

1854-5.

VICTORIA.

REPORT UPON THE VARIOUS PLANS
FOR THE
IMPROVEMENT
OF THE
PORT OF MELBOURNE.

Return to Address,
MR. MOLLISON, 27TH JANUARY, 1854.

LAI D UPON THE COUNCIL TABLE BY THE COLONIAL SECRETARY,
BY
COMMAND OF HIS EXCELLENCY THE GOVERNOR,
AND
ORDERED BY THE COUNCIL TO BE PRINTED AND PLAN TO BE LITHOGRAPHED,
11th JUNE, 1855.

By Authority:
JOHN FERRES, GOVERNMENT PRINTER, MELBOURNE.



REPORT UPON THE VARIOUS PLANS

FOR THE

IMPROVEMENT OF THE PORT OF MELBOURNE.

NOTE.—*In lieu of the Drawings which accompanied this Report, a general Plan of the Port of Melbourne has been Lithographed, on which the various schemes are shewn on a smaller scale.*

THE only plans in my possession connected with the various schemes that have been proposed for the improvement of the Port of Melbourne are those enumerated below;* and as, in most instances, these are unaccompanied with such details as would be indispensable in order to enable me to form an opinion on the merits of the proposed mode of construction in each case, I must confine myself in this Report to a review of their general features, and of their applicability, or otherwise, to the requirements of the Colony.

In considering these most important points it is indispensable to separate distinctly the necessary from the desirable, and the practicable from the impracticable,—distinctions which do not appear to me to have been always sufficiently kept in view by the promoters of some of these designs, amongst whom, nevertheless, have been numbered many of those most interested in the true welfare and prosperity of Melbourne, and of the Colony at large.

In speaking of any work as impracticable, I would be understood to mean simply one likely to be of so costly a nature that the expense of construction will either overbalance the advantages to be gained by it, or exceed the means that would probably be available for its execution.

In other words, any public work of such magnitude as to render it impossible to charge its cost directly upon the general revenue of the country, should be regarded as an ordinary commercial undertaking, the practicability of which will depend, firstly, on a calculation of the probability of the revenues accruing therefrom being sufficient, not only to afford a fair interest on the capital invested, but within a limited period to repay the whole cost; and, secondly, upon the possibility of inducing persons to invest a sufficient amount of capital in its construction.

It is known to every one that the discovery of the rich gold fields of this country caused an influx of population, and at the same time a demand for extraneous supplies, probably altogether unexampled for suddenness and magnitude.

The demand was speedily met by the presence in Port Phillip of an enormous fleet bearing the produce of almost every country.

On their arrival in Hobson's Bay, however, difficulties always great, sometimes almost insuperable, were found to exist in discharging their cargoes.

The shores of the Bay were destitute of wharves, and the river was not navigable for ships of a large class, nor if it had been so was there space or wharfage sufficient for their accommodation.

The sole resource left, therefore, was the use of lighters to transport the goods to Melbourne, an extremely slow and expensive process at that period, owing to the scarcity and high price of labor.

It is unnecessary, however, to detail all those sources of expense and inconvenience which are so well known to, and were so seriously felt by every member of this community, and to remedy which the various plans now under consideration, as well as many others not in my possession, were put forward.

The remedial steps taken by the Government in the meantime were as follows:—The improvement and extension of the Old Wharf and its approaches in Melbourne; the erection of a Jetty at Sandridge, for boats, passengers, and light goods; the commencement of a substantial Stone Pier at Williamstown, and the erection of a New Wharf, nearly half a mile in length and fifty feet wide, in Melbourne.

* 1. Plan of a Ship Canal and Docks, by F. C. Christy, Esq., C.E.
2. Plan of the Melbourne and Hobson's Bay Railway.
3. Plan of the Williamstown Branch of the Melbourne, Mount Alexander, and Murray River Railway.
4. Design for a Breakwater and Piers at Williamstown, by Lieutenant Amsinck, R.N.

