AC CONSULTING GROUP LIMITED

Consulting Engineers

HUTT CITY COUNCIL

LEISURE SERVICES DIVISION

REPORT ON FUTURE OPTIONS

FOR POINT HOWARD WHARF

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HUTT CITY COUNCIL
LEISURE SERVICES DIVISION

REPORT ON FUTURE OPTIONS FOR POINT HOWARD WHARF

1 EXECUTIVE SUMMARY

The Hutt City Council owns four wharves, and two small-boat jetties. The wharves are situated at Point Howard, Petone, Days Bay and Rona Bay. The two jetties are at Lowry Bay. The wharves are traditional hardwood piers, ranging in age from 60 years to over 100 years.

The Hutt City Council has agreed in principle to retain and maintain the wharves at Petone, Days Bay and Rona Bay, and the jetties at Lowry Bay.

This report looks at future options for Point Howard Wharf.

Point Howard wharf was partly rehabilitated in 1993/94.

Point Howard wharf was re-surveyed in 1998; the extent of deterioration and recommended repairs were reported on.

Point Howard Wharf is an asset to the Hutt City community. It is in fair condition for its age and will remain safe for controlled public use if it is regularly inspected and maintained. This regular maintenance will be an ongoing cost to Hutt City ratepayers.

This report discusses the engineering and financial aspects of the following options:

- Maintaining the wharf as a Light Recreational Wharf
- Demolition of the wharf
- Demolition of the north head only
- Demolition of the south head only
- Demolition of the north and south heads.

Within the accuracy of the cost estimates presented the 20-year costs of each of the options is very similar.

We recommend that Council consider other issues as well as the aspects discussed in this report before deciding on the future of Point Howard Wharf.

2 INTRODUCTION

2.1 Point Howard Wharf

Point Howard Wharf is one of four wharves owned by the Hutt City Council. It is in fair condition for a seventy year old wharf and will remain safe for controlled public use if it is regularly inspected and maintained. It presently requires $220,000 to $250,000 of rehabilitation work in order to restore it to the agreed standard.

2.2 Objectives

The objectives of this Report on the Future Options for Point Howard Wharf are to summarise the findings of previous reports on Point Howard Wharf and to set out a number of options for the future of the wharf, discussing the advantages and disadvantages of each option including long term financial considerations. This report is essentially an Engineering report but also identifies social, environmental and other issues where these are relevant to Council's decision on the future of the wharf.

2.3 Background

The Hutt City Council owns four wharves, and two small-boat jetties. The wharves are situated at Point Howard, Petone, Days Bay and Rona Bay. The two jetties are at Lowry Bay. The wharves are traditional hardwood piers, ranging in age from 60 years to over 100 years.

The four wharves were previously owned by the former Wellington Harbour Board, and were vested to the Hutt City Council in 1989. Records show that the wharves were well maintained until the early 1970's, but were neglected after that.

In late 1990 Ian Macallan & Co. Ltd, Consulting Engineers (IMCL) now part of AC Consulting Group Limited, Consulting Engineers (ACCG) were engaged to carry out surveys and report on the four wharves. Following these surveys, programmes were prepared to rehabilitate each wharf over a five year period.

The recommended works were carried out on Days Bay Wharf as one contract in 1992, and stage one of the programmed works for Petone Wharf and Point Howard Wharf were carried out in 1993 and 1994.

Rona Bay wharf was rehabilitated in 1996.

All timber structures in marine environments continuously deteriorate and require regular inspections and maintenance if they are to remain in use indefinitely. Regular maintenance will avoid the need for major rehabilitation in the future, and minimise the risk of a local failure, perhaps causing death or injury to a member of the public.

The earlier reports recommended that each wharf be re-inspected on a five yearly basis to assess on-going deterioration and where necessary repairs are carried out to ensure the wharves remain safe for the public.

In 1998 ACCG were engaged to re-inspect the wharves and to report. The report identified the extent of deterioration of each wharf, assessed the residual strength, made specific recommendations for remedial work and provided cost estimates.

The Hutt City Council designates the wharves as recreational facilities, although we understand that there is no written policy defining the status of the wharves, or whether they are regarded as part of Council's core services to ratepayers. We understand that no income is received from any of the wharves.

The wharves are all in regular use and have undoubted social, recreational and historical value to the community.

2.4 Rehabilitation Standard

In the past ACCG have agreed with Hutt City Council staff that Point Howard and Petone Wharves will remain in use as light recreational wharves and Days Bay Wharf as a recreational wharf.

We define a *Light Recreational Wharf* as able to carry a uniform deck load of 3 kPa (a loose crowd) and a maximum axle load of 2.5 tonnes. This means that crowds should not be encouraged to congregate on the wharf and vehicle use must be strictly controlled. A *Recreational Wharf* is able to carry a uniform deck load of 5 kPa (able to sustain a full crowd load) and a maximum axle load of 4.0 tonnes. Notices were erected on all four wharves in 1993 clearly stating the restrictions on use and the maximum axle loads and speeds permitted. Barriers are in place to prevent unauthorised vehicles from entering each wharf.

These definitions were derived by our office to provide a convenient term for each strength level; they are not terms used in New Zealand or International Standards. The deck loadings are derived from New Zealand Standards.

The wharves were all originally designed for much larger gravity loads (cargo stacked on the deck); meaning that wharf members that have some deterioration can safely carried, in many cases, these lower newly specified loads. In some cases, where the member has a high degree of deterioration, the load can be safely carried by its partner member that is good condition. Some of the wharf members are critical to strength and stability, although in most cases some deterioration is permissible.

