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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

Cons 1-12-57

G.O. No. 3192 Press Mis.

35-46
Dated 27 — 11 — 1857

Not to be folded or roughly handled

Read the following Reports from Colonel C. E. FABER, Chief Engineer; to H. FORBES, Esq., Acting Secretary to Government, dated 6th December 1856, No. 8662.

No. 35. Report UUUUU, upon a project for the improvement of the existing main irrigation channel, called Jaffer Sahib channel, and on the south bank of the Pennair, from the river Pennair, taken off immediately above the Annicut.

Amount of Estimates.

	Rs.
Widening Jaffer Sahib channel and improving the Allipoore branch...	34,000
New Survapully channel.....	50,000
Improving Lacoor channel new channel to Needamoosilly and cut to Gungapatam channel.....	15,500
Kistnapatam Main channel and branches to 8 Villages.....	44,200
Total Rupees.....	1,43,700

one lac, forty-three thousand, and seven hundred.

In sending up this project the District Engineer has reported minutely and in detail upon each of the works, so that a further discription could only be a mere repetition of his letter No. $\frac{1541}{141212}$ of the 28th November 1856.

2. The main feature of the project may be understood by a reference to the Map upon which the existing channels, the proposed new channels, the Nellore Tank channels and parts of old channels proposed to be abandoned are distinctly marked. The area of land for which it is calculated that water is required is 100 square miles, and the main or Jaffer Sahib channel now in existence (and coloured blue on the Plan, having its commencement immediately close to the Annicut) has been estimated to be widened to a breadth of 40 yards, which with a depth of 5 feet and fall of 6 inches per mile will in 5 months convey a sufficient supply of water to irrigate 64,000 acres at 8,000 Cubic yards per acre, the secondary branches and minor irrigation channels have been correctly regulated, in capacity, with reference to the areas requiring irrigation.

3. The slopes of the main channels have been fixed with a view to rendering them navigable hereafter and where the fall per mile is too great the level will be kept up by locks (to be estimated for and proposed hereafter) in the mean while these falls will be constructed and protected in a temporary manner by palmyras.

4. The first 750 yards of the present Jaffer Sahib channel runs with a width of from 22 to 50 though hard laterite and varies in depth from 8 to 15 feet, the estimated cost of repairing this and widening it to 120 feet will cost 23,243, in which an item of 2,454 Rupees is included for a dividing dam for the two principal ducts. The remaining portion of the estimate of Rupees 10,757 is for straightening and thoroughly repairing the channel to Allipooram a distance of 3,830 yards.

5. The second estimate of Rupees 50,000 is for cutting a new channel with a width of 50 yards from the first Division Dam to the existing Survapully channel, the most important branch Channel under the Annicut commanding an area of 40,727 acres, it has a fall of 8" per mile and will give off two branch channels one* to irrigate 10,000 acres to the Eastward of the Kistnapatam road and intended hereafter to form, by the construction of locks, the navigable channel to Kistnapatam in connection with the Eastern Coast Canal.

* See Estimate for Rupees 44,200.

6. The second branch is not yet estimated for.

7. By the construction of the 1st channel, the whole of the tanks and lands now irrigated by the Survapully channel, the present entrance to which is to the north of the town of Nellore and uninfluenced by the Annicut, will be brought under its influence.

8. The direct gain to Government, would, as calculated by the Collector, be, Rupees 7,413, which is the difference between the Ayacut and the highest year's Revenue, and Rupees 6,808 of fresh land brought under cultivation.

9. The Collector urges the construction of this channel from the fact, of the very marked difference there is in the state of the crops under the Jaffer Sahib channel, and these which have at present but a precarious supply and is of opinion, that as the smaller branches are constructed, bringing village after village, under the influence of the river, there will be but little doubt of success in realizing the above expectations.

10. The 3rd estimate, amounts to Rupees 15,000, and is for the improvement and extension of irrigation under the Allipooram branch of the Jaffer Sahib channel, the first Item in the estimate is for division a head for the Minor channels branching off just to the North of Goodyputty paud, but the Southern system of branch channels from it, are proposed to be postponed, till another year. Taking the Northern branch channels, it is proposed to abandon the Indacoorpett channel which is very sinuous and to widen the Laboor channel, making it serve for the lands under the two, the channel will be extended to the lands of Needamoosaly and Moodyverly Polliem, which have at present no connection with the river, and the lands of which, are about 3 square miles in extent.

11. The new cut from Indacoorpoor to Mypaud and Samarazapully, will obviate the necessity of the erection of the aqueduct across the Verthee Perinaiken an estimate for which, amounting to Rupees 6,130 was conditionally sanctioned by Government, on the 29th February 1856.

12. The cost of this cut is but 1,150 one thousand, one hundred and fifty, Rupees and brings the lands directly under the influence of the Annicut which the Aqueduct did not do. It will also supersede the old Gungapatam channel from the Pennair, the head of which is 4 miles below the Annicut, and should be abandoned.

13. The 4th estimate, amounts to Rupees 44,000 forty-four thousand, and is for cutting a channel from the Survapully new channel near Nellore and close to where it crosses the Kistnapatam road to irrigate 8 Villages situated between Bramadavadum bridge and Kistnapatam.

14. This channel will eventually be made navigable and from the connecting or junction Canal, between Kistnapatam, on the Eastern Coast Canal and Nellore, with this end in view, the slope has been laid out at 8″ a mile and the sites for the drops have been selected with a view to their ultimate conversion into locks. The ryots have agreed to cultivate at once, lands bearing an Assessment of Rupees 6,808, the available land is 17 square miles for which area the size of the channel has been calculated.

15. The branches from this channel have not been estimated for, entirely and those that have been estimated for, have been calculated, as a commencement, to convey double the quantity of water, required for their present cultivation, the District Engineer states that want of Surveyors has compelled him to postpone the full development of the channels till another year, and because he has not had time to calculate with exactitude the size of his masonry heads, to minor channels, he has also omitted their cost.

16. In addition to the estimates now forwarded, and which for the reasons above stated, as to depth of cutting and nature of soil, are comparatively expensive, the District Engineer calculates that for next year, estimates will be submitted to the amount of 1,50,000 Rupees for fully completing the irrigation minor channels, Head sluices, bridge of communication &c., and 60,000 for the locks for the navigation South of the Pennair.

17. Looking at the above works, with regard to their Revenue results, it may be stated with fairness that there will be 64,000 acres of land at 5 Rupees an acre giving a Revenue of Rupees 3,20,000 from which is to be deducted 90,000, the present annual collection; there will be left 2,30,000 Rupees of profit from which probably $\frac{1}{10}$ may be deducted as uncertain and $\frac{1}{10}$ for maintenance, leaving a clear gain of Rupees 1,92,500.

The outlay is as follows.

Cost of annicut and repairs	1,13,000
Estimates now submitted	1,43,700
Estimates for next year	1,50,000
Locks &c., ...	60,000
	4,66,700

thus there will be again of 42 per cent.

The estimates and Plans as prepared by Lieutenant Mullins and the calculations of the sizes of channels with their slopes and discharge have been carefully prepared by Lieutenant Mullins and Captain Ritherdon, whose name is also attached to them, the expenses are fairly stated and the rates those at which it is calculated that the work may be expected to be done.

I recommend the above estimates, 4 in number, viz. 34,000, Rupees 50,000 Rupees 15,500 Rupees and 44,200 each to be sanctioned and entered in the Budget for 1857-58.

Letter from Lieutenant JOHN MULLINS, District Engineer Nellore; to Colonel C. E. FABER, Chief Engineer, dated 28th November 1856, No. 1347.

SIR,

	Rs.
* Widening Jaffer Saib channel and improving Allipoorum branch	34,000
New Survapully channel...	50,000
Improving Laboor channel, New channel to Needamoosily and cut to Gungapatam channel	15,500
Kistnapatam Main channel and branches to 8 Villages	44,200

† Enclosures including estimates No. 18.

I have the honor to submit for sanction estimates* and documents,† as per margin, for the improvement and extension of the irrigation channels under the Nellore Annicut.

2. The dimensions of the Main channel and of the principal or primary and the Secondary branches, have been fixed on the supposition that these channels will have to water a given area of land, it being impossible with the very limited survey staff at my disposal to attempt to make actual surveys of waste lands.

3. The whole tract of country included between the Pennair and the lands under the Nellore Tank on the North, the Trunk road on the West, the Sea on the East, and the Rampairoo on the South, has been considered as the irrigation field, numerous lines of level and existing watercourses having shown that this tract is, generally speaking, suited as regards level for being supplied by the Annicut channels, and from this area, measuring 324 Square miles, the following deductions, which will I think be found very ample, have been made viz.

For existing Tanks and Villages.	80	
„ Pasture Lands and high ground.	50	
„ Unfit for cultivation.	32	
„ Roads, Topes, channels and Enam lands ...	62	
Total of deductions.	224	Square miles.
Balance to be irrigated...	100	do.

The main channel has therefore been arranged to supply 64,000 acres with water on the supposition that the Annicut will maintain in it an average depth of 5 feet for 5 months the slopes of all these channels have been fixed with a view to render them easy of navigation, and, with this object, that of the Main channel is proposed to be 6 inches per mile 8000 cubic yards have been allowed for each acre, and the average width of the channel becomes therefore 120 feet.

4. The primary branches the Survapully new channel and the Allipoorum channel, diverging at the 1st dividing dam, are to have a fall of 8″ per mile and the areas of the country to be watered by them being respectively $63\frac{5}{8}$ and $36\frac{3}{8}$ Square miles their average widths will be 60 and 37 feet, the average depth being kept up as in the Main channel to 5 feet.

5. The secondary branches will have a slope of 1 foot per mile, and an average depth of 4 feet, and the new minor branches will have a fall of 1 feet per mile, and an average depth of 3 feet, the excess of fall in the surface of the country being met by the erection at present of temporary palmyra drops to be taken away afterwards and re-placed by permanent masonry dams or locks,* when the details of the permanent channels of distribution to the lands shall have been finally arranged. This year the distribution will be made as far as possible by means of old fields channels, which will probably suffice to convey to the lands all the additional water that will be available during the time the enlargement and improvement of the main and primary channels is in progress.

* In channels wide enough for navigation.

6. Having thus described briefly the system on which the extension of the irrigation is proposed to be carried out, I shall proceed to lay before you the improvements contemplated in each of the estimates now submitted for sanction.

The 1st is an estimate amounting to Rupees 34,000 for widening the present Jaffer Saib channel to an average breadth of 120 feet, to form the main feeder. The existing channel is very winding, and varies in width from 22 to 40 feet, to the site of the 1st dividing dam it is 750 yards in length, the first 500 of which runs through hard laterite, varying in depth from 8 to 15 feet, the Soil above the laterite being sand and alluvial clay. Hitherto the small extent of work that has been executed in this laterite has been paid for at the rate of 8 annas per yard, but on a large scale, with improved appliances and the use of gun powder, I think the rate entered in the estimate, 6 annas a yard, will be found sufficient, and I have hopes of being able to do the work at even a lower rate than this. The estimated cost of this portion is Rupees 23,212-11 a dividing dam for the 2 principal branches has been included in the estimate at a cost of Rupees 2,450. From the 1st dividing to the second dam near Allipoorum is a distance of 3,830 yards. This portion of the channel is in a very neglected state, most parts are sufficiently wide, but from the irregularity of the banks, which mere originally cut with hardly any slope at all, and which have never been turfed or attended to, the channel is liable to choke up from the washings down from the irregular embankments above, thereby forming shoals and interrupting the regular current of the channel. The improvements contemplated in this portion consist therefore in straightening regulating the width, and in a few cases widening the existing channel, the estimated cost of which, including Turfing is Rupees 5,991-6-0. It is also proposed to substitute a Syphon under Tunnel for a palmyra aqueduct on masonry piers* which greatly obstructs the water way and would render the navigation of the channel impracticable.

