

Soundings taken in this area confirm the reports received previously that much general shoaling has taken place. For some years it has periodically been suspected that the channel inside the bar has been shoaling over a considerable part of its length rather than as only an actual bar. This is borne out by our soundings, particularly in the vicinity of the 1965 six fathom hole, centred about 270° 2.75 miles from Ninepin Light, where now we have 9 and 8 feet on and adjacent to the leading line.

(4) For some time the absence of breakers on the outer bank has been noticeable, southwestward of Ninepin, an indication of deeper water. During the recent spring tides our Huia "A" buoy shifted, with its moorings, and was recovered about 062° 2.8 miles from Ninepin. Thus, as there are indications of the major run of ebb tide and possibly a scoured channel in this area a couple of lines of soundings were made as shown on plan. As a starting line Ninepin and Paratutai were used in transit. The

... ..

*M. S. Boyack
Champion. J. M.*

The Secretary for Marine, Wellington.

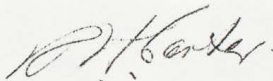
10 April 1967

Manukau Entrance (Contd.)

(4)(Contd.)

results do show slight changes and I feel that there may be a possibility of a reversion to the situation where there was but one entrance channel somewhere in this vicinity. As circumstances permit it is intended to carry out frequent checks and to endeavour to find a somewhat stable satisfactory approach. I am optimistic that further sounding to the southward of those taken may disclose a reasonable channel.

To summarise, I feel that owing to the serious instability found in the existing approaches, we can do little except to pass on to Masters the information at our disposal, and rely on them to use the extreme caution so obviously demanded. Your navigation warning adequately covers the situation and I would recommend its continuance. I will keep you informed of my findings in the area. Owing to the rapidity of change of the situation I do not propose any shifting of beacons at this stage.

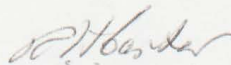


Yours faithfully,

R.H. Carter
HARBOURMASTER

The Chief Engineer A.H.B.

For your information.



Harbourmaster

117
COPY TO : HEAD OFFICE - FOR INFORMATION.
" " : HARBOURMASTER - " "

21st March, 1967.

The Secretary,
Navy Office,
G.P.O. Box 292,
WELLINGTON.

Dear Sir,

MANUKAU HARBOUR ENTRANCE SURVEYS

Further to my letter of the 17th February, I am advised by the Harbourmaster, that following a conversation with the Naval Hydrographer, it appears that Commander Smith is of the opinion that the Board is now able to undertake all investigations at the Manukau Entrance.

I am surprised that such an interpretation might be placed on the final paragraph of my letter, which in essence confirms that we are generally in a position to meet the obligation to take check soundings, subject to tide and weather conditions permitting, and in accordance with the understanding of the situation in your letter of the 29th July, 1966.

In order that there is no misunderstanding, it must be accepted that this craft which is primarily a towing vessel would not perform as satisfactorily as a survey launch at the entrances on the bar under reasonable conditions, and this could be more particularly so, at entrances other than the South Channel. It could well be that Navy may be asked to assist on check soundings when the Board cannot cope with rapid changes requiring urgent investigation. These aspects are of concern to the Harbourmaster, and I trust that the Department appreciates we may of necessity have to request assistance outside the times that surveys may be taken as your responsibility.

If there is any further clarification required, please do not hesitate to advise me so that we are jointly aware of the responsibilities and capabilities under the Agreement.

Yours faithfully,

NS:CHL

CHIEF ENGINEER TO THE BOARD.

C.P.O. Box No. 1259 AUCKLAND
TELEPHONE 33-200

REFERENCE



*Auckland Harbour Board
Quay Street
Auckland, N. Z.*

The Secretary for Marine,
Marine Department,
P.O. Box 2395,
WELLINGTON.

17th March 1967

Attention Captain Boyack

Dear Sir,

MANUKAU ENTRANCE

Further to my telegram of 16th March, to this report I attach a copy of our check sounding plan of the vicinity of the South Channel approach to Manukau Heads.

The original soundings on 1st, 2nd and 3rd March were made in adverse sea conditions, and teething troubles were experienced with the new tug and her equipment. However, the six feet sounding then obtained was checked several times and verified by hand lead. Hence my telegram of 6th March.

On 14th and 15th March, conditions were better and more accurate soundings and position keeping were possible. There was a moderate swell running which gave an estimated lift of 5 feet at times, and produced a rolling and pitching in the confused areas of shallower water. This turbulence upset the echo slightly. During the periods in which we could work on these two days the previous six feet patch on the end of the spit off South Head was crossed several times and a minimum of ten feet low water was found. This could well be an indication of the continuous shift of sand for which the area is noted. All who have been associated with sounding in the area in recent years concur that this problem appears to exist, and that it is often difficult to relate one day's sounding to those of an adjacent area previously recorded.

It is a reasonable assumption that under the conditions prevailing during our survey and the plotting of our minimum sounding, we could well be under-estimating the depth by up to two feet at times. In the interests of safety I deem it wise to discount this factor.

Regarding the submitted sounding plan, it is obvious that the inner part of the inner, 002° or Destruction Gully line channel has swung to the westward. I understand that Masters of vessels have suspected this for some time and have been working west of the leads. No doubt the extension of the spit off South Head has been recognised by broken water when there has been a swell running. In moderate to calm weather this visual warning is not seen; although about 1500 feet of turbulent water, extending from this spit, west to the north eastern point of South Bank has to be traversed.

The outer channel, 029° or Jackies Hill transit hill 900, shows a patch of twelve feet close westward of the leading line, 246½° 4750 ft. from South Head Main Light (Lat. 37° 03.75' S., Long. 174° 32.27' E. approx.) and another twelve feet patch on the 029° line 235½° 6070 ft. from the same light. Although we have no proof it does seem possible that the shoal

... ..

The Secretary for Marine
Wellington

17th March 1967

MANUKAU ENTRANCE (Contd.)

in the latter position on the chart, showing $2\frac{1}{2}$ fathoms, may have linked with the shoal showing 17 feet lying to the eastward. It would be most difficult, in fact it may be impossible, to provide alternative leading marks on this line. However, before giving any consideration to this, considerable further soundings must be taken particularly to the eastward, and some means of guiding the mariner must be sought on the site.

To summarize -

1. Outer or 029° Line of Approach:

I feel that there is nothing that we can do at the moment but to advise Masters of ships that there is a minimum of twelve feet at Low Water in places along this line and that it is advisable to proceed slightly eastward of this line. I feel that Masters will prudently regulate their passages relative to draught and swell conditions at the time.

2. Inner of Destruction Gully Beacons 002° Line

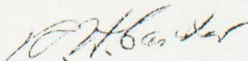
Here I feel we can now do something to help the Mariner. The beacons are approximately 400 ft. apart. Thus by moving the front beacon 25 ft. to the westward with beacons in line 005 $\frac{1}{2}$ ° vessels should pass 500 ft. west of the 10 ft. sounding, some 8,000 ft. from the rear beacon. By continuing out on this line until the other leads (Jackies and 900 ft. Hill) come in transit there should be a minimum of 15 ft. at Low Water. Inward bound course should be altered on to Destruction Gully as soon as the altered leads are in transit, some 1600 to 1800 feet earlier than previously. I have indicated in red on the plan the proposed new line provided by the moved Destruction Gully front beacon. By moving the front rather than the rear beacon we will be undertaking a considerably more easy operation, and will be lifting the front beacon a little and so reducing the present very undesirable vertical difference of about 200 feet between the beacons.

I do not feel that any amendment to charts is warranted at this stage. I intend to continue investigations in the area as weather and other circumstances permit and will keep you advised on our findings.

I am sending a copy of this letter and plan to Commander Smith, Naval Hydrographer, and would appreciate your and his comments.

I feel that a further check should be made in about a fortnight's time and before any shift of beacons.

Yours faithfully,



R.H. Carter
HARBOURMASTER

14th March 1967


THE HARBOURMASTER

THE GENERAL MANAGER

MANUKAU ENTRANCE - CHANGES.

Regarding the points raised by you at the foot of my memo dated 8th March, I wish to state in reply -

1. Surveying is continuing as weather permits. Shipping is being informed accordingly.
2. I have asked the Chief Engineer to correct defects as soon as possible. I did not use the word "serious".
3. I understand this agreement and in fact have read all relevant correspondence. Nevertheless, my impressions after speaking to Commander Smith were that Navy felt they had been relieved of these responsibilities and suggest the Chief Engineer correct their apparent mistaken ideas.


HARBOURMASTER

RHC/HG

The Chief Engineer

For your information. Copy of my reply to the General Manager's remarks.

Miss Morgan to see


HARBOURMASTER

Auckland Harbour Board

MEMORANDUM

13th March 1967

FROM

THE HARBOURMASTER

TO

THE CHIEF ENGINEER

MANUKAU ENTRANCE SURVEYS

During my telephone conversation with Commander Smith, Naval Hydrographer in Wellington, I was somewhat taken aback to learn that your letter to the Navy Office of 17th February 1967 had given the impression that we were now in a position to undertake all investigations at the Manukau entrance. The correct inference is that the Board now has the staff to undertake the work, and a vessel, which under ideal weather conditions, is able to proceed outside the Heads for this work.

Even in his initial recommendations, my predecessor was aware that a craft designed mainly as a tug and limited by her environs as to draft, would not be able to cope with all sounding work required at the entrance. In these recommendations he stated that on naval assurance he would still be relying on service assistance in the event of suspected major changes. My immediate predecessor and officers with knowledge of the area have all stressed the dangers and difficulties in carrying out frequent and regular surveys in such an exposed area in anything less than a properly designed and equipped survey vessel.

It will be perfectly obvious that there will be more occasions when check soundings will be possible in the south channel than in the northwestern bar approach. This latter area is very seldom free of turbulence and the run through the two miles immediately inside the bar is often quite as hazardous as the actual bar crossing. This factor is borne out by my own staff with experience and knowledge of the area and the Masters of coastal and fishing vessels.

I would emphasise that the new tug "Manukau", designed 90% as a tug, has so far not fallen short of my anticipated value. The three days of use in the south channel showed up many minor modifications and adjustments which are essential. However on those three days, and in the navigational emergency which existed, it was imperative that the work be done in the interests of shipping safety. Conditions were such that absolute accuracy could not be guaranteed and the vessel was rolling and pitching heavily. Normal soundings would not have been undertaken in such weather.

be it can be obtained

To summarise :-

- (1) I am not decrying the value of the "Manukau" for the designed purpose.
- (2) I understand certain modifications and adjustments are in hand in the interests of safety and positive action in handling the vessel.
- (3) You should correct the erroneous ^{interpretation arrived at by} impression given to the Navy by your letter of 17th February, and advise them that we are now in a better position to undertake check soundings, particularly in the south channel, on occasions when tidal and sea conditions permit the operation of the tug in the area. Further apparent loss of depth and increasing confused broken water inside the main bar render work in this area more difficult.

MS

RHC/HG

D. H. Carter

HARBOURMASTER

8th March 1967

THE HARBOURMASTER

THE GENERAL MANAGER

MANUKAU ENTRANCE - CHANGES.

On 15th February 1967 after reports from fishing vessels and from the signalman, Manukau Heads, based on visual observations, that the north western approach channel appeared to be shoaling considerably, a navigation warning was issued relative to this channel.

During the last week in February three vessels reported touching the bottom in the south channel, one of these spending some time stuck on the sandspit off South Head. A further navigation warning was issued covering the danger in this channel.

On Wednesday 1st March the tug "Manukau" with Captain Warr and Berry and the hydrographic team under Mr. J. Reith, made an investigation of the area. The new recording echo sounding machine failed to operate and the small visual sounder was used. This showed a sounding of 6 feet at low water on the line of Destruction Gully leading beacons approximately west of the signal station. A check by hand lead confirmed this sounding.

Further checks, after repair of sounding machine, on Thursday 2nd and Friday 3rd March were carried out and a least depth of 13 feet at low water was found on a line of approach 400 feet west of the Destruction Gully leading line, also confirming the 6 feet sounding previously disclosed. A further navigation warning was issued to cover this situation, vessels being advised to use the channel only towards high water and under reasonable sea conditions.

On Monday 6th March I held a conference with Commander Munro and Lieut. Jacques of "Lachlan", Mr. Reith and Captain Warr, when the position was discussed at length. Commander Munro's personal opinion was that the Navy was heavily committed in their programme which embraces the whole of our coastline and unless an emergency arose he did not consider that we could expect much assistance at this stage. However, he impressed on me that he was not the authority to offer or deny assistance; that rested with the Navy Office in Wellington.

On Tuesday 7th March I telephoned Commander Smith, Naval Hydrographer in Wellington, to appraise him of the position in case sudden changes necessitate the soliciting of the assistance of naval craft in determining a channel of approach. A rather awkward situation seems to have arisen, whereby the Navy Office, consequent upon receipt of the letter to them from the Chief Engineer dated 17th February 1967, has assumed that with the advent of the tug "Manukau" and engagement of Mr. Reith, the Board is able to undertake all survey work at the Manukau entrance. Under ideal conditions, which seldom occur in the area, with tides at the right time of day, and the availability of the tug relative to her other and primary duties at Onehunga, it is possible only to make irregular periodic checks at the heads.

The tug, primarily designed as such has her limitations. Turbulent sea conditions render such motion as to nullify the accuracy of the soundings owing to the heavy rolling and disturbance of the echo, as well as rendering the work somewhat hazardous to those taking part. However soundings will continue to

Mr. Reagan re surveys

check. Eng. re "essential modifications" - have we had notice of these?

hatched requires all hand notes over the page

Inland RCO

J.

ES.

The General Manager

8th March 1967

MANUKAU ENTRANCE - CHANGES (Contd)

be taken and some satisfactory means of providing leading marks through safe water will be sought as conditions permit. A check may be possible in the northwestern approach channel; but this area is subjected to much greater turbulence, necessitates sounding lines of several miles and is far more exposed than is the south channel.

Certain defects and essential modifications in the tug have been referred to the Chief Engineer and these must receive attention at the earliest possible time.

JPH
HARBOURMASTER

- Matters requiring attention - submitted verbally by the HM & Keith, which I passed to Tech. Engrs
- Priority
1. Guard rails flying bridge to be extended up to waist height.
 1. Remote control gear flying bridge to wheelhouse - rectification
 2. Echo Sounding Box. Wides to open sounding face
 2. Voice pipe ? T.B. to wheelhouse
- RS*

The Chief Engineer

For your information.

J. H. ...
Harbourmaster

1117

2nd. November, 1965

Oceanographic Institute,
P.O. Box 8009,
WELLINGTON C.1.

ATTENTION Mr. M.O. O'Connor

Dear Sir,

Following a meeting with Mr. O'Connor in Auckland recently we are taking the opportunity of forwarding to your Department relevant drawings and a report on the Manukau Bar problem.

It was understood that you would be willing to meet Mr. Roberts of the Engineer's Department when he is in Wellington on Wednesday 17th. November. Any advice that you can give on the oceanic or tidal problems involved would be greatly appreciated. We understand also that copies of a tidal fluctuation on May 6th. 1964 were sent to you by the Meteorologic Research Division and this could also be discussed. The time of appointment can be arranged later.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

ENCL :
A680/1, E1060/1, E1070/1.
Report on Manukau Harbour.

BJR:NKG

494

The Hydrographer,
Navy Department,
WELLINGTON.

12th. May, 1965

Dear Sir,

We have received in Notice to Mariners an insert for chart N.Z. 4314 showing the latest soundings from the recent survey by Lient. Commander Hoskins.

In view of the relatively large changes in the banks over the Manukau Bar approaches we would be pleased if you could send us a print of Commander Hoskins fair copy of the soundings taken over the full surveyed area.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

BJR:MJC

Auckland Harbour Board

MEMORANDUM

24th December 1964

FROM

THE HARBOUR MASTER

TO THE CHIEF ENGINEER

TIDE GAUGE WHATIPU

As it is possible that Naval Survey Craft may do some check soundings at the Manukau entrance early in 1965, would you please have the tide pole at Whatipu checked.

* WVA. would like heights of LW + HW at Piratutai reed on 19th + 20th Jan
see me
6711

HARBOURMASTER

JOW/HG

* Ref.

19th

J.A. Halberd Reads

20th

M. Mead Reads

WVA. please arrange

Done 12/1/65

7/1/65

15th January 1964

4

The Chief Asst Engineer.

Tide Gauge - Whatipy

Submitted

Reference Jimi memo of 21st December 1964
Gauge board has been checked and is correct.

Reference possible Navy Survey of Manukau
Entrance - two - 6" x 6" x 8" Pyramidal Marks have been
erected about 20' to 30' above H.W. Mark on
the beach of South Head - Manukau - approximately
1670 feet South and 7270 feet South of Signal Station
on rock shelves. They are painted white - ~~and~~
and will be coordinated as near as possible.

Inshak Beards Respectfully,

[Signature]

[Signature]

Parler. to South Head 18th Jan.

[Signature]

1117

Mr. R. Simpson,
Ministry of Works,
Head Office,
P.O. Box 8024.
WELLINGTON.

21st. December, 1964.

Dear

MANUKAU HARBOUR.

In reply to your P.W. 97/3/3, I was rather surprised to learn that your copy of Bruim and Gerittsen had not been returned since I had instructed that this be done on receipt of a copy ordered for our library. I trust that you found everything in order and that my office has indeed now returned all of the reports and information you so kindly lent. I can assure you that it has been most helpful.

Regarding the other matters mentioned in your letter, I am left with the impression that you do not realise the extent of investigation and appraisal that has been done by the Harbour Board towards formulating plans to exploit natural waterways to their full, as and when a requirement develops with a likelihood of sustaining a sufficient trade to produce an economic return on the capital development required. Also I doubt whether your comments take into account the fact that the Board is indeed proceeding with the procurement of a launch of the kind necessary to operate on the Manukau Bar with a view to collecting the data which will be required for any more realistic study of the entrance problem.

I am sure that we are all anxious that any new steel industry should be sited so as to benefit to the maximum from low transport costs and to make the most use of port facilities. My Board feels that maximum use should be made of water transport. In this regard there are two methods of approach :-

1. To arbitrarily assume that orthodox ships will have to be used and accordingly that works would have to be undertaken to provide increased draught to accommodate ships of larger tonnage.
2. To recognise that there are already in current use large ocean going barges and ships of special design that permit much larger tonnages to be carried without much increase in draught. These open the way to exploiting natural conditions to the full and minimise expenditure on works, the cost of which would have to be recouped by way of revenue.

I see no unduly difficult dredging problems within the Manukau Harbour (excluding the entrance) except that of extent. The presence of papa or sandstone is not as significant as it would have been some years ago, due to considerable improvements we have made in our blasting techniques. Recently it was necessary to deepen the head of the Jellicoe-Freyverg Basin. This involved the removal of a further 15 ft. thickness of very hard sandstone below the level of previous dredging. This was hard enough to slow the dredge to 200 cu. yds. per day when operating unaided. Drilling and blasting was done at a cost of 5/- per cu. yd. only, following which the dredge output rose to 1,350. cu. yds. per day which is the maximum attainable even in mud. If there had been any suitable floating plant available in the Manukau there is no question that we would have undertaken prickings in the Waiuku River but in view of the above results from dredging operations, I

did not consider it to be imperative to set about the assembly of special plant to do a limited investigation over a long length in what is to us a remote area.

