1987.328.250

927/5

927/5

159 Freyberg Whf Construction 1957-1962

FILE NO. 927/5

FREYBERG WHARF.

Construction

(~~STEEL SHEET PILING.~~)

General	927/1
Dredging	927/2
Railways	927/18
Water Svce.	927/15
Amenities	927/13

Auckland Harbour Board

1475 A

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 12th April 19 62

Subject FREYBERG WHARF SIGN

CODE NUMBER
791 001 20/29

Please erect the sign shown on S.1464/3 where shown on the back of the plan enclosed.

The sign is now being made by Foreman of Works.

Encl: Plan

PSH:HEW

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 £ : :

1475 A

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

1469 A

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE FOREMAN OF WORKS *Date* 11th April 19 62

Subject FREYBERG WHARF DIRECTION SIGN

Please make and install sign as shown on Drawing No. S.1464/3. Sign to be erected on the west corner of Monash Street and Kings Drive.

PSH:HEW

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 £ : :

1469 A

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

1455 A

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE FOREMAN OF WORKS *Date* 4th April 1962

Subject FREYBERG WHARF LIFEBUOY AND GRAPNEL BRACKET.

CODE NUMBER
789/036/20/29

Please make and fix the lifebuoy and grapnel brackets as shown on Drawing No. E.1000/1.

Copy to Construction Engineer

PSH:HEW

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 £		:	:

1455 A

REMARKS: _____

Signature _____

E10

Date _____ 19

THE CONSTRUCTION ENGINEER: Copy for your information

12th April, 1961.

The Project Manager,
Messrs. Wilkins, Davies & Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF -
MAINTENANCE PERIOD

Receipt is acknowledged of your letter No. 1654 dated 30.3.61 advising that Messrs. Wilkins & Davies Construction Company Limited on behalf of the joint venturers will take care of all obligations and responsibilities under the above-mentioned contract from 1.4.61 onwards.

It is understood that under this arrangement Messrs. Wilkins & Davies Construction Co. Ltd., will perform all maintenance work required during the remainder of the maintenance period and will clean up and disestablish the works site before the end of that period. Approval is given to the proposed arrangement provided the abovementioned undertakings are satisfactorily carried out.

It is noted that Mr. McKenzie will be your representative and that future payments are to continue to be made to Wilkins, Davies and Netherlands Harbour Works.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEW

Auckland Harbour Board

MEMORANDUM

10th. April, 1961.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF.

Contract 1580.

Herewith letter from the Contractor dated 30th. March, advising that the obligations and responsibilities under the Contract will be given to the Wilkins & Davies Construction Co. as from the 1st. April 1961.

I interpret the arrangement to be that, Wilkins & Davies are to undertake.

a. Maintenance work required during the remainder of the Maintenance Period.

b. Clean up and disestablishment of the Works Site before the end of the Maintenance Period.

On the 7th. April, I discussed with Messrs. Lindenberg and MacKenzie the requirements to complete the Contract, and I have no objection to the proposed arrangements.

Construction Engineer.

Mr Taylor.

Letter to Project Mgr. 12.4.61. A.T.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: NO. 1654 DATE March 30th 1961.

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

Dear Sir,

Re: Contract 1580 - Freyberg Wharf - Maintenance Period.

This is to inform you that Messrs. Wilkins and Davies Construction Co. Ltd. will, on behalf of the Joint Venture, take care of all obligations and responsibilities under the Contract from the first of April onwards.

Mr. McKenzie will be the representative of Wilkins & Davies.

All payments are still to be made to Wilkins, Davies & Netherlands Harbour Works as previously.

We take this opportunity of assuring you that Messrs. Wilkins & Davies Construction Co. Ltd. will attend promptly to all requirements under the Contract.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh

A.J. Lindenbergh,
Project Manager.

5.4.61.

THE CONSTRUCTION ENGINEER: Copy for your information

28th March, 1961.

The Project Manager,
Messrs. Wilkins, Davies & Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF.

In reply to your letter dated 20th inst. I have to advise that the Atlas Insurance Company Limited who entered into a bond on your behalf dated 28th November, 1958 in connection with the payment to you of moneys which otherwise would have been retained by the Board in terms of the Wages Protection and Contractor's Liens Act 1939 may be deemed to have been released from the said bond thirty-one days after 9th February 1961, this latter date being the date of substantial completion of the abovementioned contract works.

Attached is a certified copy of this letter which you will probably require for forwarding to the insurance company concerned.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

Encl: Copy of letter
ANT:HEW

23rd March, 1961.

The Project Manager,
Messrs. Wilkins, Davies & Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF.

In response to the request contained in your letter dated 22.3.61 it is hereby certified that the maintenance period of the first portion of the abovementioned contract was satisfactorily completed in terms of the general conditions of the contract on 3rd February, 1961.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEW

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO.:.....

DATE 22nd. March, 1961.

The Chief Engineer,
to the Auckland Harbour Board,
Quay Street,
AUCKLAND. C. 1.

Dear Sir,

CONTRACT No. 1580 - FREYBERG WHARF.

(Completion of First Portion of Contract)

In accordance with Clauses 48 & 49 of the General Conditions of the Contract the Maintenance Period of the First Portion of the Contract was completed on the 3rd. February 1961.

We would appreciate to receive a clearance certificate to that extent and we kindly ask you to send a copy of same for the Insurance Company.

Yours faithfully,

A.L. Lindenbergh,
PROJECT MANAGER.

22/3/61

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO. 1633 DATE March 20th, 1961.

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

Dear Sir,

Contract No. 1580 - FREYBERG WHARF.

We wish to acknowledge, with thanks, receipt of the Completion Certificate in regard to the above Contract.

In view of this we now formally apply for a release of the Liens Retention Bond.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh

A.J. Lindenbergh,
Project Manager.

Replied to Aud. 28.3.61.

927/5

COPY TO:

THE CONSTRUCTION ENGINEER: For your information.

14th March, 1961.

The Project Manager,
Messrs. Wilkins, Davies &
Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND. C.1.

Dear Sir,

CONTRACT No. 1580 - FREYBERG WHARF, (COMPLETION OF SECOND PORTION OF CONTRACT):

In reply to your letter No. 1614, (your Ref. 41/C1/AHB) dated 25/2/61, advising that the second portion of the above-mentioned Contract was substantially completed on 9th February 1961, I hereby certify in terms of Clause 48 of the General Conditions of Contract that this portion of the work may be considered as having been so completed on that date. It is to be understood, however, that this Certificate of substantial completion is issued subject to you undertaking to complete without undue delay such items of work which are still in progress, these mainly being extra work and works agreed to be delayed to suit other Contract works in hand. I should be glad if you will confirm that this will be done.

As you are aware, the subject of the amount of bonus, if any, which may be payable under Clause 71 on the second portion of the Contract is still under negotiation with you and this Completion Certificate does not imply that any such bonus will necessarily apply from the completion date certified herein. It will be in order, however, for you to claim one half of the retention moneys in your next progress payment claim in accordance with Clause 60 (2).

The effect of the above Certificate is also to certify substantial completion of the whole Contract in terms of Clause 48 and such being the case, for record purposes, it is advised that the maintenance period for the works covered by the present Certificate (i.e: excluding work accepted as completed on 3rd August 1960, in the first portion of the Contract) will, in terms of Clause 49, be deemed to have commenced on 10th February 1961.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD.

ANT:KJD.

EXTRACT FROM MINUTES
WORKING TRAFFIC COMMITTEE
-7 MAR 1961

4. PROGRESS OF FREYBERG WHARF PROJECT

Consideration was given by the Committee to the reports of the Chief Engineer and General Manager which outlined progress made with the construction of Freyberg Wharf and the several contracts related thereto.

Recommended -

(a) That the report be received.

(b) That the General Manager be directed to discuss with the Port Amenities Committee the question of manning vessels at Freyberg Wharf in relation to the temporary amenities provided, with a view to calling an urgent meeting, if necessary, to resolve the present restrictions imposed by the Cargo Workers' Union.

Mr Smith to note.
J.P.

ADOPTED BY BOARD
14 MAR 1961

See Bd. Minutes (next sheet)

EXTRACT FROM MINUTES
ORDINARY MEETING OF BOARD
14 MAR 1961

(Members were informed that, in relation to Item 4 - Progress of Freyberg Wharf Project - recommendation (b) thereof had now been resolved).

2nd March, 1961.

The General Manager,
A.H.B.

PROGRESS ON FREYBERG WHARF PROJECT.

The purpose of this report is to inform the Board of the progress being made on the Freyberg Wharf Project.

The situation is as follows:-

1. Dredging

The western berth and approaches have been completed.

The eastern side will be completed by the end of this year.

2. Wharf Construction (Contract 1580)

The Contractors have made good progress and the wharf is now substantially complete some two months ahead of the contract time.

3. Shed Construction (Contract 1657)

Owing to delays in the delivery of structural steel, the shed contractor is seven or eight months behind schedule in commencing erection.

It is anticipated that erection of steelwork will commence in April and, on this basis, the following completion times are expected:

Stage I	Western Shed	December, 1961.
" II	Remainder	October, 1962.

Negotiations concerning the administration of this contract are being pursued on this basis.

4. Quay Cranes (Supply of new cranes Contract 1614)

It is anticipated that the three cranes on the western quay will be completed within two months of completion of the western shed i.e. by February 1962.

Similarly it is anticipated that the three cranes on the eastern quay will be completed within two months of completion of the eastern shed i.e. by December 1962.

In the latter case, provided a temporary power supply is made available (at an approximate cost of £1,000), the three cranes on the eastern berth could be ready for limited use some five or six months earlier. This aspect should be reviewed in six months' time when progress with the shed contract can be better appreciated.

5. Rail Service

Rail service to the western berth has been available since early this year.

It is anticipated that rail service to the eastern berth will be available from August 1961. The arrangements at the east end of the grid will be temporary and will remain so for two to three years.

6. Administration and Amenities Building (Contract 1688)

This building is scheduled for completion by the end of this year and the Contractor is making good progress.

... ...

7. Electrical Sub-Station (Contract 1695)

Completion of this building is expected in May of this year.

8. Gates and Fences and Streetworks

A report covering gates, fences, approach streetworks and similar services will be submitted to the Board at its April meeting. These services will be available in good time for working the western berth and shed.

CHIEF ENGINEER TO THE BOARD

Copy.

Auckland Harbour Board

MEMORANDUM 27th. February, 1961.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

Original lost in transit. A.H.

FREYBERG WHARF.

Contract 1580.

Completion of Contract.

Herewith letter from the Contractor dated 25th. February requesting a Certificate of Completion for the Eastern Portion of the Contract as from 9th. February 1961.

In essence the Contractor is requesting a Certificate of Completion for the whole Contract for the 9th. February and the maintenance period for the remaining works (excluding from the whole that work accepted as completed in the first portion of the Contract on 3rd August 1960) will commence from the 10th. February and expire on the 9th. August.

Some items of work are still in progress but these are extra work or agreed delays to works to suit other contract works in hand, and will all be completed in the near future. The Contract can therefore be accepted as substantially completed on 9th. February 1961.

On the issue of the appropriate Certificate will you please advise me if one half of the retention monies can be claimed in the next progress claim. (Vide Clause 60/2).

Letter to Contractor 10.3.61.
A.H.

Construction Engineer.

NS.DMW.

Mr. Taylor
Herewith Copy of my memo with duplicate of Contractor's letter.
N.S.

Auckland Harbour Board

MEMORANDUM 27th. February, 1961.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF.

Contract 1580.

Completion of Contract.

Herewith letter from the Contractor dated 25th. February requesting a Certificate of Completion for the Eastern Portion of the Contract as from 9th. February 1961.

In essence the Contractor is requesting a Certificate of Completion for the whole Contract for the 9th. February and the maintenance period for the remaining works (excluding from the whole, that work accepted as completed in the first portion of the Contract on August 1960) will commence from the 10th. February and expire on the 9th. August.

Some items of work are still in progress but these are extra work or agreed delays to works to suit other contract works in hand, and will all be completed in the near future. The Contract can therefore be accepted as substantially completed on 9th. February 1961.

On the issue of the appropriate Certificate will you please advise me if one half of the retention monies can be claimed in the next progress claim. (Vide Clause 60/2).

Construction Engineer.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41 61/AHB NO. 1614 DATE 25th February, 1961.

The Chief Engineer,
to the Auckland Harbour Board,
Quay Street,
AUCKLAND C.1.

Dear Sir,

RE: CONTRACT 1580 - COMPLETION OF FREYBERG WHARF

We wish to advise that the Eastern portion of the Freyberg Wharf Contract No. 1580 was substantially completed on 9th February, 1961.

We would be obliged if you would forward to us a Certificate of completion as soon as possible.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh

A.J. Lindenbergh
Project Manager

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41 61/AHB NO. 1614 DATE 25th February, 1961.

The Chief Engineer,
to the Auckland Harbour Board,
Quay Street,
AUCKLAND C.1.

Dear Sir,

RE: CONTRACT 1580 - COMPLETION OF FREYBERG WHARF

We wish to advise that the Eastern portion of the Freyberg Wharf Contract No. 1580 was substantially completed on 9th February, 1961.

We would be obliged if you would forward to us a Certificate of completion as soon as possible.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh

A.J. Lindenbergh
Project Manager

Manual Engr. 27/2/61.

Auckland Harbour Board

MEMORANDUM

23rd. February, 1961.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF.

Herewith record plans for filing, viz,

S 1449/1 folder

1. Folder containing
   a. Pile Sections recording R.C. pile toe depths and mud level.
   b. Pile plan showing location of piles cast with air entrained concrete.

B. 1425.

2. Plans recording sheetpiling depths, tie rod and anchorage locations.

B 1342/6.

3. Copy of Isca Foundry plan 12395a for a 1 : 6.69 Crane crossing, as installed

CK 23/2/61.

Construction Engineer.

Dick,

Please note plan record reference.

Chas

NS.DMW.

Auckland Harbour Board

MEMORANDUM

21st. December, 1960.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF.

Contract 1580.

Further to my memorandum of 22nd. November advising that the Contractor's formwork on the east quay had been damaged by A.H.B. dredging plant.

Attached herewith is a claim from the Contractor for reinstatement of the damages.

Construction Engineer.

account for £60-0-0 from Contractor handed to W. Swift, N. Office, for forwarding to Insurance Co.

22.12.60

NS.DMW.

CABLE & TELEGRAPHIC ADDRESS
"BITUMIX," AUCKLAND.

MANAGING DIRECTOR
R K. CLEMOW, B.E., ASSOC. M. INST. C.E.
PHONE 25-446

BITUMIX
LIMITED
ASPHALTE SPECIALISTS
AND CONTRACTORS

P.O. BOX 75, ELLERSLIE

OFFCE AND WORKS:
PHONES: 576-039 [5 LINES]
LUNN AVENUE,
ELLERSLIE,
AUCKLAND.

30th November, 1960

The Project Engineer,
Auckland Harbour Board,
FREYBERG WHARF SITE.

Dear Sir,

Following our discussions on site last week we have pleasure in submitting the following rates for day work on carriageways and footpaths at entrance to Import and Freyberg Wharves.

1.	A. Labour	12/6 per hr.
	B. Travelling Time	8/- " "
	C. Foremans Labour	15/- " "
2.	Basecourse Metal Delivered on site	27/6 per c.yd
3.	Emulsion Tack Coat	3/- per gallon
4.	Hot mix asphalt machine or hand laid	£7. per ton
5.	All plant hire etc at Contractors Federation rates. (See attached rates schedule)	

Payment to be made on basis of foreman's daily signed diary sheets together with relative dockets.

Yours faithfully,
for BITUMIX LIMITED.

L.J.B. Hawker,
SECRETARY.

L.J.B.H./A.H.

Rec 30/11/60

Construction Engineer's Office,
30th. November, 1960.

The Secretary,
Bitumix Ltd.,
P.O. Box 75,
Ellerslie,
AUCKLAND.

Dear Sir,

FREYBERG AND JELLICOE WHARVES.
RAIL AND ROAD CONNECTIONS.

Thank you for your letter of even date submitting daywork rates for roading work at the above location.

Your rates are accepted and will you please proceed with the work at your earliest convenience.

Payment by the Board is monthly on receipt of your invoices.

Yours faithfully,

Construction Engineer.

NS.DMW.

Mr. Sutton

Employment of W.D & R.H.W roading subcontractor Bitumix Ltd on daywork as an extra to the Wharf Contract is not a suitable arrangement to all parties and I have arranged for Bitumix to work direct through me.

30.11.60

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/AHB NO. 1489 DATE 20th October, 1960.

The Chief Engineer,
to the Auckland Harbour Board,
Quay Street,
Auckland C.1.

Dear Sir,

Re: Contract No. 1580 - Freyberg Wharf
Completion of first Portion of Contract:

We thank you for your letter dated 24th August certifying the completion of the first part of the Contract.

Concerning the method of pouring the deck, Clause 13 of the Specification allows for alternative proposals for the pouring pattern of the deck to be made for the Engineer's approval. While we appreciate your cooperation in this matter, we are of the opinion that no deviation of the contract has occurred and there are no grounds on which a reduction of the bonus payments could be applied.

However, as was agreed with your Construction Engineer the bonus period of the second part of the Contract will be discussed and settled in mutual agreement when the time arises.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh
Project Manager

Auckland Harbour Board   67 A

INSTRUCTIONS TO FOREMEN & INSPECTORS

...ber 60

FREYBERG ENGINEER'S OFFICE,

To ______________________ *Date* ______________ 19

Subject ______________________

CODE	NUMBER
109 / 027 / 20-29	

Please dig trenches, lay cables to the requirements of the Electrical Engineer, provide underwharf cable fixings, and erect temporary lighting poles, all in accordance with Drawing No. EL/B256.

Encl: Drg. EL/B256

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 £		:	:

67 A

REMARKS: ______________________

Signature ______________________

E10

Date ______________ 19

THE CONSTRUCTION ENGINEER: Copy for your information

24th August, 1960.

The Project Manager,
Messrs. Wilkins, Davies & Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF (COMPLETION OF FIRST PORTION OF CONTRACT.)

Further to my letter dated 1.8.60 acknowledging receipt of yours dated 25.7.60 regarding the completion of the first portion of the contract it is hereby certified in terms of Clause 48 of the General Conditions of Contract that this portion may be considered to have been substantially completed on 3rd August, 1960, provided that you undertake to install the crane rail crossings and complete the repairs to cracked piles without undue delay.

It would appear and I understand that you recognise that the allowed variation of the specification permitting two concrete pours per wharf width in lieu of the specified three pours, has permitted earlier completion of the superstructures. We expect this to be taken into account in the establishment of the completion date for the whole contract and the question will therefore be further discussed with you at that time.

The payment of the bonus for early completion of the first portion of the Contract for the period 3rd August, 1960 to 22nd October, 1960 viz. 11 complete weeks at £400 per week = £4,400 may be claimed for in your next progress payment claim.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEB

927/1

Auckland Harbour Board

27335

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 10th August 1960

Subject SEPTIC TANKS - FREYBERG WHARF.

Herewith copies of drawing E.827/6 which describe the two septic tanks required for the conveniences to be built in the Freyberg Wharf sheds. Holes for pipe work and bolts for hangars etc. have been described on the deck detail drawings E.801.

It is proposed that the wharf Contractor should build the tank complete with the pipe work required to be built into it, and that the remaining pipe work, hangars etc. should be done by the shed Contractor. Would you please arrange for this work to be carried out and agree a price for the work so that a variation order can be issued.

Encl: 4 copies E.827/6

CLP:HEB

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 £ : :

27335

REMARKS: ______

Signature ______

E10

Date ______ 19

Auckland Harbour Board

MEMORANDUM

10th. August, 1960.

FROM CONSTRUCTION ENGINEER. **TO** ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Time for Completion - First Portion of Contract.

I have to advise that the first portion of the Contract comprising the west quay, breastwork, rail track and road approaches thereto, was substantially completed to my satisfaction on the 2nd. August, 1960.

The requirements to be completed in terms of the first portion of the Contract were agreed some months ago to permit the taking over of the quay for the Shed Erection Contract, and the provision of roading and other work to provide access to the cart docks was waived subject to early completion in the roading season. In addition the Contractor has not yet received the 2 No. crane rail crossings but it is expected that they should be installed by the end of this month.

I have discussed with the Contractor the aspects of time on delays, extra work and variations to construction and we accept that,

a. The Contractor considers that the delay in the receipt of the order to proceed with the Contract should be taken into account.

b. The delay in the installation of crane crossings would to some degree be offset by an extension of time for the additional work.

c. The variation to specification permitting two concrete pours per wharf width in lieu of the specified three, has permitted earlier completion of the superstructures. At the time of this approval, the question of effect on time for completion was to be considered at a later date.

It is felt and acknowledged by the Contractor that the Board at this stage has a credit balance of time, from Item c and by not having to complete the first portion in terms of Clause 70, but the amount is difficult to resolve. However, as early completion of the west quay has been achieved as requested, it is suggested that the matter be left over and considered in the completion date for the whole Contract, and I would recommend this as satisfactory.

If you concur with this arrangement, then the necessary certificate of completion in terms of Clause 48 could be issued and the maintenance period for this section commence, subject to an undertaking from the Contractor that the installation of crane rail crossings and outstanding repairs to cracked piles is prosecuted.

The payment of a bonus for early completion would then be from the 3rd. August to 22nd. October 1960 or 11 weeks 4 days, which in terms of Clause 71 would be a payment of

11 complete weeks at £ 400. = £ 4,400.

Mr Taylor

Letter to Contractor drafted Aut. 24.8.60

NS.DMW.

Construction Engineer.

1 copy for Mr. Seagar please.

1st August, 1960.

The Project Manager,
Messrs. Wilkins, Davies and Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT 1580 - FREYBERG WHARF

I acknowledge receipt of your letter of 25th July, re completion of Western Quay.

From discussions with my Construction Engineer it appears that he will shortly be in a position to agree with you a date on which we can accept the western quay as substantially completed. When this date is decided upon, the necessary certificate will be issued in terms of Clause 48 of the General Conditions of Contract.

Yours faithfully,

JRS:HEB

CHIEF ENGINEER TO THE BOARD

Mr Sutton.

1. Crane rail crossings. These have been generally late with supply of wharf [illegible], therefore supply of crane rail crossings is late – not necessarily [illegible] as implied.

2. Roading along side cattledock on west quay, although part of west quay will not be completed until Sept.–Oct.

3. Contractor has been able to decrease time of concreting deck on west quay by agreed variation to concrete piers.

4. If substantial completion granted on 30th July. Bonus payments could be 12 weeks at £400 = £4800. [illegible]

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41 C1/AHB NO. 1327 DATE 25th July, 1960

The Chief Engineer
to the Auckland Harbour Board,
Quay Street,
Auckland C.1.

Dear Sir,

Re: Contract 1580 - Completion Western Quay:

We herewith confirm our conversation with your Construction Engineer which took place on last Thursday 21st of July regarding the completion of the Western Quay and the items still to be completed as per enclosed list.

We wish to inform you that we expect to have the Western Quay completed by Saturday 30th July 1960, except for the cranerail crossings.

We regret that the cranerail crossings could not be delivered in time but considering that this was an extra to the contract and that we have done everything possible to speed up the delivery (see our letter No. 559 July 27th 1959) we would like to exclude this item from the completion of the first part of the Contract. We expect to have the cranecrossings on the site by the middle of August and we will have them placed without delay.

