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(2) Date of repair \_\_\_\_\_

(3) Initials of the Referencer \_\_\_\_\_

**MADRAS RECORD OFFICE.****Government of Madras.***Public works* **DEPARTMENT.**

|          |       |                 |
|----------|-------|-----------------|
| G.O. No. | 3864  | Press           |
|          |       | <del>Mis.</del> |
| 283-54   |       |                 |
| Dated    | 11 12 | 1858 .          |

**Not to be folded or roughly handled**

7.43

*Proceedings of the Madras Government, Public Works Department,  
11th December 1868.*

No. 253. Read the following letter from the Superintending Engineer, 1st Division, to the Secretary to Government, Public Works Department, dated Dowlaishwerum, 21st November 1868, No. 171 :—

\*7 Enclosures despatched by Banghy.  
3 Sheets of Plans.  
2 Tabular Statements.  
2 Abstract Estimates revised.

G. O., No. 2,692 of 22nd August 1868.  
G. O., No. 2,893 of 11th September 1868.

1. I have the honor to submit the estimates for the section of Northern Trunk Road between Toonee and Chittivulsa in the Vizagapatam District, with drawings of the bridges and culverts, &c., which it is proposed to construct.

(1.) As required by the 2nd paragraph of the letter from the Secretary to Government of India, recorded in Proceedings of the 28th April 1868, I have the honor to report that all important points have been carefully considered.

(2.) As regards the waterway provided for bridges, the method I have adopted is as follows: having ascertained, as correctly as possible, the area the drainage from which will pass through the proposed bridge, to assume the maximum flood discharge to be equal to 75,000 (M)  $\frac{2}{3}$  cubic yards per hour, M being square miles, and then to compare this with the sectional area of the dry water course and its fall per mile; of course in many instances there is no water course, only a hundred yards or so of sand, which the stream when in flood has deposited on the road over which it passed.

(3.) I have no means of ascertaining the rain-fall, velocity of stream, or area of flood, sections of the streams for which bridges are provided in the estimates; if they are required, the submission of the estimates will have to be postponed for some years until we have obtained a sufficiently large number of observations to ensure tolerable accuracy, and even then we could not be certain that we had got a maximum flood section.

2. Captain Beatty, who prepared the estimate for half of the section for which the estimates provide, viz., from Chittivulsa to Ankapilly, knows the road well; and has for years watched the effects of floods and noted down the requirements as regards additional waterway.

3. I prepared the estimate for the southern part of the section, viz., from Ankapilly to Toonee, and did it as carefully and as well as I could.

No. 254. ORDER THEREON, 11th December 1868, No. 3,864.

CIVIL WORKS, No. 29.

22nd August 1868, No. 2,692.  
11th September, ,, 2,893.

The Government regret that, though the particular attention of the Superintending Engineer was drawn in the Orders marginally noted to the necessity of his submitting the estimates for the portion of the Great Northern Road in the 1st Division with a full report and a complete specification, the estimates submitted with the letter above recorded should be laid before them with but a meagre report and without any specification. There is nothing in the papers to show whether the estimates provide for forming the whole length of 75 miles between the Toonee river and Chittivulsa, or for only portions of that distance. A detailed report, such as that furnished for the portion of the

*In bridges, the method I have adopted*

Proceedings of the Madras Government, Public Works Department,  
11th December 1868.

road in the 2nd Division, and which will be found printed with Proceedings No. 2,597, dated 24th August 1867, is what is wanted, and Captain Ryves will hasten its submission. The Government of India attach so much importance to the estimates for the road in question being submitted in the fullest detail, that His Excellency the Governor in Council cannot lay before that Government, in their present form, the estimates for the section of the line in the Vizagapatam District.

(True Extract.)

Colonel, R. E.,  
Secretary to Government.

To the Superintending Engineer, 1st Division,

Exd. G. A. Turton.

171

Superintending Engineer's Office  
1st Division Dorelucrain  
21st November 1868.

From

Captain J. G. Ryves R. E.  
Superintending Engineer  
1st Division

To

Colonel C. A. Orr R. E.  
Secretary to Government.  
D. P. W.

Madras

Enclo 7\* Sir,

3 Sheets of Plans  
2 Tabular Statements  
2 abstract Estimates  
revised.

7  
G. O. No. 2692 of  
22nd Aug 1868.  
G. O. No. 2893 of  
11th September 1868.

\* See style  
Baughy

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the Vizagapatam District with drawings  
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proposed to construct.

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of the letter from the Secretary to Govern-  
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honor to report that all important  
points have been carefully considered.
2. As regards <sup>the</sup> waterway provided  
for bridges, the method I have adopted  
is

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is as follows - having ascertained as correctly as possible the area, the drainage from which will pass through the proposed bridge - to assume the maximum flood discharge to be equal to  $75000 (M)^{2/3}$  Cubic yards per hour -  $M$  being square miles - and then to compare this with the sectional area of the dry water course and its fall per mile - of course in many instances there is no water course only a hundred yards or so of sand which the stream when in flood has deposited on the road over which it passes -

3. I have no means of ascertaining the rain fall, velocity of stream, or area of flood sections of the streams for which bridges are provided in the estimates - if they are required the submission of the estimates will have to be postponed for some years until we have obtained a sufficiently large number of observations to ensure tolerable accuracy and then

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3. I prepared the estimate for the southern part of the section viz from Ankupilly to Loozee and did it as carefully and as well as I could.

I have &c. &c.

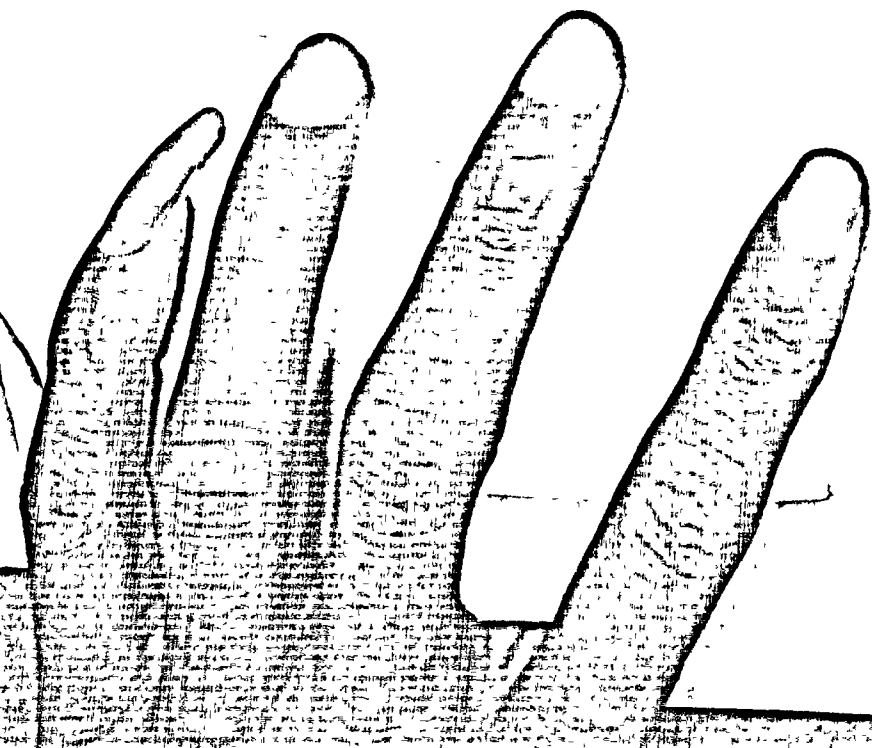
A. R. S. Capt. R. S.  
Superintending Engineer P. W. D.