With the fuller background I have given here you must agree that dredging for improvement of the internal channels of the Manukau Harbour is unlikely to present any problem excepting their extent and the volume of material that would have to be handled. There are four main arms radiating from the entrance constriction. The twin arms leading to Onehunga and the arm leading to the Pakakura-Wiri area have a natural depth of approximately 3 to 3½ fms. while that leading to Waiuku is somewhat better. Dredging to improve channel alignment is unlikely to induce conservancy problems but any substantial increase in depth is almost certain to require subsequent maintenance dredging to maintain depth. However, increase in depth would not appear to be essential for internal distribution from any steelworks site based on say the Waiuku River and the other industrial areas fringing the Manukau Harbour.

You will recall that at an earlier meeting with Mr. McKillop and yourself it was suggested that it would be most helpful if you would prepare a list of specific items on which you would like information to be obtained, or an appraisal to be given based on information already available. I was under the impression that we had indeed satisfied you on all counts, with the sole exception of prickings in the Waiuku River which we were unable to get at this stage and which in the light of the foregoing I am sure you will now agree are not vital to an appraisal of dredging potential.

As to the Harbour Entrance problem the Board is proceeding to assemble the factual information and reports indicated by Wallingford as being essential to a proper study and this is all that can be done at the present time.

I therefore trust that you will now be satisfied that my Board is very conscious of its obligation to provide firstly for the needs of seaborne trade. Any other categories of development are indeed undertaken only as a means to that end or in support of it.

Yours sincerely,

JAG:MJC

1117

Mr. R.A. Simpson,
Ministry of Works,
P.O. Box 8024.
WELLINGTON.

27th. November, 1964.

Dear Sir,

MANUKAU HARBOUR ENTRANCE

Enclosed is the book "Stability of Coastal Inlets" which you lent to me some time ago together with other papers. The latter are being returned to you under separate cover.

I would like to express my thanks for your willingness to lend this most useful information to us, and offer my apologies that they have not been returned earlier.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

CFM:MJC

ENCL: Book "Stability of Coastal Inlets"



MINISTRY OF WORKS
HEAD OFFICE WELLINGTON

TELEPHONE 46084

P.O. BOX 8024

Housing Construction Division 47075

25 November 1964

Auckland Harbour Board.

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND.

Dear Jack,

When I saw you last of a book by Brunn and Geritt "Inlets" which I passed to you at the Harbour entrance. Our library has the book and if you can now spare it back. If you wish to retain it and I will make the necessary arrangements.

I would like to take up my comments regarding the 'development' of the Queen Street approach. Such proposals should not be taken up until the Auckland Harbour Board has agreed to put itself in the position of land-owner when it would be required to spend any sums on engineering works. The need for accommodating additional points of loading and discharging is developing quite rapidly in the Manukau Harbour.

While I realise it is a long-term matter to decide the future of the Manukau entrance and that in any case little improvement there is likely until cargoes handled through the port reach very substantial figures, nevertheless, I feel sure that the Steel Investigating Company would be much happier if it knew that there were no problems in developing the internal channels step by step without meeting difficult dredging problems, and that should a site be chosen on the Manukau Harbour it is one which gives the maximum benefit in low transport costs and yet leaves the way open for maximum use of port facilities.

Kind regards,

Yours sincerely,

Ralph Simpson.

The Chairman.
This is the letter to which my reply refers. Please return after perusal.
J. Goodsir
Seen by Chairman
Return to George.
File please

MINIS
HEAD

TELEPHONE 46084

Housing Construction Division 47075

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND.

Dear Jack,

When I saw you last week I meant to ask for the return of a book by Brunn and Gerittsen entitled "Stability of Coastal Inlets" which I passed to you in connection with the Manukau Harbour entrance. Our library is seeking return of this book and if you can now spare it I would be pleased to have it back. If you wish to retain it longer please let me know and I will make the necessary arrangements with our library.

I would like to take this opportunity to say that my comments regarding the 'down town' development in Lower Queen Street should not be taken as meaning that I am against such proposals. What did concern me, however, was the fact that the Auckland Harbour Board is prepared to raise loans of £1.5M to put itself in the position of earning more from its land-ownership when it would appear to be very reluctant to spend any sums on engineering investigations against the need for accommodating additional cargoes or cargoes at new points of loading and discharge such as seem to be developing quite rapidly in the Manukau Harbour.

While I realise it is a long-term matter to decide the future of the Manukau entrance and that in any case little improvement there is likely until cargoes handled through the port reach very substantial figures, nevertheless, I feel sure that the Steel Investigating Company would be much happier if it knew that there were no problems in developing the internal channels step by step without meeting difficult dredging problems, and that should a site be chosen on the Manukau Harbour it is one which gives the maximum benefit in low transport costs and yet leaves the way open for maximum use of port facilities.

Kind regards,

Yours sincerely,

Ralph Simpson.

Maukaun Entrance.

Correspondence to Chairman 20. 11. 64.

To Wallingford Research Station 7. 9. 64.

" R. A. Simpson 14. 9. 64.

" Wallingford 21. 9. 64

From Simpson 9. 10. 64.

" Wallingford (phelostat) 23. 10. 64.

To Simpson 20. 11. 64.

Mr. R.A. Simpson,
 Ministry of Works,
 P.O. Box 8024.
WELLINGTON.

20th. November, 1964.

Dear Mr. Simpson,

Thank you for your letter of the 9th. October, with your thoughts on the possibilities of development of the outer reaches of the Waiuku River so as to provide for use by deeper draught vessels.

The whole question of improvements is dependent on what may be practical and economic at the harbour entrance, and in this regard I attach a copy of a report from Wallingford following their consideration of our Planning Study of the Entrance. Wallingford are extremely pessimistic on providing any feasible solution without the establishment of a mobile bed model. It is also apparent that they foresee that any form of improvement is likely to be quite expensive. I cannot say the report is encouraging, and I have yet to evaluate whether the total cost of a model investigation will be justified at this stage, bearing in mind that the probable answers will be expensive to undertake and very difficult to justify in terms of gain to the Board and the Port of Onehunga.

In discussing the Manukau Entrance problem with Mr. Allen prior to his return to England and before he would have had an opportunity to do any detailed study of the information we submitted to the Research Station, Mr. Allen gave an off-the-cuff figure of £10,000,000. as being his appraisal of the likely cost of training works to give improved depth over the entrance. I think that this is quite a realistic figure and that the merits of a canal between the Waitemata and Manukau Harbours to cater for ships of the required draught and its cost would have to be given very serious consideration before embarking on expenditure of this magnitude at the entrance.

Referring back to the Waiuku River, your proposal for ultimate deep water development does appear worthwhile. There is of course a very strong current through the entrance at Karaka Point with excessive turbulence and largeship handling could be difficult during mid tide flow. The provision of berth age face where shown while ideal for deep water location could tend to accentuate velocities through the entrance.

I have had a cursory inspection of the bottom of the channel of Rangiriri Creek undertaken by diver, as a probing was not possible. A hole some two feet was excavated and a sample taken which showed a medium sand with a small amount of mud binding. It is probable that this shoal area would be easily dredged material down to -30', being an accretion dur to the confluence of the Rangiriri Creek with the widened section of the main channel in the area.

At the shallows marked A on your sketch a surface sample showed material similar to that opposite Rangiora Creek but with an increased proportion of black mud. I would however, anticipate that the depth of this overburden may be limited and that the underlying material may be similar to that showing at nearby reefs. At the marked B on your plan there is a thin skin of sand only lying on very hard sedimentary material. The skin

... ..

2.

diver was unable to recover a sample of this.

I trust that the above will be of assistance to you in your own investigations.

Yours sincerely,

CHIEF ENGINEER TO THE BOARD.

ENCL: Copy of report 23.10.64 from
Hydraulics Research Station, Wallingford.

NS:MJC

4th November 1964

District Commissioner of Works,
Ministry of Works,
AUCKLAND C.1.

Dear Sir,

About June 1960 your Department established 14 survey marks within the Manukau Harbour for use by the Hydrographic branch of the Navy during survey operations. With the exception of 2 these marks consist of 44 gallon drums surmounting steel pipe beacons.

As these marks are of considerable assistance to the Board for surveying, buoy positioning etc., I am investigating the possibility of the Board taking over the maintenance thereof.

Would you please let me have your comments on this proposal. The matter has been discussed verbally with Mr. Schnackenberg.

Yours faithfully,



HARBOURMASTER

JON/HG



The Chief Engineer

copy for your information.



Harbourmaster

267
494

The Director,
Hydraulics Research Station,
Wallingford,
Berkshire,
ENGLAND.

8th. October, 1964.

Dear Mr. Allen,

With reference to your letter 103/26 dated
2nd. October, 1964, I enclose copy of my letter dated
7th. September, which at the time of writing you had
not yet received.

Kindest regards,

Yours faithfully,

WJT:MJC

CHIEF ENGINEER TO THE BOARD.

ENCL: Copy of letter.

Mrs Goodier.

Summary of Wallingford letter.

1. It is clear that the only way to understand the problem and receive a reasonable answer - is the study by mobile bed model.

2. We could probably provide a satisfactory amount of the required field data for such a model, but I doubt if a satisfactory survey of all the shoals could be done safely and in time.

3. If a model was to proceed the probable cost could be

Wallingford	£ 40,000
AAB	£ 20,000
	£ 60,000

4. It is clear that Wallingford assess that training works are impracticable or uneconomical. They also appear just as gloomy as dredging.

5. It seems to me that there is no case for a model study unless it is of National Interest and assistance would be given financially.

6. I still feel that the channel will remain with its present peculiarities, and that it will remain operative for ships of the present size. To bring larger coastal cargoes through the channel will be with the ship owners who will design larger vessels with less draught to suit.

Ad.



Please address any reply to
THE DIRECTOR
and quote: 103/26
Your reference:



Please address any reply to
THE DIRECTOR
and quote:
Your reference:

Department of Scientific and Industrial Research
HYDRAULICS RESEARCH STATION
WALLINGFORD, Berks.
Telephone: Wallingford 2381-6

DIRECTORSHIP OF THE
HYDRAULICS RESEARCH STATION

Dear Mr. Goodsir,

We have discussed the
together with the
Conditions and
a number of

We found that
the problem, and
there would be
reassessing the
outline both
glad to answer
looked upon
charge will

We should like to
appreciation
for the character
description

Materia
swell is caused
but out on the
Because the
for a very long
flood must be
and this ebb
remainder the
move slowly

looked upon as a means of transporting littoral drift northwards at the required rate: because the northerly wave-induced currents are slow, except close inshore, a wide expanse of shoal on which wave activity is continually high is necessary in order to pass the required littoral drift. A shoal would in fact widen until it is just able to pass the local littoral drift.

Possibly an important omission from the Appendix B is the part played by the tidal currents in the sea, southerly on the flood and northerly on the ebb, which is to divert the stream entering and leaving Manukau. In particular the diversion of the ebb to the right will encourage a secondary flow in the river which is northwards close to the bed. This secondary flow which is more widely known to cause accretion on the inside of river-bends must be partly responsible for the large accumulation at Windy Point. The direction of the flood and ebb current in the sea will also be largely responsible for the main channel usually being diverted to the northern side of the shoal. This is not to deny that the mechanism explained in Appendix B, whereby a channel is moved northwards by deposits on its southern bank, is also important.

J. Goodsir, Esq.,
The Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND,
New Zealand.

J.



Department of Scientific and Industrial Research
HYDRAULICS RESEARCH STATION

WALLINGFORD, Berkshire
Telephone: Wallingford 2381/6

Please address any reply to
THE DIRECTOR
and quote: 103/26
Your reference:

23rd October, 1964.

Dear Mr. Goodsir,

We have now had time to study your letter of the 7th September, together with the report entitled "Planning Study of Channel Conditions at the entrance to Manukau Harbour" which, along with a number of drawings, came by separate post.

We found that together they present a clear statement of the problem, that the data has been adequately analysed and that there would be no advantage in the Hydraulics Research Station reassessing this rather slender data at length. We agree in outline both with the report and with its appendices. We are glad to answer some of your questions in this letter, which can be looked upon as an offer to carry out work on repayment, and no charge will be made at the present time.

We should be glad to comply with your request for our appreciation of the natural agencies most likely to be responsible for the changes at Manukau, although this differs little from the description found in Appendix B of your report.

The Hydraulic Processes Involved

Material carried northwards along the shore by the predominant swell is carried into the Harbour if it arrives on a flood tide but out on to the shoals if it should arrive on the ebb tide. Because the volume of sediments in the Harbour has been constant for a very long time, one knows that any material entering on the flood must be compensated by a similar volume leaving on the ebb, and this ebb-transported material will reach the shoals like the remainder that went straight out to sea. Together both materials move slowly northwards on the bar. The very wide shoal can be looked upon as a means of transporting littoral drift northwards at the required rate: because the northerly wave-induced currents are slow, except close inshore, a wide expanse of shoal on which wave activity is continually high is necessary in order to pass the required littoral drift. A shoal would in fact widen until it is just able to pass the local littoral drift.

Possibly an important omission from the Appendix B is the part played by the tidal currents in the sea, southerly on the flood and northerly on the ebb, which is to divert the stream entering and leaving Manukau. In particular the diversion of the ebb to the right will encourage a secondary flow in the river which is northwards close to the bed. This secondary flow which is more widely known to cause accretion on the inside of river-bends must be partly responsible for the large accumulation at Windy Point. The direction of the flood and ebb current in the sea will also be largely responsible for the main channel usually being diverted to the northern side of the shoal. This is not to deny that the mechanism explained in Appendix B, whereby a channel is moved northwards by deposits on its southern bank, is also important.

J. Goodsir, Esq.,
The Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND,
New Zealand.



Methods of forecasting changes

The collection of a mass of field data on such matters as wave characteristics, tidal currents, concentrations of solids in suspension, bed materials, etc., is of itself not very helpful in forecasting natural changes. It is certainly much less helpful than records of past topographical changes and it is of no value at all in assessing quantitatively the effects of training works on the prevailing depths. Equally the mere collection of field data would not be helpful in an attempt to forecast the rate at which a deep channel would need to be dredged.

Where the topographical changes are known not to be simple and cyclic the only way of forecasting future changes is by study of a mobile-bed model. Because the problems at Manukau are similar to those encountered at Tauranga, it follows that the scales of a model suitable for studying Manukau would be similar to those of the Tauranga model, namely 1/840 horizontally and 1/72 vertically. In one respect the Manukau model would be rather more difficult to operate in that accurate reproduction of shoals would be necessary. This is in contrast to the Tauranga model where we are concerned more with the depth in the deep channels - which are easier to reproduce. The Manukau model would have to take in a rather larger area because the size of the offshore shoal is greater.

Necessary Field Observations

If we were asked to proceed with a model study we should require you to collect or to organise the collection of the necessary field data. This would amount mainly to observations of currents by float or by direction-finding current-meter. We would need the speed and direction of currents observed over periods of 12½ hours at a dozen places round the periphery of the model area and also the recording of some twenty long float-tracks. In addition we should need a few bed samples.

Some observations of waves would also be desirable. Because the complexity of waves having in reality a spectrum of periods and directions and varying from day to day has to be reproduced very simply in a model, not much use can be made of really detailed information. It would however be convenient to have estimates of direction, height and period of the waves outside the bar recorded daily by mariners for a year.

The Alternatives

One must admit that the cost of an investigation - our part would amount to some £40 000 spread over a period of three years - would be a formidable proportion of the present annual income from the Port and that furthermore the cost of improvement schemes such as a few miles of training works costing several million pounds would appear to be unjustified. Before launching into an expensive investigation one would like to have some prospect that there is a solution that might prove to be feasible, but regrettably we cannot in the present state of knowledge make any forecast whatever of the increase in depth that might be produced by training nor of the annual amount of maintenance dredging in the absence of training works.

The only possible alternative to making a model study would be to cut a channel experimentally along an alignment shown by float-tracks to be the best. This is of course the time-honoured



approach but in the case of Manukau one would still have difficulty in deciding which of the three alternative channels one should choose to open up - the South, the South West or the West Channel. It would seem that in this case the float-track method of deciding on the best alignment is hardly appropriate and there is no real alternative to studying the matter in a mobile-bed model. In view of the large topographical changes which have taken place on the Bar and the records that are available regarding them, it should be possible to obtain good quantitative relationships between the sediment transported in nature and in the model and so obtain accurate predictions both of the improvement in depth produced by training and by the rate at which maintenance dredging would need to be carried out.

Replies to questions contained in letter of 8th October 1964

Question 1

There can be no certainty that depths in the future will not be less than those that have been recorded in the past. On the other hand if the West and South West Channels have changed considerably over the last century and moreover the depth on the Bar have remained substantially the same, it is reasonable to infer that future changes in the alignment of the channel will continue to lead to similar depths. The Hydraulics Research Station has itself attempted to predict future changes of crucial depth by just this means although we did have available more complete information about the site. You will realise that it is possible, assuming that the depths result from random phenomena, to assess the limits of future changes from the theory of probability.

Questions 2 and 3

Only by studying the behaviour of a mobile-bed model would it be possible to forecast the improvement brought about by training works or by maintenance dredging at various rates. Only by the use of such a model would it be possible to determine the optimum alignment of training works or of dredged channels.

Should you wish such a model experiment to be carried out, the Hydraulics Research Station would be glad to conduct it. The cost would be approximately £40 000 and the duration some three years.

Yours sincerely,

R. C. H. Russell
for Director of Hydraulics Research

Auckland Harbour Board.

Money.

To your personal.

As.

6/7/11



Department of Scientific and Industrial Research
HYDRAULICS RESEARCH STATION

WALLINGFORD, Berkshire

Telephone: Wallingford 2381/6

Please address any reply to

THE DIRECTOR

and quote: 103/26

Your reference:

23rd October, 1964.

Dear Mr. Goodsir,

We have now had time to study your letter of the 7th September, together with the report entitled "Planning Study of Channel Conditions at the entrance to Manukau Harbour" which, along with a number of drawings, came by separate post.

We found that together they present a clear statement of the problem, that the data has been adequately analysed and that there would be no advantage in the Hydraulics Research Station reassessing this rather slender data at length. We agree in outline both with the report and with its appendices. We are glad to answer some of your questions in this letter, which can be looked upon as an offer to carry out work on repayment, and no charge will be made at the present time.

We should be glad to comply with your request for our appreciation of the natural agencies most likely to be responsible for the changes at Manukau, although this differs little from the description found in Appendix B of your report.

The Hydraulic Processes Involved

Material carried northwards along the shore by the predominant swell is carried into the Harbour if it arrives on a flood tide but out on to the shoals if it should arrive on the ebb tide. Because the volume of sediments in the Harbour has been constant for a very long time, one knows that any material entering on the flood must be compensated by a similar volume leaving on the ebb, and this ebb-transported material will reach the shoals like the remainder that went straight out to sea. Together both materials move slowly northwards on the bar. The very wide shoal can be looked upon as a means of transporting littoral drift northwards at the required rate: because the northerly wave-induced currents are slow, except close inshore, a wide expanse of shoal on which wave activity is continually high is necessary in order to pass the required littoral drift. A shoal would in fact widen until it is just able to pass the local littoral drift.