The Government also assisted private enterprise by granting valuable tracts of land for the construction of railways from Melbourne to Williamstown and to Sandridge respectively.

Whilst the accommodation for shipping has thus been gradually increasing, the number of ships arriving in the port has very sensibly declined, not from any falling off in the sources of wealth and prosperity in the country, but in consequence partly of the true nature and extent of the requirements of the Colony being better understood at home than was at first the case, but perhaps chiefly in consequence of the natural reaction following the overstocking of the Melbourne market.

The first of these causes may be expected to continue in operation, whilst the effect of the latter will diminish from day to day.

I think, therefore, that some increase in the number of vessels arriving in this port may shortly be anticipated, although it will probably for many years fall short of the number that arrived in 1853 and 1854.

Even should no such increase take place, it will still be necessary to give considerably increased facilities for taking in and discharging cargoes, before the condition of the Harbor can be considered at all satisfactory.

In proceeding to notice in a few words the plans under consideration, I would first observe, that with one or two exceptions they were all prepared at a period when the difficulties alluded to above were at a height which they will probably never reach again.

1.—PLAN OF A SHIP CANAL AND DOCKS, BY F. C. CHRISTY, Esq., C.E.

This is one of a number of competing plans, which were prepared for internal docks at Melbourne, to be connected with Hobson's Bay by a Ship Canal.

I am not in possession of any of the other plans having the same object in view, nor of the details of this, but the remarks I have to make on the subject are equally applicable to all.

The end proposed to be gained by the construction of these gigantic works, is simply to bring the largest vessels into the City itself, and thus to avoid one removal of goods by discharging direct into drays, instead of into railway trucks and from them into drays.

Experience has proved that when railway trains are able to run direct from the ship's side to the dray, and proper facilities given for unloading, that the additional expense and loss of time caused by the transshipment is not great, whilst in the present instance there are objections of a most serious nature to the construction of internal docks.

By far the most important objection is the enormous expense which would necessarily be involved in such an undertaking; an expense the full amount of which could not even be approximately estimated, without a very considerable preliminary outlay of time and money being incurred in ascertaining correctly the nature and degree of the engineering difficulties which would have to be surmounted.

Even this, however, might doubtless be overcome, were it possible that the scheme could be put forth as one of absolute and primary necessity, which is by no means the case. It must be borne in mind that Melbourne is not the final destination of a large proportion of the imports, and that as the difficulties attendant on their transport to the interior have hitherto far exceeded, both as regards time and cost, those connected with their arrival in Melbourne, so the necessity of smoothing those difficulties is proportionately greater.

Events have proved that the capital required for the construction of these great public works must be obtained from abroad, and it is not too much to say that all the funds which can probably be thus procured for years to come will not be more than sufficient for the construction of those lines of railway which are not only necessary to the welfare of this Colony at large, but which are likely to be, strictly speaking, reproductive. I cannot think that the capitalists of England would look with favor upon a plan involving a great but unknown outlay, and having for its sole object the creation of an artificial harbor in a place already endowed with a natural one, only requiring the assistance of art to become one of the finest and most convenient in the world.

2.—MELBOURNE AND HOBSON'S BAY RAILWAY.

This Railway has now been in operation for some months; the earthworks &c., being completed for two lines of rails, one of which is laid down. In connection with the Railway is a jetty at the Sandridge terminus, which has already been very useful, and has proved a great relief to the shipping and the trade of Melbourne.

3.—MELBOURNE, MOUNT ALEXANDER, AND MURRAY RIVER RAILWAY COMPANY (WILLIAMSTOWN BRANCH).

The Melbourne and Williamstown branch is the only portion of the projected line which this company has as yet attempted to execute, and this without much success up to the present time.

It is much to be regretted that a work so simple in its execution, of such limited extent, and nevertheless so important to the port and consequently to the Colony, should have been tied up and identified with a scheme so crude and undigested, and at the same time of such magnitude as that put forth by this company, embracing as it does no less than a grand system of railway communication across the whole breadth of the country, entirely unsupported by satisfactory surveys.