[illegible]

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| Names of RIVERS<br>& principal Nullahs. | MILE. | Square miles drainage<br>from which intercepted. | Square Feet waterway<br>for one bridge. | BRIDGES & CULVERTS &c. |        |               |                 |           |        |               |                                | Square feet waterway<br>provided. | Do according to local<br>Officers Estimate. |  |
|-----------------------------------------|-------|--------------------------------------------------|-----------------------------------------|------------------------|--------|---------------|-----------------|-----------|--------|---------------|--------------------------------|-----------------------------------|---------------------------------------------|--|
|                                         |       |                                                  |                                         | Already built.         |        |               |                 | Proposed. |        |               |                                |                                   |                                             |  |
|                                         |       |                                                  |                                         | Number.                | SPANS. |               | Height of Piers | Number.   | SPANS. |               | Height<br>of<br>Piers.<br>feet |                                   |                                             |  |
|                                         |       |                                                  |                                         |                        | No.    | Each<br>feet. |                 |           | No.    | Each<br>feet. |                                |                                   |                                             |  |
|                                         | 43    | 3½                                               |                                         | 1                      | 3      | 12            | 3               | 1         | 2      | 12            | 3                              | 4½                                | 420                                         |  |
|                                         | 42    | 5                                                |                                         | 1                      | 1      | 3             | 2               | 1         | 1      | 6             | 3                              | 250                               |                                             |  |
|                                         | 44    | 3                                                |                                         | 1                      | 1      | 3½            | 2¼              | 1         | 3      | 9             | 4½                             | 185                               |                                             |  |
|                                         | 40    | 1½                                               |                                         | 0                      | -      | -             | -               | 1         | 1      | 6             | 4½                             | 120                               |                                             |  |
|                                         | 39    | 2¼                                               |                                         | 0                      | -      | -             | -               | 1         | 1      | 9             | 6½                             | 156                               |                                             |  |
|                                         | 38    | 3½                                               |                                         | 0                      | -      | -             | -               | 1         | 3      | 9             | 3                              | 184                               |                                             |  |
|                                         | 37    | 1½                                               |                                         | 0                      | -      | -             | -               | 2         | 1      | 6             | 3                              | 145                               |                                             |  |
|                                         | 36    | 18                                               |                                         | 0                      | -      | -             | -               | 1         | 9      | 12            | 4½                             | 480                               |                                             |  |
|                                         | 35    | 2½                                               |                                         | 1                      | 1      | 12            | 4½              | 1         | 1      | 12            | 4½                             | 186                               |                                             |  |
|                                         | 34    | 2                                                |                                         | 0                      | -      | -             | -               | 1         | 1      | 9             | 3                              | 142                               |                                             |  |
|                                         | 33    | 1½                                               |                                         | 0                      | -      | -             | -               | 1         | 1      | 12            | 4½                             | 90                                |                                             |  |
|                                         | 32    | 1¼                                               |                                         | 2                      | 1      | 3½            | 2               | 1         | 1      | 12            | 3                              | 90                                |                                             |  |
|                                         | 31    | 32                                               |                                         | 0                      | -      | -             | -               | 1         | 9      | 12            | 6                              | 648                               |                                             |  |
|                                         | 30    | 1½                                               |                                         | 2                      | 1      | 3             | 2               | 2         | 1      | 6             | 3                              | 124                               |                                             |  |
|                                         | 29    | 6¾                                               |                                         | 3                      | 1      | 3             | 2               | 1         | 5      | 9             | 6                              | 320                               |                                             |  |
|                                         | 28    | 4½                                               |                                         | 1                      | 1      | 3             | 1½              | 1         | 1      | 6             | 3                              | 280                               |                                             |  |
|                                         | 27    | 4                                                |                                         | 4                      | 1      | 3             | 1½              | 2         | 1      | 6             | 3                              | 80                                |                                             |  |
|                                         | 26    | 2                                                |                                         | 1                      | 1      | 3½            | 12              | 2         | 1      | 6             | 3                              | 128                               |                                             |  |
|                                         | 25    | 1½                                               |                                         | 5                      | 1      | 3             | 2               | 3         | 1      | 6             | 3                              | 440                               |                                             |  |



Names of RIVERS  
& principal Nullahs.

Mile.

Square miles drainage  
from which intercepted.

Square Feet waterway  
for one bridge.

BRIDGES & CULVERTS &c.

Already built.

Proposed.

Number.

SPANS.

No.

Each  
feet.

Height of Piers.

Num ber.

SPANS.

No.

Each  
feet.

Height  
of  
Piers.  
feet

Square feet waterway  
provided.

Do according to local  
Officers Estimate.

P. 4. 14. 187/68

Drainage to the  
river by the  
road side  
near the bridge  
and  
the river side

| BRIDGES & CULVERTS & ca.                |  |                           |                                                  |                                         |                |        |               |                 |           |        |               |                                |                                   |                                              |
|-----------------------------------------|--|---------------------------|--------------------------------------------------|-----------------------------------------|----------------|--------|---------------|-----------------|-----------|--------|---------------|--------------------------------|-----------------------------------|----------------------------------------------|
| Names of RIVERS<br>& principal Nullahs. |  | From<br>Chittala<br>Mile. | Square miles drainage<br>from which intercepted. | Square Feet waterway<br>for one bridge. | Already built. |        |               |                 | Proposed. |        |               |                                | Square feet waterway<br>provided. | Do. according to local<br>Officers Estimate. |
|                                         |  |                           |                                                  |                                         | Number.        | SPANS. |               | Height of Piers | Number.   | SPANS. |               | Height<br>of<br>Piers.<br>feet |                                   |                                              |
|                                         |  |                           |                                                  |                                         |                | No.    | Each<br>feet. |                 |           | No.    | Each<br>feet. |                                |                                   |                                              |
| From Junction<br>of the river (Can?)    |  |                           |                                                  |                                         |                |        |               |                 |           |        |               |                                |                                   |                                              |
| 38 1/2 m. from source                   |  |                           |                                                  |                                         |                |        |               |                 | 1         | 1      | 20            | 5                              |                                   |                                              |
| 36 m. from Chittala                     |  |                           |                                                  |                                         | 1              | 10     | 30            | 9               | 2         | 1      | 3             | 3                              |                                   |                                              |
| 1                                       |  | 35                        |                                                  |                                         | 2              | 2      | 11 1/4        | 5 1/2           | 0         | -      | -             | -                              |                                   |                                              |
| 2                                       |  | 34                        |                                                  |                                         | 1              | 1      | 10            | 1 1/2           |           |        |               |                                |                                   |                                              |
| 3                                       |  | 33                        |                                                  |                                         | 1              | 2      | 5             | 2 1/2           | 0         | -      | -             | -                              |                                   |                                              |
| 4                                       |  | 32                        |                                                  |                                         | 1              | 3      | 5 3/4         | 2               | 1         | 1      | 6             | 4 1/2                          |                                   |                                              |
| 5                                       |  | 31                        |                                                  |                                         | 1              | 3      | 12            | 3               |           |        |               |                                |                                   |                                              |
| 6                                       |  | 30                        |                                                  |                                         | 1              | 1      | 6             | 2               | 1         | 1      | 6             | 4 1/2                          |                                   |                                              |
| 7                                       |  | 29                        |                                                  |                                         | 4              | 1      | 3             | 2               |           |        |               |                                |                                   |                                              |
| 8                                       |  | 28                        |                                                  |                                         | 0              | -      | -             | -               | 2         | 1      | 10            | 2 1/2                          |                                   |                                              |
| 9                                       |  | 27                        |                                                  |                                         | 0              | -      | -             | -               | 1         | 1      | 6             | 4 1/2                          |                                   |                                              |
| 10                                      |  | 26                        |                                                  |                                         | 0              | -      | -             | -               | 2         | 1      | 3             | 3                              |                                   |                                              |
| 11                                      |  | 25                        |                                                  |                                         | 0              | -      | -             | -               | 1         | 1      | 10            | 2 1/2                          |                                   |                                              |
| 12                                      |  | 24                        |                                                  |                                         | 0              | -      | -             | -               | 1         | 1      | 6             | 4 1/2                          |                                   |                                              |
| 13                                      |  | 23                        |                                                  |                                         | 0              | -      | -             | -               | 1         | 1      | 9             | 7 1/2                          |                                   |                                              |
| 14                                      |  | 22                        |                                                  |                                         | 1              | 1      | 9             | 1 3/4           | 3         | 1      | 6             | 4 1/2                          |                                   |                                              |
| 15                                      |  | 21                        |                                                  |                                         | 3              | 1      | 2             | 1 1/2           | 1         | 1      | 3             | 3                              |                                   |                                              |
| 16                                      |  | 20                        |                                                  |                                         | 1              | 1      | 12            | 1 3/4           | 0         | -      | -             | -                              |                                   |                                              |
| 17                                      |  | 19                        |                                                  |                                         | 1              | 1      | 9             | 6               | 0         | -      | -             | -                              |                                   |                                              |
| 18                                      |  | 18                        |                                                  |                                         | 1              | 3      | 30            | 2 1/2           | 1         | 1      | 3             | 3                              |                                   |                                              |
| 19                                      |  | 17                        |                                                  |                                         | 1              | 1      | 3             | 3               | 1         | 1      | 2             | 3                              |                                   |                                              |
| 20                                      |  | 16                        |                                                  |                                         | 1              | 3      | 9             | 2               | 1         | 1      | 2             | 3                              |                                   |                                              |
| 21                                      |  | 15                        |                                                  |                                         | 4              | 1      | 3             | 2 1/2           |           |        |               |                                |                                   |                                              |
| 22                                      |  | 14                        |                                                  |                                         | 1              | 1      | 3             | 2 1/4           | 0         | -      | -             | -                              |                                   |                                              |
| 23                                      |  | 13                        |                                                  |                                         | 1              | 6      | 30            | 7 1/2           |           |        |               |                                |                                   |                                              |
| 24                                      |  | 12                        |                                                  |                                         | 2              | 2      | 12            | 5 1/2           | 1         | 3      | 9             | 7                              |                                   |                                              |
| 25                                      |  | 11                        |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 26                                      |  | 10                        |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 27                                      |  | 9                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 28                                      |  | 8                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 29                                      |  | 7                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 30                                      |  | 6                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 31                                      |  | 5                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 32                                      |  | 4                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 33                                      |  | 3                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 34                                      |  | 2                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 35                                      |  | 1                         |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 36                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 37                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 38                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 39                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 40                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 41                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 42                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 43                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 44                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 45                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 46                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 47                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 48                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 49                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 50                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 51                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 52                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 53                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 54                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 55                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 56                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 57                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 58                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 59                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 60                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 61                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 62                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 63                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 64                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 65                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 66                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 67                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 68                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 69                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 70                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 71                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 72                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 73                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 74                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 75                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 76                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 77                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 78                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 79                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 80                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 81                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 82                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 83                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 84                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 85                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 86                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 87                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 88                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 89                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 90                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 91                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 92                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 93                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 94                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 95                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 96                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 97                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 98                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 99                                      |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |
| 100                                     |  |                           |                                                  |                                         | 1              | 1      | 12            | 2 1/2           |           |        |               |                                |                                   |                                              |