Possibly an important omission from the Appendix B is the part played by the tidal currents in the sea, southerly on the flood and northerly on the ebb, which is to divert the stream entering and leaving Manukau. In particular the diversion of the ebb to the right will encourage a secondary flow in the river which is northwards close to the bed. This secondary flow which is more widely known to cause accretion on the inside of river-bends must be partly responsible for the large accumulation at Windy Point. The direction of the flood and ebb current in the sea will also be largely responsible for the main channel usually being diverted to the northern side of the shoal. This is not to deny that the mechanism explained in Appendix B, whereby a channel is moved northwards by deposits on its southern bank, is also important.

J. Goodsir, Esq.,
The Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND,
New Zealand.



Methods of forecasting changes

The collection of a mass of field data on such matters as wave characteristics, tidal currents, concentrations of solids in suspension, bed materials, etc., is of itself not very helpful in forecasting natural changes. It is certainly much less helpful than records of past topographical changes and it is of no value at all in assessing quantitatively the effects of training works on the prevailing depths. Equally the mere collection of field data would not be helpful in an attempt to forecast the rate at which a deep channel would need to be dredged.

Where the topographical changes are known not to be simple and cyclic the only way of forecasting future changes is by study of a mobile-bed model. Because the problems at Manukau are similar to those encountered at Tauranga, it follows that the scales of a model suitable for studying Manukau would be similar to those of the Tauranga model, namely $1/340$ horizontally and $1/72$ vertically. In one respect the Manukau model would be rather more difficult to operate in that accurate reproduction of shoals would be necessary. This is in contrast to the Tauranga model where we are concerned more with the depth in the deep channels - which are easier to reproduce. The Manukau model would have to take in a rather larger area because the size of the offshore shoal is greater.

Necessary Field Observations

If we were asked to proceed with a model study we should require you to collect or to organise the collection of the necessary field data. This would amount mainly to observations of currents by float or by direction-finding current-meter. We would need the speed and direction of currents observed over periods of $12\frac{1}{2}$ hours at a dozen places round the periphery of the model area and also the recording of some twenty long float-tracks. In addition we should need a few bed samples.

Some observations of waves would also be desirable. Because the complexity of waves having in reality a spectrum of periods and directions and varying from day to day has to be reproduced very simply in a model, not much use can be made of really detailed information. It would however be convenient to have estimates of direction, height and period of the waves outside the bar recorded daily by mariners for a year.

The Alternatives

One must admit that the cost of an investigation - our part would amount to some £40 000 spread over a period of three years - would be a formidable proportion of the present annual income from the Port and that furthermore the cost of improvement schemes such as a few miles of training works costing several million pounds would appear to be unjustified. Before launching into an expensive investigation one would like to have some prospect that there is a solution that might prove to be feasible, but regrettably we cannot in the present state of knowledge make any forecast whatever of the increase in depth that might be produced by training nor of the annual amount of maintenance dredging in the absence of training works.

The only possible alternative to making a model study would be to cut a channel experimentally along an alignment shown by float-tracks to be the best. This is of course the time-honoured



approach but in the case of Manukau one would still have difficulty in deciding which of the three alternative channels one should choose to open up - the South, the South West or the West Channel. It would seem that in this case the float-track method of deciding on the best alignment is hardly appropriate and there is no real alternative to studying the matter in a mobile-bed model. In view of the large topographical changes which have taken place on the Bar and the records that are available regarding them, it should be possible to obtain good quantitative relationships between the sediment transported in nature and in the model and so obtain accurate predictions both of the improvement in depth produced by training and by the rate at which maintenance dredging would need to be carried out.

Replies to questions contained in letter of 8th October 1964

Question 1

There can be no certainty that depths in the future will not be less than those that have been recorded in the past. On the other hand if the West and South West Channels have changed considerably over the last century and moreover the depth on the Bar have remained substantially the same, it is reasonable to infer that future changes in the alignment of the channel will continue to lead to similar depths. The Hydraulics Research Station has itself attempted to predict future changes of crucial depth by just this means although we did have available more complete information about the site. You will realise that it is possible, assuming that the depths result from random phenomena, to assess the limits of future changes from the theory of probability.

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Only by studying the behaviour of a mobile-bed model would it be possible to forecast the improvement brought about by training works or by maintenance dredging at various rates. Only by the use of such a model would it be possible to determine the optimum alignment of training works or of dredged channels.

Should you wish such a model experiment to be carried out, the Hydraulics Research Station would be glad to conduct it. The cost would be approximately £40 000 and the duration some three years.

Yours sincerely,

R. C. H. Russell
for Director of Hydraulics Research



MINISTRY OF WORKS
HEAD OFFICE WELLINGTON

TELEPHONE 46084

P.O. BOX 8024

Housing Construction Division 47075

9 October, 1964

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND.

Dear Mr Goodsir,

Thank you for your letter and accompanying plan showing the channel depths in the outer reaches of the Waiuku River. The depths are quite attractive and as you say there is ample water and swinging room for any vessel which can navigate the Manukau Harbour entrance under present day conditions. Indeed if there is ever any improvement warranted and possible of being effected in time with trade requirements the channel depths as far as Waitete Point (with 22 ft minimum depth at low water) would be sufficient to bring in 30 ft draught vessels, at high tide.

At that stage the two shoal patches off Karaka Point would be a limiting factor as these narrow the channel and impose a mid channel bend of 1,000 ft. radius. This could be improved by removal of these shoals by about 60,000 yds of what may be reasonably soft rock, to provide a 3,000 ft. radius, and a 600ft. wide channel from the approach to the Waiuku River right up to the promontory lying midway between Karaka and Waitete Points. Over this length even 30ft. vessels at low water might later be accommodated, the principal work necessary being removal of a shoal length of channel off Rangiriri Creek about 2,000 ft in length and 21ft. minimum depth. As this occurs opposite an expansion in the waterway it may prove to be deposited silts and not rock.

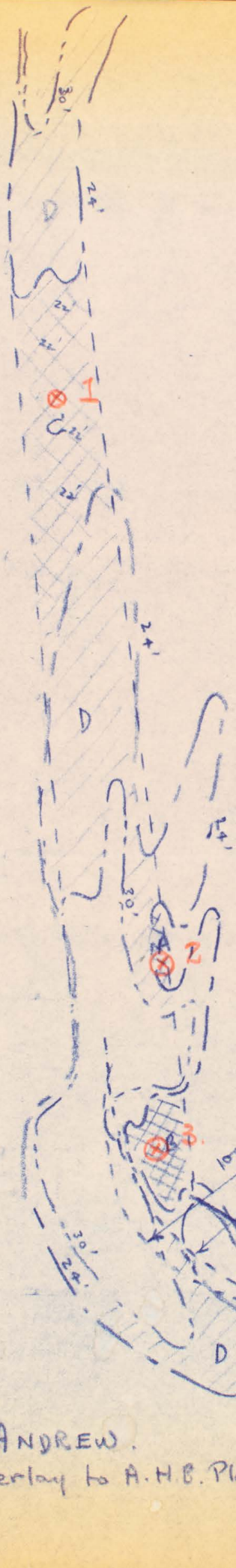
Should it prove possible to make entrance improvements in due course, and the iron concentrate have an export value as ore or as partly processed materials such as pellets or pig iron, there is no doubt that the trend would be towards the largest possible bulk vessels. I am asking the Geological Survey and our Auckland Office to comment on the likely nature of the shoal patches off Karaka Point and will let you know what their comments are. If it is at all possible to probe the shoal off Rangiriri Creek from a launch it would I feel be very helpful if only to the extent that it confirms soft materials, or that rock of undefined limits exists at this point in the channel. It might then be possible to grade a site at the entrance to Waiuku River as "suitable for development for vessels of 30ft draught subject to later investigations supporting the possibility of improvements to the Manakau Entrance for such draughts at an economic cost."

I am pleased that it was possible to intercept Fergus Allen and that he had the time to call on you before returning to the United Kingdom. What the Hydraulics Research Station has to say on the entrance question should be most interesting and may be even encouraging. When next in Auckland I would like to go out to the Manukau South Head to see the entrance area from this viewpoint, perhaps some time about mid October, and hope that you may be able to spare the time to accompany me.

The attached overlay to your plan Z 11/44C covers the points issued above.

Kind regards

R.A. Simpson
(R.A. Simpson)



Suggested Later Development

A.B. Dredging to give 3000' Radius to Sailing Course

--- General Lines of Channel

C.D. Min. present depth 22'. To be Dredged as required

— Line of Berthing and channel generally in 30' Water or better.

Scale 660 ft to 1 inch.

SITE ANDREW.
Overlay to A.H.B. Plan Z11/44C



Department of Scientific and Industrial Research
HYDRAULICS RESEARCH STATION
WALLINGFORD, Berks.
Telephone: Wallingford 2381-6

Please address any reply to
THE DIRECTOR
and quote: 103/26
Your reference:

2nd October, 1964.

Dear Sir,

Your letter of the 21st September 1964, and enclosures, was received here on the 28th September; but your letter of the 7th September has not yet arrived. I propose to await receipt of your first letter before taking any further action.

Yours faithfully,

F. H. Allen
Director of Hydraulics Research

The Chief Engineer,
Auckland Harbour Board,
Quay Street,
AUCKLAND,
New Zealand.

1117.

AIR MAIL

The Director,
Hydraulics Research Station,
Howberry Park,
Wallingford,
Berks,
ENGLAND.

21st. September, 1964.

Dear Sir,

MANUKAU HARBOUR ENTRANCE.

Please find enclosed the prints etc. referred to in my letter of 7th. September, 1964, and also a summary of reports of the Masters of various vessels using the port.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

RKW:MJC

ENCL: Prints etc.

14th. September, 1964.

Mr. R.A. Simpson,
Ministry of Works,
P.O. Box 8024.
WELLINGTON.

Dear Sir

MANUKAU HARBOUR.

Many thanks for your PW97/3/3 dated 29th. July, setting out your personal views on a number of matters concerning long term development of harbour facilities and an iron sands industry and requesting additional information in the Waiuku River locality. Whilst I cannot agree with all your conclusions it is helpful to know your thinking.

I am now able to let you have additional hydrographic data, which together with the two sheets you already have, gives a fairly complete picture of the depth of water presently available throughout the length of the Waiuku River. We have also covered what appeared from the Admiralty Chart to be the critical areas beyond. From this it will be seen that the natural depth of water upstream as far as Glenbrook is equal to that available over the bar viz. 22 feet. The nature of rock showing above low water is also indicated. Three copies of this Drawing have been furnished to Mr. Schnackenberg.

Unfortunately hand prickings proved to be inadequate and as we have no punt available on the Manukau Harbour and none are available for hire it has not been possible to determine the level of hard. However, having studied the hydrographic data, I doubt whether borings are essential at this stage unless the mill site is to be located south of Glenbrook.

Many thanks indeed for referring Mr. Fergus Allen to us. I was able to show him the file copy of the letter I had forwarded to him and to discuss the problem with him in outline. As a result of this I feel confident that he will let us have shortly, an appraisal of the Manukau Entrance problem based on the data we have been able to furnish to him together with guidance on the additional data which would be required for further study.

Kindest regards,

Yours sincerely,

CHIEF ENGINEER TO THE BOARD.ENCL: Drawing Z11/44C.JAG:MJC

7th September, 1964.

Fergus Allen Esq.,
 Director,
 Hydraulics Research Station,
~~Howberry Park,~~
 Wallingford,
 Berks,
ENGLAND.

Dear Mr. Allen,

MANUKAU HARBOUR ENTRANCE.

Your organisation has been most helpful in the advice it has given us on the hydraulic problems in the Waitemata Harbour, both in your assessment of the effect of projected reclamations on the harbour regime and in connection with the Port Model. In view of this and the fact that you are familiar with New Zealand conditions through studies you have done or are doing elsewhere around the New Zealand Coast. I have recommended, and the Board has approved, that you be approached for an appraisal of certain problems associated with the Manukau Harbour Entrance. You will now be growing familiar with New Zealand harbours and river entrances, and I am satisfied that your experience with bars of a similar kind the world over, will enable you to offer sound advice.

This enquiry is still in its preliminary stages and has been initiated by the possibility of the establishment of an iron industry based on the extensive iron sand deposits in the region. Apart from this, however, there is a rapid growth in industrial development in the area and in trade through this port and a request for safer transit over the entrance bar is likely to eventuate.

The economics of any improvement works is a determining factor as the size of the present port is small by any standards, the present annual income being only £68,000 and total trade 200,000 tons per annum. Over the past four years, however, an annual increase in trade of 20% has been maintained and there is as yet no sign of this rate of increase falling off. The largest ship trading into the port at present is a bulk cement carrier 241' x 38½' x 16' draught. Extensive training walls or costly dredging cannot be contemplated immediately, but a long-term development programme needs to be considered now in view of the probable large scale industrial growth round this harbour.

Forwarded with this letter are the following documents:-

1. "Planning Study of Channel Conditions at the Entrance to the Manukau Harbour." This study has been compiled from existing records and knowledge without recourse to any site investigations. The main report is followed by several appendices which were written by individual members of my staff and so contain various approaches to the problem, but, it is hoped, will give you a general appreciation of present knowledge without too many obvious discrepancies.
2. Drawing A.680/1. This has been traced from all available records, and gives some indication of changes through the years.
3. Drawing E.1060/1. Cross-sections of channels to indicate erosion or filling taking place.
4. Drawing E.1070/1. Typical wave patterns.
5. Admiralty Chart.
6. Subsequent survey done by Lechlan.

... ..

- 7. Recent survey of South Channel.
- 8. Wind Records for Auckland.

The historical survey shows that at least 18 feet of water has always been available in one or other of the Channels but its position has been subject to considerable change. The questions which are exercising the Board and which would be of great interest to those who are investigating the establishment and siting of a steel mill are those enumerated on Page 5 of the planning study report viz:-

- 1. Is it likely that the minimum depths of water at the Bar and in the Channels as known in the last 100 years, could reduce with a consequent restriction on shipping size?
- 2. Is it economically feasible to stabilise one or other of the Channels by training works or maintenance dredging?
- 3. Should it become desirable to provide a channel of greater depth, what are the problems and likely economics of providing and maintaining such a channel?

At this stage I would be grateful if you could see your way clear to give me your preliminary appraisal of the entrance problem and your appreciation of the natural agencies most likely to be responsible for the changes in the alignment and depth of the entrance channel and the possibility of establishing or improving it at moderate cost, if you are prepared to give it on the information which has been assembled or is otherwise available to you to date.

I fully appreciate that very much more information would be needed before any specific plans could be formulated for channel improvement proposals. Before going any further in this matter, however, it is deemed advisable to obtain at cost a preliminary appraisal as requested above, together with guidance as to the kind of additional data that would be required for a more detailed study. Would you please give me, also, an indication of your fee for the preliminary appraisal together with advice as to the methods you would adapt in pursuing further studies and your approximate costs.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

Encl:

JAG:DJJ

*File - this has
been redrafted.*

4. SEP. 1964

3

With this preliminary information at hand,
I would be pleased if you would advise on the
following matters. A tabulated form is used in an
endeavour to simplify the presentation of the problem.

A. Principal Question

The historical survey shows that at least 18 ft of water
has always been available in one or other of the channels.
but its position has been subject to considerable change

What engineering works will be necessary to
create and maintain channel depths of:-

(a) 24 ft at low water?

or (b) 30 ft at low water?

This is the basic problem, but, of course, many other factors must be considered.

B. Choice of Channel

The main S.W. and W. channel carries the major portion of the tidal flows, and if restricted by training banks, could provide more than adequate depth at the sea end. However, the South channel is protected to some extent from the prevailing seas, is preferred for south going vessels, and could well be more economically deepened and maintained.

Which channel, then, should be chosen for development?

C. Method of Development

4

We presume that two courses are open: either construct training banks or carry out initial and maintenance dredging. Training walls would be founded on existing sand banks and could be in danger of destruction by tidal scour or wave action. The walls would have to be most extensive to be of effect and costly. Only a dredger of the trailing suction type could be worked in the almost constant swell and the working days would be quite limited. Because of the large quantities of sand moving up the coast, dredging could be futile.

What method of channel development should be followed?

D. Necessary maintenance

Once a deeper channel has been formed, what work would be necessary to maintain this depth?

E. Cost

This matter could be estimated in this office once proposals have been put forward. However from your previous experience you may be able to advise on the probable cost to provide (a) a 24 ft entrance depth
(b) a 30 ft entrance depth

F. Further information

5

A recent sounding of the South Channel has been completed, but no other investigations have been carried out. It is hoped shortly to obtain some float tests in the South Channel to determine tidal currents in this area. To answer many of the previous questions further detailed information may be necessary, such as: sand particle sizes, littoral drift quantities, wave characteristics, tidal velocities and directions, etc. The obtaining of this information will not be easy, due to the remoteness of the site, weather conditions and lack of suitable survey craft. For these reasons, no action will be taken until advice is received from you upon the best course to follow.

What further site information would you desire?

G. Model studies

Would an hydraulic model or other laboratory test be of assistance in providing answers to the above questions?

I would suggest that the above questions could well be answered in the following way:-

Firstly A general opinion regarding the whole problem. This appreciation could be forwarded without detailed study or research and give us an indication of your thoughts on the problem and general possibilities of deepening the channel and entrance.

Secondly A more detailed appraisal of the entrance situation with consideration given as to what method of study should be used and what further site information will be required. An estimate of your fee for such an investigation would also be necessary.

I trust that you will be in a position to accept this request for advice and help on the proposal to deepen the Manukau Harbour entrance, and I shall be pleased to hear from you in due course.

YF

CE to Bd

Auckland Harbour Board.

The Chairman,

Would you please return
the attached letter to me
when you have perused.

Mr. McKillop is in
Auckland again & is at your
disposal if there is anything
you wish to discuss. He will
be out inspecting possible mill
sites tomorrow but any message
can be left at Steel Investigating
Co. office.

J. Soodan.

#. 8. 64.



P.W.97/3/3

MINISTRY OF WORKS
HEAD OFFICE WELLINGTON

TELEPHONE 46084

P.O. BOX 8024

Housing Construction Division 47075

24 July 1964

The Chief Engineer,
Auckland Harbour Board,
C.P.O. Box 1259,
AUCKLAND.

Dear Mr Goodsir,

The N.Z. Steel Investigating Company has made available to the Ministry of Works a copy of the letter of your Chairman, Mr R.C.F. Savory, to the Chairman of the Steel Company dated 15 June. It is realised that it is extremely difficult for the Steel Company to forecast the future development of the steel industry in New Zealand, particularly at the present time when active investigations into the industry are still in hand. The Works Department which is acting in an advisory capacity only to the Company on some aspects of development is not in a position to make any authoritative statements regarding the development of the steel industry and the demand which might be placed on the Auckland port. For these reasons I thought it might be helpful to write to you personally giving you my own viewpoint on the question of port development in the Auckland area.

