Natal Harbour Department Report

1907-08.

COLONY OF NATAL

REPORT

OF THE

ENGINEER, NATAL HARBOUR DEPARTMENT,

FOR THE

Year ended 31st December, 1907.

PIETERMARITZBURG:
"TIMES" PRINTING AND PUBLISHING COMPANY, LTD.
1908.

PRICE 2s.]

With the compliments of the Engineer-in-Charge.

The Corps of Engineers, U.S. Army

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Report of the Engineer, Natal Harbour Department, for the Year ended 31st December, 1907.

Engineer's Office,
Harbour Works, Port Natal,
22nd June, 1908.

THE HONOURABLE THE MINISTER OF RAILWAYS AND HARBOURS,
PIETERMARITZBURG,—

SIR,—I have the honour to lay before you the following report on the progress of the Harbour Works of the Colony and the work of the Department for the year ended 31st December, 1907.

The plans accompanying this report are as follows :—

Plan No. 1.—General Survey, including soundings at Outer Anchorage, along Beach (northwards), at Entrance, in Channel and in Bay. The plan also serves to show the full extent of wharfage now completed, the position and extent of ground now occupied at the Bluff for coaling, the number, capacity and approximate positions of hydraulic cranes at Point, and the new timber wharfage at Congella, together with the area which has been reclaimed and is now finished or practically so.

On comparing this plan with the surveys of previous years a further improvement will be noticed in the depths at Entrance and also in the Entrance Channel, and berthage inside the Harbour where a great amount of dredging has taken place, more especially in connection with the necessary water required for vessels using the Quay Wall at Bluff. The present survey compared with that of 1906 will show that the high and low water lines along the beach, and also the two-fathom contour line, have advanced landwards by an average of 70 feet for low water, the greatest encroachment being in a line with "The Avenue," where it is 110 feet, and by an average of 40 feet in the case of high-water mark, the greatest encroachment being near a line with Bell Street where it is 70 feet; the two-fathom line opposite Hospital Road has come in 200 feet, and to the north-east of the Vetch Beacon (Old North Pier) it has advanced seawards by 200 feet; these contours are, however, constantly changing. It would appear evident that the sand which formerly crossed the Entrance and deposited itself along the beach to the northward, and which is now caught in the *chambre d'apports* before reaching the Entrance proper and dredged away from there, is being "missed," for the simple reason that this sand deposit exists now on a small scale only as compared with former years when practically all the sand forming the "bar" passed across the Entrance, ultimately finding a resting place along the beach.

Plan No. 2.—Survey of ground north of N.G.R. main line showing extent of the area being reclaimed on behalf of the Durban Corporation, and the area actually reclaimed from the commencement of the work in February, 1907, to the end of the year. This work is being carried out departmentally in pursuance of an agreement between the Government and the Durban Corporation, the terms of which will be found in the schedule to Act 36, of 1904.

Plan No. 3.—Diagram of comparative depths at Entrance for the past three years. The average low water depth for the year was 32ft. 8in.; an increase of 1ft. 8in. over that of the previous year, and 4ft. over that of 1905; and it will appear from the diagram that the depths during 1907 have been uniformly greater, with one or two exceptions, than the best depths of the previous year, which shows the permanence of the improvement.

WORKS UNDER LOAN FUNDS.

Levelled Area, Wharf Approaches and Rail Extensions.—The principal items carried out under this head were as follows :—Rail connections and sidings from Shed "E" to Shed "B," including rails at New Quay, reclamation bank New Quay, 1,266 square yards concrete decking laid at New Quay, levelling and hardening part area between Shed "E" and Boat Dock, rubble retaining wall at east end of New Quay, concreting between rails between Shed "E" and Boat Dock, hardening area at Block "G," removal of sand from site of official quarters and levelling

of area, hardening of reclaimed area and rail-laying at Bluff, completion of stone bank at both ends of Repairing Quay, drainage of area at New Quay, deviation of main line at Bluff, levelling area and laying rails and rail connections Repairing Quay, rail-laying in upper storey Bond Store, stone retaining bank and approach to shore at end of Bluff Quay Wall, hardening between railway lines at Bluff, levelling and hardening area at Bluff Sub-station, concreting area for coaling floating craft at Repairing Quay.

In November it was arranged that all railway lines at the Point and Bluff used by the Natal Government Railways for the purposes of ordinary railway traffic should be maintained by the latter Department, the Harbour Department being responsible only for lines required for its own exclusive use, and the Congella System. In connection with this arrangement three platelayers were transferred to the N.G.R. on the 1st November.

Quay Wall.—Operations under this head were continued to the end of last financial year only, no provision having been made for further expenditure. The New Quay Wall was completed by the end of 1906 as announced in the Annual Report for that year, but the filling in and hardening of the area at the back was unfinished, and railway lines, hydraulic cranes, pressure and return water pipes, and fresh water mains and hydrants had also to be provided. By the month of June this work was so well advanced that on the 18th of the month the White Star Liner "Afric," 11,948 tons, was brought inside and berthed at this Quay. Vessels of this line now enter the port regularly, and it is interesting to note that the Government were able to assure the Agents of the White Star Company that a navigable depth of not less than 30ft. at low water would be available at all times in the Channel and up to the Quay for the deep draught vessels of their fleet.

Repairing Quay, Point.—This wall was finished off by the laying of the coping stones, which was done by the aid of the Floating Workshop, the work being completed in April.