We would appreciate to receive a certificate of completion when you take over the first portion of the Contract.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh

A.J. Lindenbergh
Project Manager

WORK TO BE COMPLETED:

Bollards to be bolted
Bollards to be patched
2 concrete pours
Finish concrete between rails
Patch concrete deck
Clean Hydrant and valve boxes
Drain box to be set in deck

Cut 4" x 1" Drainholes in sheetpiling
Make packers for watermain hangers

Hydrant spindle to be replaced

Fender piles
kerbs
Buffers
Chains
Ladders

Mastic on railtrack on deck
Plantmix around switch bolts
Plantmix rails on reclamation
Instal points box on reclamation
Check and oil all points boxes on deck
Cut out concrete for patch
Clean off waling along sheetpiling
Clean up deck
Aluminium wires for water pipe

Watermains

.....

EXTRACT FROM MINUTES
GENERAL PURPOSES COMMITTEE
19 JUL 1960

4. FREYBERG WHARF - UTILISATION OF WESTERN BERTH

The Chief Engineer advised that the Western Berth of Freyberg Wharf would be substantially complete within the next two months and could be put to restricted use, provided temporary facilities were installed.

The General Manager advised that the berth could be given limited use in cases of congestion and he considered it desirable that the facilities be provided.

Recommended -
That the reports be adopted.

FINANCIAL PROVISION MADE 26 JUL 1960

ADOPTED BY BOARD
26 JUL 1960

Designing Engs.
Please now prepare working drawings & draft instructions to Construction Engs. to carry out the work.
J.

Auckland Harbour Board 27247

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 27th June 19 60

Subject CONTRACT NO.1580 - FREYBERG WHARF

Reference your Memorandum dated 13th May, 1960, re Contractor's request for consideration on account of extra costs incurred from delays in the pitching and driving for inner east berth.

I am prepared to agree to the additional payment and would prefer it to be dealt with as an extra rather than grant an extension of time.

WJT:HEB

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 £ : :

27247

REMARKS: _____

Signature _____

E10 *Date* _____ 19

Auckland Harbour Board

MEMORANDUM 13th. May, 1960.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

CONTRACT 1580 - FREYBERG WHARF.

Driving R.C. Piles.

I forward memoranda from the Contractor dated 2nd. & 6th. May, requesting consideration for extra costs incurred from delays in the pitching and driving of piles for the inner east berth.

All the 55' piles in the dredged cut from Rows 96 - 108 (26 piles) have their finished head level at an average of 6.50 feet below deck level. This has occurred from two factors.

a. Penetration into sandstone has been somewhat more excessive than anticipated.

b. The pile length of 55' is not long enough for the conditions specified or existing. Prior practice on other wharves for the same conditions is a 60' pile which when driven into a 3' chopped hole would bring the head about one foot above deck level.

It can therefore be appreciated that,

1. In pitching a 55' pile, the strop, when the pile is landed, is located just above half-tide.
2. With heads finishing at high water, driving is limited at times of high water.

The Contractor has submitted that his costs from the delays are £ 117, which is not unreasonable for the loss of 2 days on piledriving. I am of the opinion that consideration should be given to this claim, either by equivalent value with an extension of time to the Contract or by an authorised payment.

Mr Seagar:
I will agree with the extra payment — and would prefer it to be dealt with as an extra rather than grant extension of time.
23.6.60

Seen Out.

Construction Engineer.

NS.DMW.

Auckland Harbour Board 27144

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 9th May 19 60

Subject CONTRACT 1580 FREYBERG WHARF.

The two normally reinforced piles which were driven in error in Row J need not be strengthened because they are under the corner of the shed and so not carrying the load of other piles in Row J.

Payments for these piles is to be made as for ordinary piles. The two row J piles, when driven elsewhere in the work, will be considered as normal piles for payment purposes.

PSH:HEB

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 £ : :

27144

REMARKS: _____

Signature _____

E10

Date _____ 19

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

MEMORANDUM TO:

Mr. N. SEAGAR
Construction Engineer
AUCKLAND HARBOUR BOARD

FROM: A.J. LINDENBERGH
Project Manager
FREYBERG WHARF CONTRACT

DATE: 6th May, 1960

SUBJECT: DRIVING CONCRETE PILES - B1 - 1169

Further to our memo dated 2/5/60 we are herewith forwarding the actual delay of the Menck frame due to low piles:

	DATE:	PILE NOS:	TIMES:	MENCK HOURS:	MANHOURS:
T	23/2	106 nth, sth.,	12-30pm - 2pm	1½	13½
F	26/2	103A nth	7-30am - 10am	2½	22½
F	22/4	102A nth, sth.,	12-30pm - 3-30pm	1½	13½
W	27/4	10A nth,	9-30am - 12pm	2	18
Th	28/4	100A sth,	7-45am - 10am	1½	13½
F	29/4	100A nth, sth.,	9-30am - 1pm	2	18
S	30/4	98A nth,	7-30am - 10-30am	2	18
M	2/5	96A nth,	9-30am - 2pm	2	18
		11 piles		15 hours	135 hours

The total amount of labour cost involved is 135 hours @ 16/- = £108/-/-.

The consumption cost for 15 hours standby would be 15 hours @ 12/- = £9/-/-.

We submit the above figures for your kind consideration.

Yours faithfully,

A.J. Lindenbergh

Auckland Harbour Board

27136

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 3rd May 1960

Subject FREYBERG WHARF SERVICES

Drawings E.881/7 and 8 show the revised services and roading of the Freyberg Wharf Approach.

Please arrange with the Contractor to carry out the work as amended by the enclosed drawings.

Encl: 4 copies Drg. E.881/7 and 8

PSH:HEB

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 £ : :

27136

REMARKS: _____

Signature _____

E10

Date _____ 19

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

MEMORANDUM TO:

N. SEAGAR
Construction Engineer
AUCKIAND HARBOUR BOARD

FROM: A.J. LINDENBERGH
Project Manager
FREYBERG WHARF CONTRACT

DATE: 2nd May, 1960.

SUBJECT: DRIVING CONCRETE PIRES - B-1/1157

We wish to bring to your notice that a considerable number of piles in the Eastern Wharf are being driven far below the level at which the final set was expected to be reached.

This causes delay at high tide while pitching, because the slings disappear below the water surface and while driving, because the head of the pile is too low.

We could not possibly forsee and allow in our tender to such and extent of these circumstances and we feel that we should be entitled to receive some ~~sort of~~ compensation for the costs involved.

We suggest that we base our claim on the piledriver foreman's log-book that can be inspected by you or your representative at your convenience.

Yours faithfully,

A.J. Lindenbergh.

AL.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41 C1/AHB NO. 1138 DATE 26th April, 1960.

The Chief Engineer,
AUCKLAND HARBOUR BOARD,
Quay Street,
Auckland C.1.

Dear Sir,

Re: CONTRACT 1580 - FREYBERG WHARF

We acknowledge receipt of your letter dated 4th April 1960 and reply as follows -

We accept responsibility for piles driven in error in Row J. and we are prepared to take any reasonable steps to correct or compensate for this error, but we would point out that this error was in no way wilful, that it went unnoticed by your inspecting staff until it was too late to correct by removal of the piles, and that from our knowledge of conditions ruling on these particular piles, we would consider that they in no way detract from the strength or stability of the Wharf.

We do not agree with you that the damage and positioning of the piles driven in the Western wharf is due in any way to poor workmanship, inexperienced or insufficient supervision on our part. The records of tests made and investigation work done, in our opinion, fully support our contentions that these piles were being overdriven into a disturbed and variable foundation strata. The improvement showing on the Easten Wharf is due to considerably more uniform and favourable ground conditions encountered and that the original insistence on holding the pile head in the true final positon whilst driving, regardless of where the toe is going, is not now being adhered to.

We are continuing to give this section our fullest attention. Ground conditions are expected to be more difficult in rows A & B.

No settlement of falsework has taken place since last year and, with the methods now being adopted, we consider further settlement impossible.

We must point out that the methods used prior to this have always been discussed with your Construction Engineer. (and his advice & offer of assistance not accepted !!)

Regarding your comment on the amount of supervision we have on the contract, we would point out that, at present, on our staff, there are supervising 4 Civil Engineers, 1 Engineering Surveyor, 1 Junior Surveyor, 1 Quantity Surveyor, 1 General Foreman, 1 Piledriving Goreman and 9 Section Foremen. The contract is ahead of schedule in all phases and we expect to complete each section before the completion dates set; we consider that this is in large measure due to the amount and standard of the supervision we are supplying.

..2..

Prior to receipt of your letter, arrangements had been made to employ another Civil Engineer and this man is expected on site next May.

We assure you we are watching the position closely and if the amount of work under the contract should increase, we have access to ample reserves of suitable supervising staff on the Civil Engineering and practical side.

In conclusion, we would state that, on occasions, we feel that there is a lack of liaisen between our staff and yours an we would recommend that a site meeting be held weekly to sort out points of divergence before they are actioned and to give a smoother working basis between both parties to the overall benefit of the job.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh
Project Manager

AJL/SHK

THE CONSTRUCTION ENGINEER: Copy for your information

4th April, 1960.

The Project Manager,
Wilkins, Davies and Netherlands Harbour
Works,
P.O. Box 1198,
AUCKLAND

Dear Sir,

CONTRACT NO.1580 - FREYBERG WHARF

I have before me a copy of a letter, dated 8th March, from my Construction Engineer to you re piledriving on this Contract, and your reply dated 10th March.

As I explained to you during our discussion on the eve of your departure on leave, I am seriously concerned over several aspects of this Contract.

As far as this piledriving error is concerned, the two incorrect type piles driven in row J for eastern berth are not acceptable to me. Piles of special design are specified for this position, and we require the work to be done as specified. The only completely satisfactory solution would be for you to correct the error - remove the wrongly driven piles and replace them with two piles of the type specified. I appreciate that this is now a matter of some difficulty. Under the circumstances, and in view of the particular position of these two piles, I would be prepared to accept them as driven on condition that the contract price for the making and driving of these two piles is deducted from your claim and is held by the Board as an offset to the cost of any remedial work as and when it becomes necessary as a result of your error. Had they been in any other position than the extreme inner end of the row, I should have been compelled to require them to be replaced.

I am still not satisfied with the efficacy or extent of the contractor's supervision on this contract. As I have had to point out to you on several occasions, errors and faults occur on this contract which in my opinion should not be left for us to detect and order rectification.

The errors in piledriving mentioned above are not the only cases of wrong type piles having been driven. A particularly bad feature of this is the fact that your signed piledriving records when submitted to us do not disclose these errors. A recent case of non-compliance with the specification for handling piles has been reported to me. There is no excuse whatsoever for this - especially as the lifting points are clearly marked upon the piles.

I have discussed with you and other principals of your firm the damage to piles during driving and the inaccurate final positions of many piles. The fact that some improvement has been noted latterly in this regard indicates that an improvement was not impossible to attain, and therefore should have been provided from the outset by a firm including as a joint venturer an organisation with world-wide experience and reputation in the construction of harbour works.

....

The Project Manager,
Wilkins, Davies and Netherlands Harbour
Works,
P.O. Box 1198,
AUCKLAND

4th April, 1960.

In spite of assurances that your initial difficulties in supporting the falsework for superstructure would be or had been surmounted, we have had several instances of excessive settlement of falsework, sometimes after the concrete had taken its initial set, with the attendant structural unsoundness, which again cannot be tolerated. Cases are not infrequent where falsework is completed and allegedly ready for concrete when it is found on our inspection to have quite unacceptable errors in level. I cannot but repeat that with a firm of the standing of yours, with adequate and capable supervision, these things should not occur at all - or if they very occasionally did, they should be detected at once by you and rectified accordingly.

Finally I must stress the gravity of my concern over these matters. This contract has now been running for eighteen months and on many occasions throughout that period these matters have been drawn to your notice. Will you please advise me without delay what steps you have taken and what further steps you will take to ensure that for the remainder of this contract we have no recurrence of these most unsatisfactory features.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

JRS:HEB

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/A.H.B. NO. 1048 DATE 10th March, 1960.

The Construction Engineer
to the Auckland Harbour Board,
France Street,
Auckland C.1.

Dear Sir,

Contract 1580 - Freyberg Wharf
Piledriving

We acknowledge receipt of your letter dated 8th March, 1960.

We regret that some mistakes have been made while driving r.c. piles and we would like to assure you that every endeavour is being made that this will not happen again.

The mistake in row J of the Eastern Wharf happened because the wrong piles were being loaded and the piledriving foreman not being aware of this, pitched and drove them. (It has been made clear to him in the meantime that he should check the piles before pitching them.)

We are not of the opinion that the mistakes are made intentionally which would certainly have our strongest disapproval.

Of course we will see to it that such a thing will not happen again but if there would be a case of such a nature this will be reported and we have impressed on our staff that it is in the interest of the job to do so.

Trusting that we have given a satisfactory reply to your questions,

We remain,

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh

A.J. Lindenbergh
Project Manager

c.c's: Mr. Bakewell
R.N.H.W. & W. & D.

Construction Engineer's Office,
8th. March, 1960.

The Project Manager,
Wilkins & Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND. C. 1.

Dear Sir,

FREYBERG WHARF - CONTRACT 1580.
PILE DRIVING.

Since my discussions with you on the 4th. inst. re incorrect piles in the 'J' Row on the east quay a further development not known to me, but mentioned at the time has made it necessary for a more detailed explanation of the position to date.

I would draw your attention to the following points:-

a. A 65' 'J' type pile was driven at position 34D on 9.9.59. I cannot ascertain that this mistake was made known to this office at any time, until mentioned on 4.3.60. In addition, there is no record of this matter on the pile driving sheet of the 9.9.59, and if it was known then it should have been stated.

b. A 70' 'J' type pile was driven at position 40J on 16.10.59 instead of a 65' 'J' pile. This is noted on the pile driving record sheet. The inference at the time of our noting it was that a mistake had been made, but I am led to believe that it was to replace the missing 65' 'J' in a above.

c. It is established that piles at 113J & 104J driven on 19.1.60 & 27.1.60 are normal type piles. There is no reference on your pile driving records sheets on these days, of this incorrect driving. I am inclined to believe that there may be a specific reason for this, based on a shortage of 1/70' 'J' pile used in a above. In any case, a pile driving foreman who drives the wrong pile twice requires investigation, as the 'J' piles are adequately marked.

In the light of these matters, I am reluctantly having to accept that there has been some endeavour to cover up mistakes which are your responsibility to ensure do not occur or if so, report immediately.

I will be pleased to have your explanation in writing at your earliest convenience.

Yours faithfully,

Construction Engineer

MS.DMW

Auckland Harbour Board

26942

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 8th February 19 60

Subject FREYBERG WHARF - DECK DETAILS

Herewith four copies each of drawings E.801/11 and 13 which have been amended to show holes and bolts necessary for the pipe work to the conveniences to be built within the shed. Please have this work carried out by the Contractor.

Note that it is required to cast into the deck beam a 4" cast iron trap and a short length of 4" cast iron pipe as detailed.

Bolts for hangers should be 1" diameter 9" long black.

A copy of drawing E.827/2 showing the layout of offices and conveniences is enclosed for your information.

Encl: 4 copies each E.801/11 and 13
1 copy E.827/2

CLP:HEB

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 £ : :

26942

REMARKS: _____

Signature _____

E10

Date _____ 19

Construction Engineer's Office,
29th. January, 1960.

The Project Manager,
Wilkins & Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND. C. 1.

Dear Sir,

FREYBERG WHARF - CONTRACT 1580.

Further to our discussions on the unsound work on the western quay which is the results of falsework settlement, I require you in terms of Clause 39 (1)(c) to proceed with the repairs immediately. I confirm my verbal instructions with regards to this.

1. Beams: Members having damage in form of longitudinal cracking over pile supports will be repaired by removing all unsound concrete and replacing with "gunited" concrete.
2. Beam & Cap Soffits: All cavities and unsound concrete shall be made good where directed.
3. Construction Joints: All unsatisfactory concrete on joints shall be removed and joints made good to provide a sound slab soffit.
4. Deck Surface: In areas to be specifically defined the existing deck surface shall be cut down to provide a 2" minimum thickness of wearing course concrete to bring the deck to correct level.

All work is to be undertaken competently and to my approval.

In addition I would point out that repairs to piles has not yet commenced as you assured me it would prior to Xmas. This work must proceed immediately and could be combined advantageously with the other repairs.

Yours faithfully,

NS.DMW.

Construction Engineer.

Auckland Harbour Board

MEMORANDUM 28th, January, 1960.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.
Support of Deck Falsework.

Further to my discussions with you re falsework movement, I attach copies of my letters to the Contractor regarding this matter and to report the results of an inspection of the deck complete to date, ascertaining unsound work and my further instructions to the Contractor to rectify unsound work.

Following further consideration of the aspects of falsework settlement, a comprehensive survey of the deck soffit and deck levels have been made.

1. Beams: Inspection in the western gusset area where settlement was first ascertained, I now find that we have longitudinal cracks on beam sides over piles in 4 cases. It is probable that a ruptured plan extends across the member. To ensure satisfactory design requirements, the lower ruptured section will have to be removed and replaced.

2. Beam & Cap Soffits: In many cases the soffit of beams and caps adjacent to the pile show unsoundness. A few cases exist where the concrete skin appears to have been pulled down by the falsework and a cavity formed, which can be entered by hitting with a hammer. The remaining cases yield a "drumming" sound when hit showing that unsoundness exists.

3. Construction Joints: Some joints showing an excessive thickness of overlay have been more closely examined and after removal of the grout overlay we find clean aggregate which gives an excessive depth of "honey comb" and unsatisfactory cover to steel.

4. Finished Deck Levels: In several areas the deck surface is up to 3/4" below requirement. Unfortunately this has been pronounced on shed wall lines and in consequence deck levels at door guides is not constant.

5. Reinforcement: In some cases the reinforcement in beams and slabs will be incorporated in a deflected condition.

These unsatisfactory items of work which can be seen to date have been shown to the Contractor. The results of settlement in Rows 24 & 25 which occurred in late December and are still not stripped, will have to be dealt with later.

To rectify the sub-standard work resulting from settlement that has been seen to date, I have advised the Contractor as follows.

a. Beams: The damaged lower sections will be removed and replaced in "gunited" concrete to my direction and approval.

b. Beam & Cap Soffits at Piles: Suitable repairs will be undertaken where directed.

c, Construction Joints: Where directed to be cleaned out and satisfactorily patched.

d. Deck Surface: In areas to be more specifically defined, the existing deck surface shall be removed to provide a 2" minimum thickness of wearing course concrete to bring the deck to correct level.

The Contractor has now reverted to the use of a bolt through the pile with steel yokes to ensure positive support of falsework. The first section of deck concreting with this method has worked satisfactorily. I am satisfied that settlement problems should not now exist.

NS.DMW. File

Construction Engineer.

27th January, 1960.

The Project Manager,
Messrs. Wilkins, Davies and Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF

Receipt is acknowledged of your letter No.947 dated 15th January, 1960 advising that you intend to employ Messrs. Bitumix Limited as Sub-Contractors for the work covered in Items 197, 197A and 198 of the Bill of Quantities.

Approval is given to this proposal in terms of the contract.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEB

Auckland Harbour Board

MEMORANDUM

18th. January, 1960.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Subcontractors.

Herewith letter from the Contractor dated 15th. January 1960 advising that it is their intention to sublet the roading work to Messrs. Bitumix Ltd.

I recommend this be approved.

Construction Engineer.

Mr. Taylor
Aut.

Letter to Contractors 27.1.60.
Aut.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/A.H.B. NO. 947 DATE 15th January, 1960

The Chief Engineer,
to the Auckland Harbour Board,
Quay Street,
AUCKLAND

Dear Sir,

RE: Contract 1580 - Freyberg Wharf
Roadworks

We herewith inform you that we intend to sublet the following items to Messrs Bitumix Limited:-

Items 197 - 197A and 198.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh
Project Manager

AJL/SHK

H.O. file.

Construction Engineer's Office.
24th. December, 1959.

The Project Manager,
Wilkins & Davies & Netherland Harbour Works,
P.O. Box 1198,
AUCKLAND. C. 1.

Dear Sir,

FREYBERG WHARF - CONTRACT 1580.
SUPPORT OF FALSEWORK.

Further to my letter of 16th. November with reference to the subject, recent investigations have established that this problem still exists and that in the last two deck pours on the west side of the west quay, the end results of settlement are alarming and entirely unsatisfactory.

Following difficulties in the provision of top cover to steel over beams I have had checks made, which show that in these two pours the finished level of the deck is below level on Row D to a max. of 3/4" and that also in this area a stay lath movement downwards of 1 3/4" has been observed. In the whole area there are variations in levels which are outside any permissible tolerances. It would appear that the requisite friction is not being attained, or there is a lack of responsibility in the work of providing the stay lath system.

I can only reiterate again that this problem is not being given the attention by you that it warrants. It is your responsibility to ensure that the stay lath holds, that during concreting no movement is taking place and finally any problems connected with falsework movement must be investigated by you promptly. There has been a fetish on this contract that the prime consideration is to place concrete, the question of whether the final results are satisfactory to the Board or to your own reputation is of lesser importance.

I have discussed with you the various disturbing factors which arise from these troubles i.e. effect on door guide levels, low column holding down bolts and probable unsound construction in the beams, which may not be apparent after removal of falsework.

In the light of these factors, I would confirm my directions to you following our discussions on the 22nd. and 23rd. December, 1959 viz.

1. I will not accept the concrete deck pours of the 18th. and 21st. December until you can establish to my satisfaction that settled beams are of sound construction.
2. The question of rectification of deck surface to correct levels will be taken further, contingent on the results from 1 above and further investigation on adjacent concrete.
3. The future support of falsework must be positive.

I trust this matter will be given your most earnest attention.

Yours faithfully,

NS.DMW.

Construction Engineer.

Auckland Harbour Board

26834

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 16th December 1959

Subject FREYBERG WHARF - CONTRACT 1580

Further to Instruction No. 26812 the ducts shown running under the rail tracks across the north end of Monash Street are now to be sited in the foot-path on the west side of Monash Street.

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 £ : :

26834

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board 26826

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 14th December 19 59

Subject FREYBERG WHARF

Referring to the drawings E.801 of the deck details please make the following amendments:-

1. For the positions of the door guide troughs for the quayside shed doors for 19" read 18".

2. Form, in addition to the troughs, holes for tower bolt plates at each door opening.
The above amendments are described on the enclosed un-numbered drawing.

3/. At the doorway in the shed end at row 42 (Drawing E.801/18) provide ramping through the doorway as at the South end.

4. Sheet 801/12 Row 26. Provide a 3" diam. cored hole centrally below the door guard post to the southern side of the opening. The hole will accomodate telephone wiring.

Encl. 2 copies un-numbered drawing.
4 copies E.801/18 amended.

JRS:ML.

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 £ : :

26826

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

26812

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 9th December 19 59

Subject FREYBERG WHARF SERVICES

Please arrange with the Contractor to provide the electrical and water services as shown on Drawing E.881/2 and for him to include the additional water meter in the Bill of Quantities.

Encl: 4 copies Drg. E.881/1

PSH:HEB

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 £ : :

26812

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

26757

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 19th November 19 59

Subject FREYBERG WHARF APPROACHES

CODE NUMBER
070 | 698 | 10-19.

Please demolish the concrete convenience building adjacent to the Eastern Vehicular Ferry landing, preparatory to carrying out formation work for the wharf approach.

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 £		:	:

26757

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

26746

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 17th November 1959

Subject CONTRACT 1580 FREYBERG WHARF

Please arrange with the Contractor to seal and drain this summer the area edged in red on the accompanying drawing No. E.881/1.

Encl: 6 copies Drg. No. E.881/1

PSH:MEB

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 £ : :

26746

REMARKS: _____

Signature _____

E10

Date _____ 19

Construction Engineer's Office,
16th. November, 1959.

The Project Manager,
Wilkins & Davies & Netherland Harbour Works,
Freyberg Wharf Site,
AUCKLAND. C. 1.