First of all it seems imperative for internal transport distances in New Zealand to be reduced as much as possible as our haulage rates are high and do much to restrict economic development. For this reason I do not look on the construction of the Kaimai tunnel as an invasion of the Tauranga Harbour Board on the Auckland port area but principally as an important factor in reducing the distance between rapidly developing social and industrial communities. In the same manner I have for some years now considered that the growth of industry south of Auckland warrants careful consideration of the possibilities of port development in the Tamaki River and through the Manukau. I very much doubt if the solution of the sea transport problems of industries south of Auckland will be successfully solved either by land transport to the Queen Street wharves or by sea transport through a barge canal round to those wharves. Direct connection through the Tamaki or Manukau Harbour, or both, seem to be the best means of reducing land transport costs between factory and sea and vice versa.

Even if there were no steel industry contemplated I would be very glad to know that the investigations now proposed regarding the Manukau entrance were being put in hand ready for the time when industrial development would require a nearer sea outlet than the present Auckland wharves. So far as the steel industry is concerned it is at present conceived as an industry supplying some of the internal needs of the country, and in the first report on the N.Z. Steel Investigating Company the first stage of the industry was set at quite a low level as it was possible that substantial portions of the present market could not be economically catered for by a New Zealand mill due to the great diversity of these products. There is, however, a general trend throughout the world for countries to be self-sufficient in steel production and accompanying

this trend there has been and will be a steady trend towards the production of heavy sections and plate in small quantities in special type mills which were not envisaged some years ago. By 1980 the Steel Company envisage a demand of just over 1 million tons of steel products in New Zealand but has been cautious in assessing that only the simpler sections would be manufactured in this country. As well as the trend to develop rolling equipment for heavy section and plates in smaller quantity there is also in favour of New Zealand the transport costs from Australia or further afield for all products not manufactured here. While it is necessary for the Steel Company to be very conservative in its assumptions at the present time, development is likely to be more rapid and of the materials produced about 27% would require to be dispatched to the South Island and perhaps an additional 15% to areas such as Wellington which could be better served by sea than by rail. It is possible also that some raw materials from time to time might be required at the mill and it is also anticipated that there will be an excess of demand over production in the south Pacific area for many years ahead. Much of this demand, of course, would be met by Australia, but, as you know, the rapid industrial expansion in Australia has strictly limited the availability of steel for export and this non-availability has led to New Zealand seeking supplies of steel from further abroad. If, therefore, this country produces a good quality steel it may well be that we would wish to participate in export markets later on.

In endeavouring to advise the N.Z. Steel Investigating Company regarding mill sites and the relation of particular sites to future developments in the area, the problem of assessing the value of the Manukau Harbour in the future has come up time and again. On the short term view it is not necessary to be close to the Manukau Harbour and better overall transport costs are achieved by neglecting the future of the Manukau while considering the first stages of steel development in which sea transport other than to the South Island is completely neglected. On a longer term view, however, considering the possibilities of imports of raw materials (refractories, fuel oils and possibly limestone from external New Zealand sources) and perhaps also of semi-finished products on which processing work would be finished in a New Zealand mill the advantage of a nearby port becomes much more important. If, in addition, at some later date direct export to overseas and to North Island ports as well as to the South Island could be developed then the Manukau seems of even greater importance.

In addition to examining the possibility of improvement to entrance conditions there are two other factors which could be of importance and I wonder whether the Board would consider extending investigations to cover these matters. These are:-

- (a) A check whether dredging of a channel to a depth of 30 ft below L.W. from deep water in the Manukau as far as the Waipipi Wharf area is feasible without encountering heavy rock dredging. I hope it is possible for the Board to take a few probings at critical points to check this.
- (b) The Navy survey of the Manukau Harbour is on too small a scale to check whether there is a channel of 30 ft L.W. or better in behind the Clark's Beach peninsula sufficient to permit vessels to approach, berth and swing fairly close in on the south side of this peninsula. If the Navy surveys could be extended sufficiently to define the deep water in this area it would be very helpful.

There is another possibility which I should mention and once again it is not possible to be definite but there does seem to be a considerable interest, particularly among the Japanese, in the use of iron ore from New Zealand. World prices are very competitive now for iron ores and transport needs large vessels and a loading point close to the source of the ore. Economics of export of iron ores could well require vessels beyond any reasonable development possibilities for the Manukau. Once again, however, some indication from Wallingford at this stage on the reasonable development possibilities would be very helpful in putting the ore export problem in better prospective.

I have no objection to your showing this letter to the Chairman of your Board but beyond that point I would prefer that it be kept confidential. It expresses my personal viewpoint only. It has been written mainly because it is felt that at the present time the N.Z. Steel Company cannot be specific as to its requirements and the form of development, and that you are therefore in a fairly difficult position in seeking authority from your Board to accelerate investigations into port developments, particularly in the Manukau.

Yours sincerely,

R. A. Simpson

29th. June. 1964.

THE CHIEF ENGINEER

THE GENERAL MANAGER.SURVEY OF MANUKAU HARBOUR AND BAR.

Your report of 11th. August, 1960 to the General Purposes Committee summarised the arrangements made with the Navy whereby the Navy undertook to carry out re-surveys of the bar periodically and the Board undertook to carry out frequent check soundings of shipping channels in order to provide the necessary navigational aids. At that time arrangements had been made whereby a fishing vessel suitably equipped was to be made available at a hire fee of £50. per day. The Board on 23rd. August, 1960 resolved "that authority be given to the hiring of a suitable vessel as and when required for check sounding".

The Harbourmaster encountered increasing difficulty in arranging for a vessel to be made available for such check sounding. In fact no such check sounding had been carried out for a considerable time until recently it became imperative to confirm depths available in the South Channel because of a reported loss of depth. On this occasion the Company's terms for carrying out a survey on the 13th. June, were notified by letter of 12th. June as being £80. per day and in view of the urgency and the fact that you were not available at the time, I authorised the hiring of the vessel under the terms set out in the attached letter from Messrs. Sanford Limited, dated 12th. June, 1964. The check soundings were carried out and showed that there is adequate water in the defined channel.

In view of the doubt whether the Board's resolution of four years ago intended a limit of £50. per day to be placed on the hire charge, the matter is referred for confirmation of my action and for a direction for the future. In this regard will you please note in particular, page 2 of Messrs. Sanford's letter which specifies special terms as being required in any case where the Company's fishing programme would be affected.

CHIEF ENGINEER TO THE BOARD.ENCL: Messrs. Sanford's letter.JAG:MJC

Auckland Harbour Board

MEMORANDUM

12th June 1964

FROM THE HARBOURMASTER

TO THE CHIEF ENGINEER

USE OF FISHING BOAT.

The conditions contained in the attached letter of Sanford Limited regarding the hire of a fishing boat to carry out a survey of the Manukau Entrance are to my satisfaction and I shall be pleased if you will authorise the hire of the vessel.

*Noted 30.6.64
S. Rogers.*

*Hire of fishing vessel
approved.*

J. Woodair 12.6.64.

S. Rogers.

HARBOURMASTER

1117.

Mr. R.A. Simpson,
Ministry of Works,
Head Office,
P.O. Box 8024.
WELLINGTON C.1.

11th. June, 1964.

Dear Sir,

MANUKAU HARBOUR ENTRANCE

Many thanks indeed for your letters dated 25th. May, and 5th. June, 1964. Your appraisal of the entrance problem is being given close study.

Regarding the proposed inspection next week, Mr. Schnackenberg has been in touch with me. I could not be available on Monday or Tuesday but would hope to be able to fit in with whatever arrangements are made for any other day provided I have reasonable warning.

Kind regards,

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

JAG:MJC



P.W.97/3/3

MINISTRY OF WORKS
HEAD OFFICE WELLINGTON

TELEPHONE 46084

Housing Construction Division 47075

P.O. BOX 8024

25 May 1964

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
Quay St,
AUCKLAND.

Dear Mr Goodsir,

I have had an opportunity to look over the changes in the Manukau harbour bar as shown in the Board's plan A680/1, and as there are proposals that the entrance be inspected as soon as suitable arrangements can be made I thought it might be worthwhile to set down now my first (unofficial) thoughts on improvement to the entrance.

1. The western channel seems to be by far the most stable and my first thought was that at some distant date, when growth of trade warranted, training works could be carried out which might assist in stabilizing and deepening the outer bar area.

The channel after emerging from between the heads generally runs straight for about 2 miles out of a total of 4 miles and then tends to curve to the north (and sometimes to the south) due to the instability of the outer tips of the banks. If new north and south heads could be created by the construction of training walls on either side of the channel seaward for about 2 miles the tendency could be to promote a channel further seaward which might run straight or nearly so to a point beyond the existing bar. Sand drift which causes the present stability at the outer end of the channel would then tend to be drifted into deep water. It is recognised that such training works would be very expensive and could only be justified if there was a very large trade developing or capable of being developed. Nevertheless it seemed to me worthwhile to have the opinion of such a group as the Hydraulics Research Station on the likelihood of such training works effecting improvement in the entrance channel.

2. Now that I have examined the charts supplied, the partial existence of a south channel in the form either of dead end ebb or flood channels (and sometimes both) suggests that some of the instability of the western channel is due to a leakage of tidal waters in and out to the south. The south channel seems to have broken completely through in 1863. Nevertheless over the period 1844 to 1916 the south channel seems generally to have remained closed, although there has always been a threat that this would reopen. The surveys in 1919 and in 1954 and 1956 again showed ebb and flood channels which have been completely broken through by the south route. I learnt from Mr Schnackenberg a few days ago that the south channel had broken through again in the last few days. In 1960-61 such a break through seemed imminent and would undoubtedly be encouraged by the northward swing of the main western channel and the drift of material across its mouth.

The changes would, I think, go hand in hand - the more leakage from the south channel the greater bar obstructions there would be in the western channel and if conditions such as high tides,

John Sawyer
HS

onshore winds with large volumes of drift materials, etc., are favourable then the southern channel could break through.

It does appear, however, that the south channel is less permanent and is partially choked again by sand drift from the south allowing the western channel to recover in whole or in part. This raises the question whether it would not be possible to prevent the south channel from forming largely by the construction of a rock barrier from the south head along the southern side of the western channel for a sufficient distance to block off high tide flows from the harbour turning to the south. This might also prevent the formation of tidal flood fingers penetrating into the southern bank. The rock wall construction could also be strengthened by attempts to consolidate the inshore portion of the south bank by brush fences and vegetation growth so that high sand dunes would be created in this area.

3. It may be found on further study that the approach suggested above is not the proper course to take and that attempts should be made to develop a south channel as a permanent feature and the Hydraulics Research Station could well comment on this. There appears to be a further threat of break-through to the south out near the bar area where the western channel at times shows signs of a break-through. This is particularly marked in the 1961 survey where a large sandbank is very nearly severed from the South Bank. It is probable, however, that if this had occurred just prior to the present break-through into the south channel that the western channel would have re-established itself, the sandbank moving north under the effect of the seas and under these circumstances the south channel would have deteriorated again to a stage somewhere between that of the 1944 and 1953 surveys.

I thought I would send these comments forward to you so that we might have some points for discussion when the Board and the Steel Company representatives examine the entrance from seaward.

Yours sincerely,

R. A. Simpson
R.A. Simpson *RS*

Investigating Engineer

67M

Address Reply To:
The Commissioner of Works,
Ministry of Works,
P.O. Box 8024,
Wellington, N.Z.



IN REPLY PLEASE QUOTE

P.W.97/3/3

MINISTRY OF WORKS
HEAD OFFICE

5 June 1964

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
Box 1259 C.P.O.,
AUCKLAND.

Dear Sir,

Thank you for your letter of 29 May with its enclosures dealing with the Manukau harbour entrance. Mr Simpson of this office expects to be in Auckland from 15 - 19 June and should be free about the middle of the week to discuss this matter further with you, and possibly to make the sea inspection proposed earlier. It is being left to the Auckland District Office to discuss with you suitable arrangements and time. If there is to be a sea inspection Mr Simpson would prefer this to be a small group to consider technical factors only at this stage.

It is hoped that any development of the Manukau Harbour in the future can avoid the very costly expedient of dredging, or, if not, that such dredging is very strictly limited in quantity and area. For the continued use of the south channel some dredging directly west of the South Head signal station would seem to be the appropriate point. This is in the area of the narrow isthmus between the partly formed south channel and the main channel shown in the survey of 1960-61. However, it does seem that the internal channels in the Manukau Harbour are designed by nature to discharge directly towards the WSW and even a dredged cut at this narrow point between the main channel and the south channel could well be unsuitable and expensive to maintain.

Yours faithfully,

J.T. Gilkison
Commissioner of Works

per: *R. Simpson*

Your Ref. 97/3/3.

29th. May, 1964.

The Commissioner of Works,
Ministry of Works,
P.O. Box 8024.
WELLINGTON.

Attention Mr. Simpson.

Dear Sir,

WEST COAST HARBOURS.

Thank you for your correspondence dated 24th. April, and 8th. May, and enclosures. This wealth of information is at present being studied and will be returned in due course.

The records of wave periods and heights for Westport are interesting and reveal that this harbour is well protected from the ocean swell.

I enclose for your information a copy of a study report on the Manukau Harbour Entrance which will indicate to you how far this examination has been carried out to date.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

CFM:MJC

ENCL: Copy of study report.

EXTRACT FROM MINUTES
GENERAL PURPOSES COMMITTEE

..16.AUG..1960.....

5. SURVEY OF MANUKAU HARBOUR AND BAR

Consideration was given to the report of the Manukau Harbour Advisory Sub-Committee dated 15th. August, 1960 advising that the Sub-Committee had considered the report of the General Manager dated 11th. August, 1960 advising of a letter received from the Navy Office, which requested the Board's confirmation of acceptance of the following arrangements -

- (a) Navy Department to carry out a complete survey of the Manukau Harbour and Bar, commencing October, 1960.
- (b) The Auckland Harbour Board to carry out frequent check soundings of shipping channels in order to provide the necessary navigational aids.
- (c) Navy Department to carry out re-surveys of the Manukau Bar every three to five years from 1960.

The General Manager advised that a suitably equipped vessel for the check work was available at a hire fee of £50. per day. The Board's responsibility to keep the soundings up to date would be undertaken by the Hydrographic Section and would involve the hiring of the vessel one day every two months at the most. The proposals were satisfactory to the Harbourmaster and the Chief Engineer.

Recommended -

- (a) That the Board approve the arrangements as set out in the letter from the Navy Office dated 29th. July, 1960.
- (b) That authority be given to the hiring of a suitable vessel as and when required for check sounding.

FINANCIAL PROVISION
MADE 23.AUG..1960..

ADOPTED BY BOARD
..23.AUG..1960..

27th. May, 1964.

THE CHIEF ENGINEER

THE GENERAL MANAGER.

REPORT FOR PLANNING ADVISORY PANEL.

MANUKAU HARBOUR
PLANNING STUDY OF CHANNEL CONDITIONS AT THE
ENTRANCE.

As stated in my report of the 3rd. December, 1963, the Ministry of Works and Marine Department requested information on the following matters :-

1. The proposed canal route between the Whau Estuary and the Manukau.
2. The proposed canal route between the Waiuku River and the Waikato River.
3. Information relative to possible development of the Manukau Harbour Entrance.
4. General assessment of the future of the Waiuku River and canal as part of the ultimate Manukau Harbour transport development possibilities.

Existing plans of the Whau River Canal proposals and the Waiuku - Waikato proposals have been made available to the Ministry of Works and also to the Steel Investigating Company. A hydrographic survey of the Waiuku River has also been carried out and details of this have likewise been made available to the Ministry of Works and the Steel Investigating Company and its Consultants.

My report referred to the preparation of a sequence of charts of the Manukau Harbour Entrance from which it was hoped to deduce further information. These charts have been concentrated on a single Drawing No. A.680/1 which shows changes that have taken place at the entrance over a period of more than 100 years as disclosed by successive surveys. From these the sections shown on Drawing No. E.1060/1 were drawn in the hope that these might indicate some correlation between cross sectional areas, bed configuration and channel alignment.

These charts and sections supplied a basis for a planning study of the Manukau Entrance conditions which is reasonably comprehensive and which I believe would be of considerable interest to members of the Planning Panel. I accordingly recommend that the planning study of the Manukau Harbour Entrance Conditions be circulated to members of the Panel in advance of its next Meeting.

CHIEF ENGINEER TO THE BOARD.

JAG:MJC

PLANNING STUDY OF CHANNEL CONDITIONS AT THE ENTRANCE
TO THE MANUKAU HARBOUR.

1. INTRODUCTION:

In connection with the Comprehensive Transport Survey being carried out by the Auckland Regional Planning Authority (with the assistance of the Authority's Consultants, Messrs. De. Leuw, Cather and Company), the possible development of a seaway from the Tasman to the Pacific for ships up to 30 ft. draught, was suggested as an item worthy of investigation in view of its significance in the matter of overall Regional Development.

While such a facility could be desirable, it was considered that the engineering practicability as well as the economics of a scheme to provide a deep water connection between East and West coasts, were doubtful. An essential prerequisite to the scheme would be the improvements to conditions at the entrance to the Manukau Harbour, which entails engineering problems of some magnitude.

The Board has a substantial investment in the Port of Onehunga in the provision of 900 lin. feet of berthage handling general cargo and steel to southern coastal ports, and receiving cement in bulk. Total trade for 1962-63 was 189,716 tons and at the present rate of increase of tonnage handled, 20% per annum, the need for further additional facilities at the port can be foreseen. At this stage it is more important that the entrance to the Manukau be more fully understood primarily to ensure the continued and full use of the existing harbour facilities and secondly to consider what might feasibly be undertaken to stabilise, improve or maintain the entrance for a greater potential use of the harbour.

With this in view, a preliminary study of the entrance behaviour over 100 years has been made. This now enables a fuller appreciation to be made of the subject and present problems, and provides a better basis for further investigations and opinions.

The report concludes by recommending that the study should be carried at least the further stage of obtaining a preliminary report from the Hydraulics Research Station at Wallingford, of the Manukau Entrance problem.

2. TERMS OF THE STUDY:

The study at this stage has been limited to an evaluation of the information available from reference knowledge and appraisals of physical factors which could apply to this problem. Independent study has been completed covering :-

- a. A Historical Survey over 100 years based on charts etc. to study the entrance channel location and availability of use.
- b. Considerations of the effect that littoral drift may have on conditions at the entrance.
- c. Calculation of probable wave heights resulting from a typical Tasman storm.
- . A summary of pertinent questions and answers which endeavour to provide a better understanding of the processes and their effects on entrance conditions.

These independent studies are included as Appendices, and is proposed to briefly review the situation which exists at the harbour entrance.

3. CHANNEL APPROACHES AT THE ENTRANCES:

The approach to the harbour has been through either of two channels of which the Western has been used the greater part of the time. Whilst the first two miles of the channel westward from Paritutai has remained relatively static in position and having substantial depth of water, its continuation to the open sea extending over a distance of two to three miles has been subject to changes in direction over a wide range from South West to West. The other channel (South) has remained reasonably static in location but is subject to shoaling at both ends so limiting its use over certain periods. From the point of view of the most suitable approaches to the harbour the South Channel (which is being used at the present time) has definite advantages being shorter in length, generally free of breaking water and because there is some shelter from prevailing winds.