* Belonging to the new lakha channel under the Nellore tank.

7. The next estimate amounting to Rupees 50,000 is for cutting a new channel with an average breadth of 60 feet from the 1st dividing dam to the present Survapully channel, a distance of 3660 yards.

The estimate contains the following items excavating the channel forming embankments and turfing...

	Rs.	A.	P.
Bridge for the Nawabpett road	38,112	13	0
Do. Kistapatam road...	4,000	0	0
3 Syphon tunnels for irrigation channels from the Nellore Tank...	3,000	0	0
Superintendence and sundries	3,470	0	0
	1,417	3	0
Total.....	50,000	0	0

This channel will be the most important branch channel under the Annicut, the area of the lands which it will supply being $\frac{7}{10}$ths of the whole irrigable area of 100 square miles. It will have a fall of 8″ per mile and, before reaching the present Survapully channel, will throw off two branches, the first* a few yards before reaching the Kistapatam road, intended to water about 10,000 acres of land to the eastward of Bramadavum, and hearafter to form, by the addition of locks, the navigable channel to Kistapatam, in connection with the Eastern Coast Canal. The second branch will diverge about ½ a mile South of the Kistapatam road, and will water a considerable tract of available land to the south of Ooperapelliem, estimates and levels for this channel will be prepared for the Budget of 1858-59. The great gain however which will result from this new cut in the first year will be the bringing of the whole of the Tanks and lands under the Survapully channel into connection with the annicut whereby a steady and unfailing supply will be assured to them, and a large extent of assessed land at present left waste except in very favorable seasons will regularly come under the plough. The Revenue resulting from the improved supply would it appears from the Collector's Revenue Statement make the proposed outlay tolerably remunerative, the difference between the Ayacut and the highest year's Revenue being upwards of 14,000* Rupees. There are however besides the waste lands fit for cultivation belonging to Villages now in connection with the Survapully channel, large tracts of lands to the Southward now either without water or dependant on tanks suppied by local drainage, and it is expected, and not I think without very fair grounds to

* Vide estimate Rupees 44,200.

* About 6,000 of which vide Collector's letter No. 344, would at any rate be available.

go upon, that the present Ayacut of the Survapully channel will be more than doubled within two years after the cut, and some subsidiary channels of distribution, to lands now without channel of any description, shall have been made, and there can be but little doubt therefore that the outlay proposed in this estimate will be extremely remunerative.

8. The next estimate amounting to Rupees 15,500 is for the improvement and extension of irrigation under the Allipoorum branch of the Jaffer Saib channel and includes the following items.

Dividing dam for all the channels diverging near Allipoorum	1,700
Widening Laboor channel	3,700
Dividing dam near Narrainreddypett for the Needamoosaly, Laboor and Indacoorpett branches	1,130
New cut from Laboor channel to old Gungapatam channel	4,120
New channel for the villages of Needamoosaly Moodevarty polliem &c.	3,600
New cut from Indacoorpett channel for the Mypaud and Somarauzepully lands	1,150
Blocking up old head of the Survupully channel	100

The first item provides for a dam for all the branches dividing at this point, the improvement of the Southern branches has been however postponed till next year, and the width of opening for them on the dam has been estimated from the area of the lands to be watered. At present there are separate channels for the Laboor and Indacoorpett lands, both starting from one point, and running as far as Narrainreddypett within a few yards of each other. The Indacoorpett channel is very crooked, and in a neglected state, and it is proposed therefore to abandon the upper portion and to widen the Laboor channel a good deal, instead of widening each a little, and make it serve for both branches as far as the dividing dam at Narrainreddypett, we shall thus, besides saving something now, have only one set of embankments &c., to keep in order instead of two, and as the Laboor channel has a better and more equable slope, and is much straighter than the other it has been chosen to act for both branches. There is at present a temporary cut from the Laboor to the Gungapatam channel, but it has a drop of nearly 8 feet without any provision to break the fall, and as this cut has been much worn away and as were it made permanent, the Laboor branch would require widening, a new branch from the Narrainreddypett dividing dam has been estimated for.

9. The villages of Needamoosaly, Moodevurtypolliem and Koodetepolliem have not at present any river channels their waste and occasionally cultivated lands have been roughly surveyed and a channel to water 3 square miles has been allowed ⅔rds of which will probably be at once brought under cultivation, and the remaining ⅓rd will be available for any extension of cultivation still further to the Eastward or for the Shrotriem lands of Pullypaudoo, the holders of which greatly desire water, but are at present unwilling to pay for it, they will probably when they see the channel running through their lands find it to their advantage to take water on the terms on which the Collector may be able to grant it. The new cut from the Indacoorpett channel to the Mypaud and Somarauzepully lands will do away with the necessity for the erection of the Aqueduct across the Verthe Pennaikene, an estimate amounting to Rupees 6,130 for which was conditionally sanctioned by Government on the 29th February 1856. The cost of the present cut Rupees 1,150, besides being insignificant when compared with that of the Aque-

duct, is in reality more advantageous, for by it the lands in question will be brought under the Annicut, whereas the aqueduct would have connected them with the old Gungapatam channel, which has its head 4 miles below Nellore, and which it is now intended to block up and abandon.

10. The next and last estimate is for cutting a new channel, from the new Survapully channel, near the Kistapatam road, to water the lands of 8 villages situated between Bramadavum bridge and Kistapatam. This channel will also ultimately be made navigable, and form the connecting link between the Eastern Coast Canal and Nellore. With this end in view the slope of the bed has been made gentle, 8″ per mile, and the sites for the drops (which will be at present temporarily constructed with palmyrahs) have been selected with a view to their subsequent conversion into locks. The ryots of the villages in question have agreed to cultivate at once lands bearing an Assessment of Rupees 6,808 and the extent of waste lands which will ultimately come under this channel have been estimated at 17 square miles, for which area the size of the channel has been fixed. Want of time, and, until very recently, the insufficiency of the Survey Staff (one Surveyor) have prevented estimates for the branches to the Kistapatam and Mootkoor villages being got ready for this year's Budget, but I hope that next year estimates for completing the whole of the remaining contemplated improvements and new channels in connection with the Annicut will be ready for submission. I should mention that the main portion of this Kistapatam channel has been made as far as Bramadavum of the size which will be required for the full amount of cultivation viz. 17 square miles, but the branches have, as a commencement, been made large enough only for double the extent of land now cultivated under rain fed tanks, it being impossible to fix the exact size of the branches until the exact extent of land available under each branch shall have been ascertained. For the same reason masonry regulating dams for the branches have been deferred until next year, when the estimates for channels for the two remaining villages will be ready for sanction.

11. The Revenue merits of the estimates now forwarded taken as one portion of the improvements necessary to complete the system of irrigation under the Annicut can hardly be estimated at present, with any degree of accuracy. Much must depend upon the benefit which the contemplated revision of the Assessment may offer to the cultivators, but, supposing the terms to be favorable, there can be no doubt that all the available water will gladly be taken advantage of, and it will suffice I hope if I show that even were 5 Rupees an acre (about one half of the present Assessment) to be the average rent, the whole probable outlay, from the commencement of the Annicut to the completion of all the channels which will be necessary, will yield a revenue, above that collected before the Annicut was built, amounting to nearly 50 per cent on the expenditure.

12. The work contemplated in the estimates now forwarded, being for the formation of channels near the head and requiring therefore deep cuttings, is necessarily expensive if the amount be considered with reference to the lineal measurements of the channels, and the channels which will be estimated for next year though much longer will probably cost less than the few miles now requiring sanction, because their capacity is comparatively small and the depth of cutting favorable. In addition therefore to the present estimates 1,50,000 Rupees will probably be sufficient to complete the earthwork and minor masonry works for all the channels and perhaps 50 or 60,000 Rupees more will be required for locks bridges and other works for facilitating communication. The Revenue and total expenditure will then be as follows.

5. Detailed estimates for improving Laboor channel and for new branches &c. under it.

6. Abstract of ditto.

7. Detailed estimate for new Kistapatam channel and branches (came in too late for the Collector's Countersignature.)

8. Abstract of ditto.

9. Survey Plan.

10. Plans of bridges Nos. 1. and 2.

11. Plans of syphon sluice Nos. 1. 2. and 3.

12. Plans of dividing Dams Nos. 1. 2. 3. and 4.

13. Sections of the Jaffer Saib channel.

14. Letter from the Collector of Nellore No. 335, dated 22nd November 1856 with its enclosure.

15. Do. do. do. No. 344, dated 25th November 1156.

16. Memorandum of channels.

17. Table showing names and dimension of the Kistapatam channel &c.

18. Reports on the bridges to be built across the Survapully channel Nos. 1 and 2.

15. In conclusion I have the honor to observe that the best working season in Nellore is from January to the beginning of May, and as the widening of the Jaffer Saib can only be carried out economically when the river is not in fresh, and the lands do not require water, I would earnestly recommend that, if possible, sanction to the extent of 10,000 Rupees (about half the estimated expense of widening the channel as far as the 1st dividing Dam) be given, to take effect from the 1st January, so that at all events half the increased width may be given before the irrigation season commences the new channels can be executed at any time but if the working season from January to May is not taken advantage of for widening the main channel, we shall be, in October next, in the uncomfortable predicament of having large branch channels with no main channel to feed them.

Letter from F. B. ELTON, Esq., Collector of Nellore; to Lieutenant J. MULLINS, District Engineer Nellore, dated 22nd November 1856, No. 335.

Sir,

I have the honor to acknowledge the receipt of your letters of the dates noted in the margin,* calling for a Revenue Report on certain projects in connection with the Pennar Annicut.

* 3rd November 1856, No. 1204.
14th Do. do. No. 1271.

2. The proposed enlargement of Jaffer Sahibs channel, and the new cut from thence to bring the Survapully channel within the influence of the river, are necessary parts of the annicut project, and are obviously required in order to secure the benefits of which the latter is susceptible. The value of the steady irrigation derived from the annicut by Jaffer Sahib's channel has been remarkably exemplified this year, by the excellent condition of the crops benefiting by it,

Revenue.

64,000 Acres at 5 Rupees an acre			3,20000 0 0
Deduct.			
Average Revenue, for the 5 years from Fusly 1259 to 1263, inclusive from the three old river channels	65,107 15 8		
Deduct for Revenue derived from Tanks which will be included in the Annicut system, (I have no statement from the Collector, for this and until the whole of the channels are planned it would be difficult to prepare one) ...Say...	25,000 0 4		
		90,108 0 0	
			2,29,892 0 0

Expenditure.