Quay Wall, Bluff.—This wall, 1,585 feet in length, was completed in April, when, after the groyne described below was built, the last two bollards were fixed. The last length of tunnel, 95 feet, was built in March. A handstone retaining wall between east end of wall and the wharf was built, also a temporary concrete block wall between quay and shore constructed as a stop for the reclaimed ground. A groyne, 75 feet in length, in concrete blocks to a depth of 30 feet, was laid by the aid of the Floating Workshop at the seaward end of this quay as a protection for vessels for coaling, the scend here being very strong.

Dredging.—The dredging records for the year will be found tabulated in the Port Captain's Annual Report. From these it will be seen that the total for 1907 is less than for any one of the four years previous. Comparing 1906 and 1907 the difference is insignificant, but a larger amount of spoil has been dredged outside the Breakwater, and in Sections A, B and C of the Entrance Channel than was the case in the former years. Owing to the improvements in the deep water accommodation inside the Harbour which have been brought about as the result of systematic dredging over a number of years past, the necessity for continuing this work on a similar scale has been less than it was formerly.

The provision for the service has therefore been diminished accordingly, and the dredging fleet considerably reduced by the sale of some of the plant and by laying up a number of the smaller vessels. In addition to the plant disposed of in 1906, the "Grampus" was sold to Messrs. C. H. Walker & Co., in December last, and the "Water Rat" was condemned and sold by auction in the same month.

In 1906 the dredging of a boat channel from the Creek to the foot of Gardiner Street was undertaken at the suggestion of the Durban Corporation on the understanding that the cost would be borne in equal shares by the Government and the Corporation. The work proved to be more difficult than was anticipated, and it was found when the dredging had been carried out for about half the distance that the estimate was exhausted. The Corporation declined to recognise liability until the work was completed, and then only for its portion of the original estimate, and further work was therefore suspended early in 1907.

The cost of working the dredgers has, as in previous years, been apportioned partly to Loan Funds and partly to Revenue. The repairs continued to be executed in the Harbour Workshops until August, at the end of which month these shops were closed down according to arrangement, and the work was transferred to the N.G.R. Locomotive Department.

Electric Light and Power Extension.—The amalgamation scheme whereby the Harbour and Railway electrical systems were combined, was brought into operation in August and has given great satisfaction both as regards supply of current and reduced cost of working. Energy is now supplied in bulk from the main Power Station to Sub-stations at the Point and Bluff. The Point Sub-station receives energy by means of two three-phase feeders, the pressure being 6,600 volts and the system 3-phase 50 cycles alternating current. The E.H.T. switches and other apparatus are all enclosed in concrete cells. The switchboard is operated by low tension current only and is then perfectly safe. Installed there are—one 300 K.W. motor converter, 6,600 volts to 500/550 volts on the direct current side, supplying the various lifts, motors, and arc lighting in the Point area, and three 75 K.W. static transformers oil-cooled 6,600 volts to 115 volts, connected up in "star" and supplying power for incandescent lighting at 115 volts. The Bluff Sub-station is fed by two feeders direct from the main power station. These cross the Entrance Channel at the points indicated by notice boards. The feeders are received in fireproof concrete cells and the

E.H.T. switches and apparatus are likewise protected. The Sub-station, which is a well-built brick erection, contains three 300 K.W. motor converters, 6,600 volts to 500/550 volts, at the direct current side supplying power for the motors of the Coaling Appliances and for arc lighting. There are also installed small transformers for incandescent lighting. The Bluff Sub-station was finished and taken over from the Contractor in February; the Point Sub-station was ready in June, but continued to be used as a generating station until arrangements had been completed in the main power station in August.

Four new arc lamps were erected on the New Quay and lighting arrangements completed in April. The arc lighting arrangements of the Repairing Quay were completed in July. Sixteen arc lamps were erected at the Bluff on the area set apart for coaling operations. A pumping station on pile foundations was erected departmentally at Cato's Creek for supplying sea water to the condenser at the main power station, the contract for the supply and erection of the pumping plant, which is electrically driven, being carried out by Messrs. A. H. Johnson & Co.

Additional Cranes.—The erection of the four new hydraulic cranes for New Quay opposite Shed "C" was completed in July, and the laying of the pressure and return water pipes in August, the sleeper walls and hydrants being finished in September.

Coaling Appliances, Bluff.—The erection of the Coaling Appliances was completed about the middle of April, and the plant was taken over provisionally from the Contractors on the 1st May, after the necessary tests had been made. During these tests some 2,000 tons of coal were placed in the bins. The "Neva," the first vessel to be coaled, took 1,500 tons direct from the dumper and 1,000 tons from the storage bins. On the 31st May a serious breakdown occurred on the dumper, one of the armatures being wrecked and the hoisting machinery rendered useless. This accident formed the subject of a special enquiry, the Department and the Contractors holding opposite views as regards liability. Several efforts were made to run the machinery with one motor only pending the arrival of a new armature from America, but these attempts were only partly successful, and it was not until late in September that the appliances could be satisfactorily worked.

The whole of the rail-laying in connection with the storage bins, gravitation banks, &c., in all between seven and eight miles, was finished in April and ready for use. It was, however, found by experience that the "Runaway" and "Kickback" banks to and from the dumper were not steep enough for practical working, and these had to be raised some two feet, necessitating also the raising of the trestles to the same height.