The West Channel, although carrying the major portion of the tidal flows, is bounded by the main bar which has shifted in position and depth through the years, and in the early days has been the cause of the loss of several ships and many lives. The minimum depth in this channel as shown by the various charts, has been about $3\frac{1}{2}$ fathoms although more detailed surveys carried out in recent times show local areas over the bar entrance having as little as 2 fathoms. This bar receives the full force of the predominant westerly seas and may not submit easily to artificial improvement.

4. MOVEMENT OF BED MATERIAL:

Although the available survey data is rather inadequate for the purpose, an attempt has been made to determine the order of the problem which may have to be faced in attempting to stabilise entrance channels by conservancy methods. A complete survey of the bar had been carried out by Admiralty in 1961. A re-survey done in 1963 covered portions only of the bar comprising an area of 1.9 square miles based on the South Channel and a narrow strip of the main channel which included an area of 0.4 square miles where depths are critical across the bar proper. These areas dictate what can be compared. By doing the comparison it has been deduced that 7,000,000. tons of bed material has been removed by natural agencies from the 1.9 square miles in the South Channel area whereas 2,000,000. tons of bed material has been deposited over the 0.4 square miles of the bar area covered by the 1963 survey of the outer end of the main channel. These changes have taken place over a period of 2 years but it would be dangerous to assume that the figures could be related to a time scale or an area scale or that the material eroded from one area is the same material which has shown up as a deposition elsewhere. They can only be construed as pointers to the quantities of bed material which can be moved in this locality by natural agencies.

Although these quantities are large they are not necessarily excessive as may be seen from the following quantities which have been deduced for Westport Harbour Entrance viz :-

- (a) based on monthly soundings an area of approx. 1 square mile in the roadstead was found to be subject to erosion to the extent of 5 to $5\frac{1}{2}$ million cubic yards in a year and accretion of the same amount,
- (b) over a lesser area of a quarter square mile off the entrance the changes varied from 1.4 million yards to a minimum of 100,000. yards per month with an average of at least 100,000. yards per month.

5. EVALUATION OF WAVE ACTION UNDER STORM CONDITIONS:

THE METEOROLOGICAL FACTORS IN WEATHER AND WAVES AT THE MANUKAU BAR.

The principal weather conditions which effect the Manukau Bar area and cause wind generated waves to break across the entrance can be divided into two categories :-

- (a) Remote i.e. 1,000. miles away.
- (b) Local conditions.

The most prevalent condition is one in which type (a) dominates the North Island. The picture is that of a large anti-cyclone centred North West of the North Island and moving over it and a depression moving round the Southern side of the high in Latitudes 40° - 50° S.

This creates a situation where local weather is fine with light winds but the depression which moves rapidly Eastward has generated waves of considerable height moving North up the Tasman Sea. The physical shape of the North Island is such that from Cape Egmont North, the waves are diffracted into a South West frontal aspect as they approach the coast.

The original wave height of the storm centre is not only maintained but quite often increased so that, on the Manukau Bar, swell, as it has become, arrives and is further heightened by shallow water and probably an ebb tide. At a critical height, the re-created swell breaks as a wave and may well make the entrance unworkable.

Type (b) weather is associated with the winter months, July-September or may be due to a tropical cyclone at other times. The life of the wave system propagated by local weather is usually quite short but type (b) generated waves account for a probable 60% of the Bar conditions.

Observations of actual wave heights and conditions on the entrances is now being done through the co-operation of Shipmasters and this should provide a better understanding of the local factors involved.

6. CONSERVANCY:

Maintenance or improvement of the south channel could possibly be carried out by dredging and/or training banks. Further study will be needed to determine whether either of these propositions is practicable. A heavy swell and breaking waves are regularly encountered in the area, and only a dredge of the trailing suction type could attempt such work. An indication of the amount of sand which can be moved along the coast by littoral drift action has been given above and the likelihood of maintaining a stable channel or effecting improvements by dredging would need careful investigation.

7. TRAINING WORKS:

Any training walls would of necessity be founded on sandbanks, and careful design based on adequate research would be needed to avoid their being endangered by scour from tidal action and damaged by storm waves. Economically such walls may be quite out of the question at the present time because of the relatively small volume of shipping using the Manukau Harbour and the likely cost of such works. However, these methods have been used with considerable success in some places and further detailed study may well establish the feasibility of such proposals when considered alongwith the potential of the harbour.

8. RECORD OF TIMES BAR NOT WORKABLE:

From the monthly shipping records of the Harbourmaster's Office the following information has been extracted for the years 1951 to 1963.

The years 1951-1963 inclusive had 243 days during which the bar was unworkable. This is about 2% of the total. The average is 18½ days per annum.

The worst year was 1963 (38 days) close behind was 1959 (34 days). Neglecting these two years the average would be 14½ days per year.

SUMMARY.

No. of days.

<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May.</u>	<u>June.</u>	<u>July.</u>	<u>Aug.</u>	<u>Sept.</u>	<u>Oct.</u>
4	10	14	24	49	33	42	16	16	12
<u>Nov.</u>	<u>Dec.</u>								
14	7								

Total days per annum.

<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>
7	19	28	9	9	3	16	18	34	19	19
<u>1962</u>	<u>1963</u>	<u>1964</u>								
24	38	24								

There is little in the reports to indicate how many vessels were unable to enter the harbour on these days. It can be said that vessels are not now using the Western Approach as much as the South Channel but this depends rather more on general visibility than Bar conditions. There is quite a strong case at this stage for knowing how many vessel use which channel and for what reason.

9. POTENTIAL OF HARBOUR:

The Board has an investment at Onehunga with a present day value of approximately £750,000. O. O., in wharf structures, cargo sheds and services. The tonnage of goods passing through the Port is increasing each year and this increase has been spectacular over the last two years, as shown on the graph attached. If progressive reclamation of the extensive tidal flats in the Mangere Inlet is undertaken, large areas of land will be available for industrial use close to the Port. The whole South Auckland area surrounding the upper portion of the harbour and extending to the Tamaki River shows rapid industrial development and if the investigations now being undertaken by the N.Z. Steel Investigating Co. Ltd., and its Consultants lead to the establishment of an industry for the conversion of iron sand deposits to steel and this is either based on the Manukau Harbour or conncted to it by a navigable waterway, serious consideration will have to be given to the development of a network of waterways between it and the other South Auckland industrial areas. The scale of such industrial development could determine whether or when a waterway connection between the two harbours could be justified or improvement of the Manukau Entrance seriously considered.

Even gradual increase in Port trade figures may finally result in a demand for safer and easier navigation of the Harbour Entrance, together with a request for a greater minimum depth at

... ..

the Bar, so that ships of larger dimensions may ply. Present difficulties in maintaining reliable leads to indicate the best crossing location, are due to the great volumes of sand continually moved by wave forces. The need for at least preliminary answers to the problems at the entrance would seem to be more imminent so that the potential of the Manukau can be appreciated and the expansion of the Port may be assured.

9. CONCLUSIONS:

Although we now have assembled a good deal of background information on the behaviour of the Bar, further study is required before it would be possible to give unqualified assurances on three vital questions :-

1. Is it possible that the minimum depths of water at the Bar and in the channels as known in the last 100 years, could reduce further with a consequent restriction on shipping size?
2. Is it economically feasible to stabilise say, the South Channel by training works or maintenance dredging?
3. Should it become desirable to provide a channel of greater depth, what are the problems and likely economics of providing and maintaining such a channel?

The Hydraulic Research Station at Wallingford, England, has carried out similar investigations on harbours in many parts of the world. They have expertly advised us on the likely effect of extensive reclamation in our own harbour and also on the construction and operation of the Port Model. They are currently doing a mobile-bed model study of the Port of Tauranga and its entrance problems and have already furnished a preliminary report. They are also advising the Taranaki Harbour Board and the Waikato River Authority. They would be well placed to advise the Board at this stage, to give, both a general opinion from the information provided on this report, and suggestions on what field work would be needed to provide reliable answers to the above questions.

10. RECOMMENDATION:

At this stage, a fuller knowledge of the natural agencies which are responsible for the changes in the alignment and depth of the entrance channel and the possibility of stabilising or improving it, could exert a considerable influence on the siting of an ironsands industry. It is therefore recommended that the Chief Engineer be authorised to request the Director, Hydraulic Research Station, Wallingford, to examine this matter and provide preliminary answers to the three questions listed above along with a general appreciation of the situation affecting the Manukau Entrance.

APPENDIX "A"
PRELIMINARY REPORT.
INVESTIGATIONS INTO CHANGES IN CHARACTER OF MANUKAU
BAR 1863 - 1963
REFERENCE DRAWING NO. A.680/1.

A consideration of the separate surveys of the Bar including the South Channel shown on A.680/1 indicate that while the dated sketches show big changes over the 100 years there are gaps of a number of years during which no surveys may have been made. Reference has been made, therefore, to reported shoalings from Notices to Mariners for the early years which date the changes to a year or so.

There has been, over the entire period, three directions from which the heads can be approached and each has been not less than 3 fathoms in depth at Low Water. Generally speaking, only one of these approaches has been considered to be open at one time. The three channels can be called West, South West and South Channels for this report. The history of each approach is separately dealt with.

WEST CHANNEL.

The Bar on this approach has varied in distance from $3\frac{1}{2}$ - $4\frac{1}{2}$ miles from Paratutai Lt. The deep channel from the Bar to Paratutai has changed in depth over the 100 years but the sides for 2 miles West of Paratutai have not changed appreciably.

This section can be called stable but from 2 miles out to the Bar breaches have occurred to the North West and South West in the latter to form the South West approach. In 1962-63 less than 3 fathoms was reported and the opinion was that it could be closing back to the situation in 1920. The useful life therefore would appear to have been 30-35 years. This agrees with the earlier period 1863-1903 approximately.

SOUTH WEST CHANNEL.

The earliest chart of 1844 shows this approach open but in 1863 closed. Period 20 years approximately. In 1919 this channel was open again and in fact, a sectored light was established in 1901 (Ref. 6) leading up the channel. Between 1901 and 1919 this channel was the one in use but was moving down to a South South West approach. The Auckland Harbour Board survey in 1919 established leads on the approach. The date of closing is not certain but was not later than 1954. The channel remains closed in 1961 but the bar across it is not extensive. Life of channel is approximately 40 years.

SOUTH CHANNEL.

The earliest chart shows this channel closed in 1844 but this survey is considered too sketchy. In 1853 some 90% of the channel had more than 3 fathoms in it. The chart of 1863 shows the channel as entirely open and with buoys at intervals. In 1875 "The South Channel is now the only one used" ... "least depth $2\frac{3}{4}$ fathoms" (Ref. 1). In 1882 "buoys have been laid down but their position cannot be relied upon". (Ref. 2).

In 1885 "Soundings have been taken in the South Channel. The bar (at the Southern end) had deepest water of $2\frac{1}{2}$ fathoms at low tide". In 1886 leading lights were established for shipping using the South Channel (Ref. 4.) but as far as this investigation is concerned the

... ..

Channel was closed, being under 3 fathoms, due to the apparent linking of the banks to each other at the Southern end. The final closure of this passage was noted in 1912 when the Northern end closed (Ref. 7). The working life can then be described as 1863-1885 about 22 years or a little more.

The channel remained closed to traffic until it was re-surveyed in 1960-61 and re-examined in 1963. There is no evidence of it being used between 1900 and 1960 except by small craft.

SUMMARY.

Of the three channels, the Southern is the one that is most favoured for its shorter length, because it is free of breaking water and because there is some shelter from prevailing winds. If, then, the Drawing No. A.680/1 and the additional information dating the early life of the channel, are to be a guide the main approach is again going to be from the South and without artificial improvement, open for at least 20 years.

In view of this, the following approximate figures have been deduced from the two consecutive surveys 1961 and 1963. South Channel, 7,000,000. tons of bed material removed in 2 years by wave action and the tidal regime from 1.9 square miles. West Channel 2,000,000. tons of bed material deposited. The area of the West Channel being about one-quarter of the area considered in the South Channel. (0.4 square miles). To dredge the South Channel to 18' below Datum and 1,000 ft. wide on the present leads (002°) would require the removal of 130,000. cubic yards of bed material. An alternative line which, it is thought, may induce the ebb tide to flow more freely through a 1,000. ft. wide channel, would require 455,000. cubic yards dredged to 18'. Some 90% of this quantity however, would be at the Northern entrance cutting a lead in. The channel last mentioned would be similar in shape to the one in 1863.

APPENDIX "B".

GENERAL NOTES ON MANUKAU HARBOUR ENTRANCE.

LITTORAL DRIFT AND ITS EFFECT ON CONDITIONS AT THE ENTRANCE.

As the prevailing wind direction is between west and South West, the breaking waves generally strike the coast line at a slight angle so producing a littoral drift from south to north. As well as an oscillatory flow up and down the coast due to tidal flow (reported to be southerly on flood tide and northerly on the ebb), there is an ocean current flow up or down the coast, the direction depending upon the season of the year and the depth at which measurements are made. Surface floats generally moved south between Kaipara and Manukau, but some charts show a northerly ocean current. However, the drift of sandy material along the coast is not dependent on these currents but upon wave action. The drift from south to north has been quite definitely established for the South Island and seems evident at the Manukau from the following considerations.

The shape of the bulge of sand at the Manukau Entrance, being pushed northward, indicates a movement of sand from south to north. It is suggested that generally the following movements take place :-

Wave action on the beach carried this sand northwards which meets the existing sand banks at the harbour entrance. Some sand is carried right past the main bar and onto the beaches northwards; some sand remains at the southern entrance to the south channel and is only removed when tidal action through this channel scours a deeper entrance; the greater portion of the sand is carried onto the southern banks, is washed across by wave action into the main and south channels. The sand is continually scoured by the tidal currents in the channels and dependent on tidal range, wind direction, or wave strength, is deposited along the sides of the channels, on the banks inside the harbour and on the outer bar itself. It is likely that the bulk of the sand is carried out over the bar and caught again in the littoral drift forces to be carried northwards.

WEST AND SOUTH WEST CHANNELS.

Records show that only one of these channels is open at one time and that there is a cyclic variation between them. Each channel seems to have remained open for a period of 30 to 40 years. An explanation for this behaviour is as follows :-

Assuming a condition where the water is flowing straight out of the harbour entrance in a south-westerly direction, the sand, drifting from the south, gradually encroaches on this entrance on the south side and thus causes the tidal water to cut its path more towards the west and so forces the channel to follow a curved path. This action continues over the years with the entrance bar continually moving northwards until the channel has a bend of 40° to 50° from the straight. The tidal flow then objects to this curved path, spills over the banks to the south west, and re-cuts its original channel in this direction after a period of 30 to 40 years. The process then repeats itself.

There does not appear to be any relation between the variation of this main channel and the condition of the south channel. The latter was open over the period 1863 to 1885 when the west channel was also showing 3 fathoms on the bar, but the south channel did not open in the 1930's when the west channel was again in use. It is only at the present date, when there are indications that the west channel is closing and the south west channel opening, that the south channel too may become useful.

MAJOR ALTERATIONS TO BANKS AND SHORE LINES.

1. The South banks up to 1905 were shown as drying at half tide over large areas. The latest soundings show a small area only drying at +4' (say $\frac{2}{3}$ rd tide).

2. The high water line on the northern shore has varied considerably over the years and is now up to $\frac{1}{2}$ mile seawards of its position in 1940.

3. The Huia bank has moved seawards over the past 10 years and restricted the width of the channel in this area.

MAINTENANCE OF THE SOUTH CHANNEL.

To attempt to maintain a stable entrance over the main bar by dredging or training banks would be a mammoth task and cannot be considered an economic possibility at the moment. However, it is likely that the south channel could be opened and maintained by dredging. There has always been a channel along this line presumably scoured both by tidal currents and by the wash of escaping water from waves coming across the southern banks. It is scarcely possible to estimate what quantities would be involved and shoaling could well be affected by storm conditions. It seems that this channel was in use in the years 1863 to 1885, and may again be opening up at the present time. This channel has the protection of the southern banks and is probably the only one worth considering in making improvements to the entrance depths.

FURTHER INVESTIGATIONS.

It is suggested that the following enquiries would add to our understanding of the behaviour at the entrance :-

1. Float tests at various depths in the main channel above and below Paritutai, and throughout the whole length of the south channel.
2. A re-sounding of the south channel.
3. Approach to Wallingford, for advice and the benefit of their experience with similar entrances.
4. Seek advice from Mr. Raudkivi, Hydraulics lecturer at Auckland University.
5. Seek advice from a geologist or oceanographer who is experienced with the coastal regimes of New Zealand.

REFERENCES.

- (1) New Zealand Pilot 1875, Page 190.
 - (2) New Zealand Nautical Almanac 1881, Page 62.
 - (3) New Zealand Gazette 1885 October 6th. Notice to
Mariners No. 39.
 - (4) New Zealand Gazette 1886 Notice to Mariners No. 46.
 - (5) " " " 1897 " " " No. 4.
 - (6) " " " 1901 " " " No. 71.
 - (7) " " " 1912 " " " No. 145.
-

APPENDIX "C"

NOTES ON WEATHER AND WAVE DATA.

Following along the lines that wave action on the Bar is not only a disturbing agent to the material that it consists of, but also a vehicle for transportation of the material, I have set out here notes on typical weather in the area.

A phenomena often observed, is the appearance of a heavy swell on the Bar seemingly unconnected with the weather prevailing in the area at the time. The general direction of advance of the waves is from the South West or West. This points to the sea area South of Tasmania which is being subjected to a gradient wind force as a result of cyclonic conditions.

In order to have waves or swell moving in from the West to South quadrant, the disturbing force would exist South of the 40th Parallel and the movement of the depression would be an Easterly one. Now this happens to be a frequent occurrence, especially during the summer months and two typical 2-3 day situations have been attached to show that this sequence of events takes place. About the only variations to these two pictures are that the depression may be initially further South and that it remains stationery instead of moving East at the average rate of 800 miles a day (say) or about 33 knots. The Meteorological Office say that the average time for these systems to cross the South Tasman is about 36 hours.

The gradient wind speed of the two depressions referred to can be estimated at an average of 40 knots. To arrive at wave dimensions on the Manukau Bar therefore, three considerations are allowed.

1. The generating force acts instantaneously on the area.
2. This force is a depression and not of tropical origin.
3. The swell produced is within the term "equivalent simple wave" or "significant waves".

From the assumptions that the generating area is 1,000 miles South West of the Manukau and that winds of 40 knots have created waves for a sufficiently long time to move out of the area at a constant mean dimension, the wave height would be $11\frac{1}{2}$ feet (max. 16 ft.) wave period 10 secs., wave speed 30 knots and wave length 500 ft.

However, the generating area is small in comparison to the whole area and after 48 hours the original waves would lose energy so that in Lat. 40° S they take the form of long crested waves moving at a group velocity which is half of the original wave speed. This would seem to have suggested that, at 40° S, the dimensions of the original waves have decreased. That this is not so is due to the continuing supply of energy from the rear quadrant of the depression whose gradient is still of the same order as the generating area. In other words, 40 knots and still in excess of wave speed so that energy potential exists.