1997

76

120

100

20

70

175

40

70

420

20

120

9

1680

680

52

Appears more than sufficient.

One way seems too small to be considered.

The 2000 sq ft light appears to be too small.

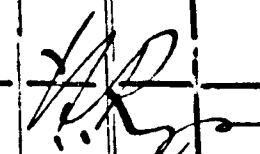
unnecessary

After more than 100 years

the river is now so small that

the water is not sufficient

| Names of RIVERS<br>& principal Nullahs.                               | From Junction<br>of <i>Chittivale</i> River | MILE.<br>From<br><i>Chittivale</i> Bridge | Square miles drainage<br>from which intercepted. | Square Feet waterway<br>for one bridge. | BRIDGES & CULVERTS &c. |               |               |                 |           |        |               |                               | Square feet waterway<br>provided. | Do according to local<br>Officers Estimate. |
|-----------------------------------------------------------------------|---------------------------------------------|-------------------------------------------|--------------------------------------------------|-----------------------------------------|------------------------|---------------|---------------|-----------------|-----------|--------|---------------|-------------------------------|-----------------------------------|---------------------------------------------|
|                                                                       |                                             |                                           |                                                  |                                         | Already built.         |               |               |                 | Proposed. |        |               |                               |                                   |                                             |
|                                                                       |                                             |                                           |                                                  |                                         | Number.                | SPANS.        |               | Height of Piers | Number.   | SPANS. |               | Height<br>of<br>Piers<br>feet |                                   |                                             |
|                                                                       |                                             |                                           |                                                  |                                         |                        | No.           | Each<br>feet. |                 |           | No.    | Each<br>feet. |                               |                                   |                                             |
| 19                                                                    |                                             | 17                                        | $\frac{1}{2}$                                    |                                         | 3                      | 1             | 6             | $2\frac{3}{4}$  | 0         | -      | -             | -                             | 55                                |                                             |
| 20                                                                    |                                             | 16                                        | $12\frac{1}{2}$                                  |                                         | 1                      | 4             | 15            | 4               | 0         | -      | -             | -                             | 315                               |                                             |
|                                                                       |                                             |                                           | $1\frac{3}{4}$                                   |                                         | $\frac{1}{2}$          | $\frac{1}{2}$ | $\frac{1}{2}$ | $3\frac{1}{2}$  |           |        |               |                               | 162                               |                                             |
| 21                                                                    |                                             | 15                                        | $1\frac{1}{2}$                                   |                                         | 2                      | 1             | 6             | 3               | 1         | 1      | 9             | 4                             | 140                               |                                             |
|                                                                       |                                             |                                           | $1\frac{1}{2}$                                   |                                         | 1                      | 1             | 9             | $5\frac{1}{4}$  |           |        |               |                               |                                   |                                             |
| 22                                                                    |                                             | 14                                        | $1\frac{1}{2}$                                   |                                         | 1                      | 1             | 6             | 3               | 2         | 1      | 9             | 3                             | 112                               |                                             |
|                                                                       |                                             |                                           | $1\frac{1}{2}$                                   |                                         | 2                      | 1             | 3             | $2\frac{1}{2}$  |           |        |               |                               |                                   |                                             |
| 23                                                                    |                                             | 13                                        | $1\frac{1}{2}$                                   |                                         | 2                      | 1             | 6             | 3               | 1         | 1      | 3             | 3                             | 144                               |                                             |
|                                                                       |                                             |                                           | $1\frac{1}{2}$                                   |                                         | 2                      | 1             | 13            | $2\frac{1}{2}$  | 1         | 1      | 12            | $4\frac{1}{2}$                |                                   |                                             |
| 24                                                                    |                                             | 12                                        | 1                                                |                                         | 1                      | 1             | 9             | 2               | 0         | -      | -             | -                             | 106                               |                                             |
|                                                                       |                                             |                                           | 1                                                |                                         | 1                      | 1             | 12            | 4               |           |        |               |                               |                                   |                                             |
| 25                                                                    |                                             | 11                                        | 2                                                |                                         | 1                      | 3             | 12            | $5\frac{1}{2}$  | 1         | 1      | 9             | 7                             | 320                               | <i>the munc<br/>reigns<br/>supplies</i>     |
|                                                                       |                                             |                                           | 2                                                |                                         | 2                      | 1             | 3             | 3               |           |        |               |                               |                                   |                                             |
| 26                                                                    |                                             | 10                                        | $1\frac{1}{2}$                                   |                                         | 1                      | 1             | 30            | $3\frac{1}{2}$  | 0         | -      | -             | -                             | 210                               |                                             |
|                                                                       |                                             |                                           | $1\frac{1}{2}$                                   |                                         | 1                      | 1             | 6             | $2\frac{1}{2}$  |           |        |               |                               |                                   |                                             |
| 27                                                                    |                                             | 9                                         | 21                                               |                                         | 1                      | 1             | 9             | $2\frac{1}{2}$  | 0         | -      | -             | -                             | 80                                |                                             |
|                                                                       |                                             |                                           | 21                                               |                                         | 1                      | 1             | 9             | 5               |           |        |               |                               | 540                               |                                             |
| 28                                                                    |                                             | 8                                         | $\frac{3}{4}$                                    |                                         | 1                      | 2             | 36            | $5\frac{3}{4}$  |           |        |               |                               | 190                               |                                             |
|                                                                       |                                             |                                           | $\frac{3}{4}$                                    |                                         | 2                      | 1             | 10            | $3\frac{1}{2}$  | 0         | -      | -             | -                             |                                   |                                             |
| 29                                                                    |                                             | 7                                         | $\frac{1}{2}$                                    |                                         | 3                      | 1             | 3             | $2\frac{1}{4}$  |           |        |               |                               | 46                                |                                             |
|                                                                       |                                             |                                           | $\frac{1}{2}$                                    |                                         | 1                      | 1             | 3             | 3               | 1         | 1      | 6             | $4\frac{1}{2}$                |                                   |                                             |
| 30                                                                    |                                             | 6                                         | $\frac{1}{2}$                                    |                                         | 1                      | 1             | 3             | $1\frac{1}{2}$  |           |        |               |                               |                                   |                                             |
|                                                                       |                                             |                                           | $\frac{1}{2}$                                    |                                         | 2                      | 1             | 6             | 3               | 0         | -      | -             | -                             | 55                                |                                             |
| 31                                                                    |                                             | 5                                         | $\frac{3}{4}$                                    |                                         | 2                      | 1             | 3             | 2               |           |        |               |                               |                                   |                                             |
|                                                                       |                                             |                                           | $\frac{3}{4}$                                    |                                         | 1                      | 1             | 6             | $1\frac{1}{2}$  | 0         | -      | -             | -                             | 90                                |                                             |
| 32                                                                    |                                             | 4                                         | $1\frac{1}{4}$                                   |                                         | 1                      | 1             | 6             | $2\frac{1}{2}$  |           |        |               |                               |                                   |                                             |
|                                                                       |                                             |                                           | $1\frac{1}{4}$                                   |                                         | 1                      | 1             | 6             | 3               |           |        |               |                               |                                   |                                             |
| 33                                                                    |                                             | 3                                         | $1\frac{3}{4}$                                   |                                         | 1                      | 2             | 6             | $1\frac{1}{2}$  | 1         | 1      | 9             | 7                             | 137                               |                                             |
|                                                                       |                                             |                                           | $1\frac{3}{4}$                                   |                                         | 1                      | 2             | 6             | $2\frac{1}{2}$  | 1         | 1      | 9             | 7                             | 160                               |                                             |
| 34                                                                    |                                             | 2                                         | 1                                                |                                         | 1                      | 1             | 12            | $2\frac{1}{2}$  |           |        |               |                               |                                   |                                             |
|                                                                       |                                             |                                           | 1                                                |                                         | 1                      | 1             | 6             | 3               | 1         | 1      | 6             | $4\frac{1}{2}$                | 100                               |                                             |
| 35                                                                    |                                             | 1                                         | $\frac{3}{4}$                                    |                                         | 1                      | 1             | 12            | $2\frac{1}{2}$  | 1         | 1      | 9             | $4\frac{1}{2}$                | 75                                |                                             |
|                                                                       |                                             |                                           | $\frac{3}{4}$                                    |                                         | 1                      | 1             | 12            | $2\frac{1}{2}$  |           |        |               |                               |                                   |                                             |
| 36                                                                    | Chittivale River                            | 0                                         |                                                  |                                         | 1                      | 11            | 30            | 10              |           |        |               |                               |                                   |                                             |
|                                                                       |                                             | $\frac{3}{16}$                            |                                                  |                                         |                        |               |               |                 |           |        |               |                               |                                   |                                             |
| <i>H.R.</i><br><i>Superintendent of Division</i><br><i>Capt. R.E.</i> |                                             |                                           |                                                  |                                         |                        |               |               |                 |           |        |               |                               |                                   |                                             |