Harbour Development, Congella Wharfage.—This wharf, 1,500 feet in length, was practically finished at the end of December, only a few small details remaining to complete it. A girder bridge, connecting the end of the wharf with the shore, was built at the east end upon solid concrete foundations, which forms access for rolling stock.

Two spare gantry girders were utilised for this work. The length of wharf built and completed during the year was practically 700 feet, about 800 feet having been constructed previously. A concrete bridge, spanning the canal, was completed and tested in June, a steam roller loaded with coal and water being run across it with safety. Good progress was made during the year with ballasting, road-making, and levelling of pumped spoil, European "relief" labour being employed on this work in addition to a large number of native rebels. The work of levelling was practically finished at the end of the year, but a lot of ballasting remained to be done on Blocks E and F. The area ballasted during the year amounted to 36·5 acres, and the road-making to 13,636 square yards of completed work and 4,340 square yards of road formation. Rail laying: A line of rails was laid in Messrs. Hunt, Leuchars & Hepburn's ground, and connected up to the general system. 1,000 feet of line, temporarily laid on wharf, taken up and relaid in permanent position.

Hardening of Roads, Point.—The hardening of the roads in the vicinity of the official houses was completed in February.

Reclamation of Low-Lying Lands, Congella.—This work was started in February. In the first instance a commencement was made in removing sand hills from the Point and Back Beach, and later on from Shortt's Corner on the Bluff line of Railway where rising ground, the property of the Government, was used as a spoil bank. Connections were made by the Railway Department at Shortt's and sidings put in at Congella for this traffic, which has been continued throughout the year, save for a temporary interruption at Shortt's in August, when labour was required for work on the Floating Dock.

Service lines laid in connection with this work amount to nearly 2½ miles. The total area of land reclaimed during the year = 55·99 acres, and the filling = 388,631 cubic yards by truck measurement. In addition to this area a piece of ground at Congella Station, ·71 acre in extent, was levelled up for the purpose of sidings necessary for the carrying on of shunting operations, but this is not included in the land to be reclaimed for the Corporation. To allow for settlement an extra 3 inches of filling has been agreed to, which amounts to roughly 400 cubic yards per acre. Prison labour has been utilised as much as possible on this work.

Port Shepstone, Training Wall.—The making up of the aprons with boulders, bagged concrete and concrete blocks was continued until April. 86 3-ton concrete blocks were made, which,

together with 87 on hand, were all deposited on the Channel side, in addition to 27 large sacks of concrete put into foundations where the wall was undermined, and large quantities of big stones and quarry material have been dumped behind the wall for support on the land side.

Works under Revenue.

Slipway Working.—New brake gear fitted in February. Repairs to gangways effected in June, 19 jarrah poles being driven, some of the crossheads and longitudinals renewed and decking relaid.

On the 1st July the control of this appliance was transferred to the Port Captain's Department.

Floating Dock Working.—The Dock was laid up for overhaul and repair on the 15th May. The centre pontoon was released and docked on the 29th, and the work of chipping and cement washing the divisional bulkheads was put in hand. This proved to be much heavier than was anticipated, 560 men being employed on this operation alone. The work was finished in July, after which the pontoon was refloated and connected up without difficulty. The end pontoons were then taken in hand similarly, the overhaul being completed and the Dock replaced in commission on the 20th August under the immediate control of the Port Captain's Department. During the above period the whole of the machinery was opened up, examined, and put in thorough working order, but the work on the side walls had to be deferred.

Floating Workshop Working.—This appliance was also transferred to the Port Captain's Department on the 1st July. During the earlier portion of the year this craft was of great service in laying the coping stones for the Repairing Quay and the blocks for the groyne at the Bluff Quay Wall, etc.

Electric Light and Power Working.—Current was supplied direct from the Point Power Station up to the 13th August, on which date the generating plant was shut down and the present system, which has already been described in Works under Loans, was brought into operation. A portion of the existing plant was utilised in the new main power station in connection with scheme of amalgamation and temporary expedients had to be resorted to for running the Point Station in the meantime ; four loco. boilers being hired from the N.G.R. and erected in position for the supply of steam before the Hornsby boilers were removed. The change over from direct to alternating current for lighting, of which notice had been advertised, was accomplished without difficulty, and on the whole the working for the year has been satisfactory and the inconvenience attending the inauguration of the new system was reduced to a minimum. The Harbour Electrical Staff was transferred to the N.G.R. paysheets in July, and subsequently reorganised to meet the new conditions at the Point Sub-station.

The Bluff Sub-station is worked entirely in connection with the Coaling Appliances and does not come under this head.

Maintenance of Outer Works.

Bluff Lighthouse.—A brilliant light was maintained from sunset to sunrise throughout the year, no failures occurring of any kind. The interior, and portions of the exterior, of the tower were painted in February. 1,761 persons entered their names on the Visitors' book during the year.

Green Point Lighthouse.—The main light gave out on several occasions, due to the vapourising tubes becoming choked or otherwise unserviceable. The subsidiary light failed one night in November necessitating the use of the "stand-by" or emergency lamp during the remainder of the watch. The defect was rectified next day and no trouble was experienced subsequently. In March the approaches to the lighthouse were cleared of bush. 407 persons entered their names on the Visitors' book during the year.

Port Shepstone Lighthouse.—This light burned well during the year. The services of the Relieving Lightkeeper were required on two occasions.