Original cost of Annicut in round numbers,	93,000
Add for repairs, improvements &c.,	20,000
Amount of estimates now submitted,	1,43,700
Do. of estimates which will be prepared for next year,	1,50,000
Do. of future estimates for locks bridges &c. which might more properly be put down to communications,	60,000
	4,66,700
Per centage of Revenue to Total expenduture,	47½

13. The survey Plan herewith forwarded is I regret to say far less perfect than I could have wished, but it has only, with great difficulty, been completed so far in time; the numerous surveys and levels from which it has been compiled I have not thought it necessary to forward, but they can be sent up at any time should you wish to inspect them. The Plan exhibits all the old channels and the improvements and new channels with which the estimates have to do, and it shews tolerably accurately the boundary of the cultivation under the Nellore tank, the lowest parts of which are on a level which the Annicut water can reach; I have marked in pencil some of the extensions, estimates for which will be submitted next year, the greater part of the remaining improvements will be to the South of that part of the Survapully channel shown on the plan. I have not been able to keep a copy of this plan and I shall feel much obliged therefore if you will be good enough to return it or a copy of it as soon as may be convenient, when the improvements and extensions for next year can be marked upon it in some colour, different to those now denoting the improvements for this year.

14. The following is a list of the Documents now forwarded in connection with these projects.

1. Detailed estimate for widening the Jaffer Saib channel and Allipooram branch.
2. Abstract estimates for ditto.
3. Detailed estimates for cut to connect Survapully old channel with main channel.
4. Abstract estimates for ditto.

as contrasted with that of the wet cultivation in other parts, which has been in imminent danger of perishing to a considerable extent, from drought, till the late change of weather, owing to the untoward character of the season, and the very late setting in of the north east monsoon. The great quantity of water in the Pennar that has run waste to the sea this year, and the anxious desire manifested by the cultivators under rain fed tanks to participate in the advantages of river irrigation are also strong grounds for recommending these projects to the favorable consideration of Government.

3. The projected extension therefore of Jaffer Sahib's channel, the improvement of the Survapully channel by bringing it under the annicut, and the subsidiary branches proposed to be taken off, with a view of securing the full benefit of the annicut to that part of the country extending as far south as the Rampairoo have my full concurrence.

4. With regard to the Revenue aspect of the question, it will be seen by the enclosed statement that in the villages specified in the list which accompanied your letter of the 3rd Instant, out of a wet Ayacut assessed at Rupees 41,163, 28,859 Rupees of land is usually in the occupation of the ryots. The average actual cultivation, however, during the last 10 years amounts to but Rupees 19,518, or little more than 47 per cent on the Ayacut. In the event of the new channels being executed the ryots engage to cultivate the lands included in their holdings but now left waste amounting to Rupees 9,341, and 6,603 Rupees of unoccupied waste making together Rupees 15,944* considering that this calculation is based on the expectations held out by the villagers only, that there is every probability of lands being taken up in these villages for cultivation by other applicants, and that a considerable extent will be available for them after what may be occupied by the villagers themselves, I think that the computed probable return will be considerably exceeded.

* Vide statement remarks on Mypaud.

5. Without precise information as to what other villages or lands will be benefitted by the contemplated extension of the annicut irrigation, and sufficient time to make the necessary enquiries it would be impossible to ascertain at once what further increase may be anticipated but the results on the limited scale on which the annicut water has been hitherto supplied by one (Jaffer Sahib's) channel only, have been so encouraging and remunerative, that I think it may be safely stated that the necessary expenditure on the project will eventually be amply repaid.

6. With these remarks, I beg to return, duly countersigned, the estimate forwarded by you.

Letter from F. B. ELTON, Esq., Collector of Nellore; to Lieutenant JOHN MULLINS, District Engineer Nellore, dated 26th November 1857, No. 344.

SIR,

With reference to your letter of this day's date No. 1332, I have the honor to inform you that so far as the Ryots of the villages already under the Survapully channel are concerned, I am unable to hold out any positive expectation of extended Cultivation, as they have shewn themselves unwilling to engage for any, at least at the present rates of Assessment.

2. The present tarrum assessed Ayacut, however in these villages is Rupees 27,504 pasture land having been since taken up, deducting from it the highest years cultivation within the last few years viz., Rupees 12,743, there remains Rupees 14,761, but of this 8,173 Rupees of land is unfit for cultivation, from being under water and other causes as shewn in the return dated 2nd August 1854 alluded to by you, leaving the available waste at Rupees 6,588. There is also a large extent of unassessed pasture land in these villages, amounting to nearly 1,600 Gortoos portions of which are doubtless fit for cultivation. Under these circumstances and considering the great desire which exists to take up land on Durkhast when it can be done with profit, it is not unreasonable to anticipate that a considerable increase of Revenue will result from extended cultivation in the villages under the Survapully channel when that channel is brought under the influence of the Annicut as proposed, though it is not possible at present to state what the probable increase will be.

Statement shewing the Ayacut Cultivation, &c. in certain Villages proposed to

Talooks.	Number.	Villages.	Wet land.		Average of 10 yards.					
			Ayacut.		Dittum.		Cultivation.		Waste.	
			Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.
1	2	3	G.	4	G.	5	G.	6	G.	7
				Rs.		Rs.		Rs.		Rs.
Survapully ...	1	Kristnapatam.....	113	2,602	33	651	20	396	13	255
	2	Pedtha Poloor.....	153	2,338	127	1,856	74	1,203	53	653
	3	Pynampooram.....	99	1,835	90	1,680	70	1,355	20	325
	4	Nallatoor.....	95	2,183	77	1,914	61	1,592	16	322
	5	Mootoocoor.....	140	2,468	98	1,775	65	1,219	33	556
	6	Vulloor.....	162	2,602	118	2,402	95	1,553	53	849
	7	Lingapolliem	21	216	17	188	9	95	8	93
			783	14,274	590	10,466	394	7,413	196	3,053
Talamunchy ..	8	Coodthypollem.....	99	1,876	42	729	31	539	11	189
	9	Wootcoor.....	31	623	26	601	19	456	7	146
			130	2,499	68	1,330	50	995	18	335
Nellore.....	10	Comericay	155	3,780	103	2,485	80	1,911	23	474
	11	Poonnoore	152	3,022	109	2,117	73	1,462	36	655
	12	Gungapatam.....	236	4,774	131	2,660	83	1,723	48	937
		Hamlet Ramanapallem.	100	2,210	100	2,210	40	907	60	1,303
	13	Niddy Moosselly	76	1,015	69	925	58	766	11	159
	14	Moodmurtipallem.....	144	3,166	77	1,703	42	934	35	769
	15	Mypaud.....	196	4,798	138	3,433	94	2,474	44	959
	16	Somarauzepully	83	1,625	65	1,530	38	933	27	597
			1142	24,390	792	17,063	508	11,110	284	5,953
			2055	41,163	1450	28,859	952	19,518	498	9,341

Nellore, Collector's office,
22nd November 1856.

be brought within the influence of the Pennaur Annicut in the District of Nellore

Lands engaged to be brought under cultivation of the means of irrigation are extended by bringing them under the influence of the annicut.								Remark.
Wet lands out of Amanut.		Out of unassessed pasture land.		Dittum waste entered in Col.		Total.		
Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	Land.	Assessment.	
G.	8	G.	9	G.	10	G.	11	
	Rs.		Rs.		Rs.		Rs.	
10	180	10	257	13	255	33	692	
21	353	.....	.....	53	653	74	1,006	
18	287	23	414	20	325	61	1,026	
12	218	9	236	16	323	37	777	
41	689	20	265	33	556	93	1,510	
13	220	38	532	53	849	104	1,601	
5	58	4	46	8	92	17	196	
120	2,005	104	1,750	196	3,053	419	6,808	
28	586	.....	.....	11	189	39	775	
4	40	6	130	7	146	17	316	
32	626	6	130	18	335	56	1,091	
15	386	.....	.....	23	574	38	960	
13	293	2	39	36	655	51	987	
.....	.....	.....	.....	48	937	48	937	
.....	.....	.....	.....	60	1,303	60	1,303	
.....	.....	39	572	11	159	50	731	
11	202	.....	.....	35	769	46	971	
20*	300	.....	.....	44	959	64	1,259	* The cultivation of the land in Mypaud specified in column 8 is contingent, the Ryots state, on a reduction being allowed in the present rates of assessment.
20	300	.....	.....	27	597	47	897	
79	1,481	41	611	284	5,953	404	8,045	
231	4,112	151	2,491	498	9,311	879	15,914	

(Signed) F. B. ELTON,
Collector.

Table showing names and dimensions of the Kistnapatam channel and its branches.

Names of channels.	From.	To.	Length.	Fall per mile.	Average depth.	Velocity per hour.	Discharge per hour.	Average breadth.	Remarks.
Kistnapatam main.....	Head.....	Bramadavum DD.... ...	6-2.0	8"	5′	2,548 yds.	23,153C. Y.	16′-4"	For watering 17 square miles the remainder can deliver twice the quantity supposed to be necessary. When the bottom breadth is less than a foot, I have made it up to 1 foot as perpendicular sides to channels in sandy soil are always falling in.
Vulloor joint branch...	Bramadavum DD ...	Vulloor DD.....	2-1·73⅓	1′	4′	2,861	5,136	4′-3	
Vulloor channel.....	Vulloor DD.....	Vulloor tank.....	0-4·150	1′	3′	2,472	4,888	5′-10	
Lingapolium channel...	do...	Lingapolium tank... ...	1-0·0	1′	3′	do.	248	10"	
Main channel	Bramadavum DD ...	Pedalapoloor DD.... ...	0-6·0	1′	4′	2,861	15,728	12′-4	
Pedalapoloor channel...	Main channel..... ...	Pedalapoloor tank... ...	1-2·0	1′	4′	do.	2,788	2′-2	
Main channel..... ...	Pedalapoloor DD ...	Varekaipoody DD	2-3·73⅓	1′	4′	do.	12,940	10′-2"	
Varekaipoody channel..	Main channel..... ...	Varekaipoody tank.....	0-4·0	1′	3′	2,472	2,508	3′-0	
Main channel...	Varekaipoody DD ...	Pinampooram DD... ...	1-3·73⅓	1′	4′	2,861	10,432	8′-2"	
Pinampooram channel.	Main channel..... ...	Pinampooram tank.....	0-2·146⅔	1′	3′	2,472	2,800	3′-4"	
Nalatoor channel.....	Main channel..... ...	Nalatoor tank.....	0-7·73⅓	1′	3′	do.	2,348	2′-10"	
Main channel to be continued in the direction of Mootkoor.									

Nellore,
26th November 1856.

(Signed) A. RITHERDON, Captain,
2nd Assistant Civil Engineer, Northern Division.

Memorandum of the Channels under the annicut for which estimates have been prepared.

Name of channel.	Square miles for Cultivation.	Fall of channel per mile.	Average Depth.	Velocity in cubic yard per hour.	Breadth perpendicular sides.	Cubic yard to be discharged per hour.	From.	To.	Shares of D. D.	Length of channel.
1	2	3	4	5	6	7		8		9
Jaffer Sahib & Survapully joint channels.	100	6"	5′	2,16[illegible]	1'20	115,000	Joint Head Sluice	1st Dividing Dam	.....	750
Survapully.....	63⅓	8"	5′	2,548	60′	92,272	1st D. D.....	Old Survapully channel...	76⅓	3,660
Allipooram	36⅔	8"	5′	2,548	37′	52,727	do.	Allipooram D. D.	43⅔	3,830
Goodapullypaud.....	.....	1′	4′	2,861	1'20	800	From do.	do. do.	2-10	1,887
Edoor	11⅓	.....	.....	.....	.....	16,650			12	Not measured
Laboor.....	21⅔	1′	4′	2,861	28⅓	36,077			25⅓	do.
Nedemoosily.....	3	1	3	...	.....	4,410	.....	.....	5-2	13,420
Labooroo.....	3	1	3	...	Variable.	4,352	From Narrainreddypett dividing Dam.	Between channels.....	3-10	3,153⅓
Gungapatam.....	4⅔	1	3	2,861 ...	7′	7,030			7-4	4,153⅓
Indoocoorpett.....	5⅓	1	3	...	Variable.	7,855			9-2	6,800
Mypaud.....	.....	1	3	2,861	4½′	4,393	Indoocoorpett.....	Mypaud old channel.....	.....	3,793⅓

Nellore,
24th Nov. 1856.