This unfortunate circumstance has, I doubt not, been the main cause of the non-completion up to the present time of the Williamstown line, the importance of which cannot be exaggerated, as I am satisfied that it is to its completion, together with that of other works more or less connected with it, that Melbourne must look for protection against the possibility of a repetition of former embarrassments in its trade.

The whole subject of railway communication, including the completion of unfinished lines, having been referred to a Select Committee of the Legislative Council, I shall offer no further remarks upon this line at the present time.

4.—DESIGN FOR A BREAKWATER AND PIERS AT WILLIAMSTOWN, BY LIEUT. AMSINCK, R.N.

This design consists of a system of piers, proposed to be erected at Williamstown in connection with a railway to Melbourne, upon the construction of which their utility would almost entirely depend.

It will be seen by a comparison of Lieut. Amsinck's plan with that of the Williamstown Railway (shewing the land already granted by Government), that the possibility of carrying out his scheme would depend either upon a surrender by the Railway Company of their grant, or upon a further grant along the shore to the south of Point Gellibrand being made to them. I shall, however, for the present put this question out of view, and consider the design upon its merits.

The principal point in which this scheme differs from any former one (intended for the same locality) with which I am acquainted, consists in its not being confined to the waters lying north and west of Point Gellibrand, but embracing a considerable expanse to the south of that Point, and consequently exposed to the prevalent southerly and south-westerly winds of this place.

To remedy this defect Lieut. Amsinck proposes to construct, by prison labor, a breakwater, commencing upon a reef about one-third of a mile S.S.E. of the Lighthouse, and pursuing nearly an easterly direction into thirty feet of water. To the north of, and to some extent sheltered by, this work he proposes (as shewn on the plan) a pier of considerable length ending in two branches, running respectively north-east and south-east; also a pier running north-east from a point about 150 yards to the north-west of the Lighthouse.

This last pier would cross at an acute angle the pier now in course of construction by the Railway Company, the direction of which is nearly north.

He also designs a third pier, of smaller dimensions, near the mouth of the river, which as explained in his report,* although not shewn on the plan, he expects will produce a beneficial effect on the direction of the currents, and in a great measure prevent the deposit of alluvial matter brought down by the river.

In preparing this design the projector has proceeded on the assumption that piers, running northwards into Hobson's Bay from the shore to the west of the Lighthouse, will tend to silt up the Bay, and will also interfere with the anchorage to an inconvenient degree, and that the construction of the projected breakwater will shelter his piers from the prevalent winds as effectually as the others would be sheltered by the natural outline of the coast.

I think that no better scheme than that proposed by Lieut. Amsinck could be adopted, if his assumptions could be considered to be proved, which, I think, is not the case.

I am satisfied that a very considerable extension of the existing piers will not in any way interfere with the anchorage, but will, on the other hand, be more convenient than those proposed by Lieut. Amsinck, in consequence of being nearer to the best holding ground.

With reference to the comparative shelter afforded by his breakwater in the one case, and Gellibrand's Point in the other, it is clear that although the breakwater would have a very great effect in protecting the piers from the action of the sea during south-westerly and southerly gales, they will not be as efficiently sheltered from south-easterly winds (which have been very prevalent during the past summer) as those within Point Gellibrand.

My own opinion at first sight, with regard to the silting up of the Bay, was very similar to that expressed by Lieut. Amsinck. Subsequent experience and observation have, however, so far modified this opinion, that I am satisfied that the extension of the Railway Pier will not cause any amount of silt which cannot be easily removed by occasional dredging.

* See Appendix.

On this point I will quote the opinion of Messrs. Oldham and Rawlinson, Civil Engineers, as expressed in a pamphlet recently published by them.* The views of these gentlemen are given as follows:—

“As we have heard serious fears expressed by many gentlemen that any piers, either in or across Hobson’s Bay, would tend to silt up the Bay, it is due to them that we should allude to it in this paper; and in entering upon this subject we will consider, first, the causes that we consider likely to act in the Bay with this result.