Cape St. Lucia Light.—Burned well during the year. Four of the radial prisms belonging to the optical apparatus were renewed. An inspection of this light was made by sea on the 8th February, when the bearings of the light were tested and found correct. Owing to the isolation of this lighthouse communication with the head office is now a matter of days. The question of establishing telegraphic or telephonic connection was considered, but in view of the large expense involved in the proposal the matter has been allowed to stand down in the meantime.

Conservancy.

Rails.—The whole of the rail system was maintained in good working order throughout the year. No. 4 through road at the Bluff was lifted and packed, also the line for empty coal trucks and the main line at $11\frac{3}{4}$ miles. The line from the Bluff Blockyard to the Magazines was lifted and overhauled. Alterations made to rails between Sheds "A" and "B" after the removal of the sheer legs to facilitate working.

Buildings.—48 Simplex fire extinguishers were placed in the Wharf Sheds, Stores and other buildings as a precaution against fire. Repairs effected to Cement Shed in Bluff Blockyard, Rope Store, Point, quarters hired by Mr. Staniland at Bluff, Hydraulic Power Station, Wharf Sheds "F" and "H," etc., etc. Partition in Wharf Shed "C" taken down and removed, sliding doors in wharf sheds overhauled, Shed "C" re-roofed with Malthoid, portion of floor of Shed "H" relaid with wooden blocks, Sheds "A," "B," "F" and "H" painted, Harbour Offices repaired and painted, screens and ventilators made and fitted at Point Sub-station, Rocket Station at Umgeni painted, shed built over stone crusher, 15 wharf shed ramps asphalted.

Machinery and Rolling Stock.—The usual repairs have been carried out to locomotives and rolling stock, shop machinery, stone crushers, road rollers, etc. In August the engineering repairs were transferred to the Locomotive Workshops of the N.G.R.

Wharfage.—The old timber wharf opposite Shed "B" was repaired for a length of 400 feet, crossheads, longitudinals, and decking being renewed where necessary, rails relaid and concrete decking renewed. Extensive repairs were also effected to the Bluff Wharf; Nos. 1 and 2 Timber Jetties repaired; 20-ton steam sheers dismantled and removed. New tide gauge with glass front erected at the Bluff. Ferry landing stage at Bluff altered and improved, new gangways from punt to shore being provided and old landing platform dispensed with. Point ferry screen repaired. Repairs effected to wall of Boat Dock and to Retaining Wall of old timber wharfage, Point.

Maintenance of Outer Works.—308 7-ton concrete blocks were made during the year for the protection of these works, of which 278 were deposited where most required. At the end of the South Breakwater a slight undermining took place, which was at once made good by means of concrete in bags packed close into the foundations, some blocks being removed for this purpose and afterwards replaced. 350 tons of sandstone from the old groyne deposited alongside North Pier, where some subsidences of the apron had occurred on the Channel side and 250 concrete pockets used for making good foundations where the wall had become undermined.

The increasing depth of the Entrance Channel year after year necessitates constant making up of the protecting blocks at the ends of both works. Constant vigilance is essential as these blocks disappear frequently, and will probably continue to do so until the foundation toe is sufficiently broad to furnish a permanent support for the blocks above.

The superstructure on both works remains good, although there are here and there small cracks at the joints of the blocks, which, however, is natural. The worst cracks appear in the joints of the Tunnel Wall on the South Breakwater, but there is no further noticeable movement and altogether both of the Outer Works appear to be quite sound and good.

Maintenance of Official Residences.—Expenditure under this heading has been confined to cases of urgent necessity, but as the greater portion of the residential properties of the Department are badly in need of repair, it will be necessary to spend a large amount on this work during the next financial year if these dwellings are to be maintained in a habitable condition.

Minor Buildings and Appliances.—Food shelters for the use of Convicts erected at Congella and at Shortt's, repairs and additions made to Coaling Office at Bluff, etc.

Surveying.—The general survey of the Harbour for the 1906 Annual Report was commenced in January and completed in April. Six special surveys of the Entrance were made during the year. Beginning in May, monthly surveys have been made of the land reclaimed at Congella for the Durban Corporation. Soundings taken under central pontoon and round the Floating Dock in June. In October surveys were made at the site of the Timber Jetties and of the Pumping Station at the Creek. The site at Shortt's used as a spoil bank for the Congella reclamation work was surveyed, and several other minor surveys were made during the year. On the 29th May an extraordinarily high tide was registered at 4.48 a.m., the gauge indicating 7 ft. 1 in., or 13 inches above ordinary spring tides.

Telephones.—In November the Port Captain's house was connected up to the Municipal Telephone system. The Departmental Telephone system has worked well throughout the year.

Port Shepstone, Conservancy.—The work of Conservancy has generally been maintained, including the clearance of rapids, upkeep of buildings and plant belonging to the Department. Since the completion of the Training Wall after the damage which occurred in August, 1906, the cost of maintaining this work has been comparatively small. Although some very heavy seas prevailed at times no further damage was done to the wall proper, but at places along the the rubble wall inside the river there have been some small mishaps owing to heavy floods; these, however, are of no serious consequence, and considering the light and loose construction of this bank it is probable that such mishaps will be common until something more lasting can be built.

Miscellaneous.—In addition to the ordinary work of the year a good many calls have been made upon the Department by other public departments for assistance in various forms, and many of the buildings, the property of the Harbour Works, together with plant and materials, have been requisitioned for various purposes.

Large quantities of stone and timber have been supplied to other departments which will be found accounted for in the schedule attached to this report.