We have based our assessment of the existing load carrying capacity of each wharf on the original capacity of the wharf, close inspection of the level of deterioration and on engineering calculations, combined with engineering judgement.

To ensure public safety *Recreational Wharves* and *Light Recreational Wharves* require access ladders extending to below low tide level, and adequate handrails to provide safety from falling onto land or shallow water.

We consider that *Recreational Wharves* and *Light Recreational Wharves* must have basic amenity lighting on the wharf deck. Wharf lighting has been extensively covered in a separate report (IMCL, 1996). Regulations require that the gazetted navigation lights on each wharf must be properly maintained.

The *Recreational Wharf* and *Light Recreational Wharf* defined above make no specific allowance for berthing of vessels, for adequate mooring bollards or a ship to shore services. In fact vessels of up to 200 tonnes displacement can safely berth at the fendered pier head and use the bollards on each of the wharves, and some original ship to shore services are still operational.

3 POINT HOWARD WHARF

3.1 Description

Point Howard Wharf is a traditional cross-braced piled timber wharf constructed circa 1929. It is tee-shaped, the stem or approach being 169m long x 4m wide and the head 159m long with the width varying from 4m to 13m.

The wharf is constructed entirely of timber (piles, pile caps, wales, braces, beams, decking and fenders) although the deck has been overlaid with a concrete topping. The wharf appears to have been constructed in two stages in 1929 and 1933.

Point Howard Wharf was Wellington's primary oil terminal until the completion of the new Seaview Wharf in 1979. Chemical tankers continued to use the wharf for a few years after that.

It appears that the southern end of the tee was repaired, and nine new piles driven in 1974 after damage resulting from a ship collision.

The wharf appears to have been well maintained until about 1980, and then neglected for a decade. In 1993, after IMCL's survey, urgent repairs were carried out to ensure public safety. A number of piles were repaired using concrete jackets and timber members were repaired and replaced. The repairs carried out were stage one of a planned five year rehabilitation programme, and concentrated on the most severely decayed members only. Further stages of the rehabilitation programme have not been carried out.

The main users of Point Howard Wharf are fishers (both recreational and those fishing to supplement their income), recreational walkers, spectators of yacht races and other harbour events and those who simply want to smell the sea and feel the wind in their face without going out in a boat. More so than the other wharves, Point Howard allows you

to *surround yourself with sea*. It is especially popular with fishermen due to the depth of the water at the pier head.

Occasionally commercial vessels use the wharf as a holding berth, although power, water and other ship services are not available. We understand that private pleasure craft, harbour ferries and harbour cruise boats rarely visit the wharf.

The container on the south arm of the head is in regular use as the starting box for yacht races. The small building on the wharf approach is sometimes rented out by the HCC but we understand it is not currently in regular use.

Lighting meets standards required by the Harbourmaster. The lighting was replaced in the 1997/98 financial year. It is susceptible to vandalism. The cable powering the wharf promenade lighting has been stolen twice since January 1999.

3.2 Survey

The wharf was last surveyed in May 1998. This survey is described in detail in report on Limited Surveys of Hutt City Wharves, ACCG, September 1998. Full survey results are given as an Appendix to that report. The survey was approached on the basis that the wharf would be rehabilitated to *Light Recreational Wharf* standard.

3.3 Survey Results

The 1998 survey identified considerable deterioration and some damage to the wharf structure. Many timber members are slightly to severely deteriorated, and the visible heads and nuts of most structural bolts are corroded. Some members have deteriorated significantly since the last survey in 1990; others appear to be unchanged illustrating the unpredictable nature of deterioration.

A few of the concrete pile jackets installed in 1994 have cracks in their outer faces, and some of the new timber members, particularly those fully exposed to the sun have longitudinal splits. These do not affect the structural integrity of the wharf.

Although the loads applied to the wharf are considerably less than the original design loads, there are a considerable number of wales and braces, and a few piles, beams, areas of deck and smaller members that should be repaired if the wharf is to remain open to the public. Some of these members had been scheduled for repair in stages two to five of the rehabilitation programme, and have not been repaired. Others have deteriorated further since the earlier survey.

The survey identifies missing and deteriorated fenders and bollards but does not schedule these for replacement. If the wharf is promoted as a holding berth, these members need to be repaired to protect both the wharf and the ship.

3.4 Assessment

We assess that Point Howard Wharf remains generally adequate as a Light Recreational Wharf, and is able to safely carry a uniform deck load of 3.0 kPa, an axle load of 2.5 tonnes and to resist code wind loads, and moderate earthquake loads. However we have identified a few areas where deterioration has resulted in local areas of weakness where the wharf strength is below this figure.

If vessels are to be berthed at Point Howard Wharf the following restrictions should apply:

- Vessels of up to 200 tonne displacement may berth in any of the fendered locations.
- Vessels of between 200 tonnes and 4000 tonnes displacement may berth at the fendered berthing areas on the outside of the tee only, must berth with extreme caution, with the approach velocity of a 4000 tonne vessel not exceeding 0.1 metres per second normal to the wharf.
- Vessels of greater than 4000 tonnes displacement should not berth at the wharf.
- Berthing should not take place in gale force winds or stronger.
- When vessels of greater than 200 tonnes are tied to the wharf, care should be exercised to ensure that bollard loads are not excessive, and that only sound bollards are used.

In summary Point Howard Wharf is in fair condition for its age and will remain safe for controlled public use if it is regularly inspected and maintained.

4 FUTURE OPTIONS

4.1 General

We have considered a number of options for the future of Point Howard Wharf. We discuss the three most favourable options in some detail here.