“In the first place the action of the waves upon the shores, more particularly during gales of wind, when the banks are liable to be worn or broken away, and the debris carried out into deep water by the recoil of the waves, may be considered first.

“From this cause Hobson’s Bay is comparatively free, the exposed shores being low and sandy. The only action likely to take place, and which the peculiar nature of the shallows on the north-east shore, as indicated on the charts, appears to shew is the gradual drift of sand by the action of the south and south-westerly gales, being the debris from the bluffs to the south of St. Kilda and Brighton along the shore in a northerly direction towards Sandridge. Now, taking it for granted that we are correct in our premises, any pier run out from the Sandridge shore would have a beneficial effect rather than otherwise, by checking this drift.

“The next and more probable cause, is the mud brought down the Yarra Yarra and Saltwater Rivers during freshets, when their waters are considerably discolored, and they are evidently surcharged with earthy matters.

“Now, owing to the slight rise and fall of tide in Hobson’s Bay, namely, about three feet six inches, there can exist but little current in itself, as must be evident, when the enormous superficies of the Port Phillip Gulf, is compared with its narrow outlet to Bass’s Straits, and more especially when the small size of the rivers that debouch into it are also considered. The natural result of the want of current must consequently take place, namely, a rapid precipitation in the comparatively placid waters of the Bay, of those particles of earthy matters which the turbulent and confined waters of the Yarra Yarra and Saltwater Rivers held in suspension before. This process will commence immediately upon the entrance of the river water into the Bay, and from the want of power in the body of river water to create or keep up any considerable current, the precipitation must and will take place in the Bay itself, whether a pier be constructed across it at the point proposed by us or not; and such being the case, we at once treat the objection as one arising not from the character and situation of our works, but from the nature of the locality, and from causes over which we can have no control; for to speak of creating a scouring power with the tides we have in the Bay, to a depth of more than three feet below low water mark is simply nonsense, and to think of running groins out to confine the river entrance, and use that as a scour, is little better.”

I believe these views to be correct as far as regards alluvial deposit from the river, although I cannot concur in the opinion that a pier run out on the Sandridge side would have a beneficial effect in checking the drift of sand along that shore.

It appears unadvisable on this occasion to entertain the question of the merits of the defensive works which form-part of Lieut. Amsinck’s scheme, which would, however, become a consideration of great importance if it were decided to carry out the piers and breakwater proposed.

To conclude, I believe that although there is much merit in Lieut. Amsinck’s design, which has been prepared with much labor and care, the present requirements of the port will be provided at a less cost and with greater convenience by proceeding with the works already commenced, than by undertaking new ones of such magnitude as those of which he is the projector, although a day may possibly arrive when a vast increase of shipping may render the accommodation that can be provided within Point Gellibrand insufficient, in which case works embracing the main features of this scheme, would probably be the best that could be undertaken.

C. PASLEY,
Captain R.E.

10th June, 1855.

* “Remarks on the best and most expeditious method of constructing Railroads and Docks for the Colony of Victoria.”

APPENDIX .

Williamstown, August, 1854.

SIR,

When I had the honor to lay before you my First Report, by the desire of His Excellency Mr. La Trobe, I was the representative of a Company formed in London through the instrumentality of merchants especially connected with trade to this Colony. The very heavy expenses, the delays and damage to goods, consequent on unloading in an open Bay, and through the intervention of lighters up a very narrow stream, to very imperfect and insufficient wharf accommodation, naturally induced those who were liable for the losses, and ran the risk of the charges, to raise a capital, and offer to assist the colonists in the works necessary to free commerce from these evils. As my instructions left me free to select the best means by which these objects could be obtained, I felt bound to leave no consideration out of the enquiry. I trust this Report, with its accompanying plans, will not receive the less favorable attention for whatever merits they possess, because they are not now backed by an EXISTING Company. Had I been met in the spirit of our professed service, much of the works necessary would now have been in a state of completion; but the colonial mind on such subjects is always so prejudiced, and was here at that period in so inflated a state, that the value of capital assistance had passed the mind of the managers of the public companies in existence, and is only returning under the pressure of renewed experience. My Company was too late and too costly, and the proprietors had too little patience; still the question remains the same, and with the destruction of outrageous profits, will tell more and more home to all classes as consumers, augmenting with the increase of population, or will, if the Bar of Geelong be deepened, drive the internal trade from Melbourne, to greater facilities and reduced charges.