The Bathing Enclosure on the Ocean Beach was, with the consent of the Government, erected for the Corporation by the Harbour Department, and with material supplied from these works. The structure, though rough, has so far withstood the heavy seas which occasionally break on the Beach, and, so far as the work goes, was well and expeditiously carried out.

A jetty for the use of the Natal Government Railways at Port Shepstone was also built by this Department, and a portion of the Bond Store was partitioned off to enable the Militia Department to make use of portion of this building.

In concluding this report it may be appropriate to review the changes which have taken place in the Department during the year. Owing to the suspension of further works of development, divers and other workmen, employed in connection with Quay Wall work, were discharged as the works on which they were engaged were finished off; shipwrights, carpenters and other tradesmen were dismissed from time to time as work diminished, and the personnel of the Department was gradually reduced. In July the Slipway, Floating Dock, and Floating Workshop were transferred to the Port Department, and the Electrical System was amalgamated with that of the Railway Department. In the same month the Engineering Workshops were closed down, and the upkeep and renewals of machinery, rolling stock, floating plant, &c., placed in the hands of the Locomotive Superintendent, Natal Government Railways. This involved the displacement of the whole of the mechanical staff, but a large number of the men were re-employed in the Railway Workshops. In November the maintenance of the railway lines at the Point and Bluff was taken over by the Railway Department. The reduction in the employees during the year will be found reflected in the Labour Returns for the year, attached to the Schedule accompanying this report. All these changes necessarily led up to the reorganisation of the Office Staff, which was considerably reduced during the year, numbering 28 in January as compared with 13 in December.

In November, Mr. Charles J. Crofts, M.Inst.C.E., who held the appointment of Engineer since the latter part of 1895, was granted six months' leave of absence, prior to retirement, and it is due to him to state that the present condition of the Harbour is largely due to his untiring zeal and energy. To appreciate his work to its full extent it is necessary to compare the present development of the Port with its condition in 1895. Mr. Crofts would no doubt, as was his wont, ascribe the credit to those who helped him, during his term of office, to accomplish so much; but this will in no way detract from his merits for the success of the Works, which were carried out under his immediate control and responsibility.

I have the honour to be,
Sir,
Your obedient Servant,
D. C. DAVEY,
Engineer-in-Charge.

SCHEDULE OF MATERIALS, &c., USED IN VARIOUS WORKS.

Levelled Area, Wharf Approaches, and Rail Extensions :—

689½ tons handstone.
767 „ crushed stone.
566 „ broken stone.
219½ „ refuse.
1,791½ „ rubble.
413¾ „ binding and blinding.
1 577¾ „ broken stone.
37½ cubic yards Bluff sand.

Electric Light and Power Extension :—

10¼ tons crushed stone.
12½ cubic yards Bluff sand.

Additional Cranes :—

44½ tons handstone.
109½ „ crushed.
32 „ broken stone.
133½ cubic yards Bluff sand.

Coaling Appliances :—

4,422½ tons crushed stone.
613½ „ broken stone.
60 „ binding and blinding.
45¼ „ broken stone.

Harbour Development :—

8,955½ tons handstone.
4,477¾ „ crushed.
1,812 „ broken.
13,730½ „ refuse.
6,345 „ rubble.
202 „ broken.
98 cubic yards Bluff sand.

Bluff Quay :—

150 tons handstone.
771¾ „ crushed stone.
81¼ cubic yards Bluff sand.

Electrical Equipment :—

10½ tons crushed stone.
10 cubic yards Bluff sand.

Repairing Quay :—

46¾ tons handstone.

Conservancy General and Conservancy :—

203 tons handstone.
433¾ „ crushed.
844½ „ rubble.
103¾ „ binding and blinding.
82½ „ broken stone.
24 cubic yards Bluff sand.

Maintenance of Outer Works :—

235 tons handstone.
872½ „ crushed stone.
205½ cubic yards Bluff sand.

Hardening Roads at Point :—

22 tons handstone.
523¼ „ crushed stone.
65¼ „ binding and blinding.
460 cubic yards Bluff sand.

Wharf Repairs :—

19½ tons handstone.
126¼ „ crushed stone.
79¾ cubic yards Bluff sand.

Supplied to P.W.D. :—

903¾ tons crushed stone.
1,123¼ „ refuse.
1,479¾ „ rubble.
127 „ binding and blinding.
265 cubic yards Bluff sand.

Supplied to N.G.R. :—

354 tons crushed stone.
36½ „ binding and blinding.

Work for Port Department :—

5¼ tons crushed stone.

Umgeni Quarry :—

55,061 tons stone quarried departmentally and supplied to works direct.
2,004 „ stone supplied to Durban Gaol.

Stone Crushers :—

13,894¼ tons stone crushed during the year and used on various works.
13,084¼ „ stone stacked for crushing.

Durban Gaol :—

2,662¾ tons broken stone sent into works.

Bluff Sand :—

1,040¾ cubic yards brought over to Point and used on various works.

Point Sand :—

266,336 cubic yards sand removed from Point sand hills and deposited on low-lying lands at Congella.

Supply of Ballast :—

250 cubic yards sand supplied as ballast for vessels.

Clairmont Quarry :—

1,317½ tons handstone
83 „ broken stone
861 „ refuse
509¾ „ binding
} sent into works and used on various jobs

Labour Returns (Daily Average).