(Signed) A. RITHERDON, Capt.
2nd Assistant Civil Engineer N. D.

1. Estimate of Rupees (3,000) three thousand, for constructing a bridge of 3 Segmental Arches the centre one being of 20 feet and the others of 15 feet span across the Survapully channel on the road from Nellore to Kistapatam.

2. The channel bed is of clay and has a fall of 8 inches per mile.

3. The foundations of the bridge are to be of laterite in chunam 5 feet deep resting on clay.

4. The Piers are to be 3 feet 6 inches thick and the abutments 4 feet 6 inches raised to an uniform height of 8 feet, the versed Sine of the centre arch to be 4 feet 6 inches, and of the others 3 feet 6 inches, giving a total height of 12 feet 6 inches and 11 feet 6 inches to their Soffits, and allowing a clear height of 3 feet 6 inches and 2 feet 6 inches above the proposed high water mark for the passage of floating bodies, the bridge will provide 515 square feet of water way, the section of the channel during the proposed highest flood being 474½ square feet.

5. The superstructure of the bridge is to be of laterite in chunam and the cutwaters of the same material.

6. The parapets are to have no interior cornices and the roadway over the bridge is to have a raise of 1 in 20 as well as the approaches to it. Over the arches its clear width between parapets will be 18 feet and between the wing walls 24 feet.

2nd Assistant Civil Engineer's Office,
Northern District, Nellore,
22nd November 1856.

(Signed) A. RITHERDON, Captain.
2nd Asst. Civil Engineer, Nellore District.

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1. Estimate of Rupees (4,000) four thousand for constructing a bridge of 3 Segmental arches, the centre one being of 26 feet and the others of 20 feet span across the Survapully channel on the road from Nellore to Nabobpett.

2. The channel bed is of clay and has a fall of 8 inches per mile.

3. The foundations of the bridge are to be of laterite in chunam 5 feet deep resting on clay.

4. The Piers are to be 3 feet 9 inch thick and the abutments 5 feet raised to an uniform height of 10 feet 6 inches; the versed Sine of the centre arch to be 6 feet and of the others 4 feet 6 inches giving a total height of 16 feet 6 inches to their Soffits and allowing a clear height of 7 feet 6 inches above the proposed high water mark at the centre and 6 feet at the other arches, for the passage of boats or other floating bodies, the bridge will provide 891 square feet of water way, the section of the channel during the proposed highest flood being 621 square feet. The superstructure of the bridge is to be of laterite in chunam and the cutwaters of the same material.

5. The parapets are to have no interior cornices and the roadway, over the bridge is to have a raise of 1 in 20 as well as the approaches to it over the arches its clear width between parapets will be 18 feet and between the wing walls 24 feet.

2nd Assistant Civil Engineer's Office,
Northern District, Nellore,
22nd November 1856.

(Signed) A. RITHERDON, Captain,
2nd Asst. Civil Engineer Nellore District.

No. 36. Report F, on an estimate for repairing and improving road No. 2 in the Madura District, extending from Dindigul to the Amravutty river at the District boundary on route to Palghaut and Coimbatore, Rupees 27,000.

In letter to the Chief Engineer No 283 of the 20th October 1856.

1. This work is recommended by Lieutenant Scott, with the concurrence of the Collector; the length of road is about 47 miles, and the proposed expenditure amounts to about 565 Rupees per mile including all masonry works.

2. When this estimate is worked out, and the bridges over the Amravutty and Shunmoogum Nuddee completed, No. 2, will be a very good and important road from Madura to the Western Coast, and the Railway.

3. The traffic is already considerable being about 1600 Carts, and 900 pack bullocks in one month. The past expenditure has averaged 1,960 Rupees per annum.

Vide Return of Traffic acompanying.

4. The principal masonry work is a bridge of 3 arches over the Mangurri Nuddy a deep and rapid mountain torrent 70 feet broad, for the construction of which ample provision appears to have been made.

5. The other works of masonry are small and appropriate, due allowance has been made for Superintendence, and for Contingencies.

6. The rates appear rather high, but not more so than are probably required to secure the rapid and efficient execution of the work; and the estimate is accordingly recommended for entry in the Budget of 1857-58.

Central Office of P. W.,
Fort Saint George,
6th December 1856.

(Signed) C. E. FABER, Colonel,
Chief Engineer.

Letter from Lieutenant C. SCOTT, Assistant Civil Engineer, in charge Madura District, Acting for the Acting Civil Engineer 8th Division; to Colonel C. E. FABER, Chief Engineer dated Thenkurray, 20th October 1856, No. 283.

SIR,

* 4 sheets of Plans
1 Sketch of the Mangurri river.
} sent separately

1 Abstract of estimate.
1 Statement of expenditure during the last 10 years.

I have the honor herewith to forward for your consideration and submission to Government an estimate amounting to Rupees 27,000 together with the necessary documents as per margin* for the repair of road No. 2 of the Madura District from its junction with road No. 15 in the Town of Dindigul to the limits of the District at the Ambravutty river.

2. The total distance is 47 miles, 6 Furlongs and 42 yards and the cost of the repairs including the construction of one bridge of 3 arches of 26 feet span and 6 feet rise over the Mangurri Nuddie in the Nellacottah Talook 4 Platform Bridges of from 6 to 3 Vents, 50 Side Dams of from 60 to 5 yards in length 3 Pavements of 15 yards together with the repair of 9 others, one side Dam and one Sluice, will average about 565 per mile.

3. The only Masonry work of any importance is the Mangurri Nuddie bridge above named, which has to be built over a deep and rapid Mountain torrent of about 70 feet in breadth which is crossed by the present line of road, which I have thought it best not to alter owing to a number of small bridges and Tunnels having already been constructed upon it, at a rather awkward place for in consequence of the existence of a mass of rock and the ruins of an old annicut at a short distance above in the middle of the stream as seen in the accompanying Sketch, the river divides in 2 and flowing round a sort of island cuts both its banks a good deal, and to guard the approaches of the bridge against this cutting, I have allowed in the estimate for the construction of a revetment wall 8' 4" high, 50 feet long on one side and 100 feet on the other, which will increase the cost of the Bridge by 540 Rupees, but I have good hopes that the additional expence will not have to be incurred when the bridge comes to be built, as however some time may elapse before that and in the intervening period the conditions of the river may alter for the worse, I have thought it proper that the estimate should be as full as possible.

4. When the repairs included in the accompanying estimate are completed, and the Ambravutty and Shunmoogum Nuddee bridges built, road No. 2 will be a very good line of communication, and its being so is very desirable, for as you will see from the accompanying return of traffic upon it, it is a very important line of Road being the one by which almost all the trade

of the Madura District, flowing in that direction, find's its way to the western coast, and its importance is likely to be enhanced by the construction of the Railway from Madras to Palghat.

5. I therefore request that if the estimate meets with your approbation you will recommend its insertion in the Budget of 1857-58.

Return of Traffic on road No. 2 in the Iyempully Talook from 1st to 30th November 1855.

Name of Articles.	No. of laden bandies.	No. of laden Bullocks &c.	Value of articles. Rs.	A.	P.
Paddy.					
Maize or Sholem					
Rice	14	17	296	0	0
Raghee grain.	60	38	901	0	0
Olive Nuts.	155	11	3,038	0	0
Garlic	51	7	735	0	0
Cotton	10	.....	105	0	0
Bamboos	42	40	1,462	0	0
Salt	16	24	883	0	0
Chilly	49	.....	231	0	0
Bangles	382	510	4,507	0	0
Drapery	13	17	384	0	0
Cocoanuts	11	.....	176	0	0
Curry stuffs	59	40	41,795	0	0
Lamp Oil	.....	22	62	8	0
Rapeseed Oil.	65	.....	4,235	0	0
Tobacco	1	.....	60	0	0
Do. Sooroots	1	.....	60	0	0
Timbers	46	49	1,508	0	0
Planks	3	.....	150	0	0
Joists	80	.....	451	0	0
Black Gram	4	.....	28	0	0
Large Gram (mochay)	12	.....	60	0	0
Horse Gram	23	.....	388	0	0
Dholl	42	20	703	0	0
Cotton	41	8	607	0	0
Thread	32	5	76	0	0
Nuts	37	7	45,739	0	0
Black Cumbly	2	.....	2,180	0	0
Combs	39	.....	4,651	0	0
Plantains Green	1	.....	108	0	0
Lamp Oil seed.	1	.....	500	0	0
Bengal Gram	.....	100	115	0	0
Sugar Candy	4	1	106	0	0
Jaggery (Palmyra)	2	.....	50	0	0
Jaggery Sugar	3	.....	1,050	0	0
Rapeseed	2	.....	45	0	0
Choury Nar	6	.....	210	0	0
Couches	6	.....	190	0	0
Scenting dust.	2	.....	20	0	0
Bones.	4	.....	130	0	0
Gall Nuts.	2	.....	90	0	0
Travellers' Carts	8	.....	35	0	0
Empty do.	1	.....	4	0	0
	116	.....	.....	0	0
	172	.....	.....	0	0
Total	1,508	933	121,305	8	0

Madura, 11th October 1856.

(Signed) R. D. PARKER,
Collector.

No. 37. Report ZZZ, on an estimate for repairing and gravelling the road from Trichinopoly to Coimbatore within the limits of the former District Rupees 30,000.

In letter to the District Engineer No. 271, dated 17th November 1856.

This is one of the most important lines of road in the South, and the traffic on it, is proportionably great, viz 120 carts, and an equal number of bullocks daily. The road has never been perfectly constructed but it is bridged, and tunnelled, throughout and the object of the present estimate is to give the surface a complete coating of gravel, a measure in which the Collector fully concurs.

2. The work appears to be one of those, the necessity of which cannot be questioned, and the rates being as moderate as the distance of carriage admits, the estimate is recommended for sanction.

3. Lieutenant Ryves states that on the completion of the work a maintenance allowance of 105 Rupees per mile or Rupees 4,200 for the whole line will be required for the road an opinion in which I entirely agree, and consider to be indispensable for an ultimately economical management of a road suitable for promoting a regular traffic.

Letter from Lieutenant J. G. RYVES, District Engineer of Trichinopoly; to Colonel C. E. FABER, Chief Engineer, dated Trichinopoly, 15th November 1856, No. 475.

SIR,

With reference to your letter No. 3485 to the Collector of Trichinopoly I do myself the honor to submit an estimate for the thorough repairs of the Coimbatore Road within the limits of this District amounting to Rupees 30,000.

2. This road is a very important one connecting as it does two large towns and forming the only means of communication from Coimbatore to Sea board of Tanjore. It is also the direct road to the Neilgherry Hills.

3. The traffic returns taken during one month give an average daily number of 120 bandies, as many pack bullocks, and between 400 and 500 foot passengers; of the latter more than half are loaded Coolies, or, in all, probably between 50 and 60 tons passing daily. On the occasion of the great feasts at Seringham I have seen this road thronged with bandies, foot passengers, bullocks, bullock coaches and palkees all pouring into Trichinopoly.