You will be aware that the port of Melbourne is deficient in almost all the natural advantages possessed by the other Australian Colonies in their harbors. We find a small bay, at the extremity of a large one, receiving the waters of two rivers, neither of them sending down any great quantity of water, except during, not only particular seasons of the year, but particular kinds of seasons, and at some periods the Yarra ceases to discharge below Melbourne; thus there are two beaches, and thus also any works that may be constructed for shipping to lay alongside of, must be irrespective of all naturally existing water power. The very narrow entrance to Port Phillip Bay, its large breadth, and the formation of the entrance to the rivers, leaves the waters to be determined by the wind, and utterly precludes, therefore, any rise to be used in favor of internal works. With these general facts, it became necessary to see whether the river could be deepened, and canalized, so as to admit of taking ships of large size and depth of draft up to Melbourne, where, if it could be done, is ample space and excellent position for any amount of dock room. Had the rivers in their conjoint efflux formed one or two bars, distinct and positive, no doubt they could be removed, and probably kept so; but such is not the case. From the point where the Yarra joins the Saltwater, down to the broad opening into Hobson's Bay, the bottom continuously varies, and would have to be cleared almost throughout the whole length; while the same causes which formed the undulations would be still at work, but increased from the passage of vessels destroying the banks. The expense would be enormous, and the results very uncertain, and the time incalculable. The main object here is to form immediate works, and, as I believe, with efficiency, on as economical a scale as possible; and thus, though I arrived with impressions and expectations in favor of the north, or Sandridge side of the Bay, I found that I was greatly in error; and after close examination, and serious consideration, I very early came to the conclusion, that the formation of an internal dock (for which I brought plans, founded on similar works in England) was an undertaking I could not recommend.

It must also be borne in mind, that if the lower part of the river could be permanently deepened, so as to admit ships of a large class to be brought up, the excavated dock to receive them can only be maintained of such size and surface as the waters of the Yarra will supply. Allowing for great evaporation, the greatest at the period when there is least water, as also for the natural drainage, as well as that in one portion of the year, for three months, there would be no supply from the Yarra at all. The area of any internal docks would thus, I apprehend, be very small. In fact, the depth of water in the river adjacent is the only resource, and in so narrow a stream, with little or no tide, is of a very limited amount. How much the waters of the Yarra decrease during the summer, or swell in the spring, I am not aware; but such docks as have been planned and discussed in Melbourne are, in my opinion, far beyond its means of supply. The difficulties, expense, and uncertainty of a canal, or dock, from the beach at Hobson's Bay, are, I trust, too well now seen to be ever again seriously brought before the public.

With respect to piers, or jetties, on the north side of the Bay, there is no doubt that if they can be constructed on open piling, and if the wind always prevailed from the eastward, as it has done this year, in direct contradistinction to last, the vicinity of Melbourne would render them beneficial for a very large amount of the shipping; as, however, according to all past experience, the prevailing winds are south-westerly, whatever has to be projected into the sea should be on the windward side.

In considering what works were necessary for the shipping in trade to this port, all other circumstances should be brought into the question, and it should be wholly divested of individual, or even class interest. Works of similar character in England, being executed on the

entire responsibility of the subscribers, are not open to the same consideration of expense as works requiring a Government or public guarantee of positive interest; there being no spare capital applicable to such purpose here at present, it is only under a sufficient guarantee it could be raised. What, then, is positively required?