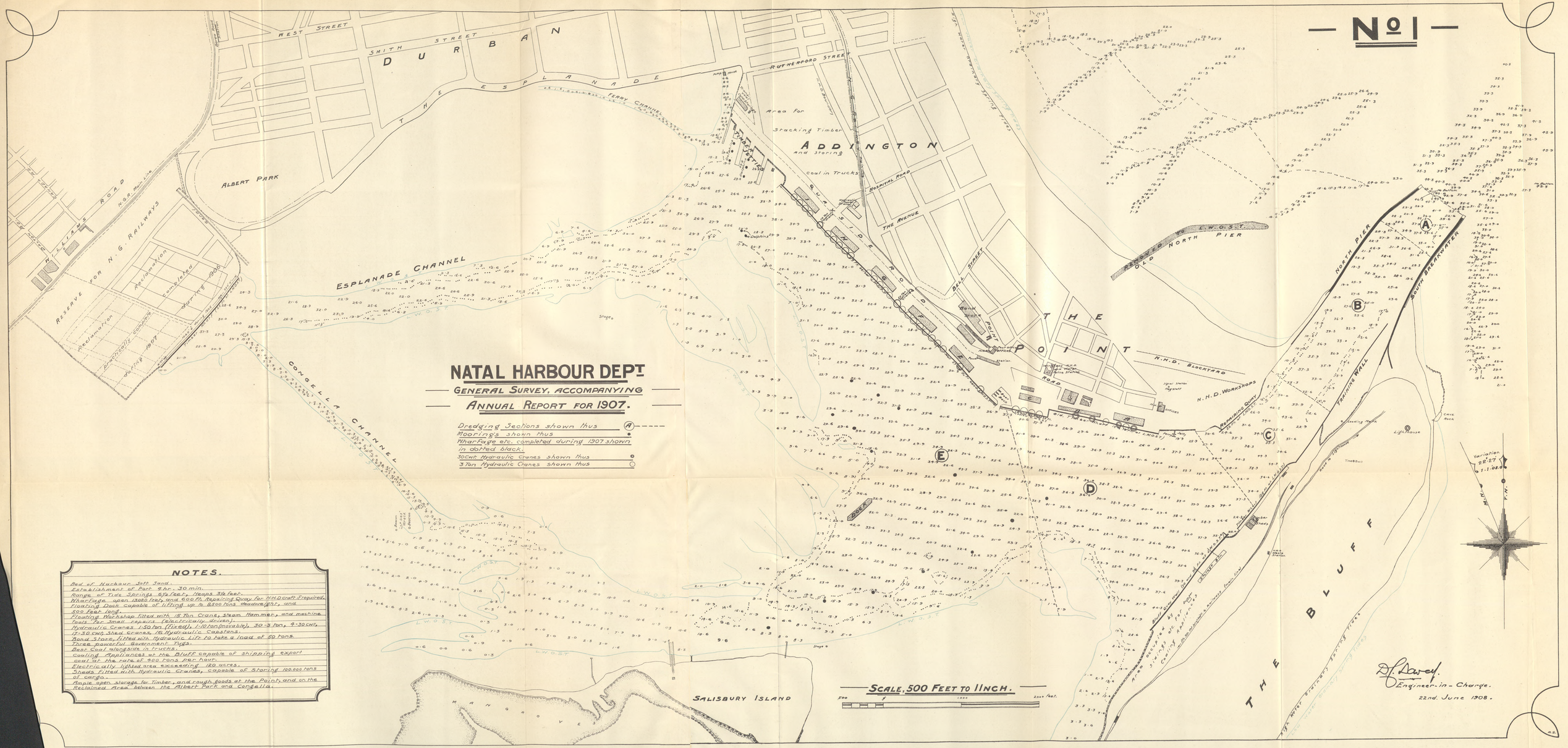
	Europeans	Natives	Indians	Convicts
Point	102	163	14	323
Bluff	14	48	1	...
Congella ...	24	19	...	...
Umgeni ...	4	11	3	...
Port Shepstone ...	4	15	12	2
Coast Lights ...	6	1	6	...
Totals ...	154	257	36	325

Average number of Rebels employed 1,121
Average number of " Unemployed " employed 76

Average number of men employed daily during 1906 :—

Europeans	292
Natives	942
Indians	128
Convicts	325
Rebels	1,477
" Unemployed "	120