4. The road is at present in a wretched state, it is however bridged and tunneled, throughout.

5. The estimate now submitted provides for 1st forming the road surface by earth excavated from the side channels and 2nd for gravelling it along the entire length (40 miles) the rate for gravel work is in some places high, as the gravel has to be brought from a distance the road running close to the Cauvery with paddy fields on the south between it and the gravel quarries.

6. I have however thought it advisable to allow for gravel at once as sanding will never make it a satisfactory road and its importance is so great that it would be found necessary to gravel it at no distant period.

7. The road when thus restored would be kept in repair by a maintenance allowance of 4,200 Rupees per annum or per mile 105 Rupees, which as the traffic increased would have to be increased.

8. The traffic as entered above is that shown in the return furnished by the Collector and no allowance has been made for bandies or bullocks, which may have passed unnoticed; this remark applies also to the statement of traffic on the Madras Trunk road as given in my letter No. 462 dated 14th November 1856.

Letter from J. BIRD, Esquire, Collector of Trichinopoly; to Lieutenant J. G. RYVES, District Engineer of Trichinopoly, dated 17th November 1856, No. 271.

SIR,

I have no hesitation whatever in concurring with you in the expediency of thoroughly repairing the Coimbatore Road No. 10, and metalling it throughout. I have the honor therefore to return your estimate amounting to Rupees 30,000, duly countersigned.

2. My letter No. 101 of date the 10th May 1856 addressed to the Chief Engineer pointed out the necessity of heavy outlay and repair on this line of communication. And Colonel Faber acquiesced in opinion with me, but for reasons set forth in his reply No. 3485 dated the 23rd May last did not sanction immediate repair.

It seems unnecessary for me to say more on the subject.

3. Your estimate for making this a metalled road is good policy, and will the be most economical for Government in the end.

Read the following Report from Colonel C. E. FABER, Chief Engineer; to H. FORBES, Esq., Acting Secretary to Government, dated 2nd June 1857, No. 863.

No. 38. Report F, on an estimate prepared by Captain BARBER, Executive Engineer for constructing a 1st Class District road from the Railway Station at Companypett to Conjeveram, a distance of 17½ miles.

1. Amount of estimate Rupees (29,100) twenty-nine thousand, and one hundred comprising the following items.

54870½	Cubic yards earth work @ 1 anna ₹ cubic yard	Rupees		3,429
10551½	do. gravelling @ 2 „ ₹ do.	„		1,319
28036½	do. do. @ 6 „ ₹ do.	„		10,514
25615	Square yards turfing @ 3 pice ₹ square yard	„		401
17½	Miles Avenue trees @ Rupees 50 ₹ mile	„		875
17	Miles stones each Rupees 3-8-0	„		60
4	Bridges from 3 arches of 15 feet to 6 arches of 30 feet span	„		7,410
34	Tunnels and small bridges from 1 Vent of 1½ feet to 10 feet span	„		1,953
	Road Dams from 8 to 30 feet long	„		377
3	Road Dams and tunnels combined from 20 to 150 feet long	„		955
	Superintendence and sundries	„		1,777
		Total Rupees...		29,100

2. The top surface of the road is to be 6 yards in width, of which 4 yards are to be gravelled 9 inches thick the side slops of the embankments are to have generally a slope of 3 to 1 and where the road is raised more than ½ of a yard, are to be turfed.

3. The bridge across the Nagavadoo surplus channel is to have 3 Segmental arches of 20 feet span the foundations to be 4 feet in depth, resting on hard gravel the height of piers and abutments is to be 3 feet, and the versed sine of the arches 2½ feet, the clear width of roadway between parapet walls is to be 15 feet.

4. The bridge across the river Nundiyaur is also to have Segmental arches, only of 15 feet span, instead of 20 feet the foundations to be 5 feet in depth resting on clay the height of piers and abutments, the versed sine of the arches and width of roadway to be the same as for the Nagavadoo bridge.

5. The bridge across the river Corteliar is to have 6 Segmental arches of 30 feet span. The foundations to be 6 feet in depth resting on rock the height of piers and abutments is to be 7 feet, and the versed sine of the arches 7½ feet the width of roadway to be as for the Nagavadoo bridge.

6. The bridge across the Govindavady surplus channel is to have 4 Segmental arches of 15 feet span the foundations to be 4½ feet in depth resting on clay the height of piers and abutments the versed sine of the arches, and width of roadway to be the same as for the Nagavadoo bridge.

7. In all these bridges the foundations are to be of rough stone, and the superstructures of brick in chunam.

8. The road proposed to be constructed will complete the line of communication from Trichinopoly and Pondicherry via Tindevanum, Wandewash, Conjeveram (crossing Trunk road No. 1 between Baulchetty's and Rajah's choultries) to the Railway at Companypett, and thence to Tritany, Naggery, Curcumbaddy and so on to Cuddapah.

9. The road for which the estimate is now forwarded is one of those noticed in Extract Minutes Consultation No. 2319 dated 16th December 1856, and as Government have observed that the estimate will receive immediate attention with reference to the Consulting Engineer's opinion, the Chief Engineer does not consider it necessary to enter further into details respecting it, beyond stating, that the rates allowed for the work are moderate and sufficient.

10. For the other road noticed in the order of the 16th December 1856, an estimate of Rupees (13,180) thirteen thousand, one hundred and eighty was sanctioned for entry in the Budget of 1857-58, for the portion from Companypett to Tritany, and an estimate of Rupees (19,040) nineteen thousand, and forty, for the remaining portion from Tritany to Naggery was directed to be re-submitted for entry in the Budget of 1858-59, Vide Extract Minutes Consultation No. 414 dated 4th March 1857.

Letter from Lieutenant J. O MAYNE, Acting District Engineer North Arcot; to Colonel C. E. FABER, Chief Engineer, dated Camp Arcot, 26th March 1857, No. 415.

SIR,

With reference to a Memo. No. 74 of the 27th Ultimo, from the Acting Superintending Engineer Northern Circle. I have the honor to submit an estimate for constructing a 1st Class District road from the Railway Station at Companypett to Conjeveram in Chingleput District amounting to Rupees (29,100) twenty-nine thousand and one hundred.

Read the following Report from Colonel C. E. FABER, Chief Engineer; to H. FORBES, Esq., Acting Secretary to Government, dated 12th November 1857, No. 5184.

No. 39. Report by the Superintending Engineer Southern Circle, on an estimate for Metalling and Gravelling Trunk road No. 4 including the Perambaddy Ghaut prepared agreeably to the orders of Government recorded in Extract Minutes Consultation, No. 1656, dated 29th August 1857.

1. Lieutenant Bean has not fully complied with the order quoted above inasmuch as he has not furnished any satisfactory accounts of the past expenditure on the road, but his reasons for the failure are perfectly valid.

2. His present estimate of Rupees 28,310 is in my opinion insufficient as the dimensions 4 yards in width allowed for Metal and Gravel are not such as the importance of the road and traffic requires, nor do I think his rates are high enough.

3. I beg to annex a revised estimate amounting to Rupees 61,000, which differs from my former calculation by my having allowed stone metal for only a portion of the distance (26 miles)

and having increased the rates proportionally. The quantity of Metal and Gravel allowed for each mile is 1500 cubic yards as before.

4. Lieutenant Bean dwells on the necessity of placing these works under the Superintendence of a qualified Officer or Subordinate and I need not add my support to his views on this point.

5. With reference to Lieutenant Bean's remark (Para. 4) that he received orders from me to transfer the Coorg Division work to the Chief Engineer of Mysore, I may observe that he had previously been instructed to do so by the Chief Engineer D. P. W., as shewn in my Minute of the 2nd November 1857.

6. I am of opinion that this work is urgently necessary and that no time should be lost in carrying it into execution after the commencement of 1858-59, in the Budget of which it should be entered.

Letter from Lieutenant J. BEAN, District Engineer Malabar; to Colonel C. E. FABER, Chief Engineer, dated Cannanore, 3rd November 1857, No. 1135.

SIR,

I have the honor to reply to the instructions contained in your Extract of Proceedings* desiring me to report for the information of Government on the expenditure hitherto incurred for metalling and annual repairs of the Trunk road No. 4, agreeably to the 8th paragraph of their Minutes of Consultation No. 1656, dated 29th August 1857.

* No. 3415, dated 7th September 1857.

2. I have not replied sooner to your instructions because I had to make an estimate for the repair and improvement of this road, and to apply for certain accounts from the Collector. As the Records of my office afforded little information on the past expenditure I wrote to the Collector on the 9th and 28th September on the subject but as yet have received no replies. In the last Official year and prior to my taking charge of the District I find that a sum of Rupees 3,940-5-2, was expended in repairs out of the annual allowance of Rupees 6,800, but for this amount owing to a want of proper supervision very efficient repairs were not undertaken, sufficient length of side drains and cuttings were not made, and the road in many places not properly levelled and sloped.

3. As regards the metalling which was to have been laid on the ghaut agreeably to an estimate of Rupees 11,024-10-11, sanctioned by Government on the 2nd December 1853, No. 426, it appears that Captain Francis in his Diary of March 1855, remarked on this work which was then in progress, and reported that inferior material was being brought to the spot at an expense of 3 annas a cubic yard and recommended that the rate should be raised.

4. I found on my joining the District in January last, that on an estimate of Rupees 8,000 which was sanctioned by Government on the 12th November 1856, a few heaps of stone were being collected on the sides of the Perambaddy Ghaut, for metalling the road. This work was progressing as fast as the great dearth of cooly labour in these unhealthy jungles would allow, and Rupees 2,047-2-11, had been expended in Coorg and Malabar up to the 30th April, when I received orders from the Superintending Engineer Southern Circle to transfer the Coorg Division work, amounting to the greater portion of the estimate† to the Chief Engineer Mysore which was accordingly done though I could not send the amount remaining as balance Rupees 1,149-0-3, to that Officer until the 10th September last. The annual allowance‡ for repairing the same portion of the road was paid to Colonel Green on the 10th June.

† Rupees 6,297-14.

‡ Rupees 3,400.

5. I have also the honor to enclose an estimate¶ for making the road in an efficient state throughout, which includes the metalling of the worst portions of the road, namely the Perambadly Ghaut and near Gunote and Irrity. The portion of this estimate which falls within the Coorg District has been measured by the Overseer of the Mysore Division. As much traffic exists on this line, and the coast monsoon is so violent in its action on all our communications in Malabar, I do not think that an estimate, other than one of large amount, will suffice for effectually preserving the road in thorough good repair.

¶ Rupees 28,346.

6. The Ghaut throughout and portions of the road are in very bad order and almost impassable in the monsoon, and I believe this fact has again lately been brought to the notice of Government by the Acting Collector. The reasons, though traceable to a great extent to careless supervision, are also the damage by the very heavy rains which fall, and the great difficulty of procuring labour in jungles where provisions are scarce and the climate most unhealthy. This latter difficulty has been felt in metalling the road, and especially so in the absence of efficient Superintendents. I do not hesitate to say that money appears to have been wasted on the road or even unaccounted for, but I would observe that this road has been most unfortunate in the class of men who have been over it. Mr. Church's career is well known, and when he left this District in July 1856, he had not been able for 6 months to superintend the work, and Overseer Drysdale who joined in December last died from the effects of intemperance on the 7th February. From that date I applied for special assistance for this road and pointed out the important works which were to be undertaken on it, but it was not until 4th June, that I received the services of Corporal then Overseer Lovejoy, and he was remanded to his Regiment from the 1st August last.