The accompanying plans, to which I have to draw your attention and to request your official report, were designed to meet the immediate, and yet to a certain extent the permanent wants of Melbourne; here is no rise and fall of tide to take any calculable use of. I believe no internal docks will ever be made in Hobson's Bay.

While, therefore, I have made provision, by simple and inexpensive piers, for unloading and loading three times the number of vessels that *now* frequent the port, I have so placed them, that none of those natural changes, which appear to me incidental to the harbor, shall effect their usefulness as time develops them.

I may mention that Hobson's Bay possesses anchorage ground so favorable as not to be surpassed; that the wind here never appears to blow home and does not lift, thus the ships lay for months without clearing hawse, with skysail yards across and without danger; while at Balaclava, landlocked and apparently secure, ships have been knocked about almost beyond control. We see the same in the houses, light wooden and veranda'd, and with shingle roofs, remain unhurt. With thirty miles fetch, there is no sea, no breakers, no rolls, at the beach at the back of Williamstown, and as there is no rise or fall of water to make it inconvenient to lay alongside of piers, all that is required is sufficient extent into deep water to admit all classes of ships, and the more, as the ships do not belong to this place, do not lay up here, and generally speaking do not require repairs.

All piers crossing the Bay, and at right angles with the river entrance, will be subject to deposit from the river, aided by the shipping laying broadside to the current. In placing my first and largest pier outside of the Lighthouse point I avoid this evil and insure its use for all time, while I secure deeper water and a greater extent of it, and do not interfere with the anchorage ground in the Bay.

The reef at the entrance of Hobson's Bay I propose to form into a breakwater by means of the boulder stone laying close to, in the same manner as the breakwater at Plymouth was formed, and as that at Holyhead and at Portland are being constructed, and by convict labor. If this be carried out to the buoy it would protect the whole Bay, as well as form a perfectly smooth water position for patent slips, or a graving dock, and hereon I have placed two batteries, as shewn in the plans and details, and designed to cover the outside of the Bay, the beach at the back, as well as the piers and river. The Lighthouse would necessarily be at the end of any projection at the entrance to the harbor.

Since my plans were formed the Mount Alexander Railway Company have commenced a solid pier of stone and earth into the Bay, not far from the pier No. 2 on the plan, and which would render it useless. Without offering any comment in this Report on that pier I should consider the form I have made mine and direction the better of the two. The upper pier at the entrance of the river was designed to counteract the evil effect of eddies, caused by the ebbing and flowing waters not following the same channel, and as the formation of a breakwater by Gellibrand's Point would direct the flowing water more into the centre of the Bay, so it would be advisable to direct the ebbing and current stream through the same course. This pier would have therefore to be close, or planked; it would be useful as a landing-place for the growing population of that neighborhood.

The existing Convict Pier is on the plan enlarged for a passenger landing and embarking place, free from the inconvenience of the mercantile traffic on the rails of the commercial piers. The north-easterly extension of 700 feet to the first pier is to guide the flood-tide after its passage by the breakwater, and being close planked to extend the protection of the formed harbor from the south-easterly winds, while the Spur Pier, of 400 feet, is specially for steamships, having two lines of rails in connection with two on the main pier leading to the Coal Depot. Ample space exists in the immediate vicinity of the piers for any extent of warehouse. The accompanying details give the dimensions and estimated probable expense. No works, however, at Williamstown will be of any general use without a railway to Melbourne; and

I have the honor to be,

Your obedient Servant,

H. AMSINCK,
Lieut. R.N.

The Colonial Engineer,
Melbourne.

PARTICULARS OF WORKS.

The breakwater commences from the southern point at the existing reef, and is to be found by the boulder stone on the spot 1480 feet into 8 feet water, thence to the Black buoy, 2100 feet from the shore, the northern or inner side to be vertical, the southern or sea side to be sloped to resist its influence; if only a breakwater, to be carried awash with high water level; if forts to be erected on it, the causeway to be 20 feet wide, and the stone cemented.—*See Forts.*

Inside of breakwater to be one or two patent slips, that being the best, if not the only position for large vessels to be hauled up in the Bay.