  
 Capt. R.E.  
 District Engineer 1st Division

[illegible]

## ABSTRACT ESTIMATE No.

TALUQ

DISTRICT

*Vijayapattanam*

WORK.

*Completing the Trunk Road No. 11 from the Junction of Marugol Road at 23-3-160 South of Vijayapattanam to the Northern Approach of Bridge across Coor River -*

| Quantity or Number.                      | Description of Work.                                                                                                                                      | Rate. | per Item.   | Amount.    | Total.    |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|------------|-----------|
| <i>2.83599 <math>\frac{7}{32}</math></i> | <i>Road</i><br><i>Co. Earthwork</i>                                                                                                                       | 1     | <i>Cy</i>   | 17724 15 3 |           |
| <i>1.00248 <math>\frac{3}{4}</math></i>  | <i>Graveling</i>                                                                                                                                          | 8     | <i>sq</i>   | 50124 6    |           |
| <i>108597 <math>\frac{1}{2}</math></i>   | <i>Superficial Surfing</i>                                                                                                                                | 9     | <i>sq</i>   | 5090 8 1   |           |
|                                          | <i>Superintendence &amp; Contingencies</i>                                                                                                                | 7     | 8           | 12 1/2     | 5810 2 8  |
|                                          |                                                                                                                                                           |       |             |            | 78750     |
|                                          | <i>Masonry</i><br><i>Bridge of 13 Arches of 18ft span height</i><br><i>of Abutments 9ft across Pandam Godee</i><br><i>in 4.5 mile from Vijayapattanam</i> |       |             |            |           |
| <i>N. 65</i>                             | <i>Sinking wells of 6ft outer Diameter &amp; 7 1/2 ft deep</i>                                                                                            | 11    | <i>Each</i> | 910        |           |
| <i>24</i>                                | <i>5 1/4 ft - 5 - 4 7 1/2 ft</i>                                                                                                                          | 12    | <i>Each</i> | 288        |           |
| <i>20</i>                                | <i>4 1/2 ft - 5 - 4 7 1/2 ft</i>                                                                                                                          | 10    | <i>Each</i> | 200        |           |
| <i>345 <math>\frac{17}{27}</math></i>    | <i>Co. Roughstone in Chumam</i>                                                                                                                           | 2     | 1           | <i>Cy</i>  | 712 14 1  |
| <i>1044</i>                              | <i>Brickwork in 50</i>                                                                                                                                    | 2     | 14          | <i>sq</i>  | 3001 8    |
| <i>337 <math>\frac{4}{9}</math></i>      | <i>Arches</i>                                                                                                                                             | 4     | 13          | <i>sq</i>  | 1623 15 2 |
| <i>136 <math>\frac{1}{9}</math></i>      | <i>Concrete work</i>                                                                                                                                      | 1     | 8           | <i>sq</i>  | 204 2 8   |
| <i>246 <math>\frac{1}{8}</math></i>      | <i>Plastering 2 coats Chumam</i>                                                                                                                          | 2     | 6           | <i>sq</i>  | 584 8 9   |
| <i>N. 13</i>                             | <i>Centings</i>                                                                                                                                           | 30    | <i>Each</i> | 390        |           |
| <i>8</i>                                 | <i>Guard Stones</i>                                                                                                                                       | 3     | <i>Each</i> | 24         |           |
|                                          | <i>Baling &amp; Temporary Dams</i>                                                                                                                        |       |             | 400        |           |
|                                          | <i>Excavating foundations</i>                                                                                                                             |       |             | 250        |           |
|                                          | <i>Filling in Kings &amp; Approaches</i>                                                                                                                  |       |             | 80         |           |
|                                          | <i>Contingencies &amp; Superintendence</i>                                                                                                                | 7     | 8           | 12 1/2     | 640 15 4  |
|                                          |                                                                                                                                                           |       |             |            | 9310      |
|                                          | <i>Bridge of 4 Arches of 12ft span height</i><br><i>of Abutments 6 feet across Thalappalam Godee</i>                                                      |       |             |            |           |
| <i>487</i>                               | <i>Co. Roughstone in Chumam</i>                                                                                                                           | 21    | <i>Cy</i>   | 1004 7     |           |
| <i>407 <math>\frac{11}{24}</math></i>    | <i>Brickwork in 50</i>                                                                                                                                    | 2     | 14          | <i>sq</i>  | 1172 10   |
| <i>157 <math>\frac{1}{2}</math></i>      | <i>Arches</i>                                                                                                                                             | 4     | 13          | <i>sq</i>  | 757 15 6  |
|                                          | <i>Concrete work</i>                                                                                                                                      | 1     | 8           | <i>sq</i>  | 115 8     |

*Trunk Road No. 11  
Completion of the  
road between  
Vijayapattanam  
& Coor River*