D. C. DAVEY,
Engineer-in-Charge.

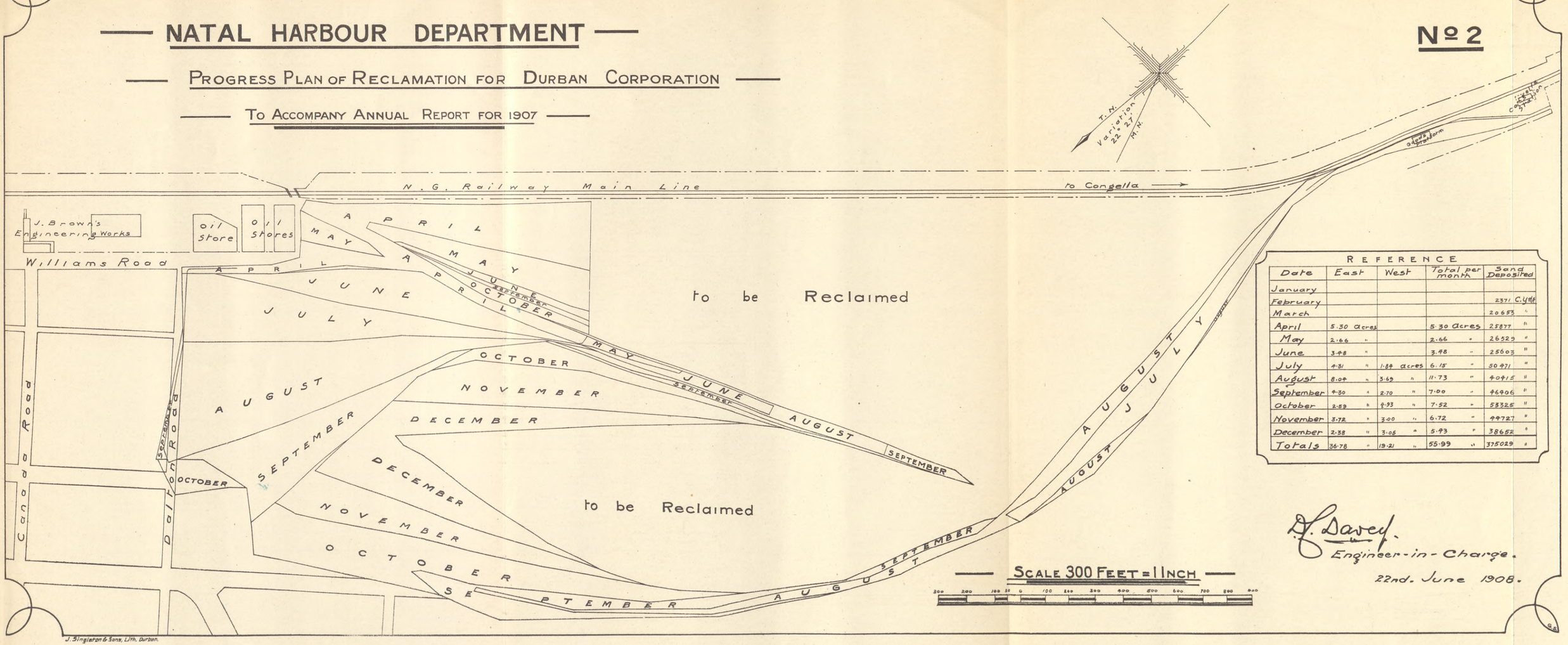

— No 1 —
NATAL HARBOUR DEPT
GENERAL SURVEY, ACCOMPANYING
ANNUAL REPORT FOR 1907.
Dredging Sections shown thus (A)-----
Moorings shown thus
Wharfage etc. completed during 1907 shown in dotted black.
30 Cwt Hydraulic Cranes shown thus
3 Ton Hydraulic Cranes shown thus
NOTES.
Bed of Harbour Soft Sand.
Establishment of Port 9 Hr. 30 min.
Range of Tide Springs 6¾ Feet, Neaps 3¼ Feet.
Wharfage open 13080 Feet, and 6007 ft. Repairing Quay for H.M.Ocraft if required.
Floating Dock capable of lifting up to 8500 Tons deadweight, and 500 Feet long.
Floating Workshop fitted with 15 Ton Crane, Steam Hammer, and machine Tools for Small repairs (electrically driven).
Hydraulic Cranes 1-50 ton (fixed), 1-10 ton (moveable), 30-3 ton, 4-30 Cwts, 17-30 Cwts Shed Cranes, 16 Hydraulic Capstans.
Bond Store, fitted with Hydraulic Lift to take a load of 50 Tons.
Three powerful Government Tugs.
Best Coal Weighed in Trucks.
Coaling Appliances at the Bluff capable of shipping export coal at the rate of 900 Tons per hour.
Electrically lighted area exceeding 120 acres.
Sheds Fitted with Hydraulic Cranes, capable of Storing 100,000 tons of cargo.
Ample open storage for Timber and rough goods at the Point, and on the Reclaimed Area between the Albert Park and Congella.
SCALE, 500 FEET TO 1 INCH.
500 0 1000 2000 Feet.
D. L. Dowell.
Engineer-in-Charge.
22nd. June 1908.
DURBAN
WEST STREET
SMITH STREET
THE ESPLANADE
RUTHERFORD STREET
FERRY CHANNEL
ALBERT PARK
WILLIAMS ROAD
N.G.R. Main Line
RESERVE FOR N.G. RAILWAYS
Reclamation Completed during 1906
Reclamation Commenced during 1907
ESPLANADE CHANNEL
CONGELLA CHANNEL
Area for Stacking Timber and Storing Coal in Trucks
TIMBER STATION
ADDINGTON
QUAY SIDE ROAD
HOSPITAL ROAD
THE AVENUE
BELL STREET
THE POINT
RESERVED TO L.W.O.S.T.
OLD NORTH PIER
NORTH PIER
SOUTH BREAKWATER
TRAINING WALL
N.H.D. BLOCKYARD
N.H.D. WORKSHOPS
REPAIRING QUAY
Life House
Variation 22°27' W 1-1-08
T.N.
M.N.
THE BLUFF
MANGROVES
SALISBURY ISLAND
L.W.O.S.T.