4.2 Light Recreational Wharf (Option 1)

Option 1 is to maintain the wharf at its present level. Until now it has always been assumed that Point Howard Wharf will remain in use indefinitely as a Light Recreational Wharf, and previous surveys and reports have been done with this in mind.

The Limited Surveys of Hutt City Wharves, ACCG, September 1998 scheduled repairs to Point Howard wharf in two priority groups, assuming that the wharf was to be restored to Light Recreational Wharf standard. All work was to be completed within four years of the survey. A total of 74 members were to be replaced or repaired. Consistent with the Light Recreational Wharf standard, fenders and bollards were not scheduled for replacement.

The rough order cost estimates (all excluding GST) for these repairs were as follows;

Priority 1 work (urgent)(Including $15,000 contingency):	$135,000 + GST.
Priority 2 work (important)(Including $15,000 contingency):	$109,000 + GST.
Priority 1 and 2 work (If carried out as a single contract) (Including $15,000 contingency total. Also $10,000 saving resulting from reduced preliminary and establishment costs.)	$219,000 + GST.

Each of these estimates includes professional fees.

In addition to these initial capital costs funds should be budgeted to re-survey Point Howard Wharf on a five yearly basis. Each survey is likely to reveal a certain amount of ongoing deterioration and damage needing repair. We recommend that $75,000 be budgeted every five years to cover the survey and the subsequent repairs.

4.3 Demolish Wharf (Option 2)

Option 2 is to demolish the wharf.

4.3.1 Authorisations Required

Resource Consent will be required under section 12(b) of the Resource Management Act in order to demolish the wharf. The Consent will need to be obtained from the Wellington Regional Council.

Agreement from the Department of Conservation who has jurisdiction over the sea bed will also be required.

In addition, the Harbour Master must be notified.

4.3.2 Demolition

Demolition of the wharf superstructure will be relatively straight forward. A condition of Resource Consent is likely to be that no demolition materials or even marine growth are dropped into the harbour. All must be removed from site.

4.3.3 Piles and Soil Conditions on Seabed

Point Howard Wharf is supported on a total of 250 piles. There may be additional broken piles protruding from the seabed.

The seabed at Point Howard consists of a layer of mud and silt, typically 11m thick, underlain by a layer of gravel. Close to the Point Howard shore, the mud/silt layer is thinner, and is underlain by rock.

The gravel underlying the mud is part of the aquifer beneath Wellington Harbour and the Hutt Valley. The mud/silt layer forms the impervious aquiclude.

From original records obtained it appears that most of the piles were driven through the mud to bear on the gravel. Artesian flow was reported from some of the test bores drilled.

The Wellington Regional Council (WRC) carefully and conservatively manages the aquifer and is unlikely to issue Consent for any activity that is likely to damage the aquifer.

Withdrawing the piles, usually the Department of Conservation (DOC) preference, is unlikely to be permitted by the WRC. Also, due to the depth that the piles have been

driven, withdrawing is likely to be difficult and expensive, and it is likely that the holes will then need to be plugged.

The fresh water in the aquifer is at a positive pressure relative to the harbour meaning that artesian water can flow from any weakness in the aquiclude, especially when the aquifer water pressure peaks, such as during an earthquake.

If Point Howard Wharf was demolished and the piles cut off at the seabed, the pressure of the aquifer could exceed the reduced load of the pile, resulting in a leak from the aquifer or possibly displacing the pile upwards.

We have discussed the matter at length with the WRC as well as the Harbour Master and conclude it is likely that, as a condition of Consent, that all piles will need to be capped with a concrete collar prior to being cut off at seabed level. We have based our cost estimate on this scenario.

However, if we can show to the WRC's satisfaction that the risk of leakage is low, we may be able to simply cut off the piles at seabed level. This will result in significant cost savings.

4.3.4 Cost Estimate

Our rough order cost estimate to demolish Point Howard Wharf is $390,000 + GST.

This allows to dismantle the wharf deck, construct concrete collars at sea bed level (protruding above sea bed) and cutting off piles at top of the concrete collar (at say 600m above surrounding bed). The price allows to remove all material off site and dispose, and assumes that the Resource Consent will not allow any demolition material to be dropped on the sea bed.

We have included a contingency sum ($20,000) and professional fees ($28,000) to facilitate obtaining Resource Consent, calling of tenders and supervision of the demolition work. We have not allowed for fees involved in a public consultation process, as this is part of the decision process and not part of the demolition costs.

We have allowed a nominal sum of $3000 per year for ten years for ongoing monitoring of the seabed to detect leaks from the aquifer, as this is a possible condition of Consent.

We have assumed that the demolition materials will have no re-sale value. In fact, some members, especially the longer piles may be able to be sold. Whilst second hand untreated hardwoods are always popular, their re-sale value is usually low.

If the Wellington Regional Council agree to the piles being simply cut off at the seabed level, our rough order cost estimate is reduced to $250,000+ GST.

Clearly if the wharf is demolished ongoing maintenance costs are eliminated with the exception of the seabed monitoring noted above.

4.3.5 *Summary*

Point Howard Wharf lies above the Wellington Harbour/Hutt Valley aquifer.

Records show that many of the piles were driven through the seabed mud and into the gravel (aquifer) below.

Removing the piles, or even reducing the load carried by the piles creates a risk of water leaking from the aquifer to the harbour.

Wellington Regional Council who manage the aquifer and the Authority from whom Consent must be obtained, will be keen to minimise this risk, and we assess it is likely that a condition of Consent will be that the piles are cut off, and capped with concrete.