*S. K. H. 1881/68*



Brought over

Bridge of 3 Arches of 9 ft span height of Abutments 4 1/2 feet -

|             |                                  |       |   |     |     |    |   |
|-------------|----------------------------------|-------|---|-----|-----|----|---|
| 178 17/100  | Cgo Roughstone in Chumam         | 2 1   | - | Cg  | 369 | 1  | 2 |
| 134 36/100  | - or - Brick work in or          | 2 1/4 | - | or  | 386 | 12 | 3 |
| 40 1/4      | - or - or - Arches               | 4 13  | - | or  | 193 | 11 | 3 |
| 18 1/2      | - or - Concrete work             | 1 8   | - | or  | 27  | 12 | . |
| 34 92 1/100 | Sggo Plastering 2 coats Chumam   | 2 6   | - | Sgr | 82  | 15 | - |
| 3           | Centrings                        | 15    | - | Ew  | 15  | -  | - |
| 8           | Guard Stones                     | 2 8   | - | or  | 20  | -  | - |
|             | Excavating foundations & heaving | -     | - | -   | 100 | -  | - |
|             | Filling in Wings & Approaches    | -     | - | -   | 20  | -  | - |
|             | Contingencies & Superintendence  | 7 8   | - | 10% | 94  | 12 | 4 |

109 1/2

Bridge of 3 Arches of 9 ft span height of Abutments 3 feet -

Similar Plans as above

|             |                                  |       |   |     |     |    |   |
|-------------|----------------------------------|-------|---|-----|-----|----|---|
| 178 17/100  | Cgo Roughstone in Chumam         | 2 1   | - | Cg  | 369 | 1  | 2 |
| 113         | - or - Brick work in or          | 2 1/4 | - | or  | 324 | 14 | . |
| 40 1/4      | - or - or - Arches               | 4 13  | - | or  | 193 | 11 | 3 |
| 18 1/2      | - or - Concrete work             | 1 8   | - | or  | 27  | 12 | . |
| 31 70 1/100 | Sggo Plastering 2 coats Chumam   | 2 6   | - | Sgr | 75  | 4  | 7 |
| 3           | Centrings                        | 15    | - | Ew  | 45  | -  | - |
| 8           | Guard Stones                     | 2 8   | - | or  | 20  | -  | - |
|             | Excavating foundations & heaving | -     | - | -   | 80  | -  | - |
|             | Filling in Wings & Approaches    | -     | - | -   | 20  | -  | - |
|             | Contingencies & Superintendence  | 7 8   | - | 10% | 94  | 5  | . |

134 1/2

Total for one - 1250 -

for two - 2500 -

Bridge of one Arch of 12 ft span height of Abutments 4 1/2 -

|             |                                  |       |   |     |     |    |    |
|-------------|----------------------------------|-------|---|-----|-----|----|----|
| 106         | Cgo Roughstone in Chumam         | 2 1   | - | Cg  | 218 | 10 | .  |
| 108 10/100  | - or - Brick in Chumam           | 2 1/4 | - | or  | 311 | 9  | .  |
| 17 1/2      | - or - or - Arches               | 4 13  | - | or  | 84  | 3  | 6  |
| 4 32 1/100  | - or - Concrete work             | 1 8   | - | or  | 7   | 1  | 4  |
| 20 42 1/100 | Sggo Plastering 2 coats Chumam   | 2 6   | - | Sgr | 48  | 9  | 10 |
| 8           | Centrings                        | 2 8   | - | Ew  | 20  | -  | -  |
| 1           | Guard Stones                     | 20    | - | Ew  | 20  | -  | -  |
|             | Excavating foundations & heaving | -     | - | -   | 45  | -  | -  |
|             | Filling in Wings & Approaches    | -     | - | -   | 15  | -  | -  |
|             | Contingencies & Superintendence  | 7 8   | - | 10% | 59  | 14 | 4  |

Brought over

Bridge of one Arch of 12 ft span height of Abutments 3 feet -

Similar Plans as above

|             |                                  |       |   |     |     |    |    |
|-------------|----------------------------------|-------|---|-----|-----|----|----|
| 106         | Cgo Roughstone in Chumam         | 2 1   | - | Cg  | 218 | 10 | .  |
| 90          | - or - Brick in Chumam           | 2 1/4 | - | or  | 258 | 10 | .  |
| 17 1/2      | - or - or - Arches               | 4 13  | - | or  | 84  | 3  | 6  |
| 4 32 1/100  | - or - Concrete work             | 1 8   | - | or  | 7   | 1  | 4  |
| 18 73 1/100 | Sggo Plastering 2 coats Chumam   | 2 6   | - | Sgr | 44  | 7  | 11 |
| 1           | Centrings                        | 2 8   | - | Ew  | 20  | -  | -  |
| 8           | Guard Stones                     | -     | - | -   | 30  | -  | -  |
|             | Excavating foundations & heaving | -     | - | -   | 10  | -  | -  |
|             | Filling in Wings & Approaches    | -     | - | -   | 56  | 15 | 3  |
|             | Contingencies & Superintendence  | 7 8   | - | 10% |     |    |    |

750

Tunnel 1 vent of 9 ft span height of Abutments 4 1/2 feet -

Similar Plans as above

|             |                                  |       |   |     |     |    |    |
|-------------|----------------------------------|-------|---|-----|-----|----|----|
| 94 31/100   | Cgo Roughstone in Chumam         | 2 1   | - | Cg  | 194 | 7  | 6  |
| 64 4/100    | - or - Brick work in or          | 2 1/4 | - | or  | 185 | 4  | 5  |
| 13 5/12     | - or - or - Arches               | 4 13  | - | or  | 64  | 9  | 1  |
| 8 12/27     | - or - Concrete work             | 1 8   | - | or  | 13  | 11 | 10 |
| 15 42 1/100 | Sggo Plastering 2 coats Chumam   | 2 6   | - | Sgr | 36  | 11 | 10 |
| 1           | Centrings                        | -     | - | -   | 10  | -  | -  |
| 4           | Guard Stones                     | 2     | - | Ew  | 8   | -  | -  |
|             | Excavating foundations & heaving | -     | - | -   | 47  | -  | -  |
|             | work to Wings & Approaches       | -     | - | -   |     |    |    |
|             | Contingencies & Superintendence  | 7 8   | - | 10% | 40  | 14 | 3  |

600

Tunnel 1 vent of 9 ft span height of Abutments 6 feet -

Similar Plans as above

|           |                                  |       |   |     |     |    |    |
|-----------|----------------------------------|-------|---|-----|-----|----|----|
| 94 31/100 | Cgo Roughstone in Chumam         | 2 1   | - | Cg  | 194 | 7  | 6  |
| 80        | - or - Brick work in or          | 2 1/4 | - | or  | 230 | -  | -  |
| 13 5/12   | - or - or - Arches               | 4 13  | - | or  | 64  | 9  | 1  |
| 8 12/27   | - or - Concrete work             | 1 8   | - | or  | 13  | 11 | 10 |
| 17 1/100  | Sggo Plastering 2 coats Chumam   | 2 6   | - | Sgr | 40  | 6  | .  |
| 4         | Centrings                        | -     | - | -   | 10  | -  | -  |
|           | Guard Stones                     | 2     | - | Ew  | 8   | -  | -  |
|           | Excavating foundations & heaving | -     | - | -   | 47  | -  | -  |
|           | work to Wings & Approaches       | -     | - | -   |     |    |    |
|           | Contingencies & Superintendence  | 7 8   | - | 10% | 42  | 8  | 6  |