FREYBERG WHARF - CONTRACT 1580.
SUPPORT OF FALSEWORK.

Dear Sir,

I wish to confirm my verbal discussions with Mr. R. Bakewell and yourself with regard to the unsatisfactory situation that exists with falsework movement and damage to the piles by your methods of endeavouring to support the falsework.

When slipping of the falsework first ocurred an endeavour to increase the frictional resistance by further timber yoking was tried, which did not prove successful. You will recall you approached me on 7.10.59 to permit yoking with pins which I accepted subject to your assurance that no damage apart from a hole for the pin was done to the pile. At that time I considered that there was only one positiv method which employed a pin right through the pile with brackets, but you considered this unsuitable and assured me that your method would be satisfactory in all respects

On the 30.10.59 I advised Mr. Bakewell that it had been noted after the removal of yokes, that excessive spawling was showing at the pin holes. His opinion at that time was that the drilling bit was responsible, and would not accept that the pins were too tight, so that on extraction and probably entry were inducing spawling. He undertook to improve the situation.

On the 11.11.59 we noted that you had changed the system of pinning under the caps in the shed area, but the results showed no improvement from the point of view of damage to piles. This was discussed with Mr. Bakewell on the 4th. November and I advised that he must find a more acceptable method either by friction or oversize pins.

Today I inspected under the deck pour and found that the majority of the singe pins were forced down, damaging concrete to the pile faces and permitting an excessive movement downwards of the falsework.

While I am appreciative of your difficulties, I have been most patient in this matter, but I cannot permit the present situation of experimentation and unsatisfactory results to continue.

Todays pour in the shed area indicates that very little reliance can be placed on friction with the piles in the waxed condition. I would refer you to the first sentence of paragraph 12 of the Specification relative to formwork, and advise that I will not permit any further concreting of deck until you can give me your written assurance that this will be complied with, and there will be no unnecessary damge to piles.

Yours faithfully,

NS.DMW.

Construction Engineer.

THE CONSTRUCTION ENGINEER: Copy for your information. This increase may be allowed to the Contractor in terms discussed by you with Mr. Taylor.

12th November, 1959.

The Project Manager,
Messrs. Wilkins, Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF

Receipt is acknowledged of your letter Ref. 41C1/A.H.B. No. 821 dated 6.11.59 advising in terms of Clause 69 of the Contract of an increase in wages under the General Order of the Court of Arbitration.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEB

Auckland Harbour Board

MEMORANDUM 6th. November, 1959.

FROM CONSTRUCTION ENGINEER. **TO** ENGINEER.

FREYBERG WHARF.

Increase in Labour Rates.

Herewith letter from the Contractor dated 6th. November advising of the increase in wages due to the recent general wage order.

Construction Engineer.

Mr Taylor.

Acknowledged Auc. 11.11.59.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41C1/AHB NO. 821 DATE Nov. 6th 1959.

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

Dear Sir,

Under the terms of the escalation clause of our Contract, we wish to advise that, in accordance with the general wage order of the Arbitration Court, an increase in wages took effect on and from 12th October 1959 as follows :

15/7d. per full week of 40 hours or 6% on ordinary time for a part week.

This increase will also apply to four (4) members of our staff covered by an Award, as listed hereunder :

Storeman, Pay Clerk, Typists (2)

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh.

A.J. Lindenbergh,
Project Manager.

MDS/JEM.

6.11.59.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41C1/AHB NO. 801 DATE Nov. 2nd 1959.

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

Dear Sir,

Re Contract No. 1580 - Freyberg Wharf - Piledriving.

We acknowledge receipt of your letter of 13th October 1959.

Having consulted our principals on this subject, we wish to refrain from further discussions until we have received their views regarding this matter.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41 C1/A.H.B. NO. 798 DATE 28th October, 1959.

The Chief Engineer,
Auckland Harbour Board,
AUCKLAND

Dear Sir,

re;- Contract 1580 - Freyberg Wharf
Services on the Reclamation

We would like to remind you that we have not yet received your definite information regarding the services on the Reclamation.

Details about the drainage system on the Western Reclamation are urgently required in order to enable us to place an order for the pipes, fittings, etc.

The delivery will take some time and as we explained to your Construction Engineer last week we wish to make use of the good season to lay the drains, and any further delay would upset our programme.

Trusting that this matter has your urgent attention,

we remain,

Yours faithfully,
for: WILKINS DAVIES & NETHERLANDS HARBOUR WORKS

A.J. Lindenbergh
Project Manager

AL.

Auckland Harbour Board

MEMORANDUM

28th. October, 1959.

FROM

CONSTRUCTION ENGINEER.

TO

ENGINEER.

FREYBERG WHARF.

Reclamation Services.

Herewith letter from the Contractor dated 28th. October, requesting detail of drainage and services in the western section of the reclamation to facilitate ordering of materials.

I have advised the Contractor that these matters are being given urgent attention.

Seagar.

Construction Engineer.

Mr Smith.

Mr. Hutchinson / [illegible] Instruction Sent

NS.DMW.

16th October, 1959.

Mr. P.E. Ellen,
N.Z. Portland Cement Association,
P.O. Box 969,
WELLINGTON

Dear Sir,

FREYBERG WHARF

Thank you for your letter 30th September forwarding a report on your observations on the problem of shrinkage cracks which have appeared on the upper surfaces of piles shortly after casting. I understand that Mr. Seagar has received a copy of this and that he will be writing to you separately in acknowledgement of it and the additional information concerning dry mix filling of holes which you also furnished.

Yours faithfully,

DEPUTY CHIEF ENGINEER TO THE BOARD

JAG:HEB

Copy to the Construction Engineer

13th October, 1959.

The Project Manager,
Wilkins, Davies and Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND

Dear Sir,

CONTRACT NO. 1580 - PILEDRIVING

I acknowledge receipt of your letters (Nos. 735 and 736) of 24th September, 1959.

As discussed at length with you and Mr. Milne on 1st October, I have not changed the opinion set out in my letter to you of 7th September.

The whole question of piledriving as discussed with you on 1st October is, of course, closely associated with your letter of 24th September re piles cracked or damaged during driving. As I pointed out, you have contracted to build this wharf in accordance with our specification. Clause 21 of the specification clearly states our requirements for pitching and driving concrete piles, and I consider that strict compliance should be within the capabilities of an experienced contractor.

In certain instances, where a pile has been slightly cracked during driving, instead of requiring it to be removed and replaced with a sound pile as specified, the Engineer's Representative is prepared to have the defect made good in an approved manner.

I am of the opinion that this does not provide any grounds for the formulation of a claim for extra payment. On the contrary, it is a concession which, as I pointed out, is being applied to too many piles in the earlier part of the work.

I trust that as a result of our discussion on 1st October, some modification in your method of driving will enable you to overcome this difficulty over the remaining portion of this Contract.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

JRS:HEB

FILE COPY

"A" INSTRUCTION 26650A

Auckland Harbour Board

MEMORANDUM 1st October, 1959.

FROM THE CHIEF ENGINEER

TO The Designing Engineer, Mechanical Engineer, Electrical Engineer, Construction Engineer. G1

INSTRUCTION NO. 26650A

FREYBERG WHARF PROJECT

In confirmation of discussion at staff conference on 29.9.59 the Target Programme for the above project is as set out below.

Please arrange your responsibilities accordingly and keep me informed on any factors effecting this target programme.

1. Construction of Freyberg Wharf (Contract 1580)

   (a) Western berth including roadway rail and other services ... ... complete by October 1960

   (b) Eastern berth and whole contract ... ... complete by April 1961

2. Freyberg Wharf Sheds

   (a) Western shed including power supply to cranes . complete by August 1961

   (b) Eastern shed including power supply to cranes . complete by May 1962

   Tenders for the Shed contract should be advertised and arranged to enable a tender to be accepted in May 1960.

3. Administration and Amenities Building including sub-station

   The completion of this building should coincide with that of the Western Shed .. ... complete by August 1961

   Planning and preparation of contract documents should be arranged so as to enable a tender to be accepted in June 1960.

4. Gates and Fences, Toll Clerks Office and Platform, Gatekeeper's Hut

   These items as effecting the Western berth should be completed by August 1961.

5. Quay Cranes

   (a) Western Berth. The removal of cranes from existing locations should be commenced in time to suit availability of Western berth for erection (i.e. October 1960) and to be complete by August 1961.

   (b) Eastern Berth. Planning and preparation of contract documents should be arranged so as to enable a tender to be accepted in April/May 1960 for completion by May 1962.

... ...

Note on Item 3. The Port Amenities Committee has been asked to make known the scope of their requirements for Cargo Workers by the end of October. Chief Assistant Engineer is arranging.

Note on Railways. Deputy Chief Engineer is arranging with the Railways Department to expedite agreement on rail layout; first as effecting Freyberg Wharf and secondly as effecting the exchange sidings.

CHIEF ENGINEER TO THE BOARD

Also sent to:
Designing Engineer
Mechanical Engineer
Electrical Engineer
Construction Engineer

Copy sent to:
Deputy Chief Engineer)
Foreman of Works) for information
G.M.'s File)

RAJS:HEB

TELEPHONE 40-760 102 FEATHERSTON STREET, WELLINGTON, C.1., NEW ZEALAND P.O. BOX 969

N.Z. PORTLAND CEMENT ASSOCIATION

MEMBER COMPANIES:
WILSONS (N.Z.) PORTLAND CEMENT LTD.
GOLDEN BAY CEMENT CO. LTD.
MILBURN LIME & CEMENT CO. LTD.
TELEGRAMS: PORTCEMENT

GENERAL MANAGER:
M. A. CRAVEN, B.E., (HONS.), A.M.I.C.E., A.M.A.M.SOC.C.E., A.M.N.Z.I.E.

PEE:JCW

September 30, 1959.

Mr. J.A. Goodsir,
Assistant Chief Engineer,
Auckland Harbour Board,
P.O. Box 1259,
AUCKLAND.

Dear Mr. Goodsir,

At the request of Mr. N. Seagar, I visited on Thursday September 24, the construction work being done on the Freyberg Wharf. Mr. Seagar was concerned at the cracking of the concrete which was being placed in the reinforced concrete piles.

It would appear that this cracking was being experienced soon after placing of the concrete and it would travel longitudinally down the pile immediately above the upper most reinforcing and at any other section such as the lifting anchorages.

On Friday September 25, I accompanied Mr. H.W. Cormack, General Manager of Certified Concrete Ltd. Auckland to inspect the placing of concrete in these piles, and to observe when cracking occurred, and to what extent.

The formwork for these piles consisted of wooden inserts between which the first pile was placed. The next day these inserts were removed and a second pile was cast between those placed the previous day. These piles were being cast on a concrete bed.

The concrete that was being placed on the morning of the inspection was of good quality, it handled easily, and responded to vibrations in an excellent manner. The operator of the vibrator ensured thorough compaction by conscientious use of the vibrator. However, one quarter hour after placing the concrete, it was apparent that severe "bleeding" was taking place. This "bleeding" is caused by the excess water over that which is required for hydration of the cement, migrating to the outside surface of the concrete, where it is generally dispersed.

Designing Engineer,
File please after you have perused. JJ

In this case where concrete moulds are being used or wooden moulds of very low absorption, the only outlet for this water is on the upper surface of the pile.

For well designed concrete mixes, some "bleeding" must always take place, but this "bleeding" can be limited to a very low figure. Where concrete is being placed in wooden moulds, or on their surfaces having say, 1 - 5 percent absorption, this "bleeding" water is quickly dispersed. In this case however, not only is the "bleeding" water excessive but it cannot be dispersed. It therefore collects on the upper surface of the pile and causes a volumetric displacement of the concrete. On the morning of the inspection this free water was accumulating to a depth of $\frac{1}{4}$ - $\frac{3}{8}$ of an inch which resulted in the concrete surface settling by this amount. On evaporation of this water, cracks in the upper surface of the concrete were then displayed. These cracks are caused by the concrete settling around the reinforcement and possibly producing voids on its undersides. It is therefore imperative that this "bleeding" and settlement of the concrete be reduced to an absolute minimum.

The use of entrained air can control this type of cracking to a considerable extent as the free water available for "bleeding" is considerably reduced and the remainder is held in the concrete by minute bubbles of entrained air. The incorporation of air entrainment would necessitate the re-designing of the concrete mix proportions and at this stage it may be oportune to revise therefore, the grading of the fine aggregate, or its percentage in the concrete.

When this free water accumulates on the concrete the top two inches of the concrete will usually have different physical properties to that of the remainder. It will have a higher water - cement ratio and hence a lower durability. Re-vibration might be applied to this concrete after all the free water has evaporated, ensuring complete compaction and a concrete having similar characteristics to that at a greater depth. Re-vibration when free water is still on the surface of the concrete will recombine this water and produce a concrete having a very high water - cement ratio and low durability. This is undesirable. Generally however, re-vibration is difficult to control and therefore elimination of "bleeding" water must be the first step, either by air entrainment and/or fine aggregate grading and percentage used.

This type of cracking is more pronounced in cool weather than in hot. As in the latter case the water is quickly evaporated from the upper surface and the absorption of the moulds is higher. Therefore, settlement takes place while the concrete is still plastic and can flow around the reinforcing bars without damage. In cool weather the evaporation of water is slow. The concrete has gained some strength and cannot flow around the reinforcing bars without cracking.

Another form of plastic cracking occurs under hot weather conditions where water is very quickly evaporated from the upper surface of the concrete resulting in differential shrinkage between the upper skin and that concrete immediately below. This differential shrinkage produces cracks which may be in any position on the upper surface of the concrete. They will however, tend to be over the reinforcing as they may be combined with settlement cracks. At the time of inspection there was no evidence of this latter form of plastic cracking. However, it could result during the summer months. There is no cure for this type of cracking other than preventing evaporation of water from the surface of the concrete after the concrete is finally finished. A curing compound containing a suitable concrete reflectant material or some form of jute covering kept continuously wet will prevent this trouble.

I have enclosed two copies of our bulletin ST. 11 "Effects of Entrained Air on Concrete", for your information.

I telephoned some of these comments to Mr. Seagar prior to my departure from Auckland last week and I hope will be of assistance to you in preventing this longitudinal cracking which in my opinion can be detrimental to the quality of the piles.

Yours faithfully,

P.E. Ellen

P.E. Ellen,
Engineer.

Enc.

N.Z. PORTLAND CEMENT ASSOCIATION
C.P.O. BOX 969 - - WELLINGTON
ST. 11

EFFECTS OF ENTRAINED AIR ON CONCRETE

INTRODUCTION

EXPERIENCE in field and laboratory has conclusively demonstrated that durability and other properties of concrete are materially improved by the purposeful entrainment of from 2 to 6% air. Purposeful entrainment of air is accomplished by adding an air-entraining agent to the concrete mix, which results in the dispersion, throughout the mix, of non-coalescing spheroids of air having diameters of from 0.003 to 0.05 in. The amount of air entrained is a function of the quality of agent added and of the grading of the fine aggregate.

Since air content has an important effect on water content and also affects cement content to some extent, the effects of these three factors on the properties of concrete are considered together.

EFFECTS ON WORKABILITY

Entrainment of air greatly improves the workability of concrete and permits the use of aggregates less well graded than are required if air is not entrained. This explains why it is possible, and usually desirable, to reduce the sand content of a mix in an amount approximately equal to the volume of entrained air. Entrained air reduces bleeding and segregation and facilitates the placing and handling of concrete. Reduced bleeding permits finishing of concrete surfaces earlier and usually with less work. Each 1% of entrained air permits a reduction in mixing water of from 2 to 4%, with some improvement in workability and with no loss in slump.

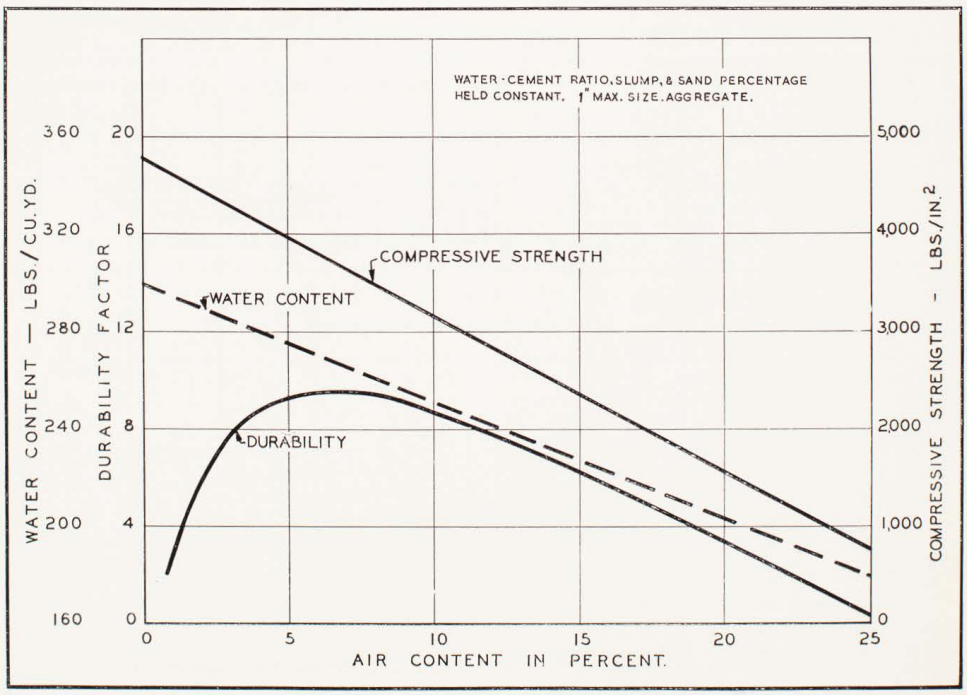
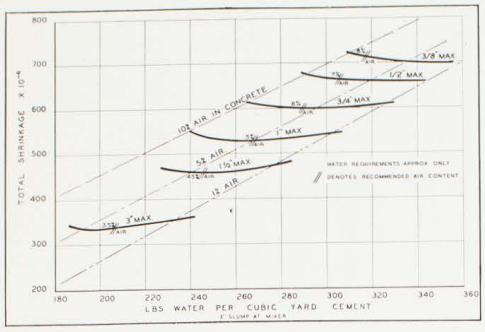


Fig. 1: Effects of air content on durability, compressive strength and required water content of concrete. Durability increases rapidly to a maximum and then decreases as the air content is increased. Compressive strength and water content decrease as the air content is increased.



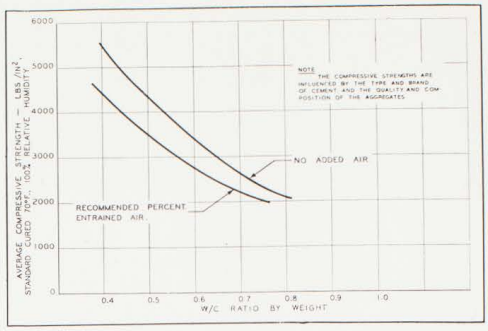
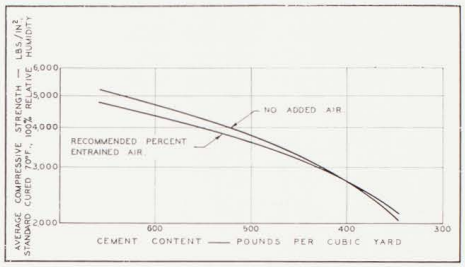


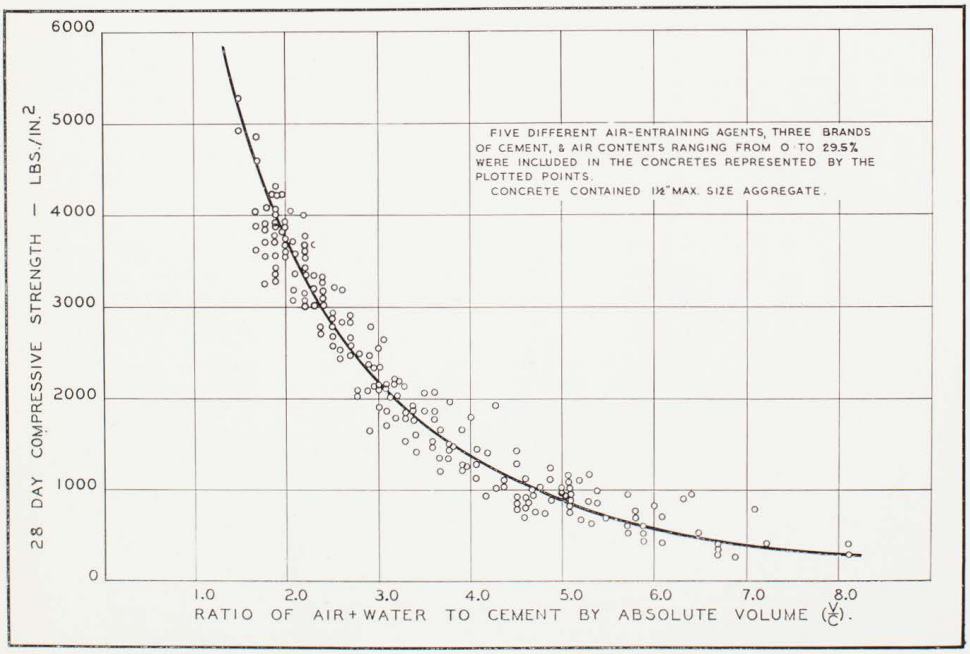
Fig. 4: Drying shrinkage of hardened concrete in relation to total water content of concrete for various air contents and maximum size aggregates.
(above)

Fig. 5: Strength in relation to water-cement ratio for air-entrained and non-air-entrained concrete.
(above right)

Fig. 6: Strength in relation to cement content for air-entrained and non-air-entrained concrete.
(right)

Fig. 7: Compressive strength of concrete in relation to voids-cement ratio.
(below)





EFFECTS ON DURABILITY

Entrainment of from 2 to 6% air, by use of an air-entraining agent, increases considerably the resistance of concrete to the disintegrating action of freezing and thawing. The entrained air, which is dispersed throughout the concrete in the form of minute, disconnected bubbles, provides spaces where forces which would cause disintegration can be dissipated.

The effects of various percentages of entrained air on the resistance of concrete to freezing and thawing are indicated in Fig 1. Fig 2 shows that, within the range of water-cement ratios generally used, concrete containing ¾ in. maximum size aggregate and 4% air is several times as durable as similar concrete without entrained air; also, that low water-cement ratios contribute considerably to the durability of concrete. A mix containing larger aggregates has lower mortar content and consequently a smaller optimum percentage of entrained air, inasmuch as the percentage of air in the mortar matrix is not greatly affected by the size of the coarse aggregate. Entrained air also contributes to the durability of concrete because it reduces the water channel structure in the hardened concrete by reducing segregation and bleeding in the fresh concrete.

Reduction in the water-cement ratio materially increases the resistance of concrete to sulphate attack. Test results indicate that entrained air up to 6%, slightly increases the resistance of concrete to chemical attack. This improved resistance is undoubtedly effected by the increased water-tightness due to the reduction in water channel structure.

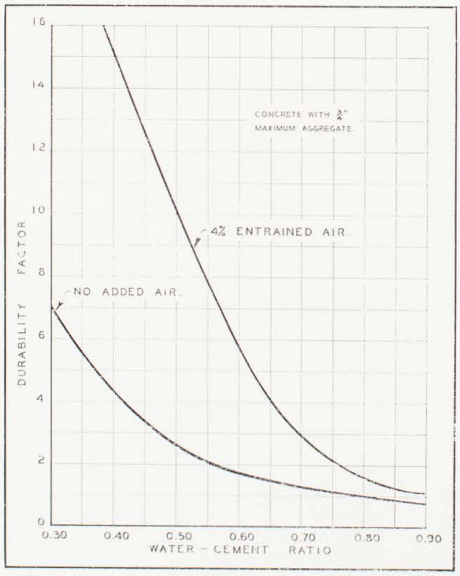


Fig. 2: Relation between durability and water-cement ratio for air-entrained and non-air-entrained concrete. High durability is associated with use of entrained air and low water-cement ratio.