The conditions of Consent have a large influence on the cost of demolishing the wharf.

Our rough order cost estimate to demolish the wharf by cutting the piles and capping with concrete is $390,000 + GST.

4.4 Partial Demolition of Wharf (Option 3)

Option 3 is partial demolition of the wharf. We have looked at three sub-options: demolition of the north head only, demolition of the south head only and demolition of the north and south heads. In each case the remainder of the wharf would be restored to a Light Recreational Wharf standard.

4.4.1 *Demolition*

The items discussed above in sections 4.3.1 to 4.3.3 are all relevant to the partial demolition options.

4.4.2 *Demolition of North Head Only (Option 3A)*

Option 3A is to demolish the north head only. The north head of Point Howard Wharf has deteriorated more than average and requiring disproportionally greater maintenance expenditure.

Our rough order cost estimate to demolish the north head only is $80,000 + GST. In addition to this there would be a saving estimated to be $35,000 on the repairs described in 4.2 above.

In summary the estimated cost of demolishing the north head and rehabilitating the remainder of Point Howard Wharf to Light Recreational Wharf standard is $264,000 + GST. This is made up of $80,000 for demolition plus $184,000 for rehabilitation assuming these works will be done as a single contract.

With this option the five-year budget for survey and repair can be reduced to $60,000 + GST. In addition we have allowed a nominal sum of $2000 per year for ten years for ongoing monitoring of the seabed to detect leaks from the aquifer, as this is a possible condition of Consent.

4.4.3 *Demolition of South Head Only (Option 3B)*

Option 3B is to demolish the south head only. The south head of Point Howard Wharf has deteriorated more than average and requiring disproportionally greater maintenance expenditure.

Our rough order cost estimate to demolish the south head only is $120,000 + GST. In addition to this there would be a saving estimated to be $100,000 on the repairs described in 4.2 above.

If the south head is demolished it is likely that the Harbour Master would require that the wharf navigation light be relocated to the central pier head. It is possible, although unlikely that the Harbour Master requires that the light is re-gazetted. We estimate that moving the light from the south head would cost in the order of $6000 + GST.

In summary the estimated cost of demolishing the south head and rehabilitating the remainder of Point Howard Wharf to Light Recreational Wharf standard is $246,000 + GST. This is made up of $120,000 for demolition plus $120,000 for rehabilitation plus $6000 for the navigation light.

With this option the five-year budget for survey and repair can be reduced to $55,000 + GST. In addition we have allowed a nominal sum of $2000 per year for ten years for ongoing monitoring of the seabed to detect leaks from the aquifer, as this is a possible condition of Consent.

4.4.4 *Demolition of North and South Heads (Option 3C)*

Option 3C is to demolish the north and south heads leaving only the approach and the central pier head. Both the north and south heads of Point Howard Wharf have deteriorated more than average.

Our rough order cost estimate to demolish the north and south heads is $200,000 + GST. In addition to this there would be a saving estimated to be $135,000 on the repairs described in 4.2 above.

If both north and south heads are demolished it is likely that the Harbour Master would require that one of the wharf navigation lights be relocated to the central pier head. It is possible, although unlikely that the Harbour Master requires that the light is re-gazetted. We estimate that moving the light from the south head would cost in the order of $6000 + GST.

In summary the estimated cost of demolishing the north and south heads and rehabilitating the remainder of Point Howard Wharf to Light Recreational Wharf standard is $290,000 + GST. This is made up of $200,000 for demolition plus $84,000 for rehabilitation plus $6000 for the navigation light.

With this option the five-year budget for survey and repair can be reduced to $40,000 + GST. In addition we have allowed a nominal sum of $2000 per year for ten years for ongoing monitoring of the seabed to detect leaks from the aquifer, as this is a possible condition of Consent.

5 SUMMARY OF COST ESTIMATES

We summarise the estimated 25-year costs for each of the above options in the table below. We have included the year 20 survey / year 21 maintenance such that the wharf will remain safe until year 25.

TABLE 1:
SUMMARY OF ESTIMATED COSTS

OPTION	CAPITAL COST YEAR 1	MAINTENANCE COSTS YEARS 6,11,16,21.	TWENTY-FIVE YEAR COSTS SIMPLE TOTAL	TWENTY-FIVE YEAR COSTS DISCOUNTED CASH FLOW
1. Maintain Wharf	$219,000	$300,000	**$519,000**	**$344,500**
2. Demolish Wharf	$390,000	$30,000	**$420,000**	**$410,100**
3A. Demolish North Head	$264,000	$260,000	**$524,000**	**$377,800**
3B. Demolish South Head	$246,000	$240,000	**$486,000**	**$351,500**
3C. Demolish Both Heads	$290,000	$180,000	**$470,000**	**$370,400**

We see from this table that within the accuracy of these cost estimates, the simple twenty-five year costs of each of the options are not significantly different except for Option 2 being the least expensive. Clearly if looking at a timeframe of longer than 25 years, or taking into account future demolition costs, demolition (Option 2) becomes more attractive.

However looking at the totals from the discounted cash flow (using a discount rate of 8%) we see that Option 2 with its high capital outlay in year 1 becomes the most expensive option, and the most attractive options are Options 1, 3B and 3C.

The following Tables 2 and 3 summarise the estimated costs of the options excluding the concrete capping monitoring costs of the cut-of piles, and the concrete capping construction and monitoring costs respectively. The removal of the capping monitoring and/or concrete capping construction costs strongly favours the demolition and partial demolition options.