650

118000

|                                                             |                                                           |           |          |
|-------------------------------------------------------------|-----------------------------------------------------------|-----------|----------|
| Brought over                                                |                                                           |           |          |
| Tunnel one Vent of 9 feet & span height of Abutments 3 feet |                                                           |           |          |
| Similar Plan as above                                       |                                                           |           |          |
| 94 $\frac{31}{100}$                                         | Cgo Roughstone in Chumam                                  | 2 1 - Cg  | 194 7 6  |
| 48 $\frac{21}{100}$                                         | - Brick in Chumam                                         | 2 14 - Br | 140 5 6  |
| 13 $\frac{5}{100}$                                          | - Arches                                                  | 2 14 - Br | 140 5 6  |
| 8 $\frac{19}{100}$                                          | - Concrete work                                           | 4 13 - Br | 64 9 1   |
| 13 $\frac{24}{100}$                                         | Sgr Plastering 2 coats Chumam                             | 1 8 - Br  | 13 - 11  |
|                                                             | 1 Centring                                                | 2 6 - Sgr | 33 1 8   |
|                                                             | 4 Guard Stones                                            |           | 10 - -   |
|                                                             | Excavating foundations & Earth work to Wings & Approaches | 2 - - -   | 8 - -    |
|                                                             | Contingencies & Superintendence                           | 7 8 - Pct | 47 - -   |
| Total for one                                               |                                                           |           | 39 7 4   |
| - for Twelve                                                |                                                           |           | 550 - -  |
|                                                             |                                                           |           | 6600 - - |

|                                                            |                                                           |           |          |
|------------------------------------------------------------|-----------------------------------------------------------|-----------|----------|
| Tunnel 3 Vents of 6 feet & span height of Abutments 4 feet |                                                           |           |          |
| Cgo Roughstone in Chumam                                   |                                                           |           |          |
| 110 $\frac{91}{100}$                                       | - Brick work in                                           | 2 1 - Cg  | 228 9 9  |
| 59 $\frac{15}{100}$                                        | - Arches                                                  | 2 14 - Br | 171 3 6  |
| 28                                                         | - Concrete work                                           | 4 13 - Br | 134 12 - |
| 13 $\frac{13}{100}$                                        | Sgr Plastering 2 coats Chumam                             | 1 8 - Br  | 20 9 4   |
| 23 $\frac{58}{100}$                                        | 1 Centring                                                | 2 6 - Sgr | 56 - 3   |
| 4                                                          | 4 Guard Stones                                            | 5 - - Ew  | 15 - -   |
|                                                            | Excavating foundations & Earth work to Wings & Approaches | 2 - - Br  | 8 - -    |
|                                                            | Contingencies & Superintendence                           | 7 8 - Pct | 65 - -   |
| Total for one                                              |                                                           |           | 50 13 2  |
| - for Two                                                  |                                                           |           | 750 - -  |

|                                                               |                                                           |           |          |
|---------------------------------------------------------------|-----------------------------------------------------------|-----------|----------|
| Tunnel 1 Vent of 6 feet & span height of Abutments 4 1/2 feet |                                                           |           |          |
| Cgo Roughstone in Chumam                                      |                                                           |           |          |
| 73 $\frac{22}{100}$                                           | - Brick in Chumam                                         | 2 1 - Cg  | 152 3 10 |
| 45 $\frac{5}{100}$                                            | - Arches                                                  | 2 14 - Br | 129 14 6 |
| 9 $\frac{13}{100}$                                            | - Concrete work                                           | 4 13 - Br | 46 12 7  |
| 1 $\frac{17}{100}$                                            | Sgr Plastering 2 coats Chumam                             | 1 8 - Br  | 2 14 8   |
| 8 $\frac{65}{100}$                                            | 4 Guard Stones                                            | 2 6 - Sgr | 20 8 8   |
| 4                                                             | 1 Centring                                                | 2 - - Ew  | 8 - -    |
|                                                               | Excavating foundations & Earth work to Wings & Approaches |           | 10 - -   |
|                                                               | Contingencies & Superintendence                           | 7 8 - Pct | 19 - -   |
| Total for one                                                 |                                                           |           | 30 9 -   |
| - for Two                                                     |                                                           |           | 420 - -  |

|                                                             |          |  |           |
|-------------------------------------------------------------|----------|--|-----------|
| Brought over                                                |          |  |           |
| Tunnel one Vent of 6 feet & span height of Abutments 3 feet |          |  |           |
| Cgo Roughstone in Chumam                                    |          |  |           |
| 2 1 - Cg                                                    | 134 13 2 |  |           |
| 2 14 - Br                                                   | 93 - 2   |  |           |
| 4 13 - Br                                                   | 46 12 7  |  |           |
| 1 8 - Br                                                    | 2 14 8   |  |           |
| 2 6 - Sgr                                                   | 15 3 5   |  |           |
|                                                             | 10 - -   |  |           |
| 2 - - Ew                                                    | 8 - -    |  |           |
|                                                             | 25 - -   |  |           |
| 7 8 - Pct                                                   | 24 4 -   |  |           |
| Total for one                                               |          |  | 360 - -   |
| - for Thirty five                                           |          |  | 12600 - - |

|                                                                                    |          |  |         |
|------------------------------------------------------------------------------------|----------|--|---------|
| Tunnel one Vent of 6 feet & span height of Abutments 2 feet. Similar Plan as above |          |  |         |
| Cgo Rough Stone in Chumam                                                          |          |  |         |
| 2 1 - Cg                                                                           | 134 13 2 |  |         |
| 2 14 - Br                                                                          | 75 - 3   |  |         |
| 4 13 - Br                                                                          | 46 12 7  |  |         |
| 1 8 - Br                                                                           | 2 14 8   |  |         |
| 2 6 - Sgr                                                                          | 13 11 3  |  |         |
|                                                                                    | 10 - -   |  |         |
| 2 - - Ew                                                                           | 8 - -    |  |         |
|                                                                                    | 15 - -   |  |         |
| 7 8 - Pct                                                                          | 23 12 1  |  |         |
| Total for one                                                                      |          |  | 330 - - |
| - for Two                                                                          |          |  | 660 - - |

|                                                                 |         |  |  |
|-----------------------------------------------------------------|---------|--|--|
| Tunnel one Vent of 4 1/2 feet & span height of Abutments 3 feet |         |  |  |
| Cgo Roughstone in Chumam                                        |         |  |  |
| 2 1 - Cg                                                        | 79 12 - |  |  |
| 2 14 - Br                                                       | 74 12 - |  |  |
| 4 13 - Br                                                       | 39 4 10 |  |  |
| 1 8 - Br                                                        | 3 8 10  |  |  |
| 2 6 - Sgr                                                       | 18 12 2 |  |  |

Carried over

142810 - -

Brought over

14280

|                                 |   |   |     |    |      |
|---------------------------------|---|---|-----|----|------|
| 1 Centring                      | - | - | -   | 8  | -    |
| 4 Guard Stones                  | - | - | -   | 4  | -    |
| Excavating foundations & Earth  | 1 | - | Est | 4  | -    |
| work to wings & approaches      | - | 3 | -   | 20 | -    |
| Contingencies & Superintendence | 7 | 8 | Plt | 17 | 14.2 |

Total for one

266

2128

- 5 - for Eight

Sum of Vent of 4 1/2 feet span  
height of abutments 4 1/2 feet.  
Similar plan as above

|                                        |   |    |     |    |      |
|----------------------------------------|---|----|-----|----|------|
| 38 2/3 Cyp Roughstone in Chumam        | 2 | 1  | Cyp | 79 | 12   |
| 34 4/27 - 52 Brick in Chumam           | 2 | 14 | 5   | 98 | 2 10 |
| 8 1/6 - 52 - - - - - Arches            | 4 | 13 | 5   | 39 | 4 10 |
| 2 10/27 - 52 Concrete work             | 1 | 8  | 5   | 3  | 8 10 |
| 8 90/100 Sqr Plastering 2 coats Chumam | 2 | 6  | Sqr | 21 | 2 7  |
| 1 Centring                             | - | -  | -   | 8  | -    |
| 4 Guard Stones                         | - | -  | -   | 4  | -    |
| Excavating foundations & Earth work    | 1 | -  | -   | 4  | -    |
| & Wings & approaches                   | - | 3  | -   | 20 | -    |
| Superintendence & Contingencies        | 7 | 8  | Plt | 26 | 11   |

Total for one

300

900

- 5 - for Three

Sum of Vent of 3 feet span  
height of abutments 3 feet

|                                       |   |    |     |    |      |
|---------------------------------------|---|----|-----|----|------|
| 35 10/27 Cyp Roughstone in Chumam     | 2 | 1  | Cyp | 72 | 15 3 |
| 25 16/108 - 52 Brick in Chumam        | 2 | 14 | 5   | 73 | 10 6 |
| 5 5/6 - 52 - - - - - Arches           | 4 | 13 | 5   | 28 | 1 2  |
| 1 8/27 - 52 Concrete work             | 1 | 8  | 5   | 2  | 13 4 |
| 5 13/20 Sqr Plastering 2 coats Chumam | 2 | 6  | Sqr | 13 | 6 8  |
| 1 Centring                            | - | -  | -   | 5  | -    |
| 4 Guard Stones                        | - | -  | -   | 4  | -    |
| Excavating foundations & Earth work   | 1 | -  | Est | 4  | -    |
| to Wings & approaches                 | - | 3  | -   | 16 | -    |
| Contingencies & Superintendence       | 7 | 8  | Plt | 19 | 1 1  |