7. In the intervals the work has been superintended by a Brahmin Maistry who owing to his long service of the road has been still employed on it but of whose knowledge and efficiency I have the lowest opinion without my being able to replace him in this duty.

8. With the growing importance of this Military and Commercial line, I would urge the importance of my having the services of an Officer or Subordinate whose health could withstand the effects of a bad climate and who has had experience in bridge building.

9. Besides the Kullartodu bridge on this line, Government in their Extract of Minutes of Consultation No. 1909, dated 10th October 1857, have sanctioned an estimate amounting to Rupees 29,923-5-9, for the Irrity bridge and the plan is to be a wooden truss which will require great care in its execution and for this work alone even a European Superintendent would be of some service.

10. Agreeably to the above order of Government I also enclose a sketch Map showing the nature of the soil through which the Trunk road runs, with the metalled portions.

No. 40. Read the following letter from Colonel C. E. FABER, Chief Engineer; to H. FORBES, Esq., Acting Secretary to Government, dated 16th November 1857, No. 5240.

SIR,

With reference to Extract Minutes Consultation No. 1993, dated 23rd October 1857, I have the honor to forward an estimate amounting to Rupees (32,000) thirty-two thousand, for metalling and constructing parapet walls to the road between Coonoor, Jackatallah and Ootacamund.

2. The road has cost Rupees 37,596 in construction *without metal*, but its dangerous and yet important character demands that its efficiency be completed, and the parapet walls are also very much required for the protection of passengers and traffic as the line runs along some steep precipices.

3. I beg to recommend the estimate the rates of which are satisfactory for entry in the Budget of 1858-59.

4. The total amount sanctioned for the construction of this road is Rupees 31,477, under the following dates viz.

6th October 1853	No. 376	Rs.	15,000-0
	„ 377		3,334-8
19th do. 1855	No. 701	„	13,143-0
		Rupees	31,477-0

Letter from Captain P. M. FRANCIS, District Engineer Coimbatore; to Colonel C. E. FABER, Chief Engineer, dated Coimbatore, 2nd November 1857, No. 216.

SIR

I have the honor to submit an estimate for metalling the new Jackatallah road as well as for parapets in obedience to Extract of Minutes of Consultation No. 1993, dated 23rd October 1857.

6th October 1853.
22nd September 1855.
19th October 1855.
Sanctioned amount 31,477.
37596 expenditure.

The metalling is for the whole road from Coonoor bridge to Lascelles lake.

This road was sanctioned as per margin but no metalling was included in the Original estimates.

No. 41. Read the following letter from Colonel C. E. FABER, Chief Engineer; to H. FORBES, Esq., Acting Secretary to Government, dated 15th September 1857, No. 3704.

SIR,

1. In Extract Minutes Consultation No. 770, dated 23rd April 1857, Government directed estimates to be prepared, and submitted in time for entry in the Budget of 1858-59, for establishing a water communication between Masulipatam and the Godavery, and for making provision to facilitate the export of salt from the Buntomilly Pans, by improving the existing creek between the Oopootair, and the Buntomilly swamps.

2. The District Engineer of the Kistnah Division in his letter No. 69, of the 4th Ultimo, now submits an estimate for the formation of a navigable Canal (length 30-5-129) with its necessary masonry works, from the Pettah basin at Masulipatam to the Oopootair, at a point opposite Yailoorpaud, where the akeed channel from the Godavery falls into that drainage, and for a junction cutting, 2000 yards in length from the main Canal near Soorampaude, to the tidal creek between the Oopootair and the Buntomilly swamps, to complete the navigation from the Nursapoor channel by means of the Oopootair, with the Salt Pans.

3. The estimate as shown in the accompanying abstract, provides.

		Rs.
Excavating main channel	... ...	
Do.	junction do.	1,03,930
Do.	outside drain	6,075
Constructing Lock with bridge near the basin at Masulipatam	... ...	2,885
Do.	do. for junction Canal	11,482
Do.	do. Lock into Oopootair...	11,482
Do.	2 Calingulahs each Rupees 3,974-14	9,000
Do.	2 do. each 2,681	7,950
Do.	1 do.	5,362
Contingencies sundries &c., at 10 per cent	... ...	3,394
	... ...	16,410
	Total Rupees.....	1,78,000

one lac and seventy-eight thousand.

4. The approval of the local authorities to the project having been communicated to Government with a letter No. 10,158 dated 9th February 1857, from the Acting Superintending Engineer Northern Circle, then in charge of the Central office, it appears unnecessary to recapitulate what has already been fully stated, and it merely remains for me to observe, that I consider the proposed arrangements most skilful, and judicious, and that the estimate is framed on moderate and sufficient data.

5. As the aggregate required by this project is in excess of the competency of the Government of India, and as the improvement is one, the importance, not to say necessity of which has already been fully admitted. I venture to take the liberty of proposing that a special application be at once made for the allowance of this project by the Home authorities, so that on being included in the Budget for 1858-59, it may at once be authorized for execution with the already received sanction of the Honorable Court.

No. 42. Read the following letter from Colonel C. E. FABER, Chief Engineer; to H. FORBES, Esq., Acting Secretary to Government, dated 10th November 1857, No. 5123.

SIR,

In para. 30 of the letter from Colonel Baker dated 11th July 1856, No. 3173, the Government of India remarked with reference to items Nos. 24 and 26 of Statement No. 1 of the Budget for 1856-57 that they were essentially isolated portions of a project for one work viz. a road from Cuddapah to Bellary, that no substantial reason existed for treating them separately, and that neither item was shown to be worthy of execution, otherwise than as a part of the

whole line, and they directed that a complete project for the whole line should be submitted, sanction being meanwhile withheld to both projects.

2. In pursuance of these orders an estimate for the Cuddapah portion of the line was submitted to Government with my report dated 6th December 1856, No. 8662, (the entire line being situated in two Districts) but the above paper was returned in Extract Minutes Consultation, 12th June 1857, No. 1131, with directions that estimates for the whole line should be simultaneously laid before Government. The estimates for the Bellary portions having been received in the Central office only lately; I have now the honor again to recur to the subject.

3. The estimate now prepared in Abstract and submitted with this report exhibits the expenditure on the whole line at one view namely :—

	Rs.
From Cuddapah to the frontier of Bellary (518 miles).....	1,07,000
From the Bellary frontier to Gooty (38½ miles).....	1,61,700
From Gooty to Bellary (51¼ miles).....	2,00,600
	4,69,300

making Rupees 4,69,300 for the entire road viz. 141 miles from Cuddapah to Bellary.

4. As the distance between these towns has been the subject of a former correspondence it is necessary to mention that that reported in my letter of the 26th August 1857, No. 3180 appears to be incorrect. The distance there given viz. 150¼ miles was taken it will be seen from the Quarter Master General's statement in the Fort St. George Gazette dated 30th January 1857, and upon this hypothesis the distance between the Gooty and Cuddapah frontier was deduced to be 48 miles, whereas from the estimate now submitted, it seems to be no more than 38½ miles. The Quarter Master General's report is probably founded upon whole measurements of the line but the tortuosity that existed in former years has been much corrected by recent improvements, particularly towards Bellary, and it is believed that the distance has in consequence been much reduced.

Extract Minutes Consultation, 12th January 1857, No. 1132.
To Government 26th August 1857, No. 3180.

5. The estimate for the first portion of the line in question, or that from Cuddapah to the Bellary frontier having been reported upon on the 6th December 1856, No. 8662, it is unnecessary to touch upon it again. The estimate for the second portion viz. that from the Bellary frontier to Gooty provides, it will be seen not only for the formation of the line, but for the necessary masonry works, which alone were estimated for in No. 26 of Statement No. 1 of the Budget of 1856-57, for the portion between Royalcheroo and Gooty.

6. The District Engineer has not forwarded with his plans and estimates a report upon the line, but this is scarcely necessary considering that the importance of forming a good communication between Cuddapah and Bellary does not admit of a moments question, the line not only forming a portion of the shortest communication between the Presidencies of Madras and Bombay but being in itself the main outlet to the eastern coast, of the cotton and other produce of the Bellary District through Cuddapah, besides being the trunk to which other important lines of internal communications lead.

7. Some doubt, however exists as to the course which the road should take from Gooty to Bellary, there being two rival propositions on this subject. The District Engineer has estimated for the line from Gooty viâ the southern point of the Yerratimraycheroo reservoir, Pantakachevoo, Goondacul, Guddakul and Permadavenhully, but considers that if the large reservoirs proposed to be erected at Goomanoor and Donacul should ever be carried into effect, the line would probably come within the water spread of those tanks; and therefore recommends for consideration the line viâ Najasamoodrum, Wudjar Curoor and Iddapincul. In answer to remarks made by the Collector on this line, he further observes that beyond being on a higher level than the country through which the present line passes and there-by affording a firmer soil and better material, the Najasamoodrun line possesses no advantages while on the contrary it is not only somewhat longer, but there is reason to apprehend that there would be a scarcity of water along the line. After duly considering the advantages and disadvantages of both lines I am of opinion that preference should be given to the present road for which the District Engineer has adapted his Plans and estimates. The construction of the reservoirs at Goomanoor and Guddakul is a future contingency which need not now be taken into

account while by placing their bunds a little lower down the streams which they are intended to stem, it is not unlikely that the difficulty referred to, may be obviated or greatly lessened. On the contrary the scarcity of water prevailing in the black cotton soil Talooks of Bellary is an evil which ought to be averted at any cost, as it will be difficult for large bodies of men or troops, or even for large quantities of traffic to move along the line without subjecting the men and cattle to great inconvenience and hardship. For these reasons I beg to recommend the line as now estimated for.

8. The rates appearing in the estimate are moderate and suffieient and if the Government approve of my recommendation, I would suggest that their amount viz. Rupees (4,69,300) four lacs sixty-nine thousand three hundred be sanctioned for entry in the Budget of the ensuing year.

No. 43. Read the following letter from Colonel C. E. FABER, Chief Engineer ; to H. FORBES, Esq., Acting Secretary to Government, dated 4th November 1857, No. 4958.

1 Comparative Statement.
7 Plans.
2 Sketch maps.
3 Abstract Estimates.
2 Traffic returns.
1 Copy of correspondence.

SIR,

I have the honor with reference to paras 5 and 6 of Extract from the Minutes of Consultation No. 764, dated 23rd April 1857, to submit for entry in the Budget of 1858-59, the following estimates.

1st. Rupees (19,800) nineteen thousand and eight hundred, for the road from old Arcot to join the western road (Trunk road No. 1), at Arapaukum, length 6½ miles.

2nd. Rupes (95,200) ninety-five thousand and two hundred, for the road from Arnee through Poloor to the boundary of the South Arcot District, at Pollyput, or Calishpaukum, length 21½ miles.

3rd. Rupees (15,100) fifteen thousand and one hundred for the road from the Palaur annicut to Timery, length 4¾ miles.

2. Accompanying the 2nd estimate, are a sketch map and Traffic returns, with a report on the necessity of so expensive a description of road, as required in Extract Minutes Consultation No. 2121, dated 13th November 1856, Para. 4.

3. Accompanying the 1st estimate, is a comparative statement showing the cause of its excess over the estimate of Rupees (15,408) fifteen thousand four hundred and eight, originally submitted to Government.

4. These projects have been already reported upon and no further remarks therefore are now necessary.

Extract from a letter from Captain C. C. JOHNSTON, Civil Engineer 4th Division ; to Lieutenant Colonel C. E. FABER, Engineers, Chief Engineer, D. P. W., dated 9th January 1856, No. 1923.

