(1) Number of pages 38

(2) Date of repair 23.12.56

(3) Initials of the Referencer Ca

TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

P.W **DEPARTMENT**

G.O. No. 137-W **Press.**
B.P. No. 138 W **Mis.**

Dated 18. 1. 1881 ~~197~~.

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

18th January 1881, No. 138 W.

Buildings and Roads.
Civil Works.

Read the following papers :—

No. 111. Despatch from the Most Honorable the Secretary of State for India.

Public Works.
No. 24.

India Office, London,
16th December 1880.

My Lord Duke,—Herewith is forwarded, for your Grace's information, copies of a Report, dated 11th November, by Mr. Parkes, C.E., on the progress made on the Madras Harbour Works during the quarter ended 30th September last.

I have, &c.,
(Signed) HARTINGTON.

His Excellency the Most Noble
The Governor in Council, Fort St. George.

From W. PARKES, Esq., M. Inst. C.E., to the Under Secretary of State for India, dated 23, Abingdon Street, 11th November 1880.

Report of Progress on the Madras Harbour Works for the Quarter ending 30th September 1880.

I have the honor to submit herewith a plan showing the state of the works of the above on the 30th September last, and a photograph taken from the top of the light-house on the 6th October.

2. Since the 30th June the north pier had advanced 488 feet and the south pier 571, making a total of 1,059 feet.

In all 1,848 blocks were set, of which 1,386 were of 27 tons or 16 cubic yards, and 462 of 22½ tons or 13⅓ cubic yards. This is without doubt an unprecedented rate of progress, and it is a proof of the efficient organization of the work that it was carried on at such a rate notwithstanding that some of the more important members of the staff had recently been temporarily incapacitated by illness, as mentioned in my last report. I am glad to state that they are now all in good health, and Mr. Beardmore is about to return to India immediately.

3. The north pier was on the 30th September 360 feet from the extreme end. The south pier at the same date 980 feet. The curved portion of the latter was finished on the 6th October. The north pier will hardly be carried out to the extreme end within the current quarter, as some delay must be anticipated during the rough weather of the north-east monsoon, but if there is no drawback of a very exceptional kind it may be fully anticipated that that point will be reached in the favorable season of the next quarter, and some progress made with the special work of the pier head.

4. With regard to the latter, Mr. Thorowgood and myself have arranged by correspondence as to the mode of effecting the widening, and the necessary specially shaped blocks are being prepared, but the particular form and mode of execution of the return inwards, shown upon the plan, is not yet definitely fixed. It is an important matter, involving nautical as well as engineering considerations, and should be decided in view of the latest and most complete observations of the effect produced by the pier upon the waves. There is, however, no financial question involved, as the estimate for the piers as a whole is amply sufficient to cover the cost without even drawing on the item of contingencies.

5. I have not shown on this, as I have on previous plans, the amount of rubble base deposited in advance of the block-work. There is a rather serious discrepancy between the returns of tonnage and the measurements of the actual base deposited. I have called Mr. Thorowgood's attention to this, but, pending the arrival of his explanation, it will be better to abstain from giving figures which on one side or the other must be incorrect.

6. In the month of August the intercepting drain was completed, thus diverting from the harbour the daily flow from four offensive sewers which formerly discharged into it, and also receiving the sewage of a considerable portion of the Black Town which formerly discharged into the sea near Fort St. George.

7. The accumulation of sand to the south of the south pier is shown upon the plan. It is similar to that experienced in former years and very much what was originally anticipated. The width of the newly added strip is greater than that of 1878-79, but that of the two years together is less than that of 1877-78 alone. A considerable portion of this accumulation will be carried away during the current north-east monsoon.

8. The movement of sand on the beach between the piers is very remarkable, and the considerable accumulation in the southern half might support the notion of a diminution of harbour space were not the positive evidence of its real cause, and the negative evidence, inconsistent with the idea of its being due to sand getting into the harbour from the outside, not both equally complete.