Total for one

235

Brought over

146778 - 1

Road Dam 50 feet long  
height 2 feet at centre

|                                 |   |   |     |    |      |
|---------------------------------|---|---|-----|----|------|
| 9 2/3 Cyp Roughstone in Chumam  | 2 | 1 | Cyp | 19 | 15   |
| 18 1/2 - 52 Broken stone metal  | 1 | - | 5   | 18 | 8 11 |
| 18 5/7 - 52 Gravel              | - | 8 | 5   | 9  | 4 5  |
| Excavating foundations          | - | - | -   | 3  | -    |
| Contingencies & Superintendence | 7 | 8 | Plt | 4  | 3 8  |

55

Adding 2 Arches to the 3 Arch  
bridge in the 4 3/4 mile -

|                                       |    |    |     |     |       |
|---------------------------------------|----|----|-----|-----|-------|
| 91 14/27 Cyp Roughstone in Chumam     | 2  | 1  | Cyp | 188 | 8 5   |
| 65 75/108 - 52 Brick in Chumam        | 2  | 14 | 5   | 188 | 13 11 |
| 35 - 52 - - - - - Arch work           | 4  | 13 | 5   | 168 | 7     |
| 18 2/7 - 52 Concrete work             | 1  | 8  | 5   | 27  | 5 4   |
| 27 7/10 Sqr Plastering 2 coats Chumam | 2  | 6  | Sqr | 65  | 12 7  |
| 2 Centring                            | 20 | -  | Est | 40  | -     |
| 2 Guard Stones                        | 2  | 8  | 5   | 5   | -     |
| Excavating foundations & filling in   | -  | -  | -   | 60  | -     |
| Wings and approaches                  | -  | -  | -   | 54  | -     |
| Removing old work (Wings & T)         | -  | -  | -   | 66  | - 9   |
| Superintendence & Contingencies       | 7  | 8  | -   | 66  | - 9   |

864

Lowering the floors of bridge of  
2 Arches of 9 ft span in the 60 1/2 mile

|        |     |                                        |   |   |     |    |    |    |
|--------|-----|----------------------------------------|---|---|-----|----|----|----|
| 21     | Cyp | Opening old floor                      | 1 | 4 | Cyp | 5  | 4  |    |
| 7      | 52  | Laying bed for new floor with concrete | 2 | - | 5   | 14 | -  | -  |
| 14     | 52  | Stone in Chumam floor                  | 2 | 1 | 5   | 28 | 14 |    |
| 18 1/2 | Cyp | Repacking old stone in bed             | 8 | - | 5   | 9  | 2  | 8  |
|        |     | Contingencies & Superintendence        | 7 | 8 | Plt | 5  | 11 | 4  |
|        |     |                                        |   |   |     |    |    | 63 |

63

Carried over

147760

Brought over

Add for probable rise in rates of labor & materials  
12 1/2 per cent on (78,750 Rs) the cost of Earth work & Graveling }  
25 per cent on (69,010 Rs) the cost of Masonry }

9845

17255

27100

Grand Total Rupees 174,860

Supg Engineer P. B. S. B.  
Don't say less than  
23rd November/68

Supg Engineer P. B. S. B.

P. B. S. B. 14-10-68

DEPARTMENT

Revised

ABSTRACT ESTIMATE No.

NEW WORK.

21

TALUQ

DISTRICT

Vijayapattanam

WORK. Completing Trunk Road No. 11 from the junction of Kasargod Road to Chittur with masonry works &c

| Quantity or Number. | Description of Work.                                                                    | Rate. | per Item. | Amount.   | Total.  |
|---------------------|-----------------------------------------------------------------------------------------|-------|-----------|-----------|---------|
|                     | <u>Road.</u>                                                                            |       |           |           |         |
| 292321              | Cgo Earth work                                                                          | " 1   | Cg        | 18270 1   |         |
| 8346 1/2            | do Graveling                                                                            | " 76  | 50        | 39116 99  |         |
| 233616              | Sgn Turfing                                                                             | " 9   | Sgn       | 12950 12  |         |
|                     | Contingencies & Superintendence                                                         | 8     | " P.C.    | 5464 93   |         |
| 159 1/2             | Acres of Compensation for additional land required                                      | 3152  | -         | 73800 -   |         |
|                     |                                                                                         |       |           | 24243 -   |         |
|                     |                                                                                         |       |           |           | 98043 - |
|                     | <u>Bridge of One Arch of 20 ft span</u><br>height of Abutments 5 ft & 4 ft rise         |       |           |           |         |
| 391 23/27           | Cgo Rubble masonry                                                                      | 1 12  | Cg        | 685 11/10 |         |
| 18 2/3              | do Brick in Chumam                                                                      | 2 14  | 50        | 53 10/8   |         |
| 28                  | do Arch work in do                                                                      | 4 13  | 50        | 134 12/4  |         |
| 9 4/2               | do Concrete work                                                                        | 1 8   | 50        | 14 2/8    |         |
| 13 3/4              | Rft Cornice work                                                                        | " 2   | Rft       | 16 10     |         |
| 30.67 1/2           | Sgn Plastering 2 coats Chumam                                                           | 2 6   | Sgn       | 72 13/8   |         |
| 22 2/9              | Cgo Loose stone road apron                                                              | " 10  | Cg        | 12 14/2   |         |
| 8                   | Guard stones                                                                            | 2 8   | Each      | 20 -      |         |
| 1                   | Entrance                                                                                | -     | -         | 40 -      |         |
|                     | Painting                                                                                | -     | -         | 30 -      |         |
|                     | Excavating foundations & filling in wings & approaches                                  | -     | -         | 40 -      |         |
|                     | Contingencies & Superintendence                                                         | 8     | -         | 91 5      |         |
|                     |                                                                                         |       |           |           | 1215 -  |
|                     | <u>Bridge of One Arch of 18 ft span</u><br>height of Abutments 6 1/2 ft & rise 4 1/2 ft |       |           |           |         |
| 395 1/2             | Cgo Rubble masonry                                                                      | 1 12  | Cg        | 688 13/7  |         |
| 17 4/2              | do Brick in Chumam                                                                      | 2 14  | 50        | 57 6      |         |
| 27 5/12             | do Arch work in do                                                                      | 4 13  | 50        | 131 15/1  |         |
| 13 1/4              | Rft Cornice work                                                                        | " 2   | Rft       | 16 12/4   |         |
| 8 1/2               | Cgo Concrete work                                                                       | 1 8   | Cg        | 12 12/4   |         |
| 32.54 1/2           | Sgn of Plastering 2 coats Chumam                                                        | 2 6   | Sgn       | 77 4/8    |         |
| 19 5/9              | Cgo Loose stone road apron                                                              | " 10  | Cg        | 12 3/6    |         |
|                     |                                                                                         |       |           | 991 2     | 1099256 |

|                                     |    |        |         |                 |
|-------------------------------------|----|--------|---------|-----------------|
| Brought Over                        |    |        |         | 991 2 10 77 256 |
| 8 Guard Stones                      | 28 | Each   | 20      |                 |
| 1 Centring                          |    |        | 30      |                 |
| Grading                             |    |        | 20      |                 |
| Excavating foundations & filling in |    |        | 20      |                 |
| Wings & Approach                    |    |        | 20      |                 |
| Contingencies & Superintendence     | 8  | 12 1/2 | 88 13 2 |                 |
|                                     |    |        |         | 1170            |

Constructing a Bridge of one arch of 12 ft span height of abutments 4 1/2 ft rise 3 feet

|                                                        |                               |        |         |          |
|--------------------------------------------------------|-------------------------------|--------|---------|----------|
| 201 11/27                                              | Cy Rubble masonry             | 1 12   | Cy      | 352 7 5  |
| 11 45/100                                              | or Brick in Chumam            | 2 14   | or      | 32 13 2  |
| 17 1/2                                                 | or Arch work                  | 4 13   | or      | 84 5 6   |
| 4 39/54                                                | or Concrete work              | 1 8    | or      | 7 1 4    |
| 101                                                    | Rft Corrie work               | 2      | Rft     | 12 10    |
| 20 47 1/2                                              | Sqr Plastering 2 coats Chumam | 26     | Sqr     | 128 10 1 |
| 15 1/3                                                 | Cy Loose Stone Road apron     | 10     | Cy      | 8 5 4    |
| 8                                                      | Guard stones                  | 28     | Each    | 20       |
| 1                                                      | Centring                      |        |         | 20       |
| Grading                                                |                               |        |         | 15       |
| Excavating foundations & filling in Wings & Approaches |                               |        |         | 15       |
| Contingencies & Superintendence                        | 8                             | 12 1/2 | 53 13 2 |          |
|                                                        |                               |        |         | 670      |