On eventual arrival at the Manukau Entrance which during the time under discussion has been experiencing light Northerly winds, the swell will, since leaving Lat. 40° S have lost some of its original speed and height although, the period and length will be the same (or according to Defant-greater) before distortion due to shoaling.

APPENDIX "C" (Contd.)

From an aerial photo series on E.1070/1 wave lengths were measured, before breaking and found to be about 500 ft. although the date of the photographs was not the dates of the surface analysis. The height of the swell is not apparent of course.

According to Sverdrup and Munk, graphs of the value of height of swell and period have been plotted against distance and time. The theory of the decay of swell proportionate to distance from generating area is given in Defant P. 105 and Dietrich Page 381 - the graph in the latter. The main problem then is to select a point on the surface analysis which can be called the point from which the original wave characteristics become those of significant waves or swell i.e. long crested waves and enter the area of decay which is the distance to the Manukau.

I have selected 40° South and 165° East as being a likely place on the second day of the analysis and this is 500 miles from the beach area. I have tabled this change as under :-

Waves - Generated characteristics	Swell Dimensions dependant on origin.
Length 500 feet.	
Period 10 secs.	12 secs.
Height $11\frac{1}{2}$ feet (max. 16 feet)	4.9 metres or 16 feet (max. 22 feet).
Speed 30 knots	Time taken 30 hours approx. Total time 17 hours and 30 hours = 47 hours.

From the above it would appear that wave height could be greater and period and length similar. If the depression had been North of the example and nearer, storm waves or swell would have been greater, and further away or further South, the height of the swell would have been less but still considerable. Even if the above distances are doubled, swell waves of 11 feet could be expected 60 hours after leaving the generating area, under the same weather conditions.

APPENDIX "D"

MANUKAU ENTRANCE.

Questions concerning a future navigable approach to the harbour.

Preparatory points on existing conditions

1. There has always been a 3 fathom depth minimum navigable channel in known history.
 2. The size of ship using the harbour right up to Onehunga is consistent with minimum depths at low water and also conditions at other West Coast ports.
 3. Surveys are infrequent.
 4. Although 18' minimum depth at low water is not generally considered a shallow depth, the lift and fall of a ship in the ocean swell at the bar make this depth a safe minimum under heavy weather conditions.
- Q.A. Is the location of entrances related to a time cycle ?
- A.A. An unqualified answer to this question must be that within the 120 years of available information, none of the 3 approaches have completed a 'closed-open-closed' sequence which could clearly be covered by the term cyclic. However if the West and South West Channels are considered as one and the South Channel as the only other, then there is the appearance of a complete cycle in the first but not yet in the second. Considered as one channel the West and South West approach has moved between a 200° alignment in the most Southerly aspect and 297° when the Channel was Westerly and as far North of West as it apparently moves. The movement from the one alignment to the other seems to take about 30 years although a more precise figure is not possible because of overlapping in time when one extreme is still open while the other is considered to be closed. If this 30 year cycle can be relied upon then the 200° aspect is due to be cleared within the next few years. At the present date this alignment seems to be indented and only closed by a narrow bar of less than 3 fathoms. The South Channel has been open for a comparatively short length of time compared to the 60 years that it was thought non-navigable and cannot be considered as connected in navigability with any particular state of the other Channel.
- Q.B. Is the location of entrance(s) related to Littoral drift and storms ?
- A.B. In the absence of bottom samples it is not possible to say whether the few descriptions of bed material shown on the latest chart are typical of the area or not. A geologist may be able to identify bed material sample as having a source quite removed from the Bar area or it may be possible to identify samples obtained as being typical of the area between Hokianga and Waikato estuary. There is no evidence supporting any theory that the Bar is formed or material found in the Harbour itself or that this material, even if similar, is transported in any large quantity from one to the other. The only exception to transportation of bed material to inside the heads is the gradual movement w'ly of the 6 fathom line on the Western end of the Huia Bank. The movement appears to be about a mile between 1860 and 1960.

APPENDIX "D" (Contd.)

A.B. (contd.) -

With reference to Drg. E.1070/1 showing typical wave patterns and surface drift records, it can be supposed that the bed material forming the Bar is not brought from afar by any vehicle but is only re-distributed in the area by wave action and tidal discharge meeting. These remarks, therefore, can be interpreted as saying that there is no evidence of littoral drift other than that caused by storm waves.

Q.C. Is the location of entrance(s) controlled by bank erosion and accretion by tidal flow within the stable 2 mile portion of the main channel port Paratutai ?

A.C. The figures offered in Drg.1060/1 for sectional area and long section of $1\frac{3}{4}$ miles of the Main Channel West of Paratutai are indicative of the change in volume over the years (below the 3 fathom line). From these figures about 12 million tons of bed material have been removed between 1860 and 1960. Generally speaking, this Channel is both deeper and narrower than it was in 1860 and the above quantity assumes that it was an average 18 ft. shallower then, as the long section shows. If the earlier coverage of this channel was as thorough as the most recent survey, the sharp increase since 1954 of sectional area shown on 1060/1 indicates a return to the broader and shallower channel of 1860 and is not just an indication of the scale difference and taking off of areas that give a false indication of change by reason of poor comparison. While, even over a short period of two years the movement of 7,000,000 tons sand can be thought of as a common occurrence, the 12,000,000 tons scooped out of the Main Channel over $1\frac{3}{4}$ miles has probably been deposited either on the Western Bar or the Huia Bank. Even between 1954 and 1960 a similar quantitative order has been removed as 1060/1 shows. The final answer to question C is therefore - yes, the quantity of apparent accretion and removal in the Main Channel is sufficient to contribute directly to the closure of either West or South approach.

Q.D. Can we accept that in 100 years or more no approach channel has less than 3 fathoms at any time ?

A.D. The only consistent natural factor that has emerged is the depth of 3 fathoms minimum at the entrance considered to be in use at any one time. Frequent references are made in Sailing Directions to this figure although from time to time Notices to Mariners have issued warnings of less than 3, say $2\frac{1}{2}$ fathoms, over short periods usually following a sequence of storms. This did not appear to have put the approach of the day out of use as the area cleared itself back to 3 fathoms minimum shortly afterwards. This happens so frequently along with overall changes in the actual approach courses to dodge shoal patches, that it cannot be connected with the larger movements of bed material. However, 3 fathoms can be accepted to be the minimum depth existing at any one time over a reasonable period of time.

Q.E. Can the West and South West Channels, in view of their locality and exposed position, be said to be uneconomical to try and maintain a minimum 3 fathoms and, if left to nature, would this affect any attempts to improve the South Channel artificially ?

APPENDIX "D" (Contd.)

A.E. The first half of this question is best answered by referring to A.A. in which the movements of the West-South West approach were outlined. From this it can be gathered that natural changes are at a maximum and that the same area is subject to the frequent local shoaling of an overnight nature. The apparent advantages in the South Channel of natural protection would surely make the whole proposition of a dredged channel more feasible provided that the channel was naturally in the "open to navigation" condition, although this may be a relatively short period, like 20 years. Assuming that a channel is dredged here to a minimum of 3 fathoms and of reasonable width, the question of maintaining the width and depth falls into two categories :-

- (1) Would the non-improvement of the Westerly approach affect the degree of maintenance in the South Channel.
- (2) Would shipping use the Western approach by preference even if a South Channel was made.

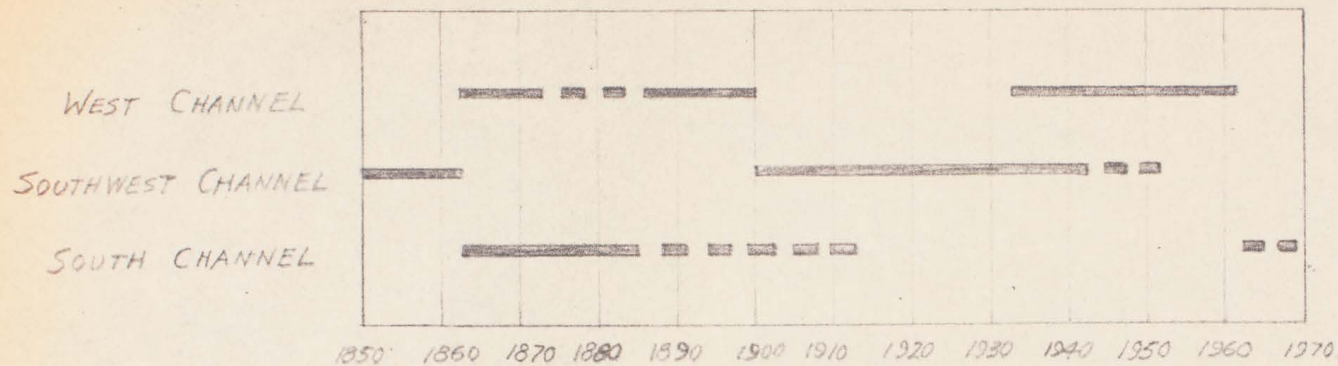
Question (2) is easily answered. Shipping must prefer the protected shorter approach, although there are navigational disadvantages. It is suspected that shoaling of the South Channel from open to closed condition takes place first at the Southern end and subsequently at the Northern end. There would also be some spillage of material over the relatively higher Middle and Emma Banks since this is purported to be in the direction of the general flow. So that Question (1) can perhaps only be answered in a negative manner. It is unlikely that there will be any assistance in maintenance from the natural formations of the Western Bar except possibly when it is closed in the North West and open in the South West.



Q.F. The South Channel always exists in some form.

A.F. The minimum navigable area in this Channel occurred in the 1920 period (E.1060/1) and the least depth was 3 ft. at the Southern end closing off 1 mile of entrant. In 1954 the situation had improved to a greater area with least depth of 10 feet located at each end. The least depth in 1963 is 16 ft. in several places but in a rather narrower channel than previously.

Q.G. Would a channel dredged to 18' off South Head benefit by having the Northern end lead more parallel to the flow of the tide at the entrance ?

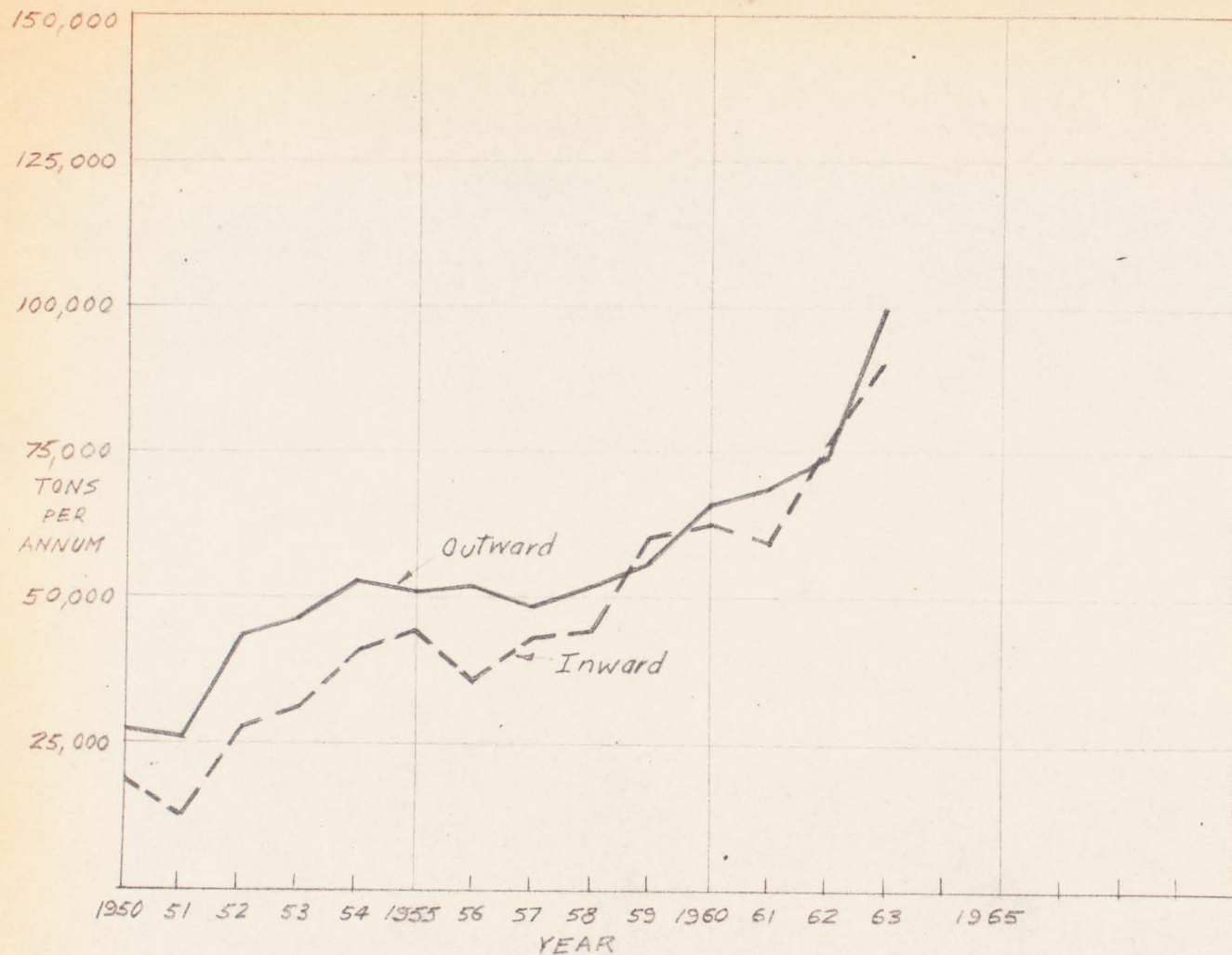
A.G. The South Channel in any state lies in a direction of between 40° and 90° of either the Main Channel or the other approaches at different times. The present tidal flow information is not only sparse but in the only near-relevant position, contentious in direction with some short observations made by A.H.B. staff. It is generally believed that the direction of flow in area bounded by South Head Signal Station - Destruction Gully Beacons - Paratutai Light and Emma Bank Tip, that the direction of flow changes through 20° or more from the East-West to NE-SW. It is still reasonable, at this stage, however, to assume that the dredge the tip of the bank on the N.W. side of S. Head would allow more of the ebb tide to discharge through the South Channel than it does at present. It is my opinion that if a channel 1000' x 18'



Periods during which Channels have been in use thus 
 Periods when Channels have been limited in use due to shoaling 

Dates have been obtained from old charts and
 Advice to Mariners and are not to be considered
 completely reliable.

AUCKLAND HARBOUR BOARD	
MANUKAU HARBOUR ENTRANCE	
PERIODS OF OPEN CHANNELS	
DRAWN <i>R.M.</i>	51612/1
DATE 25-2-63	



Percentage increase in total cargo handled:

1961 to 1962 17%

1962 to 1963 25%

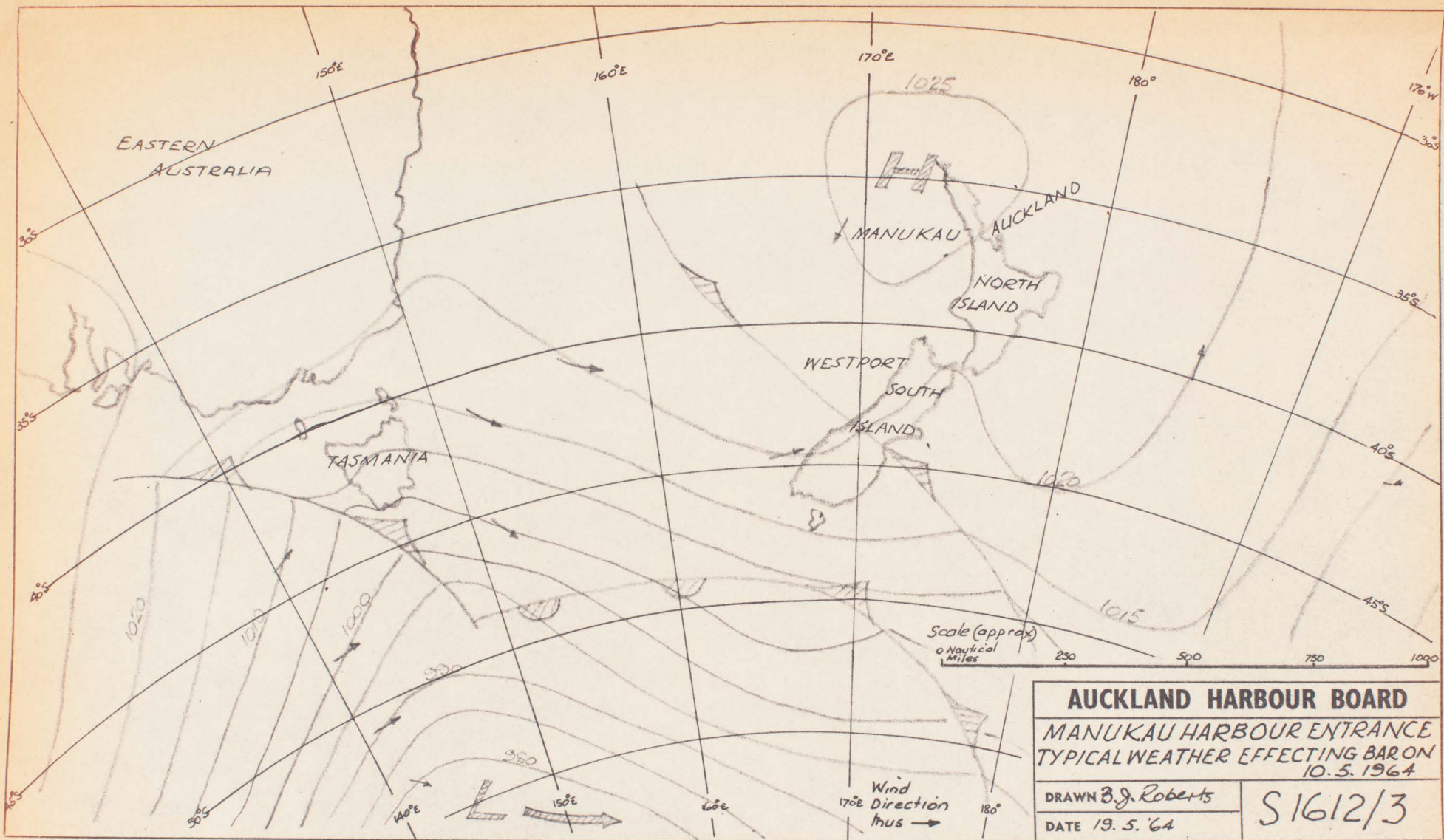
AUCKLAND HARBOUR BOARD

ONEHUNGA WHARF
TONNAGE OF GOODS HANDLED

DRAWN *BPM*

DATE 17-4-64

S1612/2





MINISTRY OF WORKS
HEAD OFFICE WELLINGTON

TELEPHONE 46084

P.O. BOX 8024

Housing Construction Division 47075

8 May 1964

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
Quay St,
AUCKLAND.