FIRST, OR LARGEST PIER.

1000 feet to the north of the breakwater, nearly east for 1500 feet, 74 feet wide, and five sets of rails; then about north-east by east 700 feet, and 52 feet wide, with three sets of rails. This pier to be diagonally closed planked, both for the tide and a protection against the south-easterly winds; the spur pier to be 400 feet long and 45 feet wide, with two sets of rails, for steam vessels, and connected with coal depot; rails of pier to be carried into warehouses, and connected with the main line to Melbourne, so as to carry direct up from the end of the pier.

Pier to be constructed open for the water.

SECOND PIER.

2000 feet from beach to the eastward of lighthouse, slightly curved at the end on account of the current from the river, 52 feet wide, and 3 sets of rails.

The convict pier to be extended 500 feet, and 40 feet wide, for passengers and luggage.

The upper pier to be 1000 feet long and 25 feet wide, and if connected with main line, to have two sets of rails.

Warehouses and coal sheds as required.

Williamstown, August, 1854.

Estimate of the probable expense of Breakwater and Piers, with Warehouses, Coal Sheds, Rails, Cranes, &c., for a Commercial Harbor in Hobson's Bay:—

	£
Convict labor for 1480 feet of breakwater	8,000
1st pier, 1500 feet, 700 feet and 400 feet	90,130
2nd pier, 2000 feet	70,700
3rd pier, 1000 feet	20,000
Passengers' pier	7,000
Rails, cranes, &c.	7,500
Warehouses	56,200
Coal sheds	6,200
Moorings, &c., &c.	12,000
Patent slip, 300 feet	55,000
Do. do. 258 feet	47,000
Contingencies	50,000
	£429,730

(Signed)

H. AMSINCK,
Lieut. R.N.

Summary of Harbor Works.

Breakwater	1480 feet long
1st patent slip	300 "
2nd do. do.	250 "
1st pier { 1500 feet direct { 700 feet extension { 400 feet spur	
{ 74 feet wide { 52 feet wide { 45 feet wide	
{ 5 sets of rails { 3 sets of rails { 2 sets of rails	
2nd pier 2000 feet long	52 wide
3rd pier 1000 do.	20 do.
Coal sheds divided for different coals	
Warehouses for bonded and other stores	
Cranes, capstans, posts, &c., for ships	
Moorings for vessels to lay before and after unloading.	

(Signed)