9. A comparison of the contour lines of the depths in October 1879 with the figures giving those of September 1880, both given on the plan, shows that there has been a deepening in the northern part of the harbour to an extent fully equal to the accumulation on the shore in the southern part. The entrance of the heavy southerly seas through the wide opening between the piers, and their reflection from the face of the north pier on to the beach, is a sufficient explanation both of the deepening and the transfer of the material southward. As the piers close in towards one another this cause of disturbance will evidently be proportionately reduced. A comparison of the lines and figures in the southern part of the harbour will show that though there has been disturbance the shoalings and deepenings nearly balance one another.

10. The negative evidence, that the movement is not connected with any action beyond the piers, is furnished by the entire absence of any indication of disturbance of the bottom in the neighbourhood of the piers in deeper water. If there were any such disturbance it would certainly show itself.

11. In the case of the very similarly placed harbour lately completed at the North Sea entrance of the Amsterdam canal, where the alongshore tidal currents are strong, but where the waves though perhaps quite as heavy as at Madras, having their maximum force from a direction nearly at right angles with the shore, and so produce little or no alongshore movement, the changes offer a striking contrast to those presented at Madras. There is very little change of the shore line near the piers of the kind which is so marked at Madras, there was nothing analogous to the accumulations of sand around the ends of the Madras piers when they were in a small depth of water; but instead of the absolute absence of disturbance in the more advanced parts which we find at Madras, there is at the North Sea Harbour a deepening outside to the extent of 10 to 15 feet, and a corresponding shoaling within the harbour. In fact the locations of disturbance and repose are reversed at the two places. There is nothing to account for these different results except the fact that the sand at the one place is under the influence of alongshore wave action, and at the other of alongshore current action.

Each result is precisely what might have been predicted as that due to the forces known to be in operation at the two places, and we may be pretty certain that where the effect is not seen the cause is absent.

12. With respect to the changes of the shore line north of the harbour, the results of the last south-west monsoon are a step towards bringing the matter into a more definite form. There is still, however, a great deal of uncertainty connected with it, and this is due to the fact that the forces acting upon it counteract one another to some extent. The alongshore action of the waves in the south-west monsoon causes a waste, but the transverse action causes an increase, and the reverse is the case in the north-east monsoon. Thus in either season a *waste* or an *increase* may be produced, according as the one or the other preponderate, and thus the records of the changes are at first sight a succession of anomalies. To the south of the harbour the two forces act in unison so that we get more consistent results.

13. It will be remembered that the beach in question has been divided into three portions, with a different treatment for each. The first, being a length of 3,500 feet from the north pier, upon which valuable property abuts, is protected for a portion of its length by a rubble stone revetment. This was damaged by a heavy sea in November 1879, but has since been restored and strengthened at a cost of about Rs. 22,000. In its present state it will take a heavier sea than that of November 1879 to damage it, and therefore we may anticipate that until such a sea occurs no further expenditure will be needed. When it does occur it will no doubt render necessary some further repairs which, in their turn, will give a further increase of strength as another step towards finality. But when the last step will be taken it is impossible to say, unless it were considered desirable, for the sake of securing absolute finality, to spend a much larger sum than is at all likely to be required under the system of feeding the sea with more stone as necessity arises.

14. The second portion, a length of 2,400 feet, has been treated by groynes. By the alongshore action of the north-east monsoon the sand accumulates in this portion, and the hope is that the accumulation may be protected by the groynes from the wasting action of the following south-west monsoon. How far this hope has been as yet realized it is not easy to say, owing to the complication of the gathering and wasting actions above described. Between March and September 1879 the shore was cut away for a width varying from 100 to 150 feet. Between September 1879 and March 1880 about half of this width was recovered. Between March and September 1880 this recovered strip was again cut away, leaving the shore line nearly where it was the year before, so that there was no loss in the twelve months. Whether the groynes were instrumental in preventing the further erosion which might have been anticipated is not clear. The plans do not show the characteristic form of the coast which is generally assumed where groynes arrest an alongshore movement. This fact would indicate a considerable preponderance of the transverse over the alongshore action, and this, if confirmed, would be satisfactory, because the transverse action is in no way affected by the projection of the harbour piers.

15. The third portion of the beach, still farther to the northward, has been left without protective works of any kind. The result has been an advance of the coast line in the year of about 100 feet for a distance of half a mile. Beyond this, without any apparent change of conditions, it has been cut away to a slight extent. These facts would tend to show that, in the last year at least, the effect of the stoppage of the movement of sand from the southward by the harbour piers has been scarcely sensible at a distance of two miles from the harbour.