SIR,

I have the honor to submit for sanction, the accompanying list of estimates, numbered from 1st to 13.

No. 5, of Rupees 95,200 improving 2nd Class road No. 6, from the Seeyaur river North of Arnee to Poloor 17 miles, and branch road No. 11 from Poloor to Paliput, on the South Arcot boundary, towards Trinamally 7½ miles. The survey and estimate for this same line of road from the Seeyaur river North to Arcot, is nearly completed.

2. The line is important as completing the communication from the South Arcot District with Trunk road No. 1 and the Railway, and connecting the large Towns of Poloor, Arnee, Arcot, Ranecpet, and Wallajahnugger, &c.

3. The present state of the road from the river to the South Arcot boundary, is described in the accompanying copy of a letter No. 33, dated 27th Ultimo, from Assistant Surveyor Mr. Dick. The estimate provides for 48 tunnels varying in size from 1 vent of 1 foot to 3 vents of 6 feet, 31 road dams from 8 to 40 yards in length, and three bridges one of 13 arches, of 44 feet span, across the Seeyaur river near Arnee Rupees 19,287, one of 13 arches of 60 feet span across the Cheyaur river near Calasapaukum Rupees 20,256, and one of 6 arches of 30 feet span across

the Moonahcalvay Muddoogoo Rupees 4,942. The Abstract accompanying the estimate exhibits clearly the cost of each description of work.

* * *

Letter from Mr. F. DICK, Assistant Surveyor, in charge of 5th Division of the 4th Division ; to Captain C. C. JOHNSTON, Civil Engineer, 4th Division, dated Chengaud, 27th December 1855, No. 33.

SIR,

I beg to forward an estimate amounting to Rupees 93,067 for improving the road from the river near Arnee, to the limits of Poloor Talook, a distance of 25 miles, which is almost impassable in the wet season, and even in the dry, the communication is very little better ; for there is not a single difficulty on the line save the Moonahcalvay and Arnee and Cheyaur rivers, which are rendered impassable during wet weather for days together, which require to be bridged, the whole road is a wretched condition from the numerous Nullahs crossing it, particularly the cultivated parts, and bandies in consequence make short stages with light loads carrying quantities of Cotton, Indigo, and other valuable produces, yearly to Madras and other places from South Arcot and Salem Districts, considering the level character of the country I made no alteration on the line, but followed the old road, making it as straight as possible. Five pieces of this road have recently undergone repair at a cost of Rupees 10,425-8-9 of which 3 are entirely neglected, as no metal of any kind has been applied ; bridges and tunnels have been built, but the approaches are cut away by the rains, leaving them inaccessible, and consequently useless, so that very little good has been done by the outlay, the other two portions are only partially metalled.

From Arnee to the end of the limits of Cirkumbaudy, a distancesof 9½ miles, the bridges will have to be built of brick, as the difficulty of procuring stone is great beyond which it is easily had, the road will be made 7 yards broad on cultivated ground, and 8 yards on uncultivated ; metalling to be 6 × ⅛ yards which is only provided for in particular places, and gravelling throughout of the same width and thickness, these materials are to be had within 3 miles of the road, chunam without any difficulty.

Read the following letter from Colonel C. E. FABER, Chief Engineer ; to H. FORBES, Esq., Acting Secretary to Government, dated 6th December 1856, No. 8662.

No. 44. Report LLL, on an estimate for repairing and improving the road from Camoothee to Sayelgoody in Madura, Rupees (40,000) forty thousand.

This estimate has been prepared under the orders of Government contained in Extract Minutes Consultation No. 1970, dated 25th October 1856.

2. It is the main salt road of the Province and its improvement is a necessary work in connection with that of the road from Madura, to Camoothee sanctioned under the above date.

3. The present road is a more improved track running through a well cultivated Country, with a mixed soil of sand and clay, and the total length being 18¼ miles, the average cost is about 2,200 Rupees per mile.

4. The surface is to be 8 yards wide with 6 yards of gravel 9 inches thick.

5. No bridges of any size are required.

6. The importance of the work having been already acknowledged by Government it only remains for the Chief Engineer to record his recommendation of the estimate, the rates of which are moderate, and sufficient.

Read the following Report from Colonel C. E. FABER, Chief Engineer ; to H. FORBES, Esq., Acting Secretary to Government, dated 26th September 1857, No. 4033.

No. 45. Report on an estimate prepared by the District Engineer of Canara, for constructing a 2nd class road from Mullapoor on the South bank of the Kalanuddee, or Black river, viâ the Kygha Ghaut to Iddagoongy miles 31-6-79.

Amount of estimate Rupees (70,330) seventy thousand, three hundred and thirty comprising the following items.

		Rs.
1,03,433	Cubic yards earth work	12,929
83,938	do. do. Gravelling	13,990

			Rs.
3,35,754	do.	do. Tamping	5,246
	Clearing jungle		1,250
2	Bridges each of	1 arch of 12 feet span	1,000
5	do.	do. 2 arches of 15 feet span	5,621
2	do.	do. 2 arches of 20 feet span	2,609
1	do.	do. 1 arch of 35 feet span	3,355
2	Timber bridges each of	2 bays of 25 feet span	5,985
37	Tunnels varying in size from	1 vent of 6 feet to 3 vents of 9 feet	14,910
31	Mile stones		31
	Sundries		3,344
		Total Rupees	70,330

1. The surface of the road is to be 9 yards in width, of which 6 yards are to be gravelled 9″ thick, the side slopes of the embankments are to have generally an inclination of 1 to 1 and where the soil requires it, are to be turfed.

2. The object of the proposed road is to connect the Hullihal, and hence the Dharwar country, and Raichore Doab with the projected Harbour at Bartcool to which from Mullapoor, the Black river is navigable.

3. Iddagoonjy, the Western terminus of the road is some 1,500 feet above the level of the sea, the Ghaut presents an unbroken ascent of nearly 8½ miles, the remaining distance being a succession of ascents and descents, and the country throughout nearly the entire length of the line is clothed with dense forest jungles.

4. The road passes through the Villages of Holigudda, Huroor, Kullicotay, Thunmany Cottaygudda, Nullenagudda, Tulkaybyle, Honnaygudda, Wasserhully, and Huttaygudda, but at present there is no traffic on it.

5. Iddagoonjy is at the head of the Arbyle Ghaut, whence a road is made north viâ Yellapoor, and Hullihul to Dharwar, and again East from Yellapoor to Moondagode on the line from sircy near the head of the Davemauny and Neelcoond Ghauts, to Hoobby, Dharwar &c.

6. The projected improvements to the ports of Coompta, Tuddree, and Sedasheghur are referred to in the District Engineer's letter No. 170, dated 13th July 1857, the latter being the one immediately connected with the Kyga Ghaut line of communication, and the convenience thus offered to the Cotton merchants, of conveying their raw produce by a good road to the coast, and there obtaining direct shipment for it to England will be a great boon. At present, the Cotton is not only taken by circuitous routes to the coast but as observed by Lieutenant Goddard is then sent to Bombay in Pattemars for final shipment.

7. The opening up of the Kyga Ghaut and of the Singawara line to the North of the Black river will, as observed by the Collector of Canara in his letter of the 16th July be most important, both with reference to their direct influence on the development of the Baitcool Harbour scheme, and their more remote, but no less certain action on the extension of the Cotton trade.

8. The Kyga Ghaut will also be of great service by relieving the Davaramunny and Arbyle lines from a great portion of the, at present, heavy, and increasing traffic on them, as evinced by the statement given by the Collector, the value of the exports at Tuddree from 1854-1855 to 1856-1857, having increased from Rupees 94,988, to Rupees 5,61,891, and of the Imports from Rupees 27,810 to Rupees 61,963.

9. It will be observed that both Mr. Robinson and Lieutenant Goddard fully appreciate the great importance of the projected improvements to the Tuddree Harbour, as referred to by the Right Honorable the Governor in para. 154 of his Minute, communicated to the Central office with Extract Minutes of Consultation No. 463, dated 13th March 1857.

10. A separate report No. 1 on the several masonry works to be constructed on the proposed road is herewith submitted.

11. The rates allowed for the work are moderate and sufficient, and the estimate is recommended by the Chief Engineer for entry in the Budget of 1858-59, as providing for an approach to the Harbour of Baitcool from the Dharwar District, in accordance with the desire expressed in para. 163 of the Right Honorable the Governor's Minute before referred to.

No. 46. ORDER THEREON, No. 2192 ; dated 27th November 1857.

Report UUUUU, *dated 6th December* 1856, *on four estimates aggregating Rupees* 1,43,700.

1. Of the four estimates submitted with the above report, for the improvement of the channels under the Pennair Annicut in Nellore, the Government consider very desirable the two which were re-submitted by Colonel Faber, in his select List dated 24th January last, viz., one for widening and improving the main, or Jaffer Sahib's channel at a cost of 34,000 Rupees and the other for the improvement and extension of the irrigation under the Allipooram branch of Jaffer Sahib's channel at a cost of 15,500 Rupees. The latter apparently provides for dividing Dams across the existing subsidiary branches, and for new cuts to carry water to the more distant lands, so as to bring them under the influence of the Pennair Annicut. It is observed that one of these cuts, viz. the one from the Indacoorpett branch to the Mypaud and Somarazapully lands estimated at 1,150 Rupees supersedes the necessity for the aqueduct and bridge over an old course of the Pennair, estimated at 6,130 Rupees and entered in Statement No. 2 of the Budget of 1856-57, but omitted in that of 1857-58, and which was designed to carry water to these very lands. It is also observed that the Collector strongly approves of the projected improvements, especially so in regard to Jaffer Sahib's channel, as tending to the increase of cultivation ; but as the four estimates have been taken together as a whole, in considering the Revenue results, it is impossible for the Government to form any idea of the extent of benefit to be derived from the two portions approved by them. They therefore request that the Chief Engineer will be good enough to lay before them, a concise but complete report confined to these two estimates ; and that he will, at the same time, draw up a fresh plan of the channels, shewing them as at present existing and as proposed to the extent now approved by Government. To enable Colonel Faber to furnish the sketch of the channels as now required, the original plan will be returned to him with these Proceedings.

Report F, *6th December* 1856, *on estimate amounting to* 27,000 *Rupees for the improvement of the Dindigul and Palghaut road within the limits of the Madura District.*

2. It is proposed, at a cost of 27,000 Rupees, to put into proper order that portion of the high road leading from Dindigul to Palghautcherry, which falls within the Madura boundary at the Amrawutty river ; the total distance to be improved being nearly 48 miles. On the completion of this improvement, and of the bridges over the Amrawutty and Shunmoogum Nuddee, both of which, the Government observe, were provided for in the Budget of 1856-57, at an estimated cost of Rupees 21,540 and 15,425 respectively, the road will become highly important. It is said that almost all the trade of the Madura District, flowing westwards, finds its way to the West Coast along this route ; and that its importance will be further enhanced on the construction of the Madras Railway to Palghautcherry. From a traffic return furnished by the Collector, which was taken in the Iyempully Talook for the month of November 1855, it is seen that 1,596 laden bandies and 922 laden carts passed along the road during that month, the aggregate value of the articles transported being reckoned at 1,21,507 Rupees. The road has been partly kept in repair from time to time at trifling cost, the aggregate outlay of nine years from 1846 to 1854, as shewn in a Statement supplied by the Collector, being 17,645 Rupees, or an average of 1,960 Rupees per annum ; though in 1851 no outlay was incurred at all, and in 1849 the expenditure rose to as much as 4,834 Rupees.