TABLE 2:
SUMMARY OF ESTIMATED COSTS (EXCLUDING CAPPING MONITORING)

OPTION	CAPITAL COST YEAR 1	MAINTENANCE COSTS YEARS 6,11,16,21.	TWENTY-FIVE YEAR COSTS SIMPLE TOTAL	TWENTY-FIVE YEAR COSTS DISCOUNTED CASH FLOW
1. Maintain Wharf	$219,000	$300,000	**$519,000**	**$344,500**
2. Demolish Wharf	$390,000	$0	**$390,000**	**$390,000**
3A. Demolish North Head	$264,000	$240,000	**$504,000**	**$364,400**
3B. Demolish South Head	$246,000	$220,000	**$466,000**	**$338,000**
3C. Demolish Both Heads	$290,000	$160,000	**$450,000**	**$357,000**

TABLE 3:
SUMMARY OF ESTIMATED COSTS
(EXCLUDING CAPPING CONSTRUCTION AND MONITORING)

OPTION	CAPITAL COST YEAR 1	MAINTENANCE COSTS YEARS 6,11,16,21.	TWENTY-FIVE YEAR COSTS SIMPLE TOTAL	TWENTY-FIVE YEAR COSTS DISCOUNTED CASH FLOW
1. Maintain Wharf	$219,000	$300,000	**$519,000**	**$344,500**
2. Demolish Wharf	$250,000	$0	**$250,000**	**$250,000**
3A. Demolish North Head	$236,000	$240,000	**$476,000**	**$336,400**
3B. Demolish South Head	$203,000	$220,000	**$423,000**	**$295,000**
3C. Demolish Both Heads	$219,000	$160,000	**$379,000**	**$286,000**

6 DISCUSSION

6.1 Public Reaction

Other matters to consider include public reaction to full or partial demolition of the wharf. Our observations suggest that the north head is considerably less popular with fishers than the south head indicating that there may be considerably greater opposition to demolishing the south head. The presence of the yacht club starting box on the south head is a matter requiring further consideration. Council could reasonably expect the Lowry Bay Yacht Club to request assistance to find a new site for the starting box. We understand that initial informal discussions with the Club have included possible alternative sites.

6.2 Environmental Issues

We are not aware of any significant environmental issues (other than those discussed above) associated with demolishing the wharf. Similarly we are not aware of any Iwi issues. Many nearby residents would no doubt be disappointed to see the wharf demolished, and some would claim it has historical significance. Others probably view it as an eyesore.

6.3 Commercial Applications

We have reviewed our earlier studies on commercial uses for Point Howard Wharf and are unable to identify any viable commercial applications.