16. On the whole, I think, it may be said that a year has passed without presenting any additional ground for anticipating future trouble from the progressive erosion of this shore. The future changes should be watched and recorded, but it should not be hastily concluded that they are attributable in all cases to the Harbour Works.

17. I have not yet received the statement of expenditure up to the 30th September. I have been unwilling to delay submitting this report, but will supplement it by my usual comparison of estimate and expenditure on the arrival of the necessary information.

18. It will be observed that the photograph shows a steamer anchored in the harbour. Most of the regular liners now come inside, and in the north-east monsoon the shelter afforded by the north pier will be of value, by enabling them to lie closer to the shore and otherwise facilitate the landing and shipping of cargo. The advance of the south pier will also render the shelter during the ensuing south-west monsoon much more efficient than it was in the last. It was at one time doubted by some persons whether a south pier was necessary at all, but I think the experience of the last year, in respect of the action of the southerly seas on the sand, goes to prove that protection from them is quite as necessary as from those from the north.

No. 111-A. Despatch from the Most Honorable the Secretary of State for India.

Public Works.
No. 25.

India Office, London
16th Dec. 1880.

MY LORD DUKE,—In continuation of my Public Works despatch No. 24, dated 16th December 1880, which forwarded copies of Mr. Parkes's Report on the progress made with the Madras Harbour Works during the quarter ended 30th September last, herewith is transmitted, for your Excellency's information, a further communication from Mr. Parkes, containing a statement of the actual outlay on the works up to the 30th September last as compared with the estimates of expenditure.

I have, &c.,
(Signed) HARTINGTON.

His Excellency the Most Noble
The Governor in Council, Fort St. George.

From W. PARKES, Esq., M. INST. C.E., to the Under Secretary of State for India, dated 23, Abingdon Street, 22nd November 1880.

Madras Harbour.

I HAVE the honor to submit, in continuation of my Report dated 11th instant, a comparative statement of the estimate and expenditure on the above works up to the 30th September last.

2. This statement must be taken subject to an undetermined amount of correction in respect of one item, the rubble base, as to which there is, as stated in paragraph 5 of my Report above named, a serious discrepancy in the tonnage returns and measurements. The results presented are taken from the figures as they stand. The correction will have the effect of increasing the amount of saving on the two piers, but to what extent I am unable to say.

3. The total expenditure returned to the Government is Rs. 47,06,208-8-5, but liabilities had been incurred to the amount of Rs. 93,614-11-8, together making my aggregate of Rs. 47,99,923, which I classify as under:—

—	Total Estimate.	Estimate of portion completed.	Expenditure to 30th Sept.	Excess.	Saving.
	RS.	RS.	RS.	RS.	RS.
Plant and preliminaries	8,00,000	8,00,000	9,07,857	1,07,857	...
North Pier to 3,512 feet	20,56,860	17,95,252	17,71,030	...	24,222
Rubble Base in advance	...	19,170	19,170	...	...
South Pier to 2,972 feet	20,56,860	14,87,355	13,64,105	...	1,23,250
Rubble Base in advance	...	19,170	19,170	...	...
Blocks in stock	...	1,16,260	1,02,660	...	13,600
Materials on hand	...	1,91,071	1,96,071	...	...
Totals ...	49,13,720	44,28,278	43,75,063	...	...
Contingencies 10 per cent... ...	4,91,372	4,42,828	1,50,947	...	2,91,881
Establishment 5 „	2,45,686	2,21,414	2,73,913	52,499	...
	56,50,778	50,92,520	47,99,923	1,60,357	4,52,953

4. I have only to remark upon this that the cost of the items, which are not affected by the discrepancy now awaiting explanation, remains almost exactly the same as heretofore, and setting the excess of the rubble base against the saving on the superstructure, the cost of the deep water portion of the piers as a whole is very close to the estimate.

5. The charge for "establishment" continues to decrease. In September 1879 it was 7·1 per cent. on the expenditure; it is now 6·1 per cent. on the whole, and for the twelve months, from 1st October 1879 to 30th September 1880, it was 4 per cent.