3. The estimate provides for a bridge of 3 arches of 26 feet span and 6 feet rise over the Mangurri Nuddee in the Nellacottah Talook, for 4 Platform bridges of from 3 to 6 vents, 50 side Dams of from 5 to 60 yards in length, 3 pavements of 15 yards, and repair of 9 others, and the repair of one side Dam and Sluice, besides earthwork, superintendence, and contingencies ; the total amount being 27,000 Rupees, or a rate of about 565 Rupees per mile, as stated by Lieutenant Scott. Of all the masonry works provided for, the only one of importance is the bridge of 3 arches over the Mangurri Nuddee, which is represented to be a deep and rapid mountain torrent about 70 feet in breadth. Both the Collector and Chief Engineer are strong-

ly in favor of the project. The latter considers the rates, which appear rather high, to be no more than requisite to ensure a rapid and efficient execution of the work. The estimate is accordingly sanctioned for entry in the ensuing Budget. It must be remarked that this project has not been illustrated by a sketch map, a convenience which is the more especially necessary in cases requiring to go before the Government of India.

Report ZZZ, 6th December 1856, on estimate of 30,000 Rupees, for reforming and metalling Trichinopoly and Coimbatore road within the limits of the Trichinopoly District.

4. The road here proposed to be improved is 40 miles in length; and, it is presumed, is the one that runs from Trichinopoly along the right bank of the Cauvery to the town of Caroor, gaining access to the latter place by a bridge across the Amrawutty, which here joins its waters to those of the Cauvery. It is represented to be a very important road, not only connecting two such large towns, as Coimbatore and Trichinopoly, but forming the only means of communication between the former District and the sea board of Tanjore, while it is the direct route from Trichinopoly and Tanjore to the Neilgherry Hills. The District Engineer states that the traffic returns taken in one month, as furnished by the Collector, gave an average daily result of 120 bandies, the like number of pack bullocks, and between 400 and 500 foot passengers, of whom more than half were laden coolies; or in all, a daily traffic of about 50 or 60 tons; and that this makes no allowance for bandies or bullocks that might have passed unnoticed. Lieutenant Ryves adds, that on the occasion of great feasts at Seringham, he has seen this road thronged with bandies, foot passengers, bullocks, bullock coaches, and palkies, all pouring into Trichinopoly. The road, which is bridged and tunnelled throughout, is however, said to be at present in a wretched state. The object of the estimate is to reform the surface of the road, and to gravel it along the entire length of 40 miles; and when it is thus restored, it is said that a maintenance allowance of 4,200 Rupees per annum, or a rate of 105 Rupees per mile, will be required at the beginning to maintain it in order, the allowance being susceptible of increase as the traffic increases. The project has the entire concurrence of the Collector; and the Chief Engineer recommends the estimate, considering the rates to be moderate, even those for the gravel, which has to be brought from a distance, as the road runs close to the Cauvery on one side, and paddy fields intervene between it and the quarries on the other

5. The Government approve and sanction the above estimate of 30,000 Rupees for entry in the Budget of 1858-59; and they likewise sanction the maintenance allowance of 4,200 Rupees per annum required to keep the road in order after its restoration. They must observe that, as in the previous case, they have felt difficulty in dealing with the project in the absence of a sketch.

Report F, dated 2nd June 1857, on estimate of 29,100 Rupees for a 1st class road from Companypett to Conjeveram.

6. This estimate provides for a short line of road, 17½ miles long, from the Town of Conjeveram to the Railway station at Companypett, in North Arcot. Colonel Pears brought to notice the importance of this road as a feeder, in his letter of the 18th November 1856, No. 240; and a petition was also forwarded by him on the 29th of the same month, from the Tahsildar and 91 other residents of Conjeveram, representing the great want of a traffic line from that Town to the Railway, as at present the merchants could not get access to the line, without the certain risk of having their carts upset, and the valuable goods with which they were laden greatly damaged, to the heavy loss of the owners. The importance of this road as a feeder to the Railway is not limited however to the Town of Conjeveram; for on its formation, it will complete the communication southwards from Pondicherry and Trichinopoly, in the one case by Tindevanum and Wandiwash, and in the other by Trunk road No. 8, thus affording uninterrupted

Extract Minutes Consultation 16th December 1856, No. 2319.

access to the Railway to those distant marts of traffic. On the north also, the communication would be open to Cuddapah by the Naggery and Kircumbaudy road, on the formation of the intervening spaces between Companypett and Trittany, and Trittany and Naggery. The proposed Conjeveram and Companypett road will further cross the high western Trunk road from Madras to Bangalore. Under these circumstances therefore, of general convenience and commercial advantage, the Government approve of the entry of the estimate in the Budget of 1858-59.

7. It is observed that the estimate provides for a road 6 yards wide, to be gravelled however to the extent of 4 only yards, with several tunnels and road dams, and 4 bridges of from 3 arches of 15 feet span to 6 arches of 30 feet span; and the rates are considered by Colonel Faber to be moderate and sufficient.

8. It is also observed that, for the space northwards from Companypett to Trittany, an estimate of 13,180 Rupees was entered in the Budget of 1857-58: and that for the continuation to Naggery, an estimate of 19,040 Rupees it was directed in Extract Minutes Consultation 4th March 1857, No. 414, should be re-submitted for insertion in the ensuing Budget. It does not appear however that the Chief Engineer has re-submitted this estimate as directed; but unless he does so, and the continuation is provided for, the communication to Cuddapah will be incomplete, by the hiatus which would be left between Trittany and Naggery. The Chief Engineer has sent up a cumbrous survey; but he has omitted a sketch map. In all cases, a sketch of the country ought to accompany the projects submitted for consideration, not only to indicate the immediate locality, but to shew the bearing of the project in respect to the surrounding country. If such a sketch be not sent up by the District Officer, it ought to be the business of the Chief Engineer on all occasions to supply the omission, as it is very inconvenient to refer to a general map encumbered with other details. A sketch convenient for reference is more especially necessary, in cases of projects having eventually to be submitted for the orders of the Government of India.

Report dated 12th November 1857, on estimate of 61,000 Rupees for the improvement of the Perumbaddy Ghaut and road.

9. This estimate is submitted in pursuance of the orders of Government in para. 8 of Extract Minutes of Consultation 29th August last No. 1656. They were there induced, on Major Lawford's report of the unsatisfactory condition of the Perumbaddy Ghaut and road, to call for an estimate of the actual outlay necessary to put the line into an efficient state. The estimate now recommended for metalling and gravelling the road, amounts to 61,000 Rupees, and has been prepared by the Superintending Engineer of the Southern Circle in supersession of one of 28,340 submitted by the District Officer, as Major Lawford considers the latter wholly insufficient for a road, whose importance and traffic requires that it should be established on a more liberal and substantial scale, than that provided for in the lesser estimate. Lieutenant Bean's explanations regarding the unsatisfactory condition of the ghaut and road, and of the accounts of expenditure, will be separately considered in disposing of the Chief Engineer's Proceedings of the 5th November 1857; but in the meantime, the Government direct the entry of Major Lawford's estimate of 61,000 Rupees in the ensuing Budget; for, keeping in view his representation of the continued scarcity to which Cannanore will be subjected, by this route being allowed to remain almost impassable, they consider it highly necessary in a military point of view, to put the communication into thorough order at an early date; and they are further led to adopt Major Lawford's estimate, as they observe from the sketch map sent up by Lieutenant Bean, that only a very small portion from Cannanore to a point somewhat short of Coodally is gravelled and appears to be in good condition, while all the remaining portion, to the boundary between Coorg and Mysore, or nearly the whole of the road, consists of clay and sand or stone, and cotton soil.

Letter dated 16th *November* 1857, *No.* 5240, *submitting estimate of* 32,000 *Rupees for putting the road between Coonoor, Jackatallah and Ootacamund into efficient order.*

10. The estimate of 32,000 Rupees submitted with the above letter, is in substitution for a smaller one of 10,140 Rupees laid before Government on the 24th September last. The latter provided only for building parapet walls to the dangerous parts of the road from Jackatallah to Octacamund; but as it was observed by Government that the road was treacherous and slippery in the wet weather from not being metalled, and that the parapet walls would thus be but an imperfect protection against accidents, they concurred in Colonel Faber's opinion that the metalling of the road was as important as the construction of parapets, and accordingly called for a complete estimate. The present one of 32,000 Rupees provides for both objects, viz., metalling the road, and building parapet walls, and is strongly recommended by Colonel Faber for entry in the ensuing Budget, as the protection is very much needed for the safety of passengers and traffic, the road running along steep precipices. The Government approve the entry of the estimate of 32,000 Rupees in the forthcoming Budget, and request that a sketch of the road may be prepared and sent to this office for transmission to the Government of India. The road, it is remarked, has already cost 37,596 Rupees, though the authorized estimated expenditure was only 31,477 Rupees, sanctioned on different occasions as follows:

Extract Minutes of Consultation, 6th *October* 1853, *No.* 376.

	Rs.
Completion of Kaity Cut and thorough repair of road to junction with the new road to the Jackatalla Barracks.....	15,000

Extract Minutes of Consultation 6th *October* 1853, *No.* 377.

Difference between the above amount and actual estimate of 18,334-8.	3,334

Extract Minutes of Consultation 3d *October* 1855, *No.* 701.

Supplemental estimate for completing the work.....	13,143
Total sanction.....	31,477

These estimates, however, it is said, did not include metalling.

Letter No. 3704, dated 15th September 1857.
do. „ 5123, dated 10th November 1857.
do. „ 4958, dated 4th do. 1857.
Report „ 8662, dated 6th December 1856, LLL.
do. „ 4033, dated 26th September 1857.

11. The projects submitted with the above letters and reports are those which were called for by Government after some correspondence with the Chief Engineer, but the Government are not disposed to take them at present into consideration, as the amount of the estimates already sanctioned for the Districts for which the above projects have been proposed is large. It will be useless to admit any more estimates for the Budget in those Districts as there is very little probability of their being sanctioned by the Government of India, under present financial circumstances. The estimates in question, as specified below, together with the papers sent up, will therefore be returned to the Chief Engineer, to be re-submitted hereafter.

Date of Chief Engineer's letter or Report.	Works.	Amount of Estimate.
	MASULIPATAM.	Rs.
LetterNo.3704, dated 15th Sept. 1857.	Forming a navigable Canal with its necessary masonry works from the Pettah Basin at Masulipatam to the Oopootair opposite Yailoorpaud and for a junction cutting from the main Canal to the tidal creek between the Oopootair and Buntosnully swamps...	1,78,000
	CUDDAPAH AND BELLARY.	
LetterNo.5123, dated 10th Nov. 1857.	Completing the entire line of road from Cuddapah to Bellary...	4,69,300
	NORTH ARCOT.	
LetterNo.4958, dated 4th Nov. 1857.	Constructing road with the requisite masonry works from Old Arcot to join Trunk road No. 1, at Arapaukum... ...	19,800
	Constructing do. with do. from Arnee through Poloor to the boundary of the South Arcot District at Pollyput or Calispaukum...	95,200
	Constructing do. with do. from the Palaur annicut to Timmery...	15,100
	MADURA.	
Report No. 8662, dated 6th Dec. 1856 LLL.	Re-constructing the road from Camoothee to Sayelgoody and constructing masonry works...	40,000
	CANARA.	
Report No. 4033, dated 26th Sept. 1857.