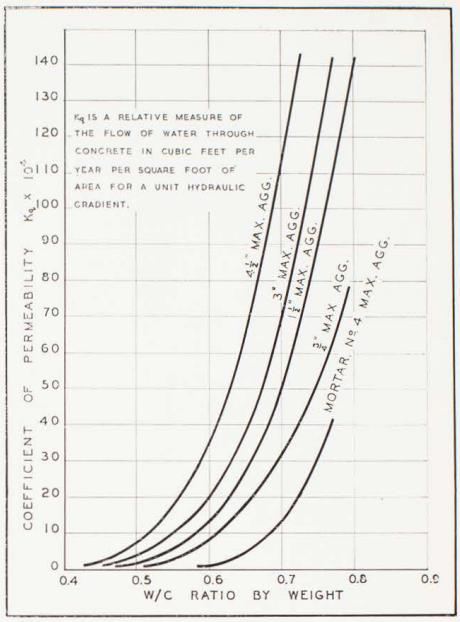


Fig. 3: Relation between coefficient of permeability and water-cement ratio for mortar and concretes of 4 maximum size aggregates. Relatively low water-cement ratios are essential to impermeability of concrete.

The resistance of concrete to erosion is related to its compressive strength; therefore, the resistance to erosion is increased as the water-cement ratio is decreased. When air entrainment results in a reduction in strength, the erosion resistance of the concrete is likewise reduced.

EFFECTS ON PERMEABILITY

The pronounced effect of water-cement ratio on the permeability of concrete is depicted in Fig. 3. Note that the permeability increases rapidly for water-cement ratios higher than 0.55 by weight.

Water-pressure tests on concrete containing entrained air show that the permeability of concrete is not appreciably affected by entrained air in the percentages ordinarily used in concrete construction if the water-cement ratio remains unchanged.

Results of tests of lean mass concretes containing pozzolanas indicate increased resistance to the flow of water when these finely ground pozzolanas are used.

EFFECTS ON VOLUME CHANGE

The drying shrinkage of concrete is governed mainly by the unit water content. The cement content of mix has very little effect on the drying shrinkage except as it may influence the water

requirement. Ordinarily this effect is small.

Fig. 4 reveals that the drying shrinkage of concrete increases with the water content. This figure also shows that as the entrained air content of the mix is increased the drying shrinkage increases. However, because entrainment of air permits a reduction in water with no reduction in slump, net shrinkage of the concrete is not appreciably increased. This fact is demonstrated by the curves for concrete mixes using various maximum size aggregates.

EFFECTS ON STRENGTH

Investigations involving thousands of tests and extending over a long period of time have demonstrated conclusively that the most important factor influencing the strength of concrete is the water-cement ratio. The typical graphs in Fig. 5 show how the strength of concrete varies with the water-cement ratio. For a given water-cement ratio the strength of concrete is reduced about 20% for recommended air contents, but where the percentage of air is held constant, as is usually the case for any given maximum size of aggregate, the strength of concrete varies directly with the water-cement ratio.

Entrainment of air in a concrete mix permits use of less water with no reduction in slump. Therefore, by keeping the cement content constant, the water-cement ratio will be decreased enough so that very little, if any, reduction in strength, within the practicable range of mixes, will result from entrainment of air (see Fig. 6). Note from this figure that, by the entrainment of air, richer mixes are reduced in strength more than leaner mixes, and very lean mixes are slightly increased in strength where the cement content is held constant.

The strength is also a function of the voids-cement ratio, v/c as shown in Fig. 7. In the voids-cement ratio, the term c represents the absolute volume of cement in a unit volume of concrete. The term v represents the total voids in a unit volume of concrete; that is, the combined volume of the water and the air voids.

EFFECTS ON ELASTICITY

Although modulus of elasticity is not directly proportional to strength, concretes of higher strength usually have higher elastic moduli. Thus, the modulus of elasticity generally increases with a decrease in water-cement ratio or air content.

EFFECTS ON CREEP AND EXTENSIBILITY

Indications are that creep and extensibility are increased to some extent as the air content or the water-cement ratio is inceased.

EFFECTS ON THERMAL PROPERTIES

The thermal properties are not materially affected by changes in air, cement, or water content within the range of practicable mixes. However, the conductivity of concrete does vary inversely as the air and water contents and directly as the cement content.

EFFECTS ON UNIT WEIGHT

The unit weight of concrete is reduced in direct proportion to the amount of air entrained. An increase in water content tends to decrease the unit weight. An increase in cement content will increase it.

Auckland Harbour Board

26626

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 28th Sept. 19 59

Subject FREYBERG WHARF - RAKER PILES

The proposal set out in your memorandum of June the 11th is satisfactory.

Please arrange with the Contractor accordingly.

(a) Rakers 56D and 63D be resited at positions 56C and 63C.

(b) To avoid the possibility of toes fouling, the four rakers be driven at a rake of 1 in 3.5.

PSH:HEB

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 £ : :

26626

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

MEMORANDUM 28th. September, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Herewith various correspondence from the Contractor.

1. 41C1/AHB. 736 24.9.59. Driving Concrete Piles.
This matter was discussed verbally with you and I have arranged with the Contractor for a further meeting with you, the date to be advised.

2. 41C1/AHB. 734. 24.9.59. Sheetpiling Surplus.
I have advised the Contractor that the value of this excess sheetpiling will be maintained as an advance on materials until a later date.

3. 41C1/AHB. 735. 24.9.59.
I have advised the Contractor the proposal for repairs is acceptable subject to certain additional requirements. The matter of the responsibility, cost of repairs and forwarding of a claim for this work will require to be resolved.

Construction Engineer.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41C1/AHB NO. 736 DATE Sept. 24th 1959.

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

Dear Sir,

Contract 1580 - Freyberg Wharf - Driving Concrete Piles

We acknowledge receipt of your letter 927/1 dated September 7th 1959 informing us that, in your opinion, the conditions envisaged in Clause 12 (2) have not arisen.

We, however, do not base our claim entirely on Clause 12 (2) but also on Clause 13 in which it is said that "the contractor shall adhere strictly to the Engineer's instructions and directions on any matter".

As stated in our letter No. 610, we chopped the holes to the depth required in accordance with the specific instructions of the Construction Engineer. As he was presumably in the possession of all the information regarding the harbour bed conditions, we maintain it is the Harbour Board's responsibility. Surely we are not in a better position to foresee the ground conditions and the resulting failure of the piles than the Construction Engineer.

The first piles in this group driven into the embankment along the trench were driven satisfactorily but the next two piles B.11 and B.12 apparently were either too close to the edge of the trench or the embankment was disturbed by previous blasting operations. There is no satisfactory way of checking this.

In addition we would point out that chopping holes is a provisional item measured on a footage basis and at the Engineer's direction.

Would you please reconsider our claim in the light of these further submissions.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 4101/AHB NO. 734 DATE Sept. 24th 1959.

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

Dear Sir,

Re: Contract No. 1580 - Freyberg Wharf - Sheetpiles.

Due to an alteration in the design a certain quantity of sheetpiles is left over. Your Construction Engineer informed us that the A.H.B. has no particular use for these sheetpiles and, therefore, is not interested in taking them over.

We will try to sell this quantity but if this would not bepossible for a reasonable price, we would ask you to agree that the A.H.B. take over these piles at the end of the contract for a price which would cover our costs.

In the meantime, we would prefer not to return the advance given on this material as long as they remain on the site.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

by Seaga
already dealt with
as requested.

Encls.
List of Sheetpiles available.

SHEETPILES LEFT OVER FROM THE FREYBERG WHARF.

Frodingham No. 5

4 doubles	20'	length
2 "	10'	length

Frodingham No. 3

24 doubles	20'	length
16 "	10'	length
1 single	27'	length

AUCKIAND
21/9/59.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 4101/AHB NO. 735 DATE Sept. 24th 1959.

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

Dear Sir,

Re: Contract No. 1580 - Freyberg Wharf - Repair of Cracked Piles.

Re your request to receive our proposal for repairing the cracked piles, we herewith enclose our suggestions.

We must point out, however, that these cracks are caused by conditions beyond our control as we are taking all possible precautions to prevent them.

We will keep our costs of repairing cracks in piles separate and will afford your officers the opportunity to audit these without prejudice.

The total cost at the end of the contract will be formulated in an extra claim.

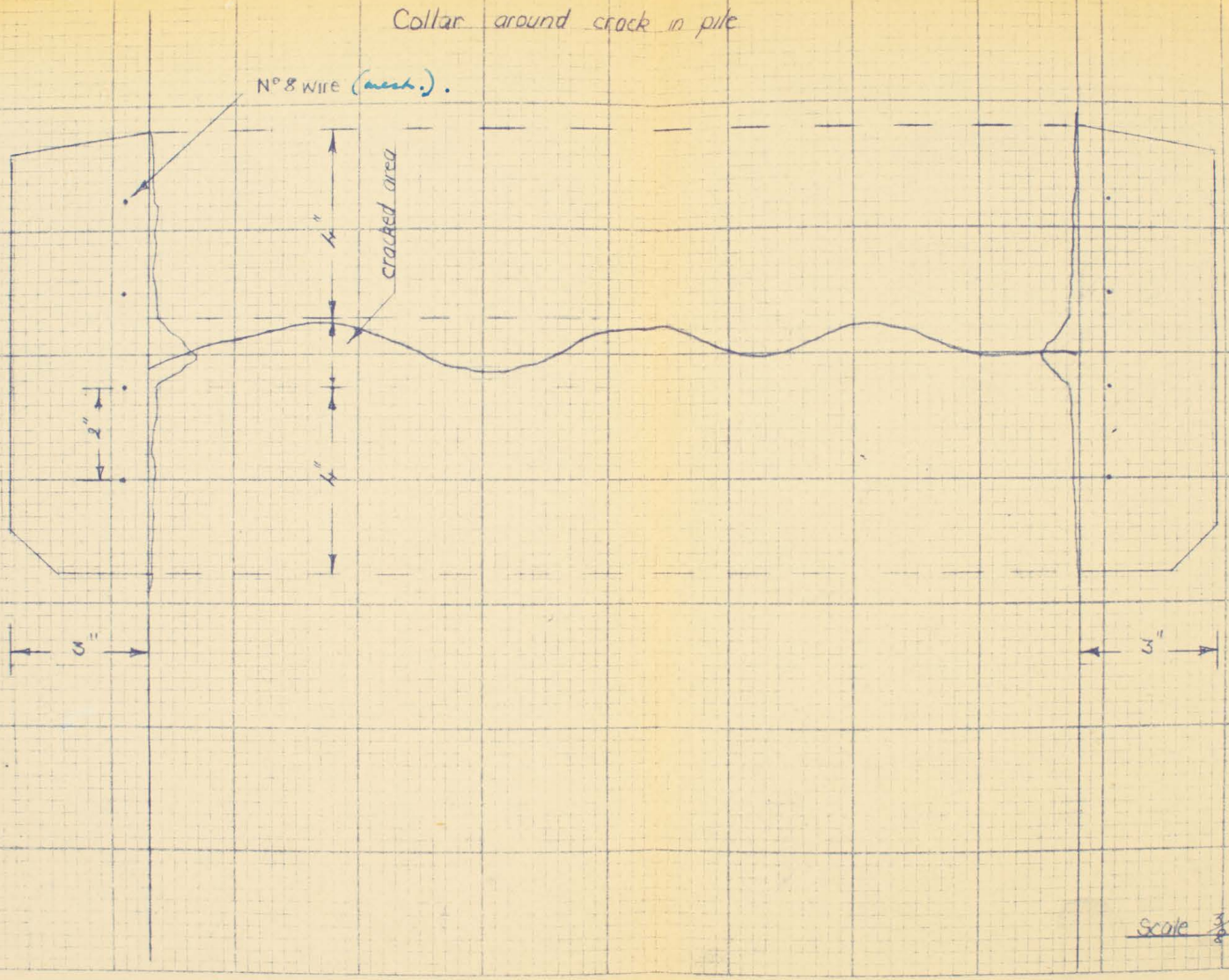
Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh

A.J. Lindenbergh,
Project Manager.

Encl.

Collar around crack in pile



Scale $\frac{3}{8}$ = 1"

11th September, 1959.

The Project Manager,
Wilkins, Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF

I have to acknowledge receipt of your letter of 25.8.59 in which you comment on the equilibrium of the sand mattress and stone bank.

The design of the sand mattress has been based on extensive shear vane tests not included on Drawing E.774/1 and 2. A summary of these tests is shown on Drawing S.1318/1.

These vane tests indicate a minimum strength below 30' L.W.S.T. of 485 lbs. per square foot in only one location and in the main material in excess of 1,000 lbs per square foot below that level.

These results are higher than indicated by Bore No.8 which must have been in disturbed ground or a very local pocket of silt.

Using the results of the vane tests the sand mattress has been designed to have an adequate factor of safety when analysed both for failure by sliding and a slip circle failure.

I thank you for the interest you have shown in the matter, and also enclose a copy of a paper recently presented to the Local Branch of the N.Z.I.E., by my Designing Engineer, Mr. P.S. Hutchinson, which I trust you will find of interest.

Yours faithfully

CHIEF ENGINEER TO THE BOARD

Encl: Copy Drg. S.1318/1
Copy of "Aspects of the Design of Freyberg Wharf for the Auckland Harbour Board

927/5

7th September, 1959.

The Project Manager,
Messrs. Wilkins, Davies & Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT 1580 FREYBERG WHARF -
DRIVING CONCRETE PILES.

I acknowledge receipt of your claim re piles B.11 and B.12 and have noted the contents.

I presume that the claim is based on the provisions of Clause 12 (2) of the General Conditions of Contract. In my opinion the conditions envisaged by this clause have not arisen and therefore I cannot allow the claim.

The Contractor's responsibilities in the matter of piledriving are set out in Clauses 20, 21 and 22 of the specification.

I shall, however, authorise payment for the chopping of the holes concerned.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

JRS:HEB

Mr. Sutton re attached.

1. Presumably the Contractors claim for payment & extension of time is lodged under Cl. 12.(2) The courses open to the Engineer are, then as in Cl. 12.(4).

2. The Contractor's letter is intentionally addressed to the Chief Engineer — the Resident Engineer is referred to in its text

3. The Contractor's claim for extra payment & time is based on the provision in Cl. 12.(2) for unforeseeable ~~extraord~~ extraordinary ground conditions

4. Since such is not the case the claim should be disallowed

I suggest the reply be sent by Consltg. Eng saying that

(a) the claim is noted but not allowed since the conditions envisaged by Cl. 12.(2) have not arisen

& (b) the Contractor's responsibilities are, in the matter of pile driving, as set out in Spec Cl. 20, 21 & 22.

[signature]

28.8.59.

Auckland Harbour Board

MEMORANDUM 28th. August, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.
Sandmattress & Stone Bank.

Herewith letter from the Contractor dated 25th. August with Drawing No. 66, concerning a condition of possible instability of the sand mattress and problem of consolidation.

The initial thoughts on this matter was prompted by the phenomena of piles on Rows I & J from Rows 14 - 20 being driven through the sandmattress, and when the toe of the pile left the base of the mattress it proceeded down to sandstone under its own weight at a considerable velocity. This condition also occurs on Rows G & H which of course is only to be expected as thickness of the mattress compared to the material underneath is small and the pile must behave after passing through the sand as if there was no sand present and the pile would move down under its own weight until sufficient resistance for support was encountered near the sandstone.

I was somewhat concerned when this phenomena first occured on the Row J piles, but after discussion with the Designing Engineer, it was established that in this particular area the material under the sand mattress was of a low strength value, but the design and stability of the mattress was satisfactory for these conditions.

As pile driving has proceeded further out, piles on Row I & J have been of relativity firm driving after penetration of the mattress, but on Row G & H the condition still exists.

It is appreciated that the Contractor has interested himself in this problem, but I feel that he may have taken rather extreme conditions in his assessments and calculations. In fact I was quite surprised to discover that at some stage the central reclamation would become a pond behind enclosing banks. The reference to settlement of the sand mattress is also of interest, as the Contractor wishes to make the point that should the mattress consolidate during and after the formation of the stone bank and reclamation, any movement of the stone and damage to concrete work which may follow, should not be his responsibility to rectify. Whether this settlement situation will arise remains to be seen, however, I feel that there will be some consolidation and can only hope that it will not be excessive.

I have attached a drawing providing more specific information as to the dimensions of the sand mattress, site investigation data soil values strengths and the shape of banks etc. at Row 15 of the west quay which, is the area referred to and the section drawn by the Contractor.

I feel that the situation is not as critical as the Contractor believes, but as he still expresses some concern I trust that his concern can be allayed.

NS.DMW.

Construction Engineer.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO. 648 DATE August 25th 1959.

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

Dear Sir,

Contract 1580 - Freyberg Wharf - Equilibrium of Sand Mattress and Stonebank.

It has been noticed while driving piles into the sand mattress that the layer between the sand mattress and the rock has very little resistance and consists probably of soft silt. Some piles went through this layer with their own weight only and dropped about 15'. It seems to us that while the scoria causeway is being built and the mud pond enclosed, a dangerous situation might occur.

Specially at low tide the scoria fill and the fluid mud will exert a horizontal pressure which will not be counterbalanced by any opposite pressure from the berth side of the sand mattress where a trench to -35' has been dredged. The stability of the sand mattress depends, therefore, on the shearing resistance of the abovementioned soft silt layer.

A quick but simplified calculation will give the approximate shear value required as follows :

The equilibrium between AA and BB will be considered

Plane of failure : a horizontal plane at -30' L.W.S.T. (see attached cross-section - Dwg. No. 66)

The level of the mud pond is taken at + 12 L.W.S.T.

The mud is considered to be a liquid with a specific density of 1.3 x 62.4 lbs./c.ft. = 81-lbs./ft.

The horizontal force from the right per running foot is

$\frac{1}{2} \times (12' + 30')^2 \times 81\text{-lbs.} = 72{,}000$ lbs./ft.

The horizontal force from the left is

$\frac{1}{2} \times (30')^2 \times 62.4\text{-lbs./c.ft.} = 27{,}700$ lbs./ft.

....2.

With a safety factor of 1.5 the required shear resistance is

1.5 (72000 lbs./ft. - 27700 lbs./ft.) = 66500 lbs./ft.

The plane of shear is 180 ft. long.

Shear per sq. ft. is 66500 lbs./ft. : 180 ft. = 370-lbs.

Drawing E774/1 shows shear values from 230-lbs./sq.ft. to 610 lbs./sq.ft. which indicates that not everywhere would the stability be safe.

It could be said that the extra weight of the scoria fill and the stone-bank would increase the vertical pressure in the subsoil, but this would not necessarily increase the shear strength in the silt layers. Those layers are probably saturated and it could take a long time before sufficient water is drained off and the extra shear could develop. It would also mean that settlement of the sand mattress would continue for quite some time.

Just when we were about to write this letter, Mr. Seagar came to see us and while discussing this matter, he informed us that the mud pond would not at all be as high as shown on our drawing and there should be an opening left in the causeways for the tide to come in and go out. This would make the circumstances more favourable. Further, it was noticed that the piles in Row J do not go down as easily as the piles in Rows G and H. This indicates that the sand mattress in that area is resting on more stable soil which will probably have sufficient shear resistance to secure stability.

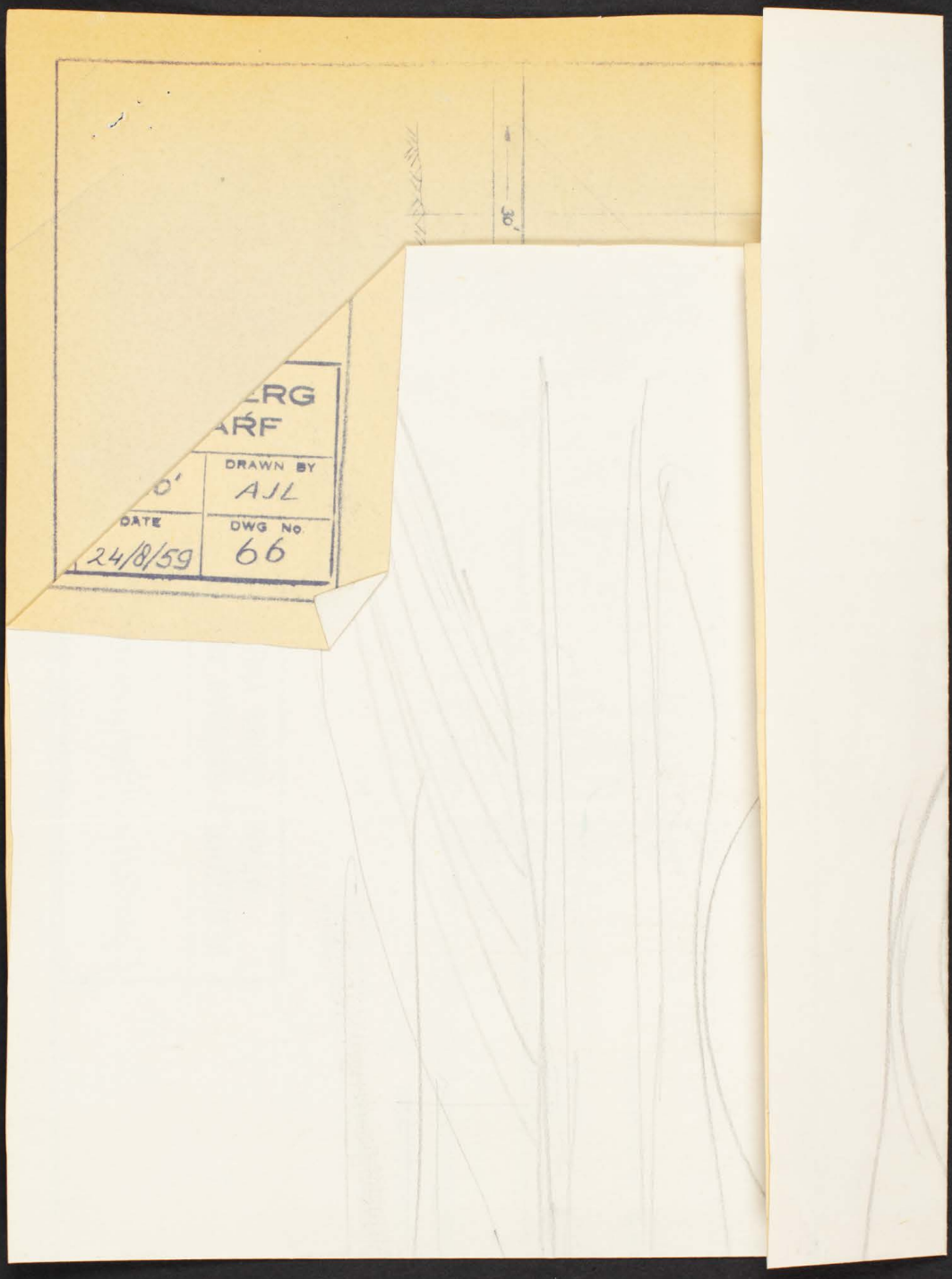
Nevertheless, we have forwarded our calculations because we are still a bit concerned about the situation.