NATAL HARBOUR DEPARTMENT

PROGRESS PLAN OF RECLAMATION FOR DURBAN CORPORATION

TO ACCOMPANY ANNUAL REPORT FOR 1907

No 2



REFERENCE

Date	East	West	Total per month	Sand Deposited
January				
February				2371 C.Yds
March				20653 "
April	5.30 Acres		5.30 Acres	25877 "
May	2.66 "		2.66 "	26529 "
June	3.48 "		3.48 "	25603 "
July	4.31 "	1.84 Acres	6.15 "	50471 "
August	8.04 "	3.69 "	11.73 "	40415 "
September	4.30 "	2.70 "	7.00 "	46906 "
October	2.89 "	4.93 "	7.52 "	53325 "
November	3.72 "	3.00 "	6.72 "	49727 "
December	2.38 "	3.06 "	5.93 "	38652 "
Totals	36.78 "	19.21 "	55.99 "	375029 "

SCALE 300 FEET = 1 INCH

300 200 100 50 0 100 200 300 400 500 600 700 800 900

D. Davey.
Engineer-in-Charge.
22nd. June 1908.

J. Singleton & Sons, Lith. Durban.

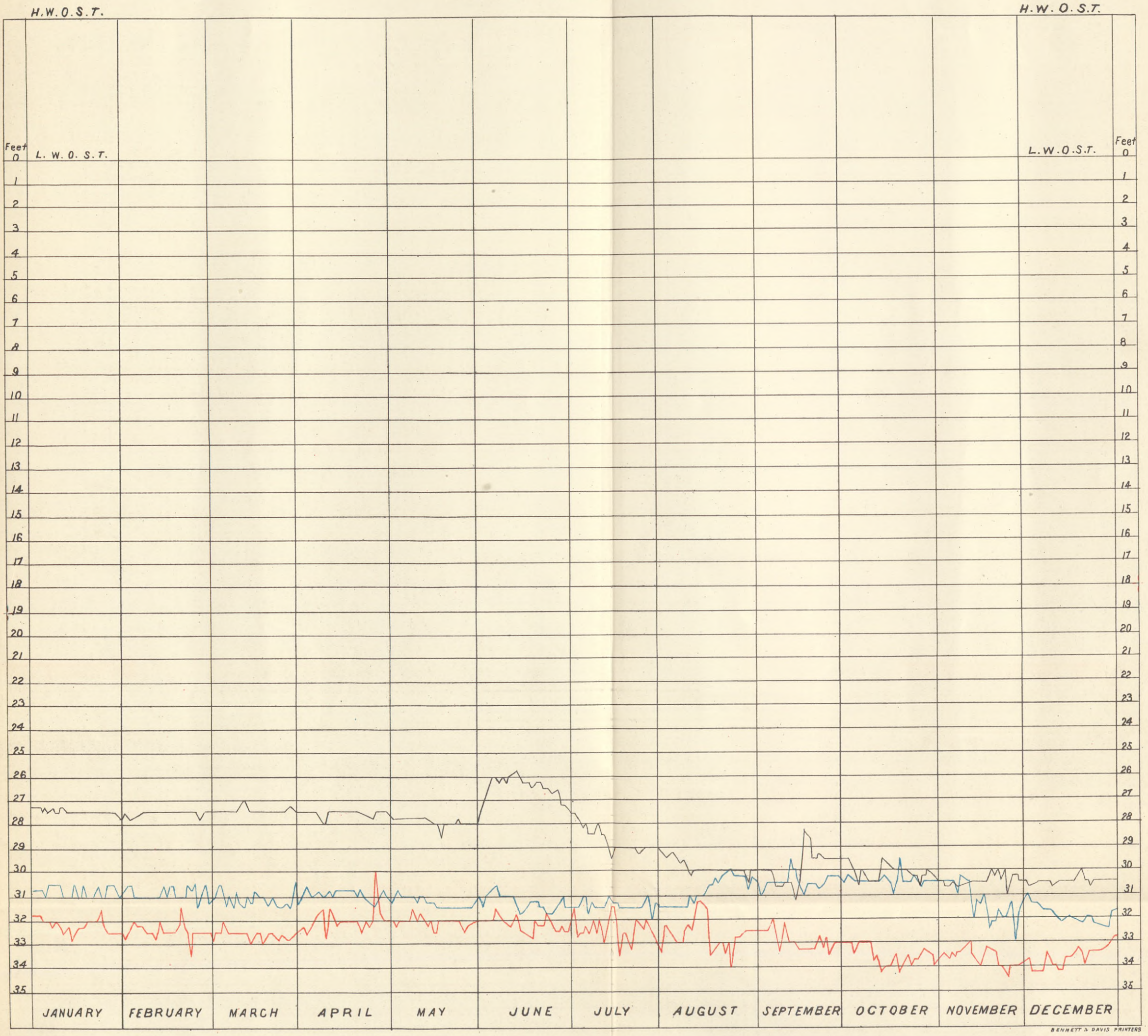
No 3

NATAL HARBOUR DEPARTMENT

DIAGRAM

SHEWING ENTRANCE DEPTHS from 1st JANUARY 1905, to 31st DECEMBER, 1907.

ACCOMPANYING ANNUAL REPORT FOR 1907.



BENNETT & DAVIS PRINTERS

1905 SHEWN IN BLACK

1906 SHEWN IN BLUE

1907 SHEWN IN RED

D. Dawes
Engineer-in-Charge.
22nd. June 1908.

HORIZONTAL SCALE 1/32" = 1 DAY

VERTICAL SCALE 1/4" = 1 FOOT

AVERAGE DEPTH FOR 1905 28' 8"

AVERAGE DEPTH FOR 1906 31' 0"

AVERAGE DEPTH FOR 1907 32' 8"