No. 112. ORDER THEREON, 18th January 1881, No. 137 W.

ORDERED to be recorded, and copies furnished for the information of the Government of India.

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
„ Secretary, Harbour Works Committee.

No. 113. (DOCKET, No. 138 W., dated 18th January 1881).

Forwarded

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

Exd. S. T. Austin.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1881) Madras.

PUBLIC WORKS.

To

THE SECRETARY TO THE
GOVERNMENT OF INDIA.

Dated January, 18th

Issued

Recd. *Encl.*

G. O., *18th January* 1881, *No.* 138 W.

JANUARY.
Nos. 111-113.

FORWARDING copies of despatches from the Secretary of State for India with the Progress Report of the Madras Harbour Works for quarter ending 30th September 1880, with a statement of the actual outlay on the works up to that date, furnished by Mr. Parkes.

138/4 . 111

India Office, London
16th December 1880.

Public Works
No. 24

My Lord Duke,

Herewith is forwarded for your Grace's information, — copies of a report dated 11th Nov: by Mr Parkes C.E. on the progress made on the Madras Harbour works during the quarter ended 30th September last.

I have the honour to be,
My Lord Duke,
Your Grace's most obedient
humble Servant,

Hartington

His Excellency,
The Most Noble,
The Governor in Council,
Fort St George.

P. D. No $\frac{2298}{2299}$ W. 4.10.80.

No. 3.

P.W. C. No 152

Public Works

16th Decr 1880

The

Rec.d [illegible]

Letter to Fort St. George

No. 214

C. B.1. N. 18 [illegible]

139/13

No. 4

2279

Copy Report by Mr Parkes
dated 11th Novr 1880

Referred to in Pub: Works Letter
to Madras No. 24 of 16th Decr 1880

Madras Harbour

138/6

Report of Progress for the Quarter
ending 30th Sept. 1880.

23 Abingdon Street
11th November 1880

Sir,

I have the honour to submit herewith a plan shewing the state of the works of the above on the 30th September last, and a photograph taken from the top of the light house on the 6th October.

2. Since the 30th June the North Pier had advanced 488 feet and the South Pier 571 making a total of 1059 feet.

In all 1848 blocks were set of which 1386 were of 27 tons or 16 cubic yards, and 462 of 22½ tons or 13⅓ cubic yards. This is without doubt an unprecedented rate of progress and it is a proof of the efficient organization of the work that it was carried on at such a rate notwithstanding that some of

The Under Secretary of State
for India

of the more important members of the staff had recently been temporarily incapacitated by illness, as mentioned in my last report. I am glad to state that they are now all in good health, and Mr Beardmore is about to return to India immediately.

3. The North Pier was on the 30th September 360 ft from the extreme end. The South Pier at the same date 980 ft. The curved portion of the latter was finished on the 6th October. The North Pier will hardly be carried out to the extreme end within the current quarter as some delay must be anticipated during the rough weather of the North East Monsoon, but if there is no drawback of a very exceptional kind it may be fully anticipated that that point will be reached in the favourable season of the next quarter, & some progress made with the special work of the pier head

4. With regard to the latter, Mr Thorowgood and myself have

arranged

arranged by correspondence as to the mode of effecting the widening, and the necessary special shaped blocks are being prepared, but the particular form and mode of execution of the return inwards shewn upon the plan is not yet definitely fixed. It is an important matter involving nautical as well as Engineering considerations, and should be decided in view of the latest and most complete observations of the effect produced by the pier upon the waves. There is however no financial question involved as the estimate for the piers as a whole is amply sufficient to cover the cost without even drawing on the item of contingencies

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the face of the north pier on to the beach is a sufficient explanation both of the deepening and the transfer of the material Southward. As the piers close in towards one another this cause of disturbance will evidently be proportionately reduced. A comparison of the lines and figures in the Southern part of the harbour will shew that though there has been disturbance the shoalings and deepenings nearly balance one another

10. The negative evidence that the movement is not connected with any action beyond the piers is furnished by the entire absence of any indication of disturbance of the bottom in the neighbourhood of the piers in deeper water. If there were any such disturbance it would certainly shew itself.