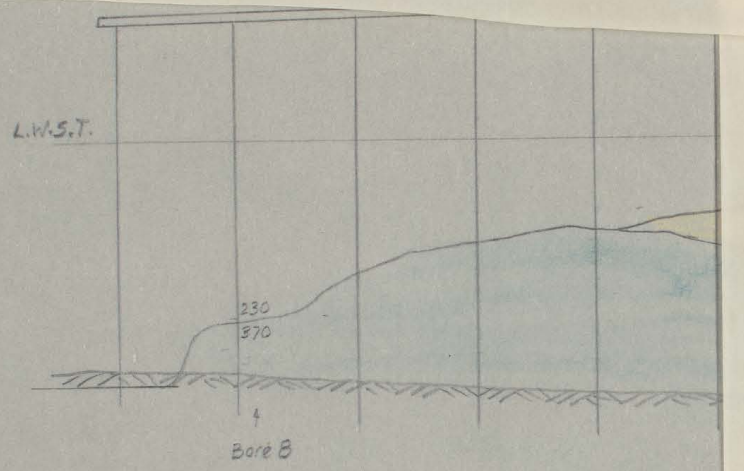
We have seen difficulties of a similar nature before and it is for this reason that we have given you our opinion on this subject. If so required, we will be glad to be of any assistance to you for making a further approach to this problem such as further site investigations or whatever you may think suitable.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A. J. Lindenbergh,
Project Manager.

Encl.
Drawing No. 66


30'
ERG
ARF
DRAWN BY
AJL
DATE
24/8/59
DWG No.
66



SECTION on ROW 15

1 inch = 20 feet

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO. 667 DATE August 31st 1959.

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

Dear Sir,

Contract 1580 - Freyberg Wharf - Wharf Services.

We acknowledge receipt of your letters Ref: 927/5 and 8 dated 12th and 26th August 1959.

Railtrack Crossings with Crane Track

We will forward drawings of the crane track crossing for your approval.

At the same time we will submit our quotation which will be based on a C.I.F. Auckland price subject to escalation similar to the other items of the railtrack mentioned in the Schedule of Materials.

Pipework

We will order the pipework according to the quantities mentioned in the Bill of Quantities. It is understood that extra costs involved due to alterations at a later stage would be subject to payment.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

AS.
Mr Hutchinson

Auckland Harbour Board.

Mr Smith.

I should be glad if you would read attached correspondence and my draft reply thereto.

① Do you consider my attitude fair & reasonable?

② would the ruling be better in the first instance from Construction Engineer?

S 14.

Auckland Harbour Board

MEMORANDUM 24th. August, 1959.

FROM CONSTRUCTION ENGINEER. **TO** ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Piles 11B & 12B. Damaged During Driving And Not Accepted In The Work.

Herewith a letter from the Contractor dated 17th. August submitting a claim of £ 433. 0. 0. for the cost of replacing 2/55' bearing piles, which I would not accept in the work.

My memorandum of the 13th. August which is attached sets out the procedure on chopped holes, damage and reasons for rejection of these two piles.

With regard to the Contractor's claim for reimbursement, I find it difficult to support it, but at the same time there could be extenuating circumstances with regard to ground conditions which may have to be considered.

For my part, I provided the Contractor with as much information as we had available on the contour of the sandstone at the trench sides, and have discussed with him the difficulty of driving piles in such conditions. I specified the depth that holes should be chopped, on the basis that all things being equal the end result should be satisfactory. With the exception of these two piles which were driven last, the remainder of the piles in chopped holes were quite satisfactory.

On the Contractor's part, he elected to chop the holes well in advance of pile driving, assuming that there would be no difficulties. There is a possibility that with his chopping bar the holes could have been out of plumb if there was a weakness on the trench side which would not have assisted the situation that developed. Finally he drove one pile and broke it, and the other pile such that the head moved 3'0" after lifting the helmet and badly cracked the pile. In both cases reputedly unaware that the piles were under considerable strain to be damaged as they were.

The responsibility of assessing ground conditions and behaviour of the pile during driving lays with the Contractor. I find it hard to accept that a competent pile driving foreman would not know that these two piles were not proceeding satisfactorily during driving.

I do not recommend that any payment be made for the two new piles provided. If you consider that there were extenuating circumstances with regard to ground conditions, then a payment of

a.	Chop holes not exceeding 7'0"	2 No. @ £ 23. 4. 0.	=	46. 8. 0.
b.	Redrive piles 55' long	2 No. @ 48. 10.0.	=	97. 0. 0.
				£ 143. 8. 0.

could be made.

I do not consider an extension of time of 3 days is warranted.

NS.DMW.

Construction Engineer.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: NO. 610 DATE August 17th 1959.

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

Dear Sir,

Re: Contract 1580 - Freyberg Wharf - Driving Concrete Piles.

While driving piles B.11 and B.12 along the edge of the blasted and dredged trench in the sandstone, more than usual difficulties were encountered.

To a certain extent some difficulties were expected by your staff and, therefore, instructions were given to chop holes to a certain level in Row B prior to driving piles which was done accordingly.

Nevertheless, after driving it appeared that pile B.12 was broken just above ground level and pile B.11 was leaning with its head 3-ft. to the East and was badly cracked.

Following discussions with the Resident Engineer both piles were pulled, the holes made wider, straightened and were chopped deeper than the toe of the previous piles, and new piles were pitched and driven satisfactorily.

As we explained to Mr. Seagar we find it hard to accept the responsibility for these difficulties which, in our opinion, are due to exceptional ground conditions in this area.

It might well be that, due to the blasting in the trench, the sandstone was fractured and when piles were driven into the embankment the toes moved with the broken up sandstone towards the trench and caused the piles to be broken or out of line.

We, therefore, submit the enclosed claim for your approval and apply for an extension of contract time of three days covering the delay involved.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

Item No.	Description	Quantity	Unit	Rate	Amount £	s	d
	CLAIM FOR PULLING PILES B.11 AND B.12 CHOPPING TWO HOLES AND SUPPLY AND REDRIVE TWO EXTRA PILES						
	Making piles 55' long	2	No.	£141.10/-	283	-	-
	Chopping holes exceeding 7' deep	2	No.	£27. -.-	54	-	-
	Redriving piles 55' long	2	No.	£48. -.-	96	-	-
	Total				£433	-	-
	Extension of time	Three days.					

Auckland
17/8/59

Auckland Harbour Board

MEMORANDUM 13th. August, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - PILEDRIVING.

Piles 11B & 12B.

On the 5th. August following the driving of pile 11B, on removal of the helmet, the pile head moved some 3'0" to the east and some 1'7" to the south. The pile showed signs of ease of movement by wave action and indicated that it could be badly damaged. I noted also that 12B while relatively satisfactory for head position showed the same tendencies.

An inspection by diver was made on the 6th. August and serious cracks with spawling was found on both piles from LW to sandstone. In addition pile 12B at sandstone level had major damage such that the diver was able to insert his closed fist an estimated 3".

These two piles are located on the bench above the trench which was blasted at the inner west quay. The level of the sandstone is about - 26' L.W.S.T. or 9" above trench level. Holes were chopped on the B line from Row 6 to Row 13 to permit the piles to be driven down with the maximum height of toe 5' above berth level, which would provide adequate support for the piles. The level of the bottom of chopped holes was about 29'0" L.W.S.T. which with the pile driven up to the shoulder would put the toe at -32' L.W.S.T. which was a satisfactory depth.

We have been driving piles to a set of ¼" with the Menck hammer on full drop in this area and the penetration into sandstone has been quite excessive which could indicate that the sandstone had a low strength value. This difficulty coupled with the possibility that the amount of sandstone on the trench side could have been less than at adjacent piles which have been driven satisfactorily, produced side failure as driving proceeded. Both piles drove some 6' below the bottom of the chopped hole and with the toe moving out to the berth and the head held severe bending and damage was done to the piles.

I advised the Contractor that these two piles were not accepted and would have to be replaced. After discussion of various methods to rectify he elected to remove the piles, trim up the sandstone with his chopping bar to give vertical holes and drive new piles.

Both the condemned piles have been inspected following removal and pile 12B has a complete failure 13' from the toe. The reinforcement on one side has buckled under compression and the concrete core of the pile had disintergrated. Pile 11B showed severe cracking throughout its length and the lower end slightly broken and out of line at 10' from the toe. However, if this pile had had to be pulled some 30" for satisfactory incorporation in its beam I would not be entirely satisfied with it.

Keegan

NS.DMW. Construction Engineer.

The Project Manager
Freyberg Wharf Contract

Now send

file

Dear Sir:

Contract 1580 – Driving Concrete Piles

I acknowledge receipt of your letter of 17th August. I am unable to accept your claim for £433 on account of difficulties which you experienced in driving piles B.11 to B.17.

Your responsibilities in the matter of piledriving are covered by clause 20, 21 & 22 of the specification, and any pile which is damaged during driving has to be replaced at your expense.

It is possible that your method of driving is such that your piledriving operator does not realise that a pile is tending to run out of position until after driving is completed and the restraint of the helmet is removed. This of course is often too late to have prevented serious damage to the pile. I prefer a rig and a method of driving which reveals any tendency of a pile to move out of position immediately that difficulty commences. Remedial measures can then be taken before damage to the pile occurs. This aspect is covered by second paragraph of clause 21 of specification.

(1)(2) (Insert from next page)

We are always ready to discuss with you possible means of overcoming piledriving troubles in difficult ground, but the responsibility ultimately rests with you to get the piles driven, undamaged, in their correct position, to an acceptable final resistance. The Board is entitled to expect this as a result of the extremely wide experience of your principals in harbour works throughout the world.

I consider that you are entitled to an extra payment of £46.8.0 (chopping 2 holes @ £23.4.0)

I cannot grant any extension of time of 3 days. It must needs be that in the course of a contract of this nature sometimes you will drive piles more

quickly than your average programmed rate — otherwise sometimes you will drive them more slowly. But you must have considered your average rate in entering into your contract with the Board, and, in my opinion, you must be prepared to take the "bad with the good".

(1) (X) It is possible also that a contributing factor in the present trouble was your decision to chop holes so far ahead of pile driving instead of the more usual practice of "chop + drive" each pile separately.

COPY TO THE CONSTRUCTION ENGINEER

927/5

12th August, 1959.

The Project Manager,
Messrs. Wilkins Davies & Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT 1580 - FREYBERG WHARF

Receipt is acknowledged of your letter dated the 27th of July.

Replies to the various points raised are set out below:-

1. Railtrack Crossings with Crane Track.

I am pleased that your supplier of railway turnouts has offered to draw and make the crossings. Crane wheel and railway details required will be forwarded to you as soon as possible. I look forward to seeing his drawings and quotation when submitted for approval.

2. Railtrack on Western Quay

Drawing No. E.859/1 showing position of rail tracks on the approach to the Western Quay is enclosed along with Drawing No. E.859/2 showing the position of turnouts on the Quay.

3. Services on Deck.

Drawing Nos. E.801/1-12 have been checked and will be issued when the position of rail tracks have been plotted on them.

4. Pipe Work

Detailed drawings will be provided in time to install the pipe work and water meter on the reclamation.

Pipe work on the wharf is shown on the service drawings.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

Encl: 2 copies of
Drg. E.859/1 & 2

PSH:HEB

Auckland Harbour Board

MEMORANDUM 31st. July, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

CONTRACT 1580 - FREYBERG WHARF.

Herewith letter from the Contractor dated 27th. July, requesting certain information as scheduled.

Item 1. The Contractor has been enquiring for details of these crossings for some time, mainly to ascertain how much of rail and crane track is not required due to the extent of crossings. I have advised him to order with no deductions for crossings as details are not yet available. The Contractor's supplier, the Isca Foundry should be capable of providing a satisfactory article if you wish to pursue the Contractor's suggestions.

Item 2. No action is required on this. I have been advised that the curve layouts will be supplied by the Design office in two weeks. In addition, dimensioned layout of track on the quays would be desirable.

Item 3 & 4, These matters can be taken together. In general the difficulty is that there are no separate drawings available of layout and dimensioned for the various services. The wharf services drawings are being built up, to detail all services holes, bolts etc., which may be a satisfactory method provided they are completed and the Contractor can check.the work and ordering of materials in conjunction with the Bill.

Referring to Item 4 which is waterservice, as the only details available to the Contractor are a line drawing and some special details on the contract drawings and only 25% of the wharf services drawings available, I had advised the Contractor that he will have to order to Bill and trust that it covers the work satisfactorily.

The Contractor feels that he is being asked to operate on a minimum of detail, and should be provided with a complete plan of each service where possible so that he has the complete layout, dimensioned and detailed affording him the opportunity to take off and order his materials for the whole works on the wharf and/or the reclamation.

I would prefer the system of dimensioned and detailed general arrangement plans for each service similar to the plans provided for the Import Wharf Contract as it proceeded.

Mr Smith
Please give attached letters some consideration — then I think we should discuss the position with Seager & Hutchinson
JS.

Seager
Construction Engineer.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO. 559 DATE July 27th 1959.

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

Dear Sir,

Contract 1580 - Freyberg Wharf

In trying to ensure an efficient and speedy execution of the work, we wish to draw your attention to the following points on which we would like to receive further information :

(1) Railtrack Crossings with Crane Rail

The full length of the crane track has been ordered to be rolled and shipped from England. In the meantime, the makers have advised us that they would be glad to make drawings for the crane rail crossings so that these crossings would still be fabricated in England in time. In case you could agree to this proposal, would you please forward the necessary information regarding flanges of crane wheels etc. before the end of the month.

(2) Railtrack on the Western Wharf

In order to be able to place the drain holes for the railtrack on the approach to the Western Wharf, we need to know the accurate position of the curved railtrack within 2 weeks.

(3) Services on the Deck

The drawings received so far for the services on the deck (Nos. 801/1 - 801/12) are marked "unchecked". Would you please verify the above-mentioned drawings.

(4) Pipework

We have not received sufficient detailed drawings of the wharf services to be able to calculate the exact length of piping required and, therefore, we will order the pipes according to the quantities given in the Bill of Quantities of the specifications.

....2.

We are preparing a detailed time schedule for the work to be carried out in connection with the wharf services.

In connection with ordering materials and planning of the work involved, we would appreciate receiving detailed drawings as early as possible.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

COPY TO THE CONSTRUCTION ENGINEER

30th July, 1959.

The Project Manager,
Messrs. Wilkins Davies and Netherlands,
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF

Receipt is acknowledged of your letter dated 23rd inst. advising that one day's production was lost while repositioning your piledriver necessitated by a ship's anchor fouling its moorings while berthing at Jellicoe Wharf.

As you are aware Mr. Seagar has taken this matter up with the Harbourmaster and every effort will of course be taken to avoid a recurrence of the incident.

The delay of one day has been recorded and will be taken into account in the event of an extension of time for completion of the contract being required.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEB

Auckland Harbour Board

MEMORANDUM 24th. July, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Herewith from the Contractor letter dated 23rd. July, with reference to a delay of one day in pile driving due to the carrying away of the pile drivers stern mooring when berthing a ship on the 22nd. July.

I have taken up the matter with the Deputy Harbour Master, and no further action is required. Both the Harbour Dept. and the Contractor appreciate the difficulties and it is hoped that a similar occurence will not need to eventuate again.

This delay of one day can be recorded and taken in the account for any extension of time which may be required.

Construction Engineer.

Answered Ack. 30.7.59

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: NO. 556 DATE July 23rd 1959.

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

Dear Sir,

Contract 1580 - Freyberg Wharf

We wish to report the fact that yesterday, July 22nd, the "Van Yung", whilst berthing along the Jellicoe Wharf, dropped her anchor and picked up a mooring wire of our piledriving frame.

Fortunately, our crew were able to let the wire run off from the winch on the piledriving frame so that no damage was done although one day's production was lost while recovering the wire and re-positioning the piledriving frame.

The position of our piledriving frame and its moorings has been discussed with the Harbour Master some time ago and no doubt the pilots are aware of our floating plant in this area.

We fully appreciate the difficulties involved and that circumstances might compel the pilot to order the anchor to be dropped while berthing a ship but where circumstances would permit, the co-operation of the pilots in trying to avoid further delays and damage will be very much appreciated by us.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh,
Project Manager.

Answered
Auth.
30.7.59.

Auckland Harbour Board 26483

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* ~~16th~~ July 19 59

Subject FREYBERG WHARF - PILE DRIVING SETS

(Reference your memo of 19.6.59)

In an effort to keep the pile heads from moving out of their correct position while the pile toe is being driven into the sandstone, you may reduce the final set to ¼" for piles 55' long and under when driven into sandstone with negligible overburden.

PSH:HEB

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 £ : :

26483

REMARKS: _____

Signature _____

E10 *Date* _____ 19

Auckland Harbour Board

MEMORANDUM

19th. June, 1959.

FROM CONSTRUCTION ENGINEER.

TO ENGINEER.

FREYBERG WHARF.

PILE DRIVING & SETS.

Further to my discussions with you on 16.6.59, herewith information for investigation into pile driving sets.

1. Hammer Specifications.

It now transpires that certain details provided previously were incorrect and the actual specification from handbook and measurement is.

Type of Hammer	Menck MRB 600.		
Total weight of Hammer	9.35 tons		
Weight of Ram	6.65 tons		
Weight of Helemt (estimated)	0.75 tons		
Stroke No. 1 Setting (Max. stroke)	4'-1"	(In operation 3'-10" +)	
No. 2 Setting (Min. stroke)	2'-1"	(In operation 2'- 6")	
No. of blows per minute No. 1 setting	34	(In operation up to 40)	
No. 2 setting	?	(In operation up to 50)	
Boiler pressure	150 lb/in.^{2}		
Helmet Cap block	21" dia.	7" thick	hard wood
Biscuit	20" x 20"	3" thick	pinus

2. Temporary Compression.

Attached is a diagrammatic measurement of temporary compression taken on driving pile 5 C. Temporary compression of helmet biscuit appeared to be of the order of 1". Hammer was working on No. 2 setting of stroke. Toe into sandstone, negligible overburden. — 22-6-59 [illegible] – 50' pile set 1/20" / 7/8" comp of helmet & biscuit

3. Certain variations to specified set have been made, in conjunction with change over of hammer stroke by Contractor in an endeavour to improve driving and reduce cracking.

17.6.59	Pile 5 C	Stroke reduced No 2, final set	1/24"
18.6.59	Pile 6 D	" " " , final, set	1/24"
	Pile 6 C	" " " , final set	1/12"

It is intended to drive the next pile 7 D to a set of 1/8", following discussions re driving with you at this office today, and dependent on the penetration the decision to maintain this set for similar conditions will be made. Any investigation into the provision of a new schedule of sets should I feel be related to

a. Piles driven into sandstone with negligible overburden.

b. Piles driven to sandstone through the full depth of sand mattress.

and an early advice on this matter would be appreciated.

Mr Hutchinson

NS, DMW.

Seager
Construction Engineer.

Auckland Harbour Board

26450

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE FOREMAN OF WORKS *Date* 29th June 1959

Subject FREYBERG WHARF

CODE NUMBER
109/001/20-29

Please make up the pipes and fittings for test pressure cells as shown on Drawing Nos. S.1285/2, 3 and 4.

Mr. Mead, extension 831 can give any further information required.

This equipment is required by the 8th of July.

Encl: 2 copies of Drgs.
S.1285/2, 3, and 4.

Copy to Mr. Mead

PSH:HEB

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 £ : :

26450

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

MEMORANDUM 11th. June, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF.
RAKER PILES.

It has been pointed out by the Contractor that the rakers located at 56 D and 63 D cannot be driven as required without fouling. Looking into the matter of rakers in this area it would appear that there could also be a possibility of the fouling of toes of rakers 54 D and 65 D, if they flattened in rake and drove lower than expected.

To obviate any difficulties, I would suggest that

a. Rakers 56 D and 63 D be resited at positions 56 C and 63 C.

b. To avoid the possibility of toes fouling the four rakers be driven at a rake of 1 in 3.5.

The alternative to b if the rake is not to be changed, is to drive the west quay two rakers to correct rake and direction and then if necessary make adjustment to direction on the east quay two rakers to suit when they are ready to be driven, however, this method is not recommended.

Would you please advise what is required in this matter.

Construction Engineer.

Mr Hutchinson

NS.DMW.

P. HARRISON, M.N.Z.I.S., REG. ENG. C. K. GRIERSON, O.B.E., F.N.Z.I.S. REG. ENG.

BRANCH OFFICES
ROTORUA
WHAKATANE

TELEPHONES 43-578
40-360

HARRISON & GRIERSON
AND
PARTNERS

REG. SURVEYORS, REG. ENGINEERS
TOWN PLANNERS

201-202 VICTORIA ARCADE
QUEEN STREET
AUCKLAND, C.1

R. M. GRIERSON, M.N.Z.I.S., REG. ENG.
~~S. P. DEVERELL, M.N.Z.I.S.~~
R. L. ROUD, M.N.Z.I.S. (ROTORUA)
R. F. COLDHAM, M.N.Z.I.S. (WHAKATANE)

RD/RR

27th May, 1959

The Engineer,
Auckland Harbour Board,
P.O. Box 1259
AUCKLAND. C.1.

attention: Mr. P. Hutchinson

Dear Sir,

re: Freyberg Wharf - base lines.

In accordance with your verbal request we forward herewith copy of our tracing 939S, showing the position of the various survey marks and general details in connection with the new Freyberg Wharf. This is the plan which has already been supplied to the Contractor.

Yours faithfully,
HARRISON & GRIERSON & PARTNERS.

R. Dickson

Per: R. DICKSON

encl.

Branch Offices:
ROTORUA R. L. ROUD, M.N.Z.I.S.
WHAKATANE R. F. COLDHAM, M.N.Z.I.S.

HARRISON & GRIERSON AND PARTNERS

TELEPHONES 43-578 40-360,

CONSULTING ENGINEERS
REGISTERED SURVEYORS
TOWN PLANNERS

P. HARRISON, M.N.Z.I.S., REG. ENG.
C. K. GRIERSON, O.B.E., F.N.Z.I.S., REG. ENG.
R. M. GRIERSON, A.M.N.Z.I.E., M.N.Z.I.S.

201-202 VICTORIA ARCADE,
QUEEN STREET,
AUCKLAND, C.1.

RD/RR

14th May, 1959

The Engineer,
Auckland Harbour Board,
P.O. Box 1259
AUCKLAND. C.1.

Dear Sir,

re: Freyberg Wharf.

In accordance with your instructions, the survey necessary to fix the position of marks required on the North Shore in connection with the construction of the new Freyberg Wharf, has been completed.

The position of the marks actually erected have been checked by observations and their positions clearly indicated to the Contractor who has been supplied with a copy of the Plan showing the set out, with additional information to assist him. At the same time the position of the marks on the Southern side have been checked as has the position of the tower erected by the Contractor for setting out purposes.

We thank you for your instructions to carry out this work on behalf of your Board and enclose our account herewith for the work in connection with the North Shore and the checking of the Southern-side marks.

Yours faithfully,
HARRISON & GRIERSON & PARTNERS.

R. Dickson

Per: R. DICKSON

encl. Account prepared & passed for payment 5/6/59
£58-12-0.

~~Mr Smith~~
Mr. Hutchinson

Copy to Construction Engineer

927/5

7th May, 1959.

The Project Manager,
Wilkins, Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND

Dear Sir,

CONTRACT 1580 - FREYBERG WHARF -
CHOPPING HOLES

I acknowledge receipt of your letter of 24th April regarding the chopping of holes for piles and your expenses incurred so far in the determination of this matter.

It is agreed, that the results from test piles driven and your ability to provide a hole with the steel tube in sandstone, show that the erection of the Benoto rig is not now necessary. At this stage the question of further specified chopped holes would appear unlikely, but if necessary will be a small number limited to the sandstone at the inner east berth, depending on the satisfactory completion of dredging.