Dear Mr Goodsir,

The following information on weather and sea conditions around the entrance to Westport will amplify the information already given to you:-

1. Wave Period:

This was recorded 9 a.m. and 3 p.m. by signalman at the signal station near the outer end of the west breakwater. The analysis for one year 25/4/51 to 24/4/52 shows:-

<u>Period Secs.</u>	<u>Length</u>	<u>No. of observations</u>
5	85-105	2 .6
6	100-130	14 4.5
7	120-160	36 11.0
8	140-190	48 14.5
9	160-210	37 11.0
10	175-245	60 18.0
11	195-270	38 11.5
12	210-295	37 11.0
13	230-320	28 8.5
14	250-350	14 4.75
15	265-370	12 3.5
16		3 1
17		1 .3
18		Nil
19		Nil
20		1 .3
Total		311 331

Periods of 7 - 12 secs. were most frequent, the maximum being 60 observations of 10 sec. period representing nearly 20% of the total observations. It is probable that lower amplitude but longer period waves often occurred but were obscured by the shorter high amplitude seas. The one record of a 20 sec. period was made on a day of almost complete calm and had a wave height of only 1-2 feet with normal river flow.

Distribution was fairly even throughout the year with the greatest concentration of long period waves in September-October and of shorter period waves in April-May.

2. Wave Height:

This was recorded by the signalman as the lift of the sea

*Mr Beegan
Please forward to him
his best effort in acknowledgment.*

against the outer face of the west breakwater, and was checked frequently against the similarly estimated height from the tug when on the daily sounding run.

Analysis for one year 25/4/51 to 24/4/52 shows:-

(1) Wave Height (ft)	(2) No. of Observations	(3) Observations corrected for River Flow Conditions
Calm	0	0%
1	22	6.5
2	110	32.3
3	84	24.7
4	64	18.7
5	46	13.5
6	11	3.2
7	3	0.9
8	1	0.3
	<u>341</u>	Total observations

Heights of two feet represented the greatest proportion; approximately 30% followed by heights of 3 ft and 4 ft.

Very high seas are quite rare confirming the statement frequently made that the bar depths rather than seas on the bar limit shipping movements.

3. Set Across the Entrance:

This was recorded by the signalman in accordance with past custom at the port. Vessels entering or leaving have to make allowance for a strong current running across the entrance usually from the west to east (easterly set) or less frequently from the contrary direction (westerly set). Immediately an entering vessel passes between the moles the bow section is no longer exposed to this cross current while the stern is still affected and the vessel tends to pivot rapidly requiring special care in steering to enter with sufficient angle across the channel to counteract the tendency to swing and at a speed sufficient for rapid response to the helm. Similar conditions hold on departure, but the effect is greater on the vessel in light trim, and on occasions vessels cannot enter to load due to set.

The set across the entrance is caused by the piling up of the sea against one breakwater or the other due to the effect of local winds. Strong sets to the east generally coincide with south-west to west winds and the stronger the wind the stronger the set. Sets to the west were generally weaker and most of them accompanied winds from the south-west and west.

... Enclosed is our library copy of Braun and Gerritson
... which you can return to me in due course. Also enclosed is
... a grading curve for the sand of the Westport harbour bar and
a chart showing the wind directions at the entrance.

If there is any more information you would like to have please let me know.

Yours faithfully,

J.T. Gilkison
Commissioner of Works

per: *J. Gilkison*

Encl:

SIEVE ANALYSIS

JOB :-

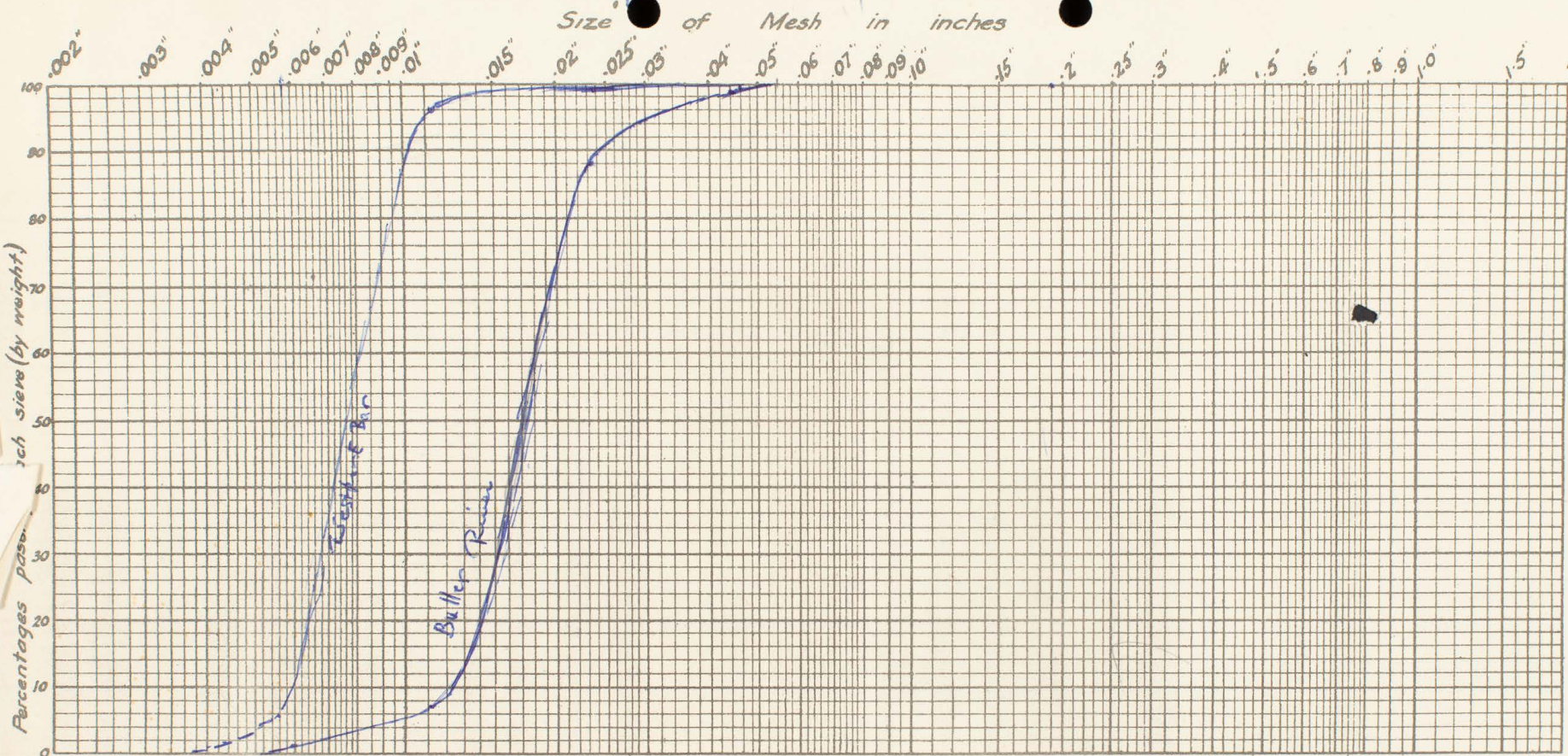
Source of Material :-

Description of Material :-

Test No :-

Date of Delivery :-

Test Date :-



B.S.S.	300	240	200	170	150	125	100	85	72	60	52	44	36	30	25	22	18	16	14	12	10	8	7	6	5	4	3	2
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Tyler	200	150	100	65	48	35	28	20	14	10	8	6	4	3	2	1	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512	1/1024	1/2048	1/4096
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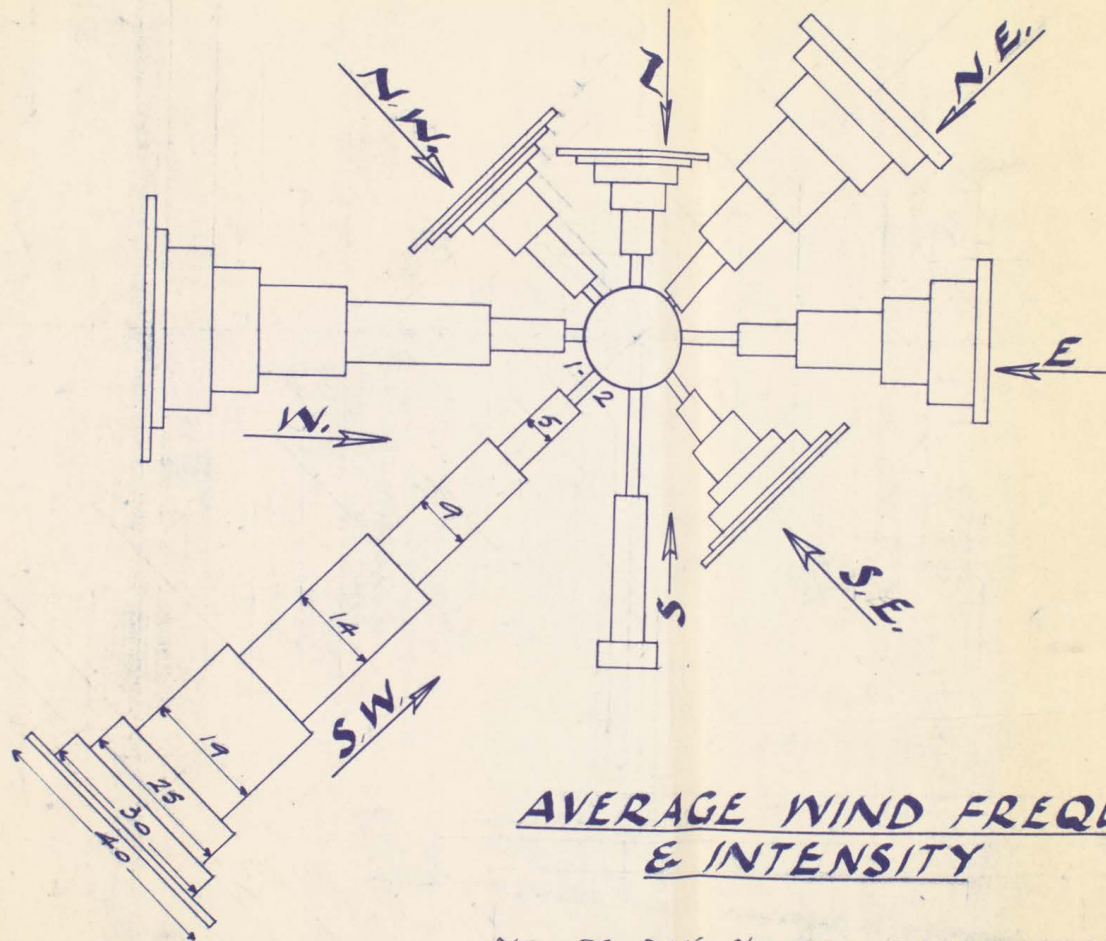
A.S.T.M.	200	150	100	65	48	35	28	20	14	10	8	6	4	3	2	1	1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512	1/1024	1/2048	1/4096
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B.S.S. = British Standard No 410, 1931.
 Tyler = Standard of Tyler Co U.S.A.
 A.S.T.M. = Standard of A.S.T.M. & U.S. Bureau of Standards.

RELATIONSHIP OF ROUND & SQUARE	Square Openings	Round Openings
	1/8"	3/16"
	3/16"	1/4"
	1/4"	3/8"
	3/8"	1/2"
	1/2"	3/4"
	3/4"	1"
	1"	1 1/2"
	1 1/2"	2"

NOTE :- The above is based on size of openings only, & not on percentage screening area, which affects time element alone.

NOTE: THE DIAGRAM BELOW IS BASED ON OBSERVATIONS MADE REGULARLY AT 9 A.M. & COVERS THE PERIOD 1911 TO 1934. WINDS ARE GENERALLY IN N.E. DURING FORENOON SWINGING ROUND TO S.W. FOR REMAINDER OF 24 HRS. & THE DIAGRAM GREATLY EXAGGERATES N.E. W. WEATHER THEREFORE.



AVERAGE WIND FREQUENCY & INTENSITY

NO. OF DAYS PLOTTED DIRECTIONALLY - 1" REPS. 20 DAYS.

WIND SPEED (M.P.H.) PLOTTED NORMAL TO
WIND DIRECTION - 1" REPS. 20 M.P.H.

WIND SPEEDS PLOTTED CORRESPOND TO BEAUFORT SCALE
FIGURES 1 TO 8 INCLUSIVE.



P.W.97/3/3

MINISTRY OF WORKS
HEAD OFFICE WELLINGTON

TELEPHONE 46084

P.O. BOX 8024

Housing Construction Division 47075

24 April 1964

Mr J. Goodsir,
Chief Engineer,
Auckland Harbour Board,
C.P.O. Box 1259,
AUCKLAND.

Dear Sir,

In discussions with you last week I undertook to send forward some information on the conditions at the Westport Harbour entrance for study in connection with the queries raised about the future development of the Manukau Harbour entrance. ... I am now enclosing the following:-

1. A copy of reports of Sir John Coode of 1881. This is interesting in that it gives the original depths at the mouths of Greymouth, Westport, Waitara, Patea and other harbours which can be compared with the depths at these harbour entrances today.
2. A Report on Greymouth and Westport Harbours prepared by Rendel, Palmer and Tritton of December 1946 which discusses the sand drift problems.

There is also a Paper by F.W. Furkert published by the New Zealand Royal Society in that year which is interesting in his discussion of the amount of drift material passing up the coast.

3. A report on Methods of Improving Westport Harbour of 15 May 1953 by the Engineer-in-Chief, Ministry of Works, to the Minister for Marine.

In discussions with you I misquoted from memory the volume of material found to move over a square mile off the Westport Harbour entrance and the correct figure of at least 5 million yards p.a. is given on page 8.

4. A graph of the changes in average bar depths at Westport from 1883 - 1960. You will see that the average depth at H.W. prior to construction of the training works was 10 - 12 ft and that the immediate effect on the moles was to give an improvement to at least 21 ft average H.W. depth, and this was steadily improved by construction of river training walls within the harbour and by breakwater extensions which concluded in 1917. The following year the maximum average depth during the lifetime of the port was reached at 26½ ft. The effect of the last mole extension declined as sand built up behind the western breakwater until a general average was established about 1930 very largely at the level obtained from the first construction of the moles over 1887 - 1889. There has been some evidence over the last decade of a greater instability in average bar depths which may be due to an overall build up of the roadstead area. This, however, has not been detected when present contours are compared with early surveys and it may be due to the use of echo sounding equipment from 1950 onwards which has permitted survey of the entrance on practically every day of the year.

The volume of bar dredging beyond 1952 has not been inserted in the chart but has generally lain between 200,000 - 300,000 yards p.a.

5. A preliminary note and first stage report on the Tauranga Harbour investigations of January and October 1963 prepared by the Hydraulics Research Station for the Tauranga Harbour Board. On pages 16 - 18 of the first report there is an interesting approach to the calculation of the volume of drift material which offers an approximate method of calculating the volume of material which may move at the Manukau entrance.
6. Charts showing the changes in the entrance to Otago Harbour with the construction of the original training mole and changes which have subsequently occurred, together with a brief description of entrance conditions.
7. I am obtaining a record of the height and direction of waves at Westport as promised. Westport, however, has some special features in that the shelter of The Steeples reef off Cape Foulwind and the shallow depths from that point across the Westport Harbour entrance result in seas approaching the entrance from an almost constant direction. Sea heights for the same reason are also considerably reduced in the roadstead area, although they are, again, increased by the effect of the river current in opposition to the waves.

Mention was made of a publication by Braun & Gerretsen on the stability of sandy inlets. A copy of this is being obtained from our Hydraulics Laboratory and I will send this on to you as soon as available.

The report of 1953 on Westport Harbour you may keep if you wish. I would like to have the other papers back in due course as they form part of my records. You are welcome, however, to take copies of any that you wish.

Yours faithfully,

J.T. Gilkison
Commissioner of Works

per: *Robinson*

Encl:

EXTRACT FROM MINUTES
GENERAL PURPOSES COMMITTEE

.....1967-1960

5. SURVEY OF MANUKAU HARBOUR AND BAR

Consideration was given to the report of the Manukau Harbour Advisory Sub-Committee dated 15th August 1960 advising that the Sub-Committee had considered the report of the General Manager dated 11th August 1960 advising of a letter received from the Navy Office, which requested the Board's confirmation of acceptance of the following arrangements -

- (a) Navy Department to carry out a complete survey of the Manukau Harbour and Bar, commencing October 1960.
- (b) The Auckland Harbour Board to carry out frequent check soundings of shipping channels in order to provide the necessary navigational aids.
- (c) Navy Department to carry out re-surveys of the Manukau Bar every three to five years from 1960.

The General Manager advised that a suitably equipped vessel for the check work was available at a hire fee of \$50. per day. The Board's responsibility to keep the soundings up to date would be undertaken by the Hydrographic Section and would involve the hiring of the vessel one day every two months at the most. The proposals were satisfactory to the Harbourmaster and the Chief Engineer.

Recommended -

- (a) That the Board approve the arrangements as set out in the letter from the Navy Office dated 29th July 1960.
- (b) That authority be given to the hiring of a suitable vessel as and when required for check sounding.

FINANCIAL PROVISION
23 AUG 1960

ADOPTED BY BOARD

.....
23 AUG 1960

Requiring logs.

It will be necessary for you to furnish assistance for the conduct of periodic check surveys of the bar when heavy survey has been done. It will not be our responsibility to say when such surveys are to be done or to arrange for the craft to be available but this Dept. will accept upon request. J.

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To FOREMAN OF WORKS:

Date 12th December 1960

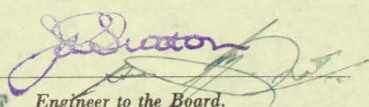
Subject MANUKAU SURVEY,
LAUNCH "ARAHU".

Please arrange to have the Launch "Arahi" brought overland to the Waitemata Harbour on the 19th December.

George Dale arranged her cartage to the Manukau but the Crane used from the Auckland Crane Company was not of sufficient capacity to handle the "Arahi" with safety.

Will you arrange for a 10-Ton Crane to lift the "Arahi" and for Dales to do the cartage.

Mr. Hutchinson will provide any technical assistance required.


CHIEF Engineer to the Board.

returned to Engineer's Office immediately on completion of Work)

This work was completed on _____ at a cost of:—

- - : :
- - : :
Total £ : :

271 A

Signature _____

Date _____ 19



PLEASE QUOTE M6/2/28

M. 2523

Your ref: 1103.

MARINE DEPARTMENT,
T. & G. BUILDINGS, GREY ST., WELLINGTON C.1., N.Z.

TELEGRAMS AND CABLES: "SECYMARINE"

TELEPHONE ~~XXXX~~ Extn 29
71-759

26 February 1964

The Acting Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Sir,

Manukau Harbour Entrance-Surveys of Bar

Thank you for your letter of 13 February and for the drawing showing the movement of sand banks at Manukau Harbour entrance.

I have carried out an extensive search of old records available to me only to find that files that could have thrown light on the subject matter you raise, were destroyed in a major fire that occurred on 1957 here in Wellington.

However, for what it may be worth I have gleaned the following out of early editions of the publication "New Zealand Pilot", produced for the Admiralty in 1864, 1883 and 1908. Even here I do not have every edition which was and still is customary to be revised every 10 years or so.