11. In the case of the very similarly placed harbour lately completed at the North Sea Entrance of the Amsterdam Canal where the along shore tidal currents are strong, but where the waves though perhaps quite as heavy as at Madras, having their maximum force from a direction nearly at right angles with the shore, and so produce little or no alongshore movement, the changes offer a striking contrast to those presented at Madras. There is very little change of the shore line near the piers of the kind which is so marked at Madras there was nothing analogous to the accumulations of sand around the ends of the Madras piers when they were in a small depth of water; but instead of the absolute absence of disturbance in the more advanced parts which we find at Madras, there is at the North Sea Harbour a deepening outside to the extent of 10 to 15 ft and a corresponding shoaling within the harbour. In fact the

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Each result is precisely what might have been predicted as that due to the forces known to be in operation at the two places, and we may be pretty certain that where the effect is not seen the cause is absent.

12. With respect to the changes of the shore line North of the harbour the results of the last South West Monsoon are a step towards bringing the matter into a more definite form. There is still however a great deal of uncertainty connected with it, and this is due to the fact that the forces acting upon it counteract one another to some extent. The alongshore action of the waves in the South West Monsoon causes a waste but the transverse action causes an increase and the reverse

is

116

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13. It will be remembered that the beach in question has been divided into three portions with a different treatment for each. The first, being a length of 3500 feet from the North Pier, upon which valuable property abuts, is protected for a portion of its length by a rubble stone revetment. This was damaged by a heavy sea in November 1879 but has since been restored and strengthened at a cost of about Rs 22000. In its present state it will take a heavier sea than that of November 1879

to

to damage it, and therefore we may anticipate that until such a sea occurs no further expenditure will be needed. When it does occur it will no doubt render necessary some further repairs which in their turn will give a further increase of strength as another step towards finality. But when the last step will be taken it is impossible to say unless it were considered desirable for the sake of securing absolute finality to spend a much larger sum than is at all likely to be required under the system of feeding the sea with more stone as necessity arises.

14. The second portion, a length of 2400 feet has been treated by Groynes. By the alongshore action of the North East Monsoon the sand accumulates in this portion and the hope is that the accumulation may be protected by the Groynes from the wasting action

action of the following South West Monsoon. How far this hope has been as yet realized it is not easy to say owing to the complication of the gathering and wasting actions above described. Between March and September 1879 the shore was cut away for a width varying from 100 to 150 feet. Between September 1879 and March 1880 about half of this width was recovered. Between March and September 1880 this recovered strip was again cut away, leaving the shore line nearly where it was the year before, so that there was no loss in the 12 months. Whether the Groynes were instrumental in preventing the further erosion which might have been anticipated is not clear. The plans do not shew the characteristic form of the coast which is generally assumed where groynes arrest an alongshore movement. This fact would indicate a considerable

considerable preponderance of the transverse over the along shore action and this, if confirmed, would be satisfactory because the transverse action is in no way affected by the projection of the Harbour Piers.

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16. On the whole I think it may be said that a year has passed without presenting any additional ground for anticipating future trouble from the progressive erosion of this

shore

shore. The future changes should be watched and recorded but it should not be hastily concluded that they are attributable in all cases to the Harbour Works.

17. I have not yet received the statement of expenditure up to the 30th September. I have been unwilling to delay submitting this report, but will supplement it by my usual comparison of estimate & expenditure on the arrival of the necessary information.

18. It will be observed that the photograph shews a steamer anchored in the Harbour. Most of the regular liners now come inside & in the North East Monsoon the shelter afforded by the North Pier will be of value by enabling them to lie closer to the shore & otherwise facilitate the landing & shipping of cargo. The advance of the South Pier will also render the shelter during the ensuing South West

Monsoon

Monsoon much more efficient than it was in the last. It was at one time doubted by some persons whether a South Pier was necessary at all, but I think the experience of the last year in respect of the action of the Southerly seas on the sand goes to prove that protection from them is quite as necessary as from those from the North.

I have &c.

(sd) W. Parkes.

India Office London

138/14

16th December 1880

Public Works

No. 25.