There does not appear to be any reason why this matter should not be finalised now, and I consider a satisfactory settlement in addition to the £820 paid to date for making two and driving one test pile is:

(a) Your costs for provision of the Benoto grab and accessories - £800, the assembling of the steel tube - £200, and the driving of test pile No.2 - £300, will be paid.

(b) The cost of providing a test hole with the steel tube is not accepted.

(c) Should any further holes be required, they will be paid for at Bill rates.

Your request for an extension of contract time of one week is noted, and I will give this due consideration at a later date.

Yours faithfully,

NS:HEB

CHIEF ENGINEER TO THE BOARD

Auckland Harbour Board

MEMORANDUM 30th. April, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF-CONTRACT 1580

Chopped Holes for R.C. Piles.

Herewith a letter from the Contractor dated 24th. April requesting consideration at some future date of the payment of certain expenses incurred in the provision of plant and investigation to resolve the question of chopped holes.

For information a summmary of the position to date is:

1. Test piles and investigation re the necessity for holes.

   a. 2/65' piles were cast as instructed in December 1958.

   b. 1/65' pile was driven through 5'0" of hard band satisfactorily, establishing that holes are not necessary to get the piles down to the basement sandstones. Pile has not yet been recovered.

   c. 1/65' pile was driven on the inner west berth line in sandstone at my suggestion to establish if chopping required. Penetration satisfactory, pile recovered with cracks on lower half, but would be suitable for re-use in the wharf at sand mattress.

   d. Contractor procured and assembled Raymond Boring Bar, chopped test hole satisfactorily for depth in sandstone bench of west gusset.

   e. Contractor chopped 8 holes required at west gusset. Bill value due £ 139. 12. 0.

   f. The necessity for further holes at this stage is indefinite and provided Hapai can complete sandstone dredging required at the inner east berth, the necessity may not arise.

2. Provision of Plant by Contractor to Chop Holes.

   It must be accepted that the employment of the Benoto grab on floating plant was probably the only satisfactory method to provide holes for the conditions given at the time of tender. In October though a decision was made to use test piles, the provision of the Benoto gear was considered still necessary should the piles fail to penetrate the hard band, and the plant may have to operate as intended.

   The results from test piles now establish that the Benoto gear will not be required. The Contractor has provided alternative gear in the Raymond Bar, which has chopped holes in uncovered sandstone, and should be capable of dealing with further holes.

The Menck pile driver has no gear apart from two small jetting pipes on hand to assist with difficult piles, so that the Contractor must have a suitable tool to provide assistance as part of its equipment, ready for use if required. The Raymond Bar should cover this contingency.

3. Expenses incurred by the Contractor.

The matter of a payment of £ 800 for amortization, duty etc. on the Benoto could depend on whether this money is included and has been paid in some form in the £ 91,000. of Item 3 of the Bill of Quantities. The value of the Benoto rig in Item 3 of Appendix 'A' appears to me to have not been included in the original figure of £ 91,000. and is now included to provide a total value of plant available to justify a further advance if required. In my opinion the claim of £ 800. could be paid.

Of the additional expenses.

a. The cost of the assembly of the steel tube (Raymond Bar) should be accepted by the Contractor, but as the likelihood of any further holes being required is negligible the recovery of the cost from Bill rates is negligible, and consideration should be given to paying this.

b. Driving of second test pile and test hole - £ 600. I propose that £ 300 be paid for the second test pile, but no payment be made for the test hole, as the Contractor had to establish if the boring bar would do the job.

Summarised:

1. Payments made to date.

Provide 2/65' test piles	520. 0. 0.	
Drive first test pile	300. 0.0. ✓	820. 0. 0.

2. Payments recommended.

Drive second test pile	300. 0. 0. ✓	
Provide steel tube	200. 0. 0. ✓	
Benoto expenses	800. 0. 0.	1,300. 0. 0.

3. Payment not recommended

Test hole by steel tube	300. 0. 0.

4. Extension of Time:

This in my opinion is difficult to justify as the Menck pile driver had no other work available at the time. However, as stated it is work not forseen in the contract, and an extension of time could be warranted.

I consider this matter should be finalized at this juncture on the facts and work done to date. Should it be necessary to chop any further holes then they should be paid for at the Bill rates.

Construction Engineer.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO. 335 DATE April 24, 1959.

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

Dear Sir,

Re: Contract No. 1580 - Freyberg Wharf - Chopping Holes.

Now that the driving of two testpiles has proved that only a few holes had to be chopped and a method was found to chop those remaining holes by means of a heavy steel tube, the erection of the Benoto grab is not required.

You will no doubt be pleased with the result that the chopping of holes is thus not necessary which will result in a saving of approximately £10,000 to the Board.

However, as we pointed out in our letter dated October 24th 1958, in ensuring that we would be able to chop holes the following expenses have been incurred :-

Amortization Benoto grab & accessories, say 50% of £800	£400
Customs Duty, say 50% of £400	200
Insurance & freight to & from New Zealand	200

In addition to the above the following expenses have been made :

Assembling steeltube	£200
Driving a testpile & a testhole - 2 @ £300	600
	£1,600

The recovery from the chopping of nine holes will only meet a small proportion of the abovementioned costs although we understand that there is still a possibility that more holes will have to be chopped

It is, therefore, too early yet to come to a definite agreement on this matter and when it is finally decided that no more holes are to be chopped, we would be pleased to discuss this matter again with your goodselves.

...2.

However, due to the fact that our piledriving frame was engaged in driving and pulling testpiles which item was not foreseen in the contract, we feel entitled to ask for an extension of contract time of one week.

Yours faithfully,
WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS,

A.J. Lindenbergh.

A.J. Lindenbergh,
Project Engineer.

30.4.59.

Auckland Harbour Board 26304

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 24th April 19 59

Subject FREYBERG WHARF - BEAM AND PILE CAP SOFFIT LEVELS

Herewith 4 copies of A.610/1 on which the soffit levels of the beams and pile caps have been marked. Two are for issue to the Contractor and two for your reference.

Encl: 4 copies A.610/1

PSH:HEB

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 £ : :

26304

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

26296

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE FOREMAN OF WORKS *Date* 16th April 1959

Subject FREYBERG WHARF - STRAIN GAUGE COVERS

CODE NUMBER
109/001/20-29

Please make up three strain gauge covers as shown on Drawing No. E.841/1, and supply labour as necessary to fix them to the sheet piles.

Encl: 2 copies Drg.
E.841/1

PSH:HEB

J. A. Burton

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 £ : :

26296

REMARKS: _____

Signature _____

E10

Date _____ 19

Electronic Development and Applications Co. Ltd.

18-20 LORNE ST.
WELLINGTON
NEW ZEALAND

P.O. BOX 6415
TE ARO

TELEPHONES
54-039
54-130

TELEGRAMS & CABLES
"EDAC"

YOUR REF.

OUR REF. LWH/BT

April 13, 1959

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

Dear Mr. Sutton,

Thank you for your letter of 17th March. We hope you will excuse our delay in answering but we have been awaiting results of the latest test drive at Bluff. We regret to say that the Pyrotenax cables - fitted to the resistance gauges have fractured during the drive and we are still in trouble.

Mr. Mason has probably given you some of the background of our attempts to design suitable strain gauges for measurement of stress in the sheet-piles at Bluff. We have found the greatest difficulty in keeping the sea water out of the ordinary resistance strain gauges which we used in our early efforts and decided to start afresh with an "acoustic" gauge which, although still requiring waterproofing, was not nearly so susceptible to moisture. This type of gauge is very much more stable than the resistance gauge and is superior in performance for this type of work but is bulkier and much more expensive.

We developed a suitable prototype which gave very promising results when we tested it in Wellington Harbour but it proceeded to fall to pieces in a short time when attached to a pile being driven. Despite several modifications we could not get a unit which would withstand the vibration.

We reverted back to the resistance gauge for a final attempt, making a complete encapsulated unit with Pyrotenax connecting cable which appeared to be as strong as a battleship. A number of these were installed on a sheet pile at Bluff and driven, and to our despair we found that in every case the Pyrotenax cable had failed even though it was clipped to the pile at about 15 inch intervals.

B. 1336

dlh Hutchinson

We have two gauges therefore which we are confident will be suitable for the long term static tests as long as they can be attached after driving. We are still unable to offer anything which will withstand the pile driver.

The acoustic gauge in its present form would cost £20.10.0. each plus 1/5 for each foot of cable, and the resistance gauge would cost £8. 0. 0. each plus 1/5 per foot of cable.

We are enclosing sketches of both gauges which will give you an idea of the appearance and size of each of the units, but as they would be made up specially they can be changed to suit your installation if you require it. The method of attachment to the sheet pile can also be varied. It is intended with the present design to bolt on the acoustic gauge but to weld on the resistance unit around its base plate.

Delivery could be made within a month so long as we were not held up for such things as O-rings or driving coils.

Please do not hesitate to write if there is any further information you require.

Yours faithfully,
ELECTRONIC DEVELOPMENT & APPLICATIONS CO. LTD.

B. 1336.

L.W. HARRISON.

Auckland Harbour Board

26281

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 13th April 1958

Subject FREYBERG WHARF - REINFORCING DETAILS

Attached are four copies each of drawing Nos. E.775/1 and 2 and S.1144/3 and 7; two for your reference and two for issue to the Contractor. Will you please ensure that the previous issues of these drawings are destroyed. The new copies contain amendments to dimensions of certain bars to remove some inconsistencies that have become apparent. Contract Drawing No. A.587/5 is also affected. Will you, therefore, please make the following alterations to the copies held by you and the Contractor.

In the Steel Details at the bottom L.H. corner of A.587/5; bar Mark Cb6; the 2'7" dimension should read 2'5" and the cut length 11'0" should read 10'8".

Encl: 4 copies each of
Drgs Nos. E.775/1 and 2,
S.1144/3 and 7

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 £ : :

26281

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

26259

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 2nd April 19 59

Subject CONTRACT 1580 - FREYBERG WHARF.

The following sets out the details of holding down bolts for the cargo sheds:-

1¾" diameter square or hexagon headed bolts 24" long with not less than 5" threaded and with 5" x 5" x ½" m.s. washer welded under head. 528 No.

¾" diameter square or hexagon headed bolts 15" long with 4" thread and with 3" x 3" x ⅜" m.s. washer welded under head 96 No.

¾" diameter square or hexagon headed bolts 15" long with 4" thread. 96 No.

This information is intended to enable the Contractor to order the bolts: details of their positions will be contained on the wharf services drawings. A variation order for the work will be issued along with those drawings.

CLP:HEB

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 £ : :

26259

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board 26257

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 2nd April 1959

Subject FREYBERG WHARF CONTRACT NO. 1580 - RAKER PILES

All longitudinal reinforcement of raker piles is to be carried into the superstructure.

Please amend the fourth line of Clause 26 of the specification to read - "except in Row J and raker piles all bars" etc.

On Drawing A.587/1 alter the Note to read - "In Row J and rakers" etc.

Please agree a rate with the Contractor when a Variation Order will be made to cover this alteration.

The centre line of the raker piles is to intersect the centre line of the ~~bearer piles~~ beam 1'6" above the soffit of the beam.

PSH:HEB

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 £		:	:

26257

REMARKS: _____

Signature _____

E10

Date _____ 19

927/5

16th March, 1959

The Project Manager,
Wilkins, Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

Further to our conversation with regard to the construction work on the new Freyberg Wharf, I wish to inform you that you must conform to the following regulations concerning the satisfactory lighting of your floating plant and the outer portion of the new construction during the hours of darkness.

(1) All anchored or moored floating plant must carry a bright white light at such a height and in such a position as to be most visible to all craft manoeuvring in the vicinity.

(2) The outer extremities of new construction must at all times be adequately marked with all round white lights.

It is understood that you are driving an isolated test pile several hundred feet from the shore. The position of this at night must be indicated by a flashing red light. Our constructional engineer will assist you in this matter.

Yours faithfully,

L Burgess

DEPUTY HARBOURMASTER

JOW/HC

Copy of letter to Construction Engineers & 2 copies of notice. Also 6 copies of notice to Foreman of Works.

16 MAR 1959

The Chief Engineer

For your information.

Deputy Harbourmaster

17th March 1959

Auckland Harbour Board

TO WHOM IT MAY CONCERN

FREYBERG WHARF - CONSTRUCTION AREA

Construction of Freyberg Wharf has commenced and it has become necessary to declare a Prohibited Anchorage and issue a warning to shipping regarding the danger in this area of obstructions, both floating and submerged.

Definition of Area -

The prohibited anchorage area is triangular in shape the base being the harbour foreshore from a point 400 feet east of the base on the eastern side at Jellicoe Wharf to a second point 1030 feet west of the landward end of the Eastern Tide Deflector.

From the first point the side of the triangular area runs 048° and from the second point the side runs 347° to the point of intersection.

The seaward extremity of construction and all floating plant will be adequately lit during the hours of darkness by all round white lights.

A temporary test pile approximately 500 feet off shore in the centre line of the area will be driven on Wednesday 18th March 1959 or as soon thereafter as weather permits. This pile will be lit with a red light flashing every second and will remain in position for about two weeks after which it will be withdrawn without further notice.

DEPUTY HARBOURMASTER

17th March 1959

17th March, 1959.

Mr. L.W. Harrison,
Electronic Development & Applications Co. Ltd.,
P.O. Box 6415,
Te Aro,
WELLINGTON

Dear Mr. Harrison,

Mr. Mason of the Bluff Harbour Board has told me that you are supplying equipment to him for measuring the stresses in sheet piles and tie rods. He tells me that you have developed an acoustic type of gauge which though it did not stand up to driving stresses is considered the most stable type if it can be fixed after driving.

I am also interested in the resistivity gauges which you are attaching to a small plate enclosed in a waterproof capsule.

I enclose Drawing A.587/2 showing in red the position at which it is proposed to fix the gauges.

Could you please send me details, cost and delivery of the acoustic and resistivity gauges which you are supplying to the Bluff Harbour Board along with your recommendations for the installation.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

Encl: One half size
copy Drg. A.587/2

PSH:HEB

Copy to Construction Engineer

927/5

13th March, 1959.

Wilkins, Davies and Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND

Dear Sir,

FREYBERG WHARF CONTRACT 1580
STONE BANKS AND RECLAMATION.

The method of construction of the stone bank shown on your Drawing No.30 (A.H.B. Drawing No.B1318/1) is approved.

As regards the construction of the reclamation between the stone banks, will you please submit a rate per cubic yard (as measured in the delivery truck) for suitable run of pit scoria, delivered, placed and consolidated to grade in the reclamation.

This rate per cubic yard should be itemised into -

(a) Prime cost at tip head on site.

(b) Rate for placing and consolidating to grade.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

PSH:HEB

TELEGRAPHIC ADDRESS
"HARBOUR, BLUFF

CODES:
A1., WESTERN UNION,
A.B.C., 4TH AND 5TH EDITION
SCOTT'S, BENTLEY'S

ALL COMMUNICATIONS TO BE
ADDRESSED TO
THE ENGINEER,
P.O. BOX 1 BLUFF NTG/JJ

"The Port of Southland"

TELEPHONES:
OFFICE, BLUFF - No. 14
ENGINEER'S RES. No. 105

BLUFF HARBOUR BOARD,
ENGINEER'S OFFICE,
SOUTHLAND
~~BLUFF~~,
Southland, N.Z.,

10th March, 1959.

Our Ref: 927/5

Mr. J.R. Sutton,
The Chief Engineer,
Auckland Harbour Board,
C.P.O. Box 1259,
AUCKLAND.

Dear Mr. Sutton,

With reference to your letter of the 5th inst., the following information may be of some value to you.

Our problem was to find a gauge which could be attached to the pile before driving, would withstand driving impacts and would remain stable for the period of the test. We started off with the idea of using the resistivity type of gauge but tests carried out by EDAC Ltd. in Wellington Harbour on our behalf caused us to doubt whether this type would remain stable for a sufficiently long period.

We then developed the acoustic type again in conjunction with EDAC Ltd. and it would appear that this is the most stable and most accurate type. We had a prototype made and carried out driving tests on two occasions, and in each case the gauge broke up and we were forced to abandon its use. The enclosed drawing shows the general dimensions of this gauge and the method we proposed for fixing. If you propose to fix the gauges after driving, this is the type we would recommend you use.

For our own tests we have gone back to the resistivity type of gauge. We now have this fixed to a small plate and enclosed in a waterproof capsule. These are made up by EDAC Ltd. and we weld the plate to the pile and attach the cables. We have only recently driven the pile with these gauges on and we suspect that two at least of a total of nine will have failed due to the cable pulling out of the gauges. We have arranged for EDAC Ltd. to test these gauges on Monday 16th inst., to see whether they are still operating, and it could be several months, assuming the gauges to be satisfactory, before the final tests are made. We will let you know the results of next Mondays tests.

We suggest that if you want further information on the gauges that you write to Mr. L.W. Harrison, Electronic Development & Applications Co. Ltd., P.O. Box 6415, Te Aro, Wellington.

We hope this information may be of some value to you and would be interested to learn of the results of your investigations when they become available.

Yours faithfully,

D.E.S. Wards

CHIEF ENGINEER.

dr Hutchinson

ENCL:

B. 1336

427/5

Auckland Harbour Board

MEMORANDUM 9th. March, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF.

1. Stone Banks:

Herewith Drawing No. 30 from the Contractor giving details of an alternative construction for the stone banks.

This proposal is based on the formation of the reclamation prior to or in conjunction with the tipping of the stone. Stone will be placed after piles are driven and before deck falsework is placed.

The amount of stone required is practically the same as in the contract bank shape, and no amendment to quantities as billed are necessary.

Subject to the shape being suitable, I can see no objection to this method.

2. Reclamation:

Further to my memo of 10th. February, I have had preliminary discussions with the Contractor regarding undertaking this work and the provision of suitable filling. To ensure continuity of supply and quality, it is considered that scoria is the best material.

For the Contractor to undertake this work, there are two methods of measurement available.

a. nett measured volume.
b. truck measurement.

The first method has the difficulty of arriving at a satisfactory measured volume, and the tendency of the Contractor to load his rate to cover indeterminate factors such as consolidation of scoria and muds.

The truck measure system, while it brings some difficulties in ensuring satisfactory truck measurement, has the advantages of getting a satisfactory rate (i.e. AHBA reclamation banks) and to arrange for suitable filling at lower rates when available.

I consider that the latter method would have advantages and should be applied to this instance. Rates submitted for this should be itemized per yd^3. for, the delivered cost of the scoria, the cost of plant to form and consolidate, and profit and overhead mark up if any, so that, should suitable cheaper filling be available at intervals the necessary adjustment can be made.

Construction Engineer.

NS.DMW.

9/7/5

Auckland Harbour Board 26203

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 19

Subject CONTRACT NO. 1580 - FREYBERG WHARF
TEST PILES

(Further to Instruction No. 25981 of 3rd December, 1958)

Site investigation for the test piles to be driven between pile rows C and B Nos. 71 and 72 has shown that the sandstone layer is only 2 feet thick at that position. Previous site investigation has shown the layer 5 feet thick between pile rows E and D and Nos. 67 and 68.

Therefore please arrange for the first of the test piles to be driven in this position.

Drawing Z7/81 refers.

Encl: 1 copy of Bore log B.50

PSH:HEB

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 £ : :

26203

REMARKS: _____

Signature _____

E10

Date _____ 19

Auckland Harbour Board

26198

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 12th March 1959

Subject FREYBERG WHARF

Herewith four copies of Drawing No. A.810/1, Freyberg Wharf - Location of Piles, two for your reference and two to be issued to the Contractor.

Encl: 4 copies Drg. A.810/1

PSH:HEB

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 £ : :

26198

REMARKS: _____

Signature _____

E10

Date _____ 19

927/5

5th March, 1959.

D.E.S. Mason Esq,
The Chief Engineer,
Southland Harbour Board,
BLUFF

Dear Mr. Mason,

The construction of Freyberg Wharf has commenced and a start made on the steel sheet pile breastworks.

I understand that you have had some experience of the use of strain gauges on sheet pile walls. We are considering fitting strain gauges to our wall and tie rods so would appreciate any information you could send us.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

PSH:HEB

COPY TO THE CONSTRUCTION ENGINEER

26th February, 1959.

The Project Engineer,
Messrs. Wilkins, Davies & Netherlands Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sir,

CONTRACT NO. 1580 - FREYBERG WHARF

Thank you for your letter submitting for approval your schedule for daywork in terms of Clause 52 (3) of the General Conditions of Contract.

In this regard I have to advise that under most circumstances it is anticipated that extra work or variations will be done under the relevant bill item if applicable or you will be asked to submit your quotation for such work. Such being the case it will be appreciated that daywork will only be used when there is no alternative.

The rates quoted are approved.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEB

Auckland Harbour Board

26159

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 26th February 1959

Subject DRAWINGS

Herewith two sets of drawings, one to be issued to the Wilkins, Davies and Netherlands Harbour Works and one for your reference, each comprising

Deck Slab Reinforcement and Schedules	E.810/9, 10, 11 and 12 S.1239/34 to 56.
Beam Reinforcement and Schedules	E.775/3 S.1144/9 and 10

Encl: Drawings

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 £ : :

26159

REMARKS: _____

Signature _____

E10 *Date* _____ 19

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.: 41 C1/A.H.B. NO. 219 Mail 25. DATE 18th February, 1959.

To the Chief Engineer,
AUCKLAND HARBOUR BOARD

Dear Sir,

Re: CONTRACT NO. 1580 - FREYBERG WHARF.

Would you please give your approval to subletting the cutting and the welding of the Larsen sheetpiles to make splices for the walings to Messrs Steelex Limited.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS.

A.J. Lindenbergh
PROJECT MANAGER.

Acknowledged and approved with qualification that welders must be certificated.
24/2/59.

COPY TO CONSTRUCTION ENGINEER: Your memo of 13.2.59 refers

18th February, 1959.

Messrs. Wilkins, Davies & Netherland
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sirs,

CONTRACT 1580 - FREYBERG WHARF

I have to acknowledge receipt of your letter 41 Ci/A.H.B. of 13.2.59 in which you request that I reconsider the ruling given by my Construction Engineer in relation to the required age of the concrete deck before it could be subjected to load from your works crane.

I have considered that matter and am not prepared to vary the Construction Engineers ruling.

In this regard I would refer you to the Specification C.12 and to N.Z.S.S. 95 Part V Cl. 511 Table 4 and would point out that I consider it improducent to add a live load to a structure at an age not in excess of that specified as the minimum for stripping framework.

Please comply with the ruling of my Construction Engineer in this regard.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

RAJS:HEB

Auckland Harbour Board

MEMORANDUM 13th. February, 1959.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Derrick Crane for Wharf Deck Construction.

Herewith letter from the Contractor dated 13th. February with proposals of the establishment of a derrick crane on the wharf deck to assist construction.

I am advised that they are very anxious to use this method and require reconsideration of my ruling that the minimum age of concrete before loading shall be 21 days.

Seagar

Construction Engineer.

Mr Smith.
I had previously discussed this with Seagar and agreed with him that 21 day minimum was not unreasonable. Have you any comments?

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/A.H.B. NO. 208 Mail 24 DATE 13th February, 1959

Derrick on Wharf Deck.

To the Chief Engineer,
Auckland Harbour Board,
AUCKLAND.

Dear Sir,

We consider placing a derrick on the deck of the Wharf for handling shuttering steel and concrete.

To have full use of the derrick we need to place it on concrete which is 14 days old.

The king post will travel above a beam in the deck and when operating it will rest on top of a pile.

The rails on sleepers will help to spread the load.

We discussed this matter with the R.E. who informed us that the age of the concrete should be 21 days before a derrick could be put on.

However we would appreciate if you could reconsider this reply. We are prepared to strengthen the false work under the crane track to give better support to the concrete.

We have enclosed drawing 29 which shows you the position of the derrick on the deck.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS.