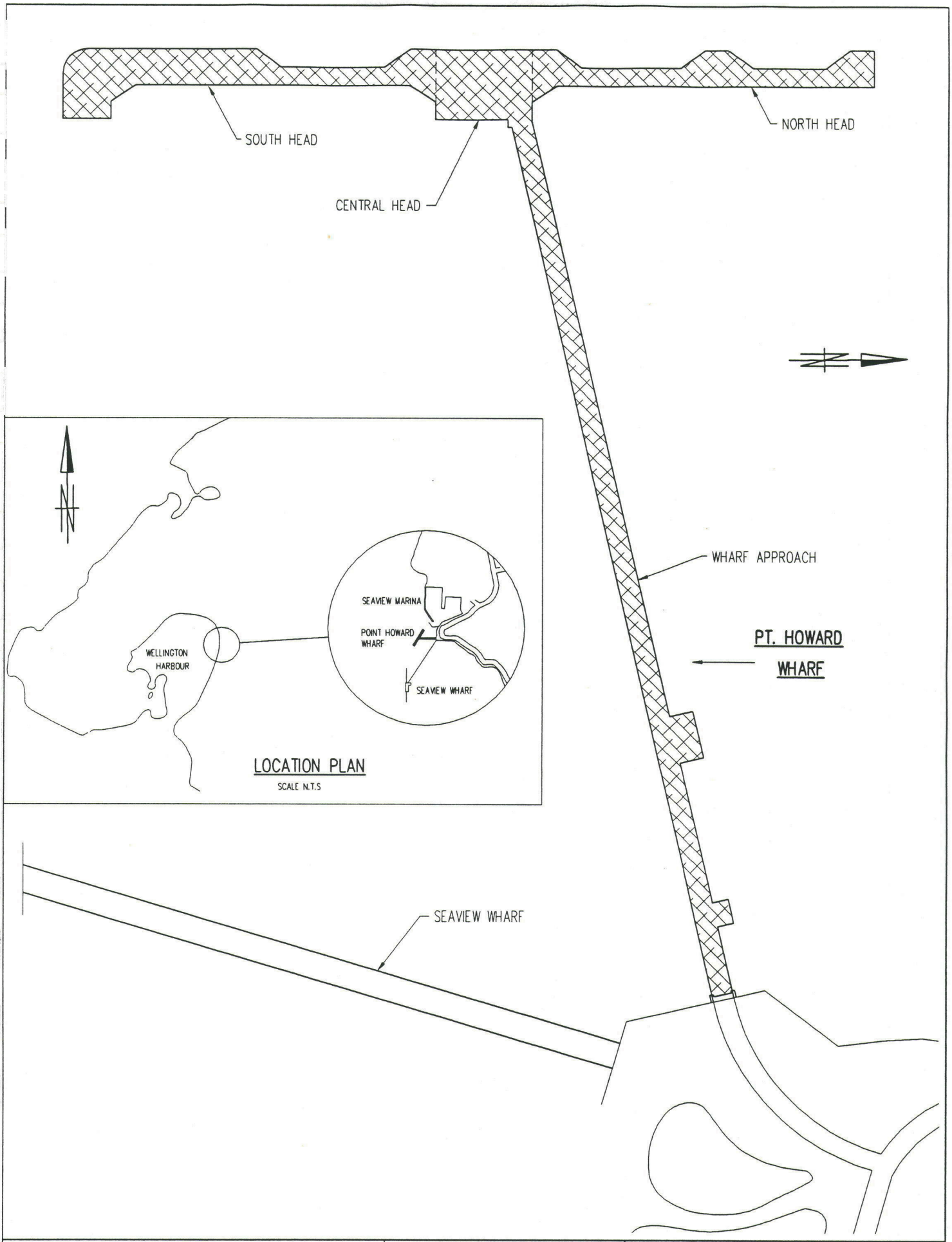
7 CONCLUSION

Point Howard Wharf is an asset to the Hutt City community. It is in fair condition for its age and will remain safe for controlled public use if it is regularly inspected and maintained. This regular maintenance will be an ongoing cost to Hutt City ratepayers.

There are a number of options available to the Hutt City Council. Some of the options are discussed in this report. Within the accuracy of the cost estimates presented, the 25 year costs of each of the options is not significantly different. Full demolition of the wharf has the advantage of eliminating future maintenance costs.

Appendices

Appendix 1: Plans of Wharf Options



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PROJECT

HUTT CITY COUNCIL
LEISURE SERVICES DIVISION

FUTURE OPTIONS FOR
POINT HOWARD WHARF

AC Consulting Group
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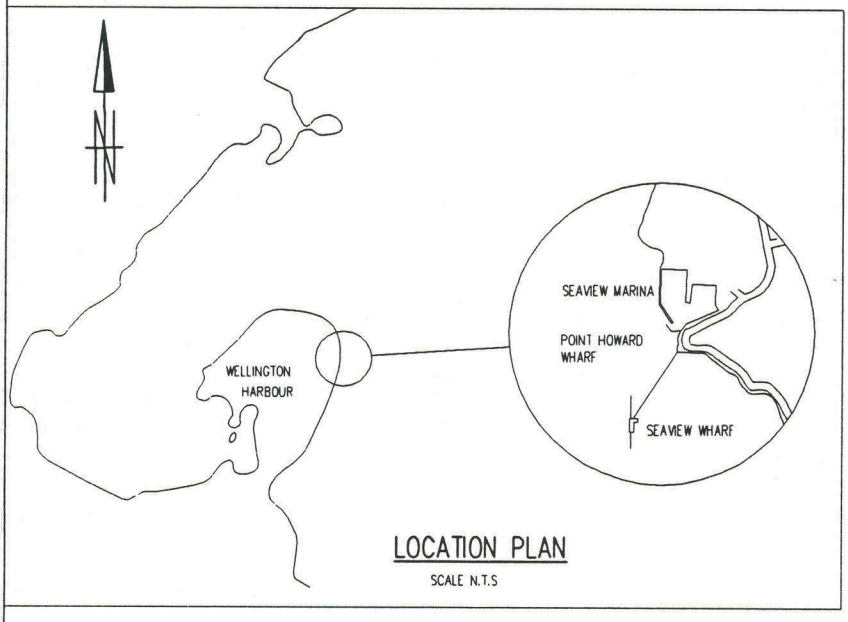
SKETCH NO. W1265\WHARF1

FOLDER REF.