1864:

The Bar and Entrance were surveyed in December 1863 by Captain Sidney R.N. It stated that "Buoys were in existence". This was the first survey to be undertaken after Captain Drury's survey of 1853. Early chart numbers mentioned were numbers 1117 and 2726.

1883:

Buoys frequently adrift. The buoys off South Head have been removed. In February 1878 (the 1883 Pilot states) two channels, main and south in use. The former is the only one a large vessel could enter by but the South Channel (formerly known as Fanny Channel) is the only one used. Least water in South Channel $2\frac{1}{2}$ fathoms and channel shifts after strong S.W. gales.

1908:

This edition stated "In 1905 the Bar was 1 mile wide with a depth on it of $4\frac{1}{4}$ fathoms which depth had been maintained for 5 years.

In 1906, the depth $4\frac{3}{4}$ fathoms, and appeared to be deepening.

M. Seagar

M. Roberts

.../2

South Channel entrance lies southeastward of Heron Spit, the southern extreme of Middle Bank. In 1897 this spit was reported to be extending eastward. Depth not more than 2 fathoms at L.W.S.

Off South Head, a spit changes considerably and extends towards Paratutai. It sometimes disappears altogether, then reforms and may extend off shore for a distance of $\frac{1}{4}$ mile.

Finally, some old copies of chart 2726 I have (1920 print) indicate that the chart was ^{first} published in 1860 and revisions took place in 1872, 1879, 1886, 1890, 1894, 1897, 1900, 1906 and 1920, which to me, indicate that changes were taking place necessitating revision at intervals more frequent than the usual practice.

Yours faithfully,

S. O'Halloran

for G. L. O'Halloran
Secretary for Marine

117
4103

13th February, 1964.

The Secretary,
Marine Department,
P.O. Box 2395,
WELLINGTON.

Dear Sir,

REF: MANUKAU HARBOUR ENTRANCE
DRAWING NO. A680/1 SURVEYS OF BAR 1864-1961.

In connection with a general investigation into the movements of the sand banks of the Manukau Bar throughout the years, we have enclosed a copy of the above drawing. From the information given by old charts available in Auckland and copies of the most recent surveys, it is possible that some indication of the navigability of the Manukau Entrance in the future may be derived.

With particular reference to sketch 3 on the drawing dated 1863, it would appear that the South Channel was not only open to drafts of 21' but was buoyed. Of all the chart and survey dates mentioned, this appears to have been the best situation. In view of the recent (1961-1963) surveys and examinations by the Royal New Zealand Navy, there seems to be grounds for expecting the South Channel to revert to the condition

However, the period 1863-1913 was prior to the Harbour Board's control of the harbour under the Manukau Harbour Control Act of 1911 and the next complete survey by Captains Sargeant and Gibbons in 1919 shows no access through the South Channel. We have been unable to determine how long the buoys remained in place or how long the South Channel remained in the 1863 condition. You would therefore be pleased to know of the first reports in your own records may show of changes in this channel or the removal of the buoys for any particular reason.

Yours faithfully,

ACTING CHIEF ENGINEER TO THE BOARD.

A680/1.

19th December, 1963

MR. B.J. ROBERTS.THE CHIEF ASSISTANT ENGINEERRE - TIDAL FLOW DATA PARATUTAI.

On Wednesday 18th December a short series of drogue current tests were made in the area between S. Head Signal Station and Paratutai Light. The drogue, which is a canvas covered frame about 3 ft. cube, was lowered to the following depths and allowed to run in the flow while being supported by a small float.

High water Westport was 1203 and the range of tide at Paratutai was predicted to be about 9.0' (Springs 10.5'). The results were as under.

1117 - 1142	Flow	0.6	Knots	Direction	035 ⁰	Drogue at	32'	Depth	
1202 - 1215½	"	0.9	"	"	233 ⁰	"	45'	"	
1221 - 1229	"	2.1	"	"	295 ⁰	"	20'	"	

All tests started on the new Destruction Gulley Beacons in Transit about 1 mile away from the Lower Beacon. This area is about ½ mile due East of A on the survey of the Manuka Bar 1960.

It was also noted that Minepin Rock came clear of Paratutai Island South Face at a distance of 1½ cables (900 ft.) rounding Paponga.

A.H.B.
Engineer's Dept.
1.3.61.

Mr. P.S. Hutchinson,

Following the two days with H.M.N.Z.S. "Tarapunga" on the Manukau Bar survey, herewith I have reported the conditions on those two days.

1. Weather on both days was anticyclonic with light NE - SE winds.
2. Swell and breakers over dry patches were always present.
3. Visibility until at least 1300 on both days/^{was}poor with a cloud base of 700ft obscuring trig beacons on high ground. The visibility increased to a reasonable degree after this time. Visibility at sea level was poor from seaward at most times due to spray and the absence of a wind to dispel it off the foreshore. This would have precluded the use of beacon-flags for survey during a lot of the two days when working 3-4 miles off-shore.
4. The best sighting of both trig points and flags at beach level would be during the afternoon the sun then having sufficient Northing and Westing to cast light on them instead of behind them.

RECOMMENDATIONS

For future A.H.B. survey of the Manukau Bar bearing in mind that the above conditions are those of fine weather and that worse weather could mean lessened visibility due to rain and more difficult swell and sea conditions, I put forward for consideration the following:-

1. That fixing of a craft having the means to sound the bar channel be done from the land seaward by using two theodolites and radio telephone communication.
2. That the possibility of cooperation between the A.H.B. and the owners of regular trading ships having an echo sounder be investigated. This with a view to asking the master of the ship concerned to fix soundings on his machine when called for from the observing party while using the bar and delivering the trace to the office for reductions of the soundings.

B.J. ROBERTS
1.3.61.

BJR:CRD
19.7.63

MANUKAU HARBOUR :

A.H.B Endowment Boundary (as defined by Manukau Harbour Control Act 1911 & Harbours Act 1908) is High Water Ordinary Spring Tide. Between 16 Aug. 1926 & 20 Aug. 1927 (370 days) there were 25 sets of Spring Tides. The average of the highest tide of each set of Spring tides at ONEHUNGA was 15.56 A.D.S., which is now the accepted level of ordinary Spring Tide H.W. in Manukau.

See letter file 1117: report by Engineer, 23 Aug 1927.

Note by Angus. 27.11.40: "Nautical Almanac states that height of H.W. at Manukau Heads is 1.3' lower than at Onehunga. (L.W. 0.1' lower). Thus, acceptance of Onehunga figure for whole of Manukau is questionable."

From Auto. Tide Gauge Records at ONEHUNGA. 1926-1939.

Mean High Water	13.96	
Mean Low Water	4.16	
Mean Sea Level	9.06	
Highest Recorded Tide	17.50	13.8.39
Lowest Recorded Tide	0.43	23.9.26.

27.11.40:

6th October, 1941.

Mr. McFarlane,
Engineer's Dept.,
Franklin County Council,
PUKEKOHE.

Dear Sir,

TIDES ON MANUKAU HARBOUR.

The following are details of the level of High Water of certain tides on the Manukau Harbour as asked for by you:-

Date	22/9/41	23/9/41	24/9/41	25/9/41	26/9/41
Time of H.W. - (Standard Time)	10.55	11.25	12.25	13.15	14.05
Level of H.W. - (feet above A.D.S.)	15.33	15.62	15.58	15.21	14.87
Level of H.W. - compared with H.W.O.S.T. - (15.56 A.D.S.)	0.23 below	1.06 above	0.02 above	0.35 below	0.69 below

Yours faithfully,

SUPERINTENDENT & ENGINEER.

DH, OM

COMPARISON OF TIDE LEVELS

AUCKLAND

MANUKAU

<u>BENCH MARK</u>	19.92	
		<u>17.75 HIGHEST RECORDED TIDE (ONGA)</u>
<u>HIGHEST RECORDED TIDE</u>	16.60	
		<u>15.56 HIGH WATER ORDINARY SPRING TIDE</u>
<u>MEAN HIGH WATER SPRINGS (AD. CHART)</u>	13.60	
<u>MEAN HIGH WATER (RECORDED)</u>	13.21	<u>13.96 MEAN HIGH WATER (RECORDED) ONGA</u>
<u>MEAN SEA LEVEL (RECORDED)</u>	9.25	
<u>MEAN TIDE LEVEL (AD. CHART)</u>	9.23	<u>9.06 MEAN SEA LEVEL (RECORDED) ONGA</u>
<u>MEAN LOW WATER (RECORDED)</u>	5.29	
<u>MEAN LOW WATER SPRINGS (AD. CHART)</u>	4.50	
		<u>4.16 MEAN LOW WATER (RECORDED) ONGA</u>
<u>DATUM OF SOUNDINGS (AD. CHART)</u>	3.50	
<u>LOWEST RECORDED LOW WATER</u>	2.56	<u>2.34 LOW WATER ORDINARY SPRING TIDES ONGA</u>
		<u>0.43 LOWEST RECORDED LOW WATER ONGA</u>
<u>DATUM AUCKLAND DOCK SILL</u>	0.00	

NOTE -
 (LW.05T IS THE
 DATUM OF SOUNDINGS
 ON AD. CHART OF
 MANUKAU HARBOUR

Auckland Harbour Board

MEMORANDUM

FROM

Drawing Office

To

Sept 26th 1934
THE ENGINEER.

Manukau Harbour.

High Water Ordinary Spring Tides as determined from the average of the Highest Tide of each of 25 sets of Spring Tides occurring in 370 days between Jan 1st to Jan 5th of following year

1936 = 15.40

1937 = 15.36

1938 = 15.42

1939 = 15.84

Total 62.65

AVERAGE H.W.O.S.T = 15.66 A.D.S.

W. V. C.

CHECKED BY W. V. C.

Auckland Harbour Board

MEMORANDUM

FROM

Drawings Office

To

Sept 23rd 1924

THE ENGINEER

Karaka-8367

Manukau Harbour

L.W.O.S.T. = 2.335 A.D.S.

Low Water Ordinary Spring Tides as determined from the average of the lowest tide of each of 25 Sets of Spring Tides occurring in 370 days between August 16th 1926 and August 20th 1924

This is the same period as was used in November 24th 1940 for determining the figure of H.W.O.S.T.

For the same period MEAN HIGH WATER WAS 14.085 A.D.S.

" " " " " LOW " " 4.154 A.D.S.

W.M.S.
G. Brown

Auckland Harbour Board.

MEMORANDUM

From

28. November 1940.

Eric J. Angus.

To

Drawing Office.

THE ENGINEER

TIDE LEVELS - MANUKAU HARBOUR :

The level of high water of Ordinary Spring Tides at Onehunga was investigated in August 1927 and figure of 15.56 A.D.S. was accepted. See letter file 1117: Report by Guiguen 23 Aug. 1927.

This level is the average of the highest Spring tide of each Set of Spring tides (occurring at approx. 14 day intervals), 25 in number, recorded between 16 Aug. 1926 and 20 Aug. 1927. (370 days).

I have taken out a figure for the Mean height of all Spring tides recorded in year 1939, the term 'Spring tide' being applied to all tides coming above the average H.W. for the year, being in 1939 14.27 A.D.S. In other words,

I have divided all tides into two categories — 'Springs' and 'neaps': Spring H.W. being all tides above the average H.W. level, and neap H.W. being all tides below the average H.W. Results are as follows:—

'SPRING' TIDES:	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
No. of tides.	27	25	30	32	33	29	39	28	26	31	26	30	356
Aggregate Height.	408.15	381.75	452.76	482.13	490.85	437.79	600.29	434.15	394.79	469.42	384.22	451.64	5388.24
Mean height of H.W.	15.12	15.27	15.09	15.07	14.87	15.10	15.39	15.52	15.18	15.14	14.78	15.05	15.135

This gives height of H.W. of Mean Spring Tide as 15.135 A.D.S.

The average of the highest Spring tide of each Set of Spring tides (14 day intervals) for 25 such tides in 1939 is 15.87' A.D.S., about 9" above the mean Spring Tide.

Note: The average H.W. for 1939 was 14.27 A.D.S. compared with average H.W. 1925 to 1939 of 13.96 A.D.S., i.e. 0.31' higher.

Also, the 1939 average Ordinary Spring Tide H.W. level of 15.87' is higher than the accepted value for 1926-27 figures (15.56) by 0.31'.

Hence: a fair value for High Water of MEAN Spring Tide would be 15.00 A.D.S.

AT ONEHUNGA.

Tide levels will vary in other parts of the harbour:

N.Z. Nautical Almanac gives height of H.W. at Manukau Heads as 1.3-feet lower than at Onehunga. (this figure is approx. & will vary between Springs & neaps.)

The Board considers that the tide levels at Onehunga are not as such part of the whole of the Tides of the shore as are concerned and uncorrected by the flow and ebb of the tide at ordinary Spring tides. This would justify 15.56.

11/11/40

— AUCKLAND — HARBOUR — BOARD —

— Comparison of Levelling Data —

HARBOUR BOARD	GOVT RLY DEPT	A. E. TRAMWAYS	CITY COUNCIL
22.17		7.19 Thames Hotel Step	8.67
21.38	12.16 Door-Step old Luggage Room		7.88
20.00 Cope of Auckland Dock			6.50
19.85 " " Calliope Dock			
16.60 16.7 Highest ST	26.3.26 42.04		2.67
15.00 H.W. S.T.			1.50
14.98		0.00 Datum	1.48
13.50. O.H.W. S.T.			0.00 Datum
13.21 Mean High Water	Nov 1903 - Nov 1914	Dec. 1939.	- 0.40
13.00			
11.80			
11.04 Lowest H.W. Neaps	12.09 ?		- 2.46
9.22 Mean Sea Level	0.00 Datum		- 4.28
8.85 Mean Sea Level 1907 & 1908	from Surveyor General		
8.00 Highest L.W. Neaps	21.4 11 ?		- 5.50
5.31		Dec. 1939.	
5.30 Mean Low Water	Nov 1903 - Nov 1914		- 8.20
3.00 L.W. S.T.			- 10.50
2.75 2.56 Lowest LWST	23.5.05 7.6.25		- 10.75
0.00 Auckland Dock Sill			- 13.50

Mean H.W.N.T. Onehunga
Lowest H.V.N.T. Onehunga

MANUKAU HARBOUR :

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See letter file 1117: report by Engineer, 23 Aug 1927.

Note by Angus, 27.11.40: "Nautical Almanac states that height of H.W. at Manukau Heads is 1.3' lower than at Onehunga. (L.W. 0.1' lower). Thus, acceptance of Onehunga figure for whole of Manukau is questionable."

From Auto. Tide Gauge Records at ONEHUNGA. 1926-1939.

Mean High Water	13.96	
Mean Low Water	4.16	
Mean Sea Level	9.06	
Highest Recorded Tide	17.50	13.8.39
Lowest Recorded Tide	0.43	23.9.26.
		27.11.40.

-19.50 Calliope Dock Sill

EXTRACT FROM BOARD'S RESOLUTIONS OF TUESDAY, 18th. FEBRUARY, 1936.

3. TITLES TO THE FORESHORE - MANUKAU HARBOUR.

Letter from Mahony, Dignan & Foster, 10.12.1935, asking the Board to reconsider its attitude in regard to titles to the foreshore at Manukau Harbour; together with report of Engineer, 23.8.1927, in connection with the same matter.

That the previous decision that no action be taken be adhered to.

1117

August 23rd.

27

The Superintendent.

MANUKAU HARBOUR BOUNDARIES.

The "Crown Grant Act of 1908" defines the boundary of foreshore lands as "High Water Mark at Ordinary Tides".

For purposes of interpretation the "New Zealand Survey Regulations" defines "High Water ordinary tides" as the line of mean high water mark taken over 370 days[#].

The Manukau Harbour Control Act 1911, (with certain minor exceptions) vests in the Board the whole of the tidal lands as defined by the "Harbours Act 1908".

"Tidal Water" is defined in the "Harbours Act 1908" as "lying within the ebb and flow of the tide at ordinary spring tides".

The level of high water at ordinary tides, at Onehunga as referred to in the Crown Grant Act 1908 and determined from continuous tide readings at Onehunga Wharf from 16th. August, 1926 to 20th. August, 1927 inclusive is 14.09 above A.D.S. The level of High Water ordinary spring tide at Onehunga as referred to in the Harbours Act 1908 and determined by taking the mean of the highest of each series of spring tides over the same period is 15.56 above A.D.S.

It will therefore be seen that owners of Crown Grants abutting on the Manukau hold titles to land which at a later date has been vested in the Board. From time to time owners of Crown Grants apply to have their properties brought under the Land Transfer Act which involves a re-survey of their properties and a detailed definition of their foreshore boundary.

If this latter boundary is determined with regard to the Manukau Harbour Control Act, then the property-holder is deprived of an area granted to him under his Crown Grant and where the land is gradually shelving, this may amount to a considerable area.

If on the other hand the boundary is defined in accordance with the definition contained in the Crown Grant then the Harbour Board is deprived of a portion of its area granted under the Manukau Harbour Control Act.

*H.W.O.S.T. 15.56 A.D.S.
This figure to be used in determining B.C. boundary with abutting properties.*

See also "Tidal lands" definition Act 1923 Clause 5.

The Crown ^G grants ante date the Manukau Harbour Control Act and owing to an apparent error in the wording of the latter act, an anomaly has been created which should be rectified.

Surveyors called in to prepare the necessary documents in order to bring Crown grants under the Land Transfer Act are unable to decide the matter and on a number of occasions have appealed to me for a ruling. In the face of the Act I am only able to refer them to the definition as given in the Harbours Act although it is clear that this is quoted in error.

I suggest that the matter should be referred to the Board's solicitors and that if necessary the exact position should be defined by legislation.

ENGINEER TO THE BOARD.

Auckland Harbour Board

MEMORANDUM

Drawing Office

To

23 Aug. 1927

THE ENGINEER

Karaka-8367

High Tides from 16 Aug. 1926 to 20 Aug. 1927 (inclusive)

No. Days	No. Tides (Possible)	No. Tides Recorded	Height Mean	A.P.S.
370	716	710	10005.52	14.09

Mean Height of Highest Spring tides only. = 15.56
of each series of Springs (25)

C. Purchas

Ch. G. 23/8/27.

22/8/27.

High water for 370 days
16 Aug 1926 to 20 Aug 1927 (inclusive)
14.09

Average level of High water Spring Tides
Being the means of the highest tides
of each series of springs for
a period of 370 days = 15.56
(the same period as above)

Manukau Harbour.

Auckland Harbour Board.

MEMORANDUM.

FROM

Drawing Office



TO

January 25th 1916
Assistant
THE ENGINEER.

94502

By Planimeter
Water area in Waianakau Harbour at low water.
taken from Admiralty Chart 1853 = 48.5 Sq. Miles.

Approx. total area of Waianakau Harbour from County map up to M.H.
(3. Field by planimeter made 149.09 miles }
+ another " " 15.4 " " } = 152. Sq. Miles

A.H.B. Endowment Area = 152 less 48.5 Sq. Miles
including about 1602 acres above H.W.

= 103.5 Sq. Miles.

1 by J. Duncan
and by J. P. Murray.

memo to Sec:
25/1/16

J.D. 25/1/16.