A.J. Lindenbergh
PROJECT MANAGER.

ENCL. Drawing No. 29.

Auckland Harbour Board

MEMORANDUM 13th. February, 1959.

FROM	TO
CONSTRUCTION ENGINEER	ENGINEER.

FREYBERG WHARF - CONTRACT 1580.

Daywork Rates.

Herewith letter from the Contractor dated 5th. February submitting for approval his rates for daywork.

1. Labour Rates: these are quite high compared to schedule rates at present in operation on crane erection and other works by tradesmen, by some 3/- per hour.

   As it is a rate including the use of various gear, transport, and no increased rates for foremen and leading hands they could be satisfactory.

2. Plant Rates: I recommend this method be accepted.
3. Materials Rates: The nett percentage of 12½% is comparable to the accepted practice in the provision of materials.

Seagar

Construction Engineer.

Mr Taylor – please discuss with Seagar. Are we likely to pay for much extra work on "daywork" basis, or on agreed lump sum basis?

Where applicable extra work or variations will be at bill item rates or quotes and daywork rates will only be used when there is no alternative. Daywork will however be kept to a minimum.

AWT

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/A.H.B.
Daywork.

NO. 188

DATE 5th February, 59.

To The Chief Engineer,
Of the Auckland Harbour Board,
AUCKLAND.

Dear Sir,

FREYBERG WHARF CONTRACT - DAY WORK.

We herewith submit for your approval our schedule for Day Work required under Item 52(3) of the General Conditions of Contract.

These rates are equivalent to those which Wilkins & Davies Construction Co. Ltd. receive on Civil Engineering contracts throughout the country, and we feel that the basis of these is fair and reasonable.

These rates are not meant to recover the overhead costs which will occur on the Contract and therefore, we would not be prepared to substitute these rates, without due consideration, but we would be prepared to carry out any additional work to the Contract on this basis.

Yours faithfully,
for WILKINS DAVIES NETHERLANDS HARBOUR WORKS.

A.J. Lindenbergh
PROJECT MANAGER.

ENCL. Labour, Plant and
Material Schedule.

15.

A.H.L

LABOUR SCHEDULE.

The under-mentioned prices shall include all necessary supervision; use and sharpening of tools; all allowances paid to workmen; and the Contractors' overhead charges and profit. Foremen and Gangers would be paid for as ordinary workmen. These rates are for ordinary time only time only and shall be proportionately increased for time and a half and double time of overtime.

Concretor	16/6d.
Concretor's labourer	16/6d.
Scaffolder	16/6d.
Bricklayer	16/6d.
Bricklayer's labourer	16/-d.
Pipelayer	17/6d.
Pipe-jointer	17/6d.
Steelbender	16/6d.
Steelfixer	16/6d.
Excavator	16/-d.
Labourer	15/6d.
Carpenter	17/-d.
Carpenter's labourer	16/-d.
Painter	17/-d.
Plumber	17/6d.
Plumber's labourer	16/6d.
Fitter	17/6d.
Fitters' mate	16/6d.
Electrician	19/6d.
Electrician's labourer	16/-d.
Watchman (including hut and lamps)	15/6d.
Truck Driver	16/6d.
Concrete Mixer Operator	16/-d.
Lorry Driver	16/6d.
Pneumatic tool operator	16/-d.
Excavator operator	16/6d.
Roller driver	16/-d.

12/- day

PLANT SCHEDULE

Plant on day work will be made available on the basis of the rates agreed upon by the Contractors Federation and shall be as outlined in their schedule, a copy of which is attached.*

MATERIAL SCHEDULE

15% shall be added to the cost of materials delivered to the site. Cost of materials means the invoice price of materials delivered to the site, without deduction of any cash discounts not exceeding 2½%. The Contractor shall furnish the Engineer with such receipts or other vouchers to prove the amounts paid and, before ordering materials, shall submit to the Engineer quotations for same for his approval.

Not available. I have a copy which I have used on previous contracts.
A.S.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/A.H.B. NO. 210 Mail 24 DATE 13th February, 1959
Dumping Scoria.

To the Chief Engineer,
Auckland Harbour Board,
AUCKLAND.

Dear Sir,

We wish to put on record that from to-day on we are not able to dump any more scoria.

No more scoria can be dumped in the Western Breastwork till the sheetpiles are driven.

No more scoria can be dumped in the Eastern Breastwork due to the fact that dredging operations are not completed.

Yours faithfully,
WILKINS DAVIES & NETHERLANDS HARBOUR WORKS.

A.J. Lindenbergh
PROJECT MANAGER.

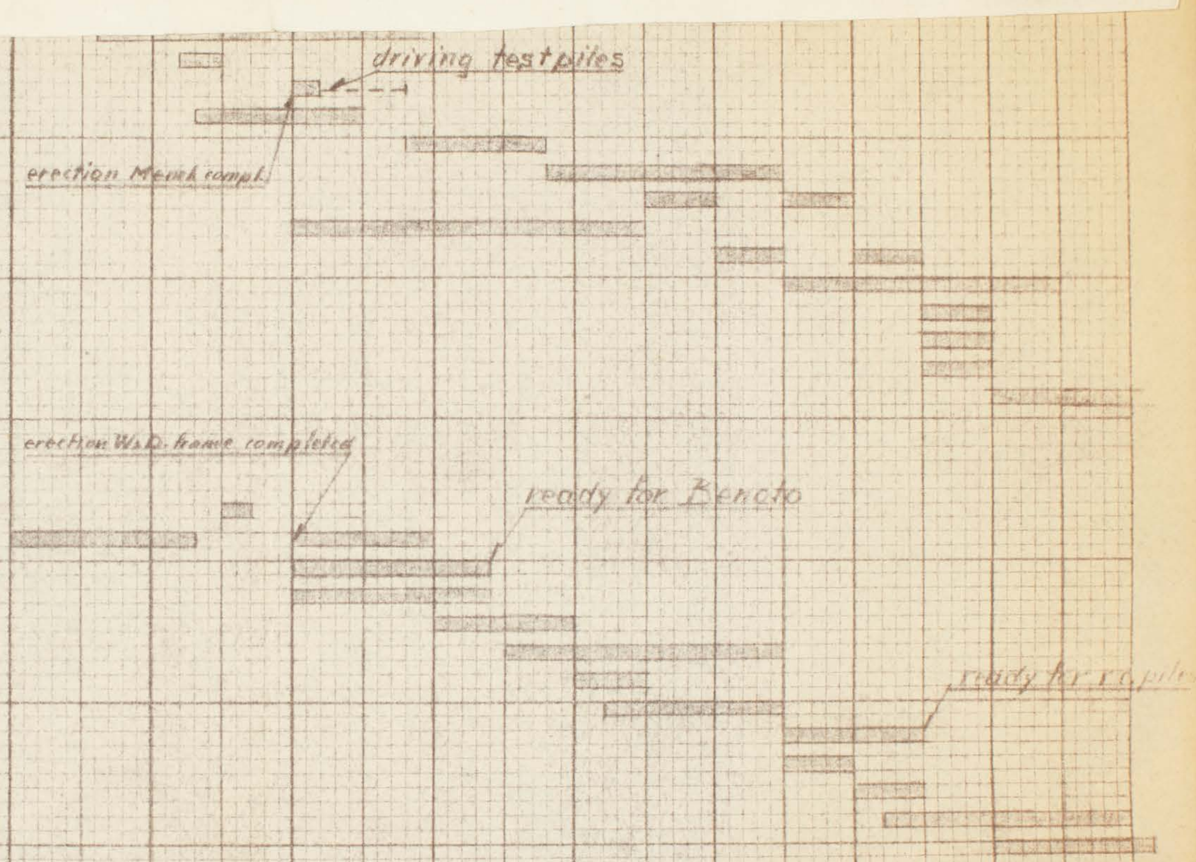
This letter does not require a reply. The contractor has an excess of scoria on the west which is his problem. On the east no good purpose is served by tipping more scoria for some feasible time, and dumping of stone is not holding him up.

13.2.59.

driving wooden piles	16 No	RB22	6/d.
	16 No	Menck	8/d.
" erecting staging			
driving sheetpiles sewer	42 No	Menck	6/d
driving from sewer to E	214 No	Menck	8/d
driving anchor piles	214 No	RB22	15/d
preparing walings			
placing tierods & walings		RB22	
final scoria fill			
driving sh. W. of sewer	29 No	W&D	6/d
driving anchor piles	28 No	RB22	10/d
placing walings & tierods		"	
scoria fill			

Eastern Breastwork

driving wooden piles	12 No	RB22	6/d
erection staging			
driving sheet p. No 3 & 4	82 No	W&D	6/d
driving anchor piles	82 No	RB22	6/d
placing walings & tierods	40 No	RB22	
filling scoria			
driving wooden piles	24 No	RB22	6/d
erecting staging			
driving sheet p. No 5	80 No	Menck	8/d
driving anchor piles	80 No	RB22	15/d
placing walings & tierods			
scoria fill			
driving sh. No 4	74 No	W&D	6/d



Freyberg Wharf 20-1-59 AJL.

To Area Office File. [illegible] 27.1.59.

Auckland Harbour Board 26073

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 20th January 1959

Subject CONTRACT 1580 - CONSTRUCTION OF FREYBERG WHARF.

Herewith two sets of drawings and schedules of Beam and Deck Slab Reinforcement in Area "B" of Freyberg Wharf for issue to the Contractor.

Encl: Drawings

DC:HEB

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 £		:	:

26073

REMARKS: ______

Signature ______

E10

Date ______ 19

927/5.

Auckland Harbour Board

MEMORANDUM 23rd. December, 1958.

FROM	TO
CONSTRUCTION ENGINEER	ENGINEER

FREYBERG WHARF CONTRACT.

Herewith letter from the Contractor dated 22nd. December, submitting for approval V.H. Farnsworth Ltd. as a sub-contractor to undertake the painting of sheetpiling.

Farnsworth will provide the labour only, the Contractor supplying the tar paint.

I am advised that arrangements have been finalized for the supply of tar paints for the whole of this work from the Auckland Gas Co.

Construction Engineer.

Construction Engineer

There is no objection to Farnsworth as subcontractor on this work.

12.1.59.

Contractor Advised
13.1.59

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF. 41 C1/ B-1 NO. 133 DATE 22nd December, 1958

The Chief Engineer,
Auckland Harbour Board,
AUCKLAND C.1.

Dear Sir,

We intend to sublet the painting of the sheet piles to V.H. Farnsworth Ltd. Please inform us whether you can agree to this.

Yours faithfully,

WILKINS, DAVIES AND
NETHERLAND HARBOUR WORKS

Auckland Harbour Board

MEMORANDUM 22nd. December, 1958.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF CONTRACT.
TEST PILES.

With reference to the attached letter from the Contractor dated 18th. December, I have no instructions re measurement of this work, and I propose that the cost of casting and driving of the piles be at agreed rates and paid under Item 77 (Prov. Sum of £ 5,000 for testing piles).

Construction Engineer.

dr Hutchinson
Was not instruction issued to Consts. Engr. re driving of these piles? I would have expected contractor to make + drive these at schedule Bill rates. If, however, Seagar agrees that some extra is justified, the cost shared will be based on Bill rates, but charged against Item 77

NS.DMW.

Auckland Harbour Board

MEMORANDUM 19th. December, 1958.

FROM	TO
CONSTRUCTION ENGINEER.	ENGINEER.

FREYBERG WHARF - PHOTOGRAPHIC

RECORD OF CONSTRUCTION.

Work on the contract is now reaching the stage where photographic records of construction should be commenced. I understand, however, that the Department's camera is not servicable and that a replacement camera has been requested. Could this matter be expedited.

H Seagar.

Construction Engineer.

NS.DMW.

WILKINS, DAVIES & NETHERLANDS HARBOUR WORKS

JOINT VENTURE OF:
WILKINS AND DAVIES CONSTRUCTION CO. LTD., WELLINGTON
AND
ROYAL NETHERLANDS HARBOUR WORKS CO., AMSTERDAM
FOR THE CONSTRUCTION OF THE FREYBERG WHARF

P.O. BOX 1198
TEL. 34-891
34-892
CABLE ADDRESS:
"HARBOURWILK"
AUCKLAND

REF.:..... NO.:..... DATE 18th Dec. 1958

The Chief Engineer,
Auckland Harbour Board,
AUCKLAND C.1.

RE: Test Piles.

Dear Sir,

In reply to your letter of 24th of October, we confirm the order to make two test piles.

As we pointed out to the R.E., we have to make certain extra arrangements, as our main casting yard is not yet ready and we presume that you will agree that extra costs involved would be payable to us.

Referring to your last paragraph of the letter, we would like to approach you again when the result of the test driving is known.

Yours faithfully,

WILKINS, DAVIES AND
NETHERLANDS HARBOUR WORKS

927/5.

11th December, 1958

THE CHIEF ENGINEER THE GENERAL MANAGER

CONTRACT 1580 - CONSTRUCTION OF FREYBERG WHARF

The Contractors (Messrs. Wilkins & Davies Construction Company) inform me that Provisional licences to import reinforcing steel, tie bars and steel sheet piling during 1958 for the above contract have been issued by the Customs Department.

In seeking clarification of the term "Provisional" the Contractor is informed (see copy of letter attached) dated 25.11.58 that the matter will be reviewed on conclusion of discussions now being carried on between the Reserve Bank and the Auckland Harbour Board.

Since I have no knowledge of any such discussions and since the Contractor requires early satisfaction in this regard it is suggested that the Reserve Bank be requested to communicate with the Customs Department to clear the way for current and future licence applications affecting Contract 1580 in the terms of the Reserve Bank's agreement with the Board.

CHIEF ENGINEER TO THE BOARD

RAJS:HEB

Z7/5

Auckland Harbour Board

25981

INSTRUCTIONS TO FOREMEN & INSPECTORS

ENGINEER'S OFFICE,

To THE CONSTRUCTION ENGINEER *Date* 3rd December 1958

Subject CONTRACT NO. 1580 - FREYBERG WHARF
TEST PILES

Please arrange with the contractor to make and drive two 65' long test piles to obtain information on the layer of sandstone which exists at about 30 feet below L.W.S.T. shown on Drawing Z7/81.

One pile is to be driven between pile rows C and B and Nos. 71 and 72 and the other pile between pile rows E and D and Nos. 84 and 85.

Encl: 2 copies of
Drg. Z7/81

PSH:HEB

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 £ : :

25981

REMARKS: _____

Signature _____

E10

Date _____ 19

COPY TO THE CONSTRUCTION ENGINEER

927/5

27th November, 1958

Messrs. Wilkins, Davies and
Netherland Harbour Works,
P.O. Box 1198,
AUCKLAND

Dear Sir,

In reply to your letter of the 24th of October I confirm that two test piles are to be made and driven to establish whether or not holes need to be drilled in the overlying layer of sandstone. Particulars of these piles and location of test drive will be supplied to you.

I am not prepared to accede your request to be paid a lump sum of £4,900 for establishment of plant and then to be paid half bill rates for items 61, 62 and 63.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

PSH:HEB

Copy to construction Engineer

927/5

13th November, 1958.

Messrs. Wilkins, Davies and Netherlands
Harbour Works,
P.O. Box 1198,
AUCKLAND C.1.

Dear Sirs,

HIRE OF STEEL PILE PUNT

Further to your Mr. Lindenberg's discussion with Mr. Seagar regarding the hire of one of the Board's steel pile punts for a considerable period for use on the Freyberg Wharf Contract I have to advise that this can be made available on the following terms:-

Hire Rate - £40. 0. 0. per week.
Mooring lines will be supplied with the punt but any renewals necessary during period of hire shall be to hirer's account.
Punt to be returnable on two weeks notice on either side.
Punt to be returned in same good order and condition as when delivered to the hirer, fair wear and tear excepted.

We await your further advice in the matter.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

ANT:HEB

927/5

21. 11. 38.

The Engineer

Tsingtung Wharf - Larsen 5 Walings.

Herewith letter from the Contractor dated 11. 11. 38 submitting amended rates to those provided in his letter of 24. 10. 38, for the work in Larsen '5' under items 124 & 125.

These new rates are in terms of my memo. of 7. 11. 38 and I recommend that they be accepted.

H Seagar.
Construction Engr.

419 Hutt Road, Lower Hutt
P.O. Box 313, Lower Hutt
Telegraphic & Cable Address: "Wilkdav" Wellington,
Telephone 60-729

WILKINS & DAVIES CONSTRUCTION CO. LTD.

BUILDING & CIVIL ENGINEERING CONTRACTORS
P.O. Box 1198, AUCKLAND.

November 11, 1958.

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

Dear Sir :

Re : Contract No. 1580 - Freyberg Wharf - Whalings.

After discussion with your Resident Engineer Mr. Seagar regarding our previous letter of 24th October, 1958, we agreed to forward a new proposal for alteration of items 124 and 125.

The reason is that Mr. Seager prefers to have the cost of the material required for the splices included in the rate for Item 125.

We now propose the following alterations :-

Item 124 45.2 tons - £98.10. 0 per ton
Item 125 42 No - £54. 0. 0 per unit.

Yours faithfully,
p.p. WILKINS, DAVIES AND NETHERLANDS HARBOUR WORKS:
A. Lindenberg,
PROJECT MANAGER.

21. 11. 58.

Auckland Harbour Board.

927/5

Mr. Hutchinson

re attached.

1. Please discuss with Constr. Eng & draft reply

2. Plant charge for Smoto Grab — is this not covered by item 3 of the bill?

(3) Walings if this price is acceptable I presume a Variation Order should be issued

[signature]. 29.10.58

514

419 Hutt Road, Lower Hutt
P.O. Box 313, Lower Hutt
Telegraphic & Cable Address: "Wilkdav" Wellington.
Telephone 60-729

WILKINS & DAVIES CONSTRUCTION CO. LTD.

AND THE ROYAL NETHERLANDS HARBOUR WORKS CO. LTD.

BUILDING & CIVIL ENGINEERING CONTRACTORS

ATTENTION:
THE CHIEF ENGINEER

24th October, 1958

Messrs. The Auckland Harbour Board,
AUCKLAND.

Dear Sirs,

RE: FREYBERG WHARF - CHOPPING HOLES

In last week's conversation between Mr. P.S. Hutcheson, Mr. N. Seager, and the undersigned, the possibility was considered of driving the piles, without chopping holes, through the rocklayer as shown on drawing E774/1 and 2 in section DD and CC.

For this reason you proposed that we should drive a few test piles with our pile frame at the commencement of the work, which would give sufficient data to decide whether holes in this area should be chopped or not.

If holes are to be chopped, this will be carried out by means of a Benoto grab operating through a 4' dia. tube which serves as a guide. The holes in the rock, also, will have a dia. of 4', giving ample room for the pile to be placed in.

The chopping of the holes will be done well in advance of the driving of the piles so that these operations do not interfere with each other.

It was agreed that the Benoto machine should be sent out, erected on a barge, and brought into working condition to have it available whatever the outcome of the test pile driving may be.

Even if a decision was made that, in general, no chopping of holes was required, it would still be wise to have this equipment available on site.

However, we feel that, if little or no work was done by this machine, it would not be reasonable that we should bear the entire burden of the expense of bringing out the Benoto to New Zealand, bringing it into working condition, and returning it to Europe afterwards, as such would be the case according to the Bill of Quantities. For the items 61, 62 and 63 covering chopping holes are provisional items. The amounts involved are :-

C/ENG.

Messrs. The Auckland Harbour Board. 24th October, 1958

Item 61	300 No.	15/10	£4,650. 0. 0.
62	110 No.	19/ 8	£2,134. 0. 0.
63	130 No.	23/ 4	£3,016. 0. 0.
			£9,800. 0. 0.

We estimate the cost of bringing out the Benoto and bringing it into working condition at :-

Benoto Grab with spare parts -

New value £3,500 - interest and amortisation	£ 800. 0. 0.
Customs Duty	£ 400. 0. 0.
Insurance and freight to and from New Zealand	£ 200. 0. 0.

Barge with frame and winches -

New value £16,000 - interest and amortisation	£1,000. 0. 0.
Erection and fabrication special parts	£2,000. 0. 0.
Dismantling	£ 600. 0. 0.
	£5,000. 0. 0.

We propose that half of the above £9,800 be paid as a lump sum while the remainder will be paid in accordance with the number of holes chopped, but at half the prices mentioned in the Bill of Quantities.

The reason why we have put forward the above to you at an early stage is that, in our opinion, the foundation is the most important part of the work and the drilling of the holes has our full attention.

Yours faithfully,
WILKINS & DAVIES CONSTRUCTION CO. LTD. AND
THE ROYAL NETHERLANDS HARBOUR WORKS CO.LTD

A.J. Lindenbergh
PROJECT MANAGER

7.11.58.

The Engineer

Freyberg Wharf. Larssen 5 Walings.
(Reference Contractors letter 24th October 1958.).

Contractors proposal for price revision is.

Item 124	Walings	45.2 ton		
	Splices	12.6 "		
		57.8 "	@ £98.10.0.	= 5693.6.0.
Item 125	Splices	42 No.	@ £35	= 1470.0.0
				£7163.6.0.

I do agree that we should pay £98.10.0 per ton for piling used in the splices, and consider that should be calculated on say £65 ton the on site value. Consider the Bill items should be.

Item 124	Walings	45.2 ton	@ £98.10.0	4452.1.0.
Item 125	Splices 16'.	42 No	@ £54.10.0	2289.0.0
				£6741.1.0

Difference in value £422.5.0.

Will you please finalize this matter with the Contractor and issue the necessary Variation Order amending Items 124 & 125.

[signature]
Consult. Engr.

12.11.58.

The Designing Engineer.

Freyberg Wharf - Tar for Sheetpiling.

Further to our discussions on suitable bars etc for painting of sheetpiling, the position is now.

a. Since yesterday, when I thought the matter had been resolved, Mr Lindenbergh has been advised by Richardson McCabe that it would be extremely difficult to obtain a licence to import "Lawca", if a suitable material available in N.Z.

b. It is essential that we have some definite ideas on products in N.Z. that would be acceptable, so that material is available by time when the first section of piling is due to arrive.

I do not like the present proposal for Flintkote immersion, unless a good thickness can be obtained.

L. Keegan.
Constr. Engr.

419 Hutt Road, Lower Hutt
P.O. Box 313, Lower Hutt
Telegraphic & Cable Address: "Wilkdav" Wellington,
Telephone 60-729

WILKINS & DAVIES CONSTRUCTION CO. LTD.
AND THE ROYAL NETHERLANDS HARBOUR WORKS CO. LTD.

BUILDING & CIVIL ENGINEERING CONTRACTORS

ATTENTION:
THE CHIEF ENGINEER

24th October, 1958

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

Dear Sirs,

CONTRACT NO. 1580 - FREYBERG WHARF - WHALINGS

In reply to your letter of 17th September, 1958, we wish to inform you that we have ordered the Larssen whalings as specified.

Since our price in the Bill of Quantities was based on 27 tons of channels for £3,010 which is £111.10.0. per ton, we now propose to revise the price of this item as follows :-

Item 124 57.8 tons £98.10.0. per ton.

This price is in accordance with the price for sheetpiles under Item 122 and the quantity includes the sheetpiles for making the splices.

For the same reason we propose to alter our price for Item 125 for staging, handling, cutting, welding, burning holes and surface treatment, as follows :

Item 125 42 No. Rate: £35. 0. 0.

Yours faithfully,
WILKINS & DAVIES CONSTRUCTION CO. LTD. AND
THE ROYAL NETHERLANDS HARBOUR WORKS CO.LTD

A.J. Lindenbergh
PROJECT MANAGER

14. 3. 58.

The Chief Engineer

Freyberg Wharf
Design of Fendering System.