DRAWING TITLE

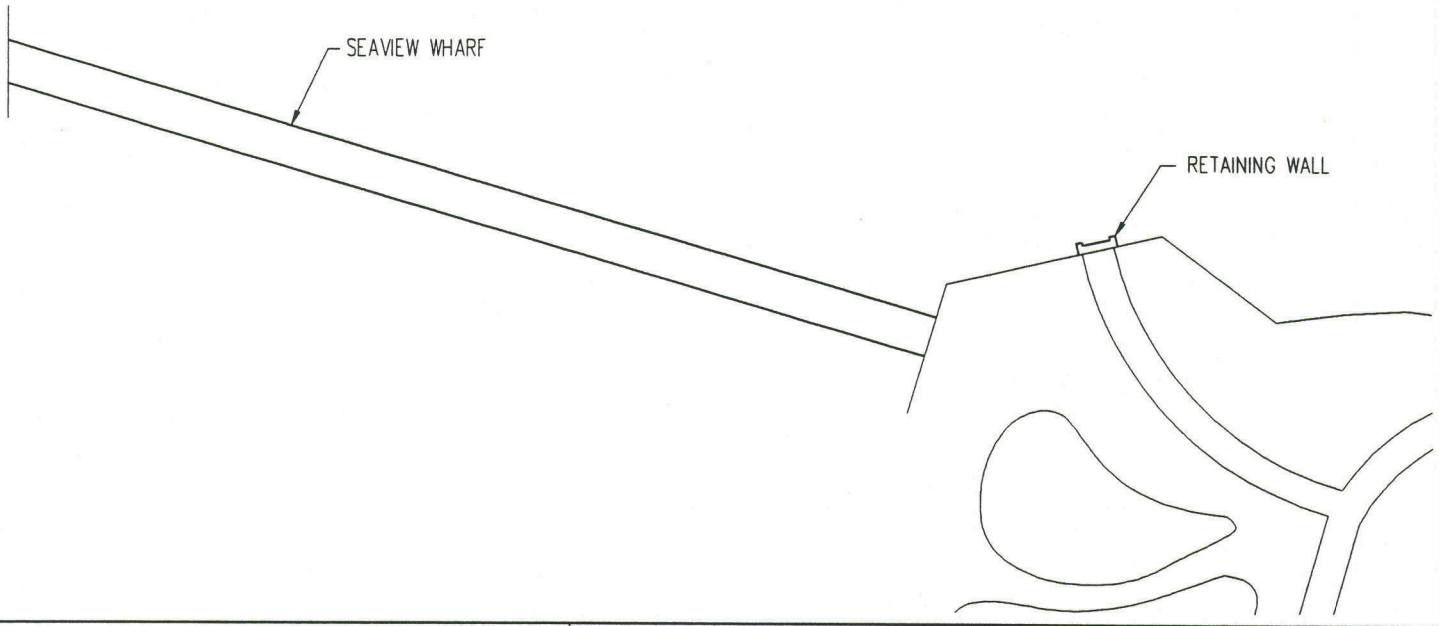
OPTION 1. LIGHT RECREATIONAL WHARF

REV



LOCATION PLAN

SCALE N.T.S



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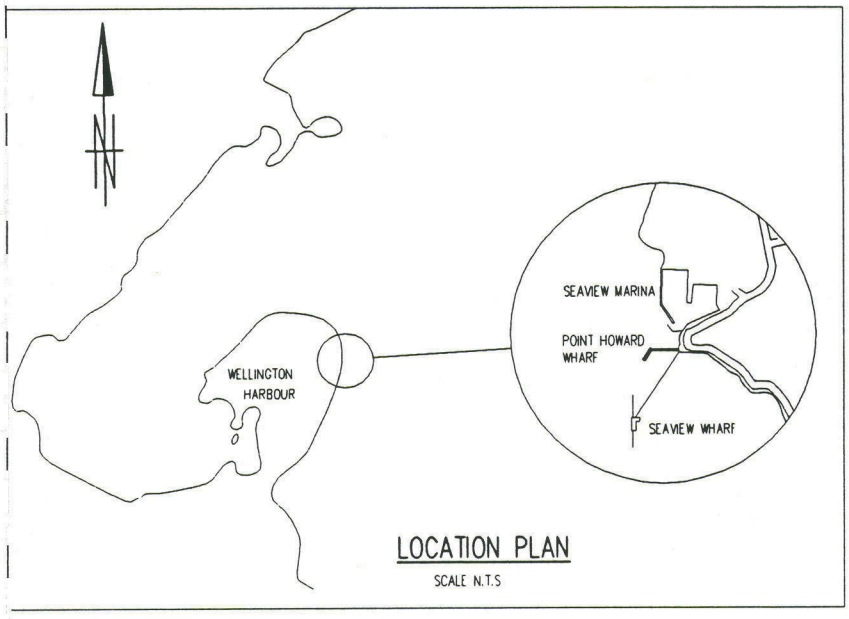
SKETCH NO. W1265\WHARF2

FOLDER REF.

DRAWING TITLE

OPTION 2. FULL WHARF DEMOLITION

REV



LOCATION PLAN

SCALE N.T.S

POINT HOWARD WHARF

SEAVIEW WHARF

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FUTURE OPTIONS FOR
POINT HOWARD WHARF

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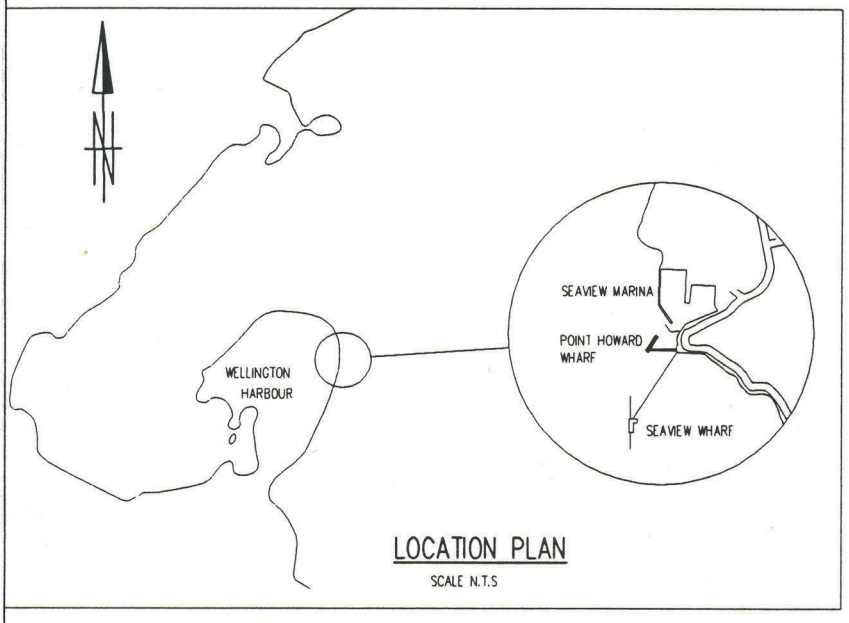
SKETCH NO. W1265\WHARF3

FOLDER REF.