Tunnel 1 Vent of 10 ft span height of abutments 2 5/8 ft rise 2 7/8

|                                           |                               |        |        |          |
|-------------------------------------------|-------------------------------|--------|--------|----------|
| 89 1/2                                    | Cy Rubble masonry             | 1 12   | Cy     | 155 74 4 |
| 13 11/36                                  | or Brick in Chumam            | 2 14   | or     | 38 4 1   |
| 16 1/2                                    | or Arch work in or            | 4 13   | or     | 81 6 7   |
| 3 2/3                                     | or Concrete work              | 1 8    | or     | 5 10 8   |
| 30                                        | Rft Corrie work               | 2      | Rft    | 3 12     |
| 12 42/100                                 | Sqr Plastering 2 coats Chumam | 26     | Sqr    | 29 8     |
| 4                                         | Guard stones                  | 28     | Each   | 8        |
| 1                                         | Centring                      |        |        | 15       |
| Excavating foundations & filling in Wings |                               |        |        | 12       |
| Contingencies & Superintendence           | 8                             | 12 1/2 | 30 8 4 |          |
| Total for one                             |                               |        |        | 389      |
| for Four                                  |                               |        |        | 1520     |

Tunnel 3 Vents of 9 ft span height of abutments 7 ft rise 2 1/4 feet

|         |                   |      |    |                 |
|---------|-------------------|------|----|-----------------|
| 289 8/7 | Cy Rubble masonry | 1 12 | Cy | 402 4 11        |
|         |                   |      |    | 402 4 11 102616 |

|                                                        |                               |        |        |                 |
|--------------------------------------------------------|-------------------------------|--------|--------|-----------------|
| Brought Over                                           |                               |        |        | 102 4 11 102616 |
| 25 67                                                  | Cy Brick in Chumam            | 2 14   | Cy     | 67 14 6         |
| 10 8/42                                                | or Arch work in or            | 4 13   | or     | 202 2           |
| 11 1/3                                                 | or Concrete work              | 1 8    | or     | 17              |
| 70                                                     | Rft Corrie work               | 4      | Rft    | 17 8            |
| 36 20 1/2                                              | Sqr Plastering 2 coats Chumam | 26     | Sqr    | 86 14 11        |
| 4                                                      | Guard stones                  | 28     | Each   | 8               |
| 3                                                      | Centring                      | 10     | Each   | 30              |
| Excavating foundations & filling in Wings & Approaches |                               |        |        | 20              |
| Contingencies & Superintendence                        | 8                             | 12 1/2 | 68 3 8 |                 |
|                                                        |                               |        |        | 920             |

Tunnel 1 Vent of 9 ft span height of abutments 7 ft rise 2 1/4 feet

|                                           |                               |        |        |         |
|-------------------------------------------|-------------------------------|--------|--------|---------|
| 157 2/3                                   | Cy Rubble masonry             | 1 12   | Cy     | 276 1 9 |
| 10 61/100                                 | or Brick in Chumam            | 2 14   | or     | 30 6    |
| 14                                        | or Arch work                  | 4 13   | or     | 67 6    |
| 3 2/3                                     | or Concrete work              | 1 8    | or     | 5 10 8  |
| 15 13 1/2                                 | Sqr Plastering 2 coats Chumam | 26     | Sqr    | 35 15 1 |
| 4                                         | Guard stones                  | 28     | Each   | 8       |
| 1                                         | Centring                      |        |        | 15      |
| Excavating foundations & filling in Wings |                               |        |        | 25      |
| Contingencies & Superintendence           | 8                             | 12 1/2 | 36 8 6 |         |
| Total for one                             |                               |        |        | 500     |
| for Five                                  |                               |        |        | 2500    |

Tunnel 1 Vent of 9 ft span height of abutments 4 1/2 feet. Similar plan as above

|                                           |                               |        |        |         |
|-------------------------------------------|-------------------------------|--------|--------|---------|
| 156 2/3                                   | Cy Rubble masonry             | 1 12   | Cy     | 237 5 9 |
| 10 61/100                                 | or Brick in Chumam            | 2 14   | or     | 30 6    |
| 14                                        | or Arch work                  | 4 13   | or     | 67 6    |
| 3 2/3                                     | or Concrete work              | 1 8    | or     | 5 10 8  |
| 12 96/100                                 | Sqr Plastering 2 coats Chumam | 26     | Sqr    | 30 12 5 |
| 4                                         | Guard stones                  | 28     | Each   | 8       |
| 1                                         | Centring                      |        |        | 15      |
| Excavating foundations & filling in Wings |                               |        |        | 25      |
| Contingencies & Superintendence           | 8                             | 12 1/2 | 38 7 2 |         |
|                                           |                               |        |        | 460     |

Tunnel 1 Vent of 9 ft span height of abutments 5 ft. Similar plan as above

|           |                    |      |    |          |
|-----------|--------------------|------|----|----------|
| 132 5/9   | Cy Rubble masonry  | 1 12 | Cy | 231 15 6 |
| 10 61/100 | or Brick in Chumam | 2 14 | or | 20 6     |



Brought over  
Add for probable rise in rates  
of labor and materials

12½ per cent on (98,043 Rs.) the Cost of Earth  
work & Graveling — 12,255-  
25 per cent on (17,887 Rs.) the Cost of  
Masonry — 4,475

115930

16730

Grand Total Rs. 1,32,660

Supd. Office to  
Dowlaishwaram  
23<sup>rd</sup> November/88

V.R. — Capt. R.R.  
Superintending Engineer

S. M. 4687/88

Civil Works 27

Public Works Department

No. 3864

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 11<sup>th</sup> Decr. 1888

Read the following

From The Asst. Engineer (Here enter No. 171) dated 21<sup>st</sup> November 1888

22<sup>nd</sup> Aug<sup>r</sup> 1888. No 2692  
11<sup>th</sup> Sept " " 2893.

The Government regret  
that, though the particular  
attention of the Superintend-  
ing Engineer was drawn in  
the order marginally noted  
to the necessity of his sub-  
mitting the estimates  
for the portion of the Great  
Northern Road in the 1<sup>st</sup> Div.  
with a full report and  
a complete specification, the  
estimates submitted with  
the letter above recorded should  
be laid before them with

but a meagre report &  
without any specification.

There is nothing in the  
papers to show whether the  
estimates provide for forming  
the whole length of 75  
miles between the Poonce  
river & Chitturusa, or  
for only portions of that  
distance. A detailed report,  
such as that furnished for  
the portion of the road in  
the 2<sup>d</sup> D<sup>n</sup>, and which will  
be found printed with  
Pro: No. 2597 dt 24 Aug<sup>r</sup> 67,  
is what is wanted, and  
Capt Rynds will hasten  
its submission. The Govt  
of India attach so much

29  
importance to the estimates  
for the road in question being  
submitted in the fullest  
detail, that the <sup>the Govt</sup> Council  
cannot lay before that body  
in their present form.  
The estimates for the section  
of the line in the Vizaga  
part are 20.

W.B.  
in

20  
The Supy. Engr. 1<sup>st</sup> Div.  
M. S. Duke 11/12/68.  
16

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M. S. Duke 11/12/68.  
16

Cue 4687

Govt. of 1868 Madras.

PUBLIC WORKS.

pt. Circular.

&c., &c., &c.

Dated

Recd.

Encl. 7

G. O., 11<sup>th</sup> Decr 1868, No. 3864

Nos. 253-254

Great Northern Trunk Road

Paying orders on the letter  
from the Sub-Engr of the 1<sup>st</sup> Div  
submitting estimates for the  
portion of the Great Northern  
Trunk road in the Vizag.  
-patam D<sup>o</sup>.