My Lord Duke,

In continuation of my Public Works Despatch No. 24 dated 16 Dec. 1880, which forwarded copies of Mr. Parkes' report on the progress made with the Madras Harbour Works during the quarter ended 30th September last, herewith is transmitted for your Excellency's information a further communication from Mr. Parkes containing a statement of the actual outlay on the works up

His Excellency,
The Most Noble,
The Governor in Council
Fort St. George.

up to the 30th September
last as compared with
the estimates of expenditu

I have the honor to be
My Lord Duke
Your Grace's most obedient
humble servant,

Hartington

P.W.C.P. 151

No. 5

B. Lr. 2292/2259 W. 4.10.80.

Public Works
16th Decr. 1880

The
Letter to Fort St. George
No. 25

Recd. 6 January / 81

C.D.I.R.K.1.

Madras Harbour

138/46

23 Abingdon Street
22nd November 1880.

Sir,

I have the honour to submit, in continuation of my report dated 11th instant, a comparative statement of the estimate and expenditure on the above works up to the 30th September last.

2. This statement must be taken subject to an undetermined amount of correction in respect of one item, the rubble base, as to which there is, as stated in para 5 of my report above named, a serious discrepancy in the tonnage returns and measurements. The results presented are taken from the figures as they stand.

The correction will have the effect of increasing the amount of saving on the two piers, but to what extent I am unable to say.

3. The total expenditure returned to

The Under Secretary of State
for India

to the government is Rupees 47.06,208-8-5 but liabilities had been incurred to the amount of Rupees 93,614 - 11.8 together making my aggregate of Rupees 47.99.923 which I classify as under

	Total Estimate	Estimate of Portion completed	Expenditure to 30 Sept	Excess	Saving
Plant and Preliminaries	800 000	800 000	907 857	107 857	
North Pier to 3572 ft.	2056 860	1798 252	1771 030		24 222.
Rubble base in advance		19 170	19 170		
South Pier to 2972 ft	20.56.860	4.87.355	13.64.105		1.22.250
Rubble base in advance		19.170	19 170		
Blocks in Stock		1.16.260	1.02.660		13.600
Materials on hand		1.91 071	1 96.071		
Totals	49,13,720	44.28.278	4375063		
Contingencies 10 per cent	4.91.376	4.42.828	1.50.947		2.91.881
Establishment 5 " "	2.45.686	2.21.414	2.73.913	52.499	
	56.50.778	50.92.520	47.99.923	1.60.357	4.52.953

4. I have only to remark upon this that the cost of the items which are not affected by the discrepancy now awaiting explanation remains almost exactly the same as heretofore, and setting the excess of the rubble base against the saving on the superstructure the cost of the deep water portion of the piers as a whole is very close to the estimate

5. The charge for "Establishment" continues to decrease. In September 1879 it was 7.1 per cent on the expenditure. It is now 6.1 per cent on the whole, and for the 12 months from 1 October 1879 to 30 September 1880 it was 4 per cent.

I have &c

(sd) J. W. Parkes

No. 6

Letter from Mr. Parkes
dated 22nd Novr. 1880.

Referred to in Pub: Works Letter to
Madras No. 25 d/16th Decr. 1880

No 137 W   12   13 W

Works

PUBLIC WORKS DEPARTMENT.

138/18

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 18th Jany/81

Read the following :—

Despatch from the Secy. of State } (H.E. No 24 d/ 16th Decr/80)
Do   Do — (" " 25 " 16th —do—)

Ordered to be recorded, and copies furnished for the information of the Government of India.

H.E. No 138 W d/ 18 Jany/81

Forwarded.

Dated 31-1-81

12/1/81

Supdt. Engr. H. Works &
Secy. Harbour Works Committee

Dated 31-1-81

& a photograph [illegible]

162

Govt. of [1879] Madras.

PUBLIC WORKS.

To

Dated 24

Issued

Recd. Endt.

G. O. 18th May 1881 No. 187-8 W

Nos. 111-112

113

Mr. H. Woollen, Pensioner

from the 3rd [illegible]

~~Lt. Davies~~ [illegible] the [illegible]

report of the [illegible] for

the qr. ended 30th Sept.

with a statement of the

actual outlay on the

works up to that date

returned to the [illegible] of

G.O.

[illegible]