The rubber fender system has been designed to deal with the approach speeds, normal to the wharf, as listed below of the following sized ships.

The normal working max. force on any fender pile is 20 tons which gives an energy absorption per rubber of 7,000 ft lb.

DISPLACEMENT	PILES HIT	APPROACH SPEED NORMAL	EMERGENCY.
1,000	2	·53 KNOT	·92 KNOT
3,000	2	·3 "	·52 "
7,000	3	·25 "	·44 "
10,000	3	·2 "	·34 "
20,000	4	·17 "	·3 "
30,000	4	·13 "	·22 "

When, in emergency, the force per pile reaches the working maximum of 50 T. the K.E. absorbed by each rubber is 22,000 ft lb. The corresponding speeds of approach are in the last column above.

D. Le Blanc.

REF: 916

COPY TO GENERAL MANAGER

25th June, 1957.

Messrs E.D. Kalaugher & Co.
P.O. Box 9,
LOWER HUTT

Dear Sirs,

Thank you for your letter of June 17th in which you enquire as to the possibilities of carrying out pile driving and similar work for the Board.

There is no immediate prospect of such work being offered but I will bear in mind that you are equipped for such work and will communicate with you when a suitable opportunity occurs.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

RAJS:HEB

REF: 916

COPY TO GENERAL MANAGER

21st June, 1957.

Messrs William Coward & Co.,
3 St. James's Square,
LONDON S.W.1.

Dear Sirs,

STEEL SHEET PILING

Thank you for your letter of June 11th in which you report the present situation in the supply of steel sheet piling.

The situation seems most uncertain and I will communicate with you further depending on the progress of the project at this end.

In the meantime I should be grateful if you would keep me posted as to any changes in the situation.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

RAJS:HEB

E. D. Kalaugher & Co. Ltd.

Civil Engineering Contractors

Telegraphic Address:
"KALENG"
Lower Hutt

P.O. Box 9, LOWER HUTT,

17th June, 1957.

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

Dear Sir,

Harbour/Sea Protection Works.

Sheet Pile Driving.

We have recently completed, with excellent progress, the driving of a continuous interlocked sheet pile breastwork with bulkheads some three thousand five hundred feet long, as part of the Eastbourne Sea Wall.

We have now available for work elsewhere plant, equipment and skilled operators, capable of driving accurately piles up to a weight of 1½ tons each.

We are, of course, anxious to retain this organisation at its present stage of efficiency by keeping it continuously employed. If your Board is considering any construction or repair work within this category, we could immediately, at your request, make available for discussions either our Principal or our Chief Engineer.

We would be prepared to carry out works on a contract basis (lump sum or schedule rate) or on any mutually satisfactory basis. We should be pleased if you would advise us of any work you may have available.

Enquiries as to our standing can be made from the Eastbourne Borough Council and its Consulting Engineers, Messrs. Seaton, Sladden & Pavitt, Wellington.

Yours faithfully,
E. D. KALAUGHER & CO. LTD.

Managing Director.

AUCKLAND HARBOUR BOARD

DATE. 18.6.57

TO The Engineer

PLEASE ACKNOWLEDGE	
PLEASE REPLY DIRECT SUBMITTING COPY TO HEAD OFFICE	
PLEASE REPORT	
FOR YOUR INFORMATION PLEASE RETURN	
FOR NECESSARY ACTION PLEASE	

for Secretary

TELEPHONES: WHITEHALL 2537, 2538
CABLEGRAMS: COWARDS LONDON
ALL CODES: PRINCIPALLY
A.B.C. CODE 6TH EDITION

William Coward & Company Ltd.

ESTABLISHED 1837

3 ST. JAMES'S SQUARE
LONDON S.W.1

AGENTS FOR
OVERSEAS CORPORATIONS

REF. WJP/AP
29/57

DATE 11th June, 1957.

The Auckland Harbour Board,
P.O. Box 1259,
Auckland,
New Zealand.

FILE 916

ENG'S

Dear Sirs,

Steel Sheet Piling.

We thank you for your letter of the 18th April in regard to your future requirements for 802 tons of steel sheet piling.

We have interviewed both the Appleby-Frodingham people and the Larssen people in London, namely, The British Steel Piling Co. Ltd. and Sagma Ltd. respectively.

Our investigations have shown that it is imperative that an order be placed immediately if reasonably prompt shipment during this year is to be secured. Both rollers of this piling express their inability to look further forward in the future than the present rolling since the demand for steel piling continues at a very high level.

Accordingly we would strongly recommend to your Board, the desirability of placing your orders in hand before the end of the year as was envisaged by you, and indeed, we suggest that it be done immediately.

As you may be aware, an export quota is given to steel mills to cover their over-seas orders and the demand against this is very high indeed.

The British Steel Piling Co.Ltd.

The above are the London agents for the Appleby-Frodingham Steel Co. and we have secured from them quotations as follows:-

Section:	No. 3
In Lengths of:	10/50 ft.
Quantity:	Over 50 tons.
Quality of Steel:	B.S. 15 of 1936.
Price:	£52. 0. 0d. per ton.

Extras: One slinging hole per pile free of charge.
"Piling will be invoiced at price ruling for country of destination at date of despatch. Order would be subject to confirmation by Purchaser & Supplier three months before scheduled rolling."

This material is offered subject to inspection if required and final acceptance at the Works of the Appleby-Frodingham Steel Co., Scunthorpe, Lincs. No.charge for ordinary inspection or provision of test certificates, extra charge for surface inspection.....10/-d. per ton."

/continued.....

Time of Delivery:	September or October rollings, subject to export quota being available.
Place of Delivery:	F.O.B. Hull.
Terms of Payment:	Net cash against Mate's receipt and invoice in London at time of shipment.
Available for Acceptance within:	28 days.

Section:	No. 4
In Lengths of:	10/50 ft.
Quantity:	Over 50 tons.
Quality of steel:	B.S. 15 of 1936
Price:	£52. 7 6d. per ton.
Extras:	One slinging hole per pile free of charge. Extra for rolling lengths over 50 ft. up to 70 ft.....1/-d. per ton per ft. for each ft. or part thereof over 50'.

"Piling will be invoiced at price ruling for country of destination at date of despatch. Order would be subject to confirmation by Purchaser & supplier three months before scheduled rolling."

"This material is offered subject to inspection if required and final acceptance at the Works of the Appleby-Frodingham Steel Co., Scunthorpe, Lincs. No charge for ordinary inspection or provision of test certificates, extra charge for surface inspection....10/-d. per ton".

Time of Delivery:	December 1957, subject to export quota being available.
Place of Delivery:	F.O.B. Hull.
Terms of Payment:	Net cash against Mate's receipt and invoice in London at time of shipment.
Available for Acceptance within:	28 days.

Section:	No. 5
In Lengths of:	10/50 ft.
Quantity:	Over 50 tons.
Quality of steel:	B.S. 15 of 1936.
Price:	£52. 7. 6d. per ton.
Extras:	One slinging hole per pile free of charge. Extra for rolling lengths over 50 ft. up to 70 ft.... 1/-d. per ton per ft. for each ft. or part thereof over 50'.

"Piling will be invoiced at price ruling for country of destination at date of despatch. Order would be subject to confirmation by Purchaser and supplier three months before scheduled rolling."

"This material is offered subject to inspection if required and final acceptance at the Works of the Appleby-Frodingham Steel Co., Scunthorpe, Lincs. No. charge for ordinary inspection or provision of test certificates, extra charge for surface inspection...10/-d. per ton."

Time of Delivery:	January 1958, subject to export quota being available.
Place of Delivery:	F.O.B. Hull.
Terms of Payment:	Net cash against Mate's receipt and invoice in London at time of shipment.
Available for Acceptance within:	28 days.

/continued.....

We have also raised with these people their ability to offer the Larssen No. 5 and if necessary this section can be transferred to Appleby-Frodingham Section No. 5 when it can be rolled at the same time as the two items in the first section of the Specification.

Subject to Export Quota steel being available at date of receipt of order, Appleby-Frodingham would offer to supply the 175 tons of No. 3 section from rollings during September or October this year, the 412 tons of No. 4 Section from a rolling early in December of this year and the No. 5 Section either 157 tons or 215 tons from a rolling due to take place during the first half of January 1958. All prices are F.O.B. Hull.

Sagma Limited.

These people are agents for the South Durham Steel & Iron Co. Ltd. and we again inform you that if an order were placed immediately, they can supply the Larssen No. 5 and if necessary, the Larssen equivalent of the Appleby-Frodingham sections, to the extent of 1,000 tons or more for shipment to arrive in New Zealand before the end of this year.

As a present indication of price, we are quoted £52 per ton F.O.B. Middlesbrough subject to confirmation.

We are sending to you herein a leaflet giving details of all the Larssen sections for your information.

We would stress again that the query raised in the last paragraph of your letter regarding the possibility of an order being placed at the end of this year, and the resulting delivery, is very difficult to answer and the steel mills find themselves unable to give anything like a close estimate in view of the uncertainty of the Export quota and both have asked to stress the desirability of making an immediate requisition.

We hope that the information we have given you is of some help to you and we shall look forward to the receipt of your instructions in due course.

Yours faithfully,
pro: WILLIAM COWARD & CO. LTD.

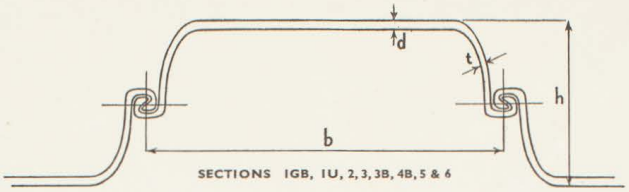
W.J. Peterson.
Manager.

Encl:

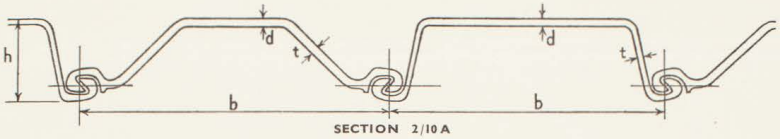
SOUTH DURHAM STEEL & IRON CO., LTD.

INCORPORATING
CARGO FLEET IRON COMPANY LTD., MIDDLESBROUGH.

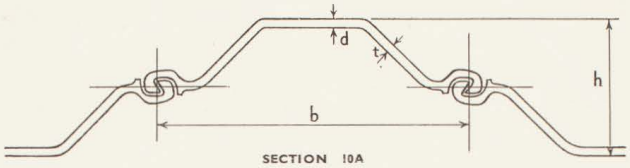
DIMENSIONS AND PROPERTIES OF
LARSSEN STEEL PILING



SECTIONS 1GB, 1U, 2, 3, 3B, 4B, 5 & 6



SECTION 2/10A



SECTION 10A

OCTOBER, 1956

BRITISH

Section	b Inches	h Inches	d Inches	t Inches	Sectional Area Square Inches per foot of wall	Weight		Combined Mom. of Inertia ins.⁴ per foot	Section Mod. ins.³ per foot
						lbs. per linear foot	lbs. per sq. ft.		
1 GB	15¾	5⅛	0.32	0.23	5.44	24.30	18.50	20.0	7.8
1 U	15¾	5⅛	0.37	0.37	6.38	28.50	21.70	23.3	9.1
2	15¾	7⅞	0.40	0.31	7.35	32.79	24.98	62.2	15.8
3	15¾	9¾	0.56	0.35	9.33	41.66	31.74	123.3	25.3
3 B	15¾	11¾	0.53	0.35	9.34	41.70	31.77	175.1	29.8
4 B	16 9/16	13½	0.61	0.43	12.07	56.75	41.17	286.9	42.5
5	16 9/16	13½	0.87	0.47	14.34	67.19	48.74	371.9	55.1
6	16 17/32	17 5/16	0.87	0.55	17.47	81.84	59.39	676.1	78.1
10 A	17¾	7⅞	0.50	0.50	8.03	40.40	27.30	46.1	11.7
2/10 A	15¾/17¾	4 13/16	0.40/0.50	0.31/0.50	7.73	32.79/40.40	26.30	27.2	6.9

METRIC

Section	b mm.	h mm.	d mm.	t mm.	Sectional Area cm.²/m. of Wall	Weight		Combined Mom. of Inertia cm.⁴/m.	Section Mod. cm.³/m.
						Kg./m. Linear	Kg./m.² of Wall		
1 GB	400	130	8.1	5.8	115	36.2	90	2729	419
1 U	400	130	9.5	9.5	135	42.4	106	3184	489
2	400	200	10.2	7.8	156	48.8	122	8494	850
3	400	247	14.0	8.9	198	62.0	155	16839	1360
3 B	400	298	13.5	8.9	198	62.1	155	23910	1602
4 B	420	343	15.5	10.9	256	84.5	201	39165	2285
5	420	343	22.1	11.9	303	100.0	238	50777	2962
6	420	440	22.0	14.0	370	122.0	290	92298	4200
10 A	450	200	12.7	12.7	170	60.1	133	6290	629
2/10 A	400/450	122	10.2/12.7	7.8/12.7	164	48.8/60.1	128	3709	371

Rolling margin is within 4 per cent over and 2½ per cent under theoretical weight.

7th June, 1957.

Messrs. Richardson, McCabe & Co. Ltd.,
P.O. Box 792,
WELLINGTON C.1.

Dear Sirs,

STEEL SHEET PILING

I have to thank you for your letter KC:SQ, dated 2nd May, 1957, enclosing copy of letter from your Principals concerning protective coatings for steel sheet piling, together with drawing showing thickened sections.

I note that you have written to both the paint manufacturers mentioned for details of their products, and shall be pleased to receive this additional information.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

6th June, 1957.

Messrs William Coward & Co.,
3 St. James's Square,
LONDON S.W.1.

Dear Sirs,

STEEL SHEET PILING

On April 18th I wrote to you requesting information on the availability of steel sheet piling.

I should be interested to learn what progress you have made as I continue to receive conflicting reports from local agents.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

RAJS:HEB

916

48 WELLESLEY ST. WEST
AUCKLAND, C.1., N.Z.
PHONES: 41-456
45-438

Ponsonby

SAGMA
(N.Z.) LTD.

P.O. BOX 2756
AUCKLAND, C.1., N.Z.
CABLES AND TELEGRAMS:
"SAGMACAR"
AUCKLAND

13063
Foster

4th June, 1957.

SD/ynh

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

(For attention Mr. Goodser)

Dear Sir,

We confirm having the available export capacity for 1,000 or more tons of Larssen piling which we could ship from England before the end of the year.

Should there be any further advice you may wish us to obtain from our principals please advise us and we shall not hesitate to cable them on your behalf without obligation.

We should say the above tonnage would be available to you over any section, including 3B, listed by our principals, the South Durham Steel and Iron Company Limited.

Yours faithfully,
SAGMA (N.Z.) LTD.

S. Douglas
S. Douglas
Managing Director

Noted File on Freyberg Whf. file.
G.T.

TELEGRAPHIC & CABLE ADDRESS
"DREDGER" WELLINGTON
TELEPHONE 70-789 (3 LINES)

RICHARDSON, McCABE & CO. LIMITED

ENGINEERS AND MANUFACTURERS' REPRESENTATIVES

BRANCHES AT.
AUCKLAND
& CHRISTCHURCH

13 GREY STREET,
WELLINGTON, C.1, N.Z.

PLEASE ADDRESS ALL MAIL TO THE COMPANY
P.O. Box 792
WELLINGTON, N.Z.

KC:SQ

2nd May, 1957.

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

Attention: Mr. Hutchinson.

Dear Sir,

Protective Coatings.
Steel Sheet Piling.

Further to our letter of 27th March, we have now received details from The British Steel Piling Co. Ltd., concerning the protective coatings which they have recommended. A copy of our Principals letter is attached hereto together with the drawing showing thickened sections.

For your information, we have written to both the paint manufacturers mentioned, asking for details of their products, and also asking whether they can be obtained locally in New Zealand. We will write to you again when this additional information comes to hand.

Yours faithfully,
RICHARDSON McCABE & CO. LTD.

Per: [signature]

Enc

69m

THE BRITISH STEEL PILING COMPANY LIMITED

WORKS CLAYDON
Nr IPSWICH SUFFOLK
TELEPHONE
CLAYDON 366 & 367
TELEGRAMS PILINGDOM
PHONE IPSWICH

BSP

TELEPHONE
TRAFALGAR 1024/8
TELEGRAMS
PILINGDOM
LESQUARE LONDON

KINGS HOUSE
10. Haymarket
LONDON S.W.1
(REGISTERED OFFICE)

Air Mail Letter No.30.

OUR REF GMC/EC.

YOUR REF KC:SO NO.1134

DATE 26th April, 1957.

Messrs. Richardson, McCabe & Co., Ltd.,
P.O. Box 792,
Wellington, N.Z.

Dear Sirs,

AUCKLAND HARBOUR BOARD.

We acknowledge with thanks receipt of your letter of the 9th April with which you enclosed a copy of a letter dated 5th April from the Chief Engineer to the Auckland Harbour Board.

Lowca Black Varnish is manufacturered and sold by the United Coke & Chemicals Co. Limited, Sales Dept., 34, Collegiate Crescent, Sheffield, 10 and they will be able to let you have full information regarding its composition, etc. Occasionally sheet piles are painted with preparations manufactured by Wailes Dove Bitumastic Limited, 6, Duke Street, London, S.W.1, but we should mention that they have a large number of different types of coating and it would be best if you communicated with them direct. We believe that certain of the thicker Wailes Dove coatings should be applied to the piling at the site, but the makers will advise you regarding this.

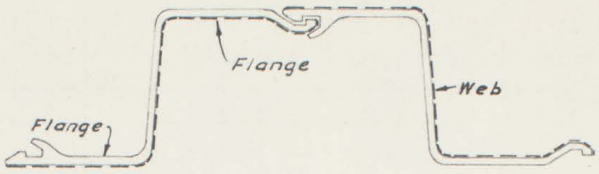
The bulk of the piling which we supply is painted with Lowca Black Varnish and we should mention that the covering capacity of this is of the order of about 40 square yards per gallon. One disadvantage of a black paint complying with B.S.1070 is that the coating is somewhat thinner; this is indicated by the information given in the British Standard that the paint normally covers 80 square yards per gallon.

We are firmly of the opinion that it is not worth spending money on any expensive paint as even the best will have a limited life compared with that of the piling as a whole. To take an extreme case, even a sprayed zinc or other metallic coating would have a life of perhaps five to ten years only, while its cost would be prohibitive. As we have already mentioned, the money would be far better spent in using a heavier pile section having an increased thickness of metal. We would remind you that it is possible to supply any of the Frodingham sections as a rolled-up section having 0.03" of additional thickness. Details are given at the top of the enclosed copy of our drawing No. 36587/3. The thickened-up sections given in the bottom portion of this drawing can only be supplied if the tonnage ordered is sufficient for one complete rolling and this means for quantities of the order of 1,000 tons or so. The rolled-up sections can be supplied for smaller quantities ordered.

Yours faithfully,
for THE BRITISH STEEL PILING CO.LTD.

ROLLED - UP SECTIONS

Flange and Web thicknesses increased by increasing distance between rolls.



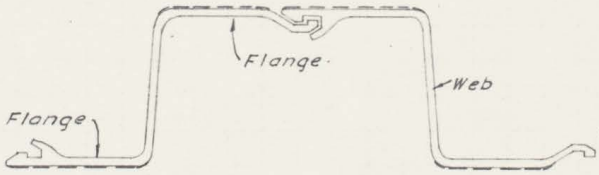
Additional material indicated by dotted line.

Weights per lineal foot are for single pile and not double pile as illustrated.

Section	English					Metric				
	Flange thickness ins.	Web thickness ins	Weight lb./lin.ft.	Weight lb./sq.ft.	Section Modulus ins³	Flange thickness mm.	Web thickness mm.	Weight Kilos/m.	Weight Kilos/sq.m.	Section Modulus cms³
1A	0·30	0·30	26·08	19·87	11·32	7·7	7·7	38·8	97·0	608
1B	0·41	0·41	30·31	23·09	11·07	10·3	10·3	45·1	112·7	595
2	0·35	0·32	33·71	25·69	19·64	8·9	8·0	50·2	125·4	1056
3	0·45	0·42	43·42	33·08	29·93	11·5	10·6	64·6	161·5	1609
4	0·58	0·48	56·51	43·06	45·62	14·7	12·2	84·1	210·2	2453
5	0·70	0·50	70·67	50·63	61·06	17·8	12·7	105·2	247·2	3282

THICKENED SECTIONS

Flange thickness increased by modifying rolls. Web thickness unchanged. Quantity ordered to be sufficient for one complete rolling.



Additional material indicated by dotted line.

Weights per lineal foot are for single pile and not double pile as illustrated.

Section	English					Metric				
	Flange thickness ins.	Web thickness ins	Weight lb./lin.ft.	Weight lb./sq.ft.	Section Modulus ins³	Flange thickness mm.	Web thickness mm.	Weight Kilos/m.	Weight Kilos/sq.m.	Section Modulus cm³
1A	0·33	0·27	26·58	20·25	11·98	8·4	6·9	39·6	98·9	644
1B	0·44	0·38	30·64	23·34	11·59	11·0	9·5	45·6	113·9	623
2	0·38	0·30	34·77	26·49	20·72	9·6	7·6	51·7	129·3	1114
3	0·48	0·40	44·35	33·79	31·18	12·2	10·2	66·0	165·0	1676
4	0·61	0·45	56·83	43·30	46·91	15·4	11·4	84·6	211·0	2522
5	0·73	0·47	70·84	50·75	62·37	18·5	11·9	105·4	247·8	3352

FRODINGHAM STEEL SHEET PILING

Details of Modified Sections

SCALE:

DRAWN BY RHB

THE BRITISH STEEL PILING CO. LTD
LONDON AND CLAYDON, SUFFOLK

DRG.NO. 36587 /S

DATE 21:9:54

Section Moduli of Sections 1A and 3 altered 20:2:57

Supply of Steel Sheet Piling — U.K. Frodingham

Jack Malcolm (Richardson Co Cocks) 21.5.57.

1. The supply position is difficult & uncertain

2. Frodingham have consumed the whole of their normal steel quota but, out of a special quota for export to Commonwealth countries they would supply:—

No. 3.	70 tons	to be rolled late this year,
No. 4	400 "	" " " " "
No. 5	135 "	" " " early next year.

3. In general the delivery period should be taken as 12 months.

∴ It would be prudent to order the sheet piling when tenders are advertised

[signature] 21.5.57

6.6.57 See also letter from SAGMA.

REF: 916

18th April, 1957.

Messrs William Coward & Co.,
3 St. James's Square,
LONDON S.W.1.

Dear Sirs,

STEEL SHEET PILING

My Board proposes in the very near future to proceed with the construction of a new two berth wharf for which tenders will be invited as soon as the necessary financial arrangements have been completed.

For a portion of this work it is intended to use steel sheet piling, preferably "Appleby-Frodingham" and "Larssen", and a recent discussion with the local agent for the former material indicates that there may be considerable delay in obtaining supplies of steel sheet piling of U.K. manufacture.

The approximate quantities of sheet piling which will be required are as follow:-

Appleby-Frodingham			
No. 3	Lengths	27' - 36'	65 tons
No. 4	"	36' - 69'	412 "
No. 5	"	41' - 63'	127 "
No. 3	"	10' - 20'	110 "
No. 5	"	10' - 20'	30 "
Larssen			
No. 5	Lengths	30' - 40'	58 "
		TOTAL	802 tons

To assist us in specifying a realistic completion time, I should be pleased if you would make the necessary enquiries and inform me of the probable time lag between placing of order and receipt of these materials, assuming that the order was placed towards the end of this year.

Yours faithfully,

CHIEF ENGINEER TO THE BOARD

RAJS:HEB