H. AMSINCK,
Lieut. R.N.

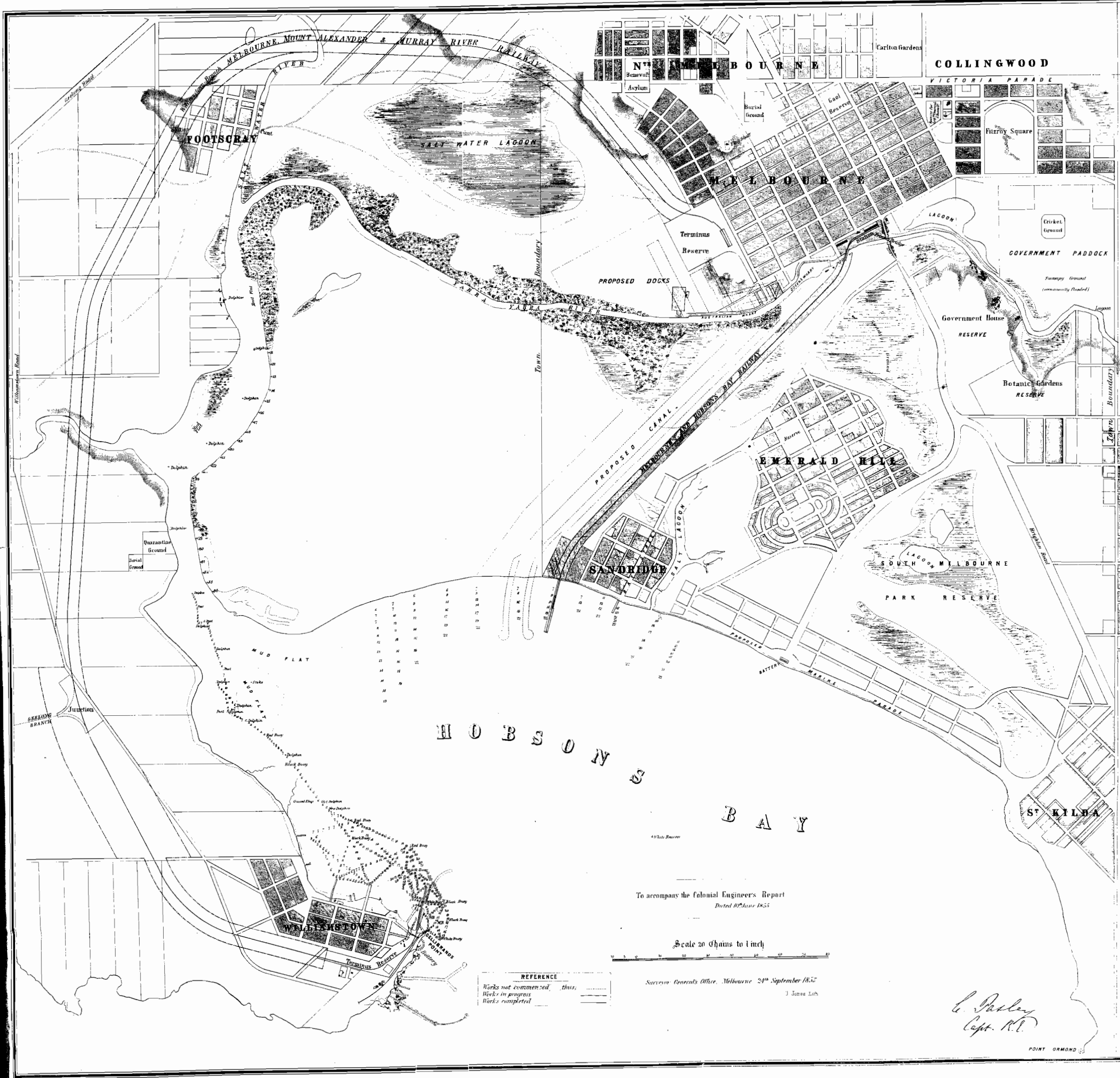
Williamstown, August, 1854.

Description of Fortifications for Hobson's Bay.

Length of causeway from beach to Fort Charles 1350 feet
 Width of do. 20 feet
 Dimensions of fort.—Length 100 feet, width 84 feet, height
 10 feet above high water, No. of guns, 14, pointing from
 east south-east to west south-west.
 Height of tower, 15 feet, No. of guns, 22, contains a powder
 magazine for the ships as well as the forts.
 Length of the platform from Fort Charles to Fort Albert ... 825 feet
 Width 20 feet
 Capable of being lined with artillery
 Length of Fort Albert, 75 feet, width, 84 feet
 Height above high water, 10 feet, No. of guns, 16, bearing
 from east north-east to south south-west
 Height of tower, 15 feet, No of guns, 18
 Shot furnaces
 Height of lighthouse, 75 feet above high water.

(Signed)

 H. AMSINCK,
 Lieut R N.



FOOTSCRAY

MELBOURNE

COLLINGWOOD

MELBOURNE

EMERALD HILLS

SANDRIDGE

HOBSON'S BAY

ST. KILDA

To accompany the Colonial Engineer's Report
Dated 10th June 1855

Scale 20 Chains to 1 inch



Surveyor General's Office, Melbourne 24th September 1857
J Jones Lith

REFERENCE
 Works not commenced thus, ————
 Works in progress ————
 Works completed ————

L. Dalry
Capt. R.E.

POINT ORMOND