DRAWING TITLE

OPTION 3a. DEMOLISH NORTH HEAD

REV



LOCATION PLAN

SCALE N.T.S

POINT HOWARD WHARF

SEAVIEW WHARF

DESIGNED		
DRAWN	S.L.FEARNLEY	2/99
CHECKED		
Q.C. CHECK		
APPROVED		
SCALES 1:1000	FILE NAME : F:\W1265\WHARF1.DWG	

PROJECT

HUTT CITY COUNCIL
LEISURE SERVICES DIVISION

FUTURE OPTIONS FOR
POINT HOWARD WHARF

AC Consulting Group
Consulting Engineers
P O BOX 2934 TEL 472 3377
WELLINGTON FAX 472 3423

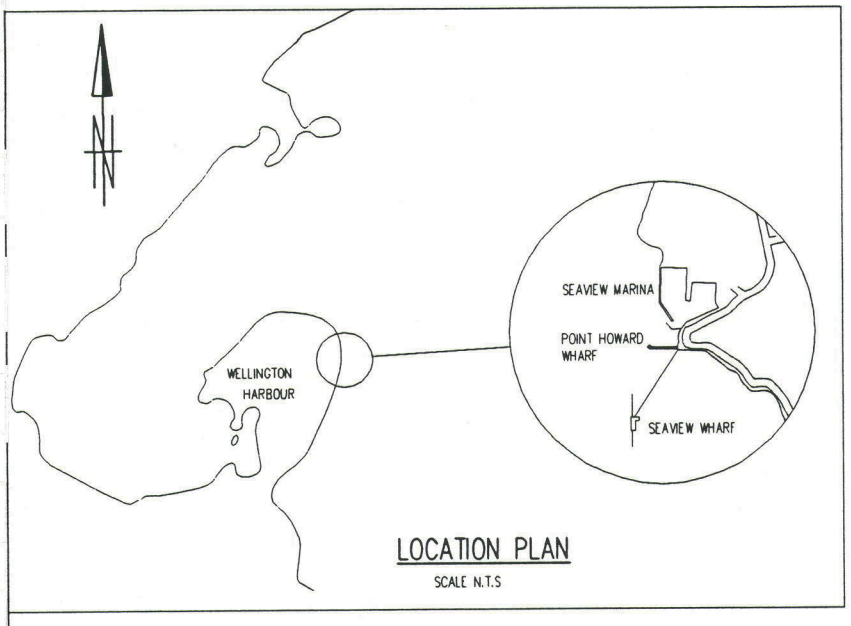
SKETCH NO. W1265\WHARF4

FOLDER REF.

DRAWING TITLE

OPTION 3b. DEMOLISH SOUTH HEAD

REV



LOCATION PLAN

SCALE N.T.S

POINT HOWARD WHARF

SEAVIEW WHARF

DESIGNED		
DRAWN	S.L.FEARNLEY	2/99
CHECKED		
Q.C. CHECK		
APPROVED		
SCALES 1:1000	FILE NAME : F:\W1265\WHARF1.DWG	

PROJECT

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FOLDER REF.

DRAWING TITLE

OPTION 3c. DEMOLISH NORTH & SOUTH HEADS

REV

Appendix 2: Photographs

Photo 1: South side of Wharf Approach
Note concrete pile jackets

Photo 2: North Head
Note Concrete jacket on pile AA41

Photo 3: Corner of Central Head
Pile Q38 very severely damaged

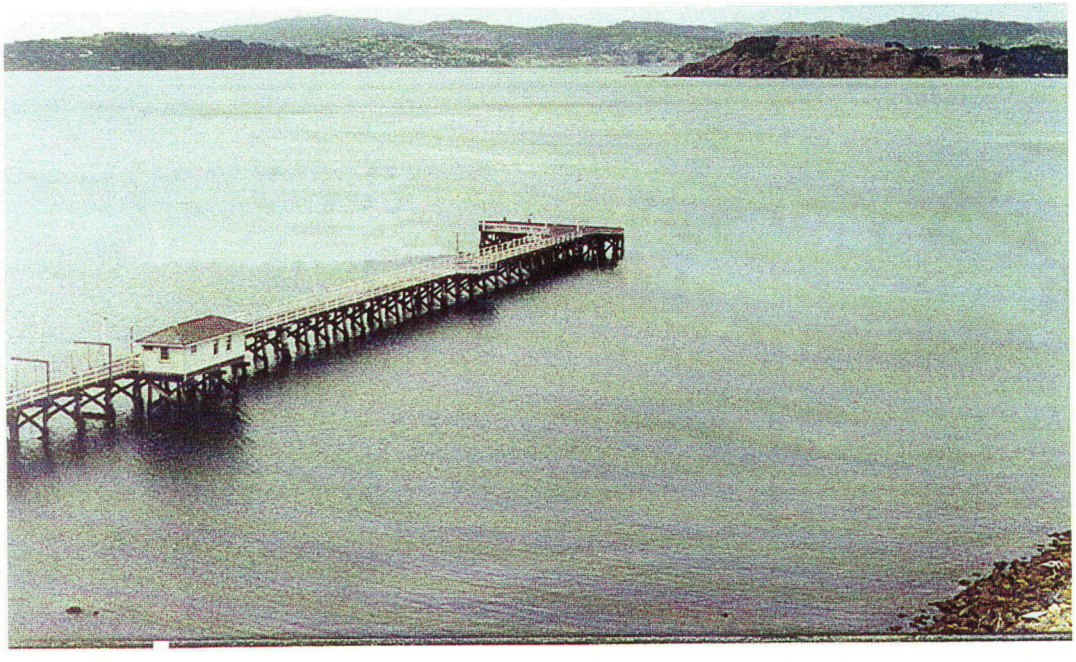
Photo 4: Typical view under Central Head
(Looking South)

Appendix 3: Artist's' Impressions

Option 1 **Light Recreational Wharf**

Option 3A **Demolish North Head**

Option 3B **Demolish South Head**



Option 3C **Demolish both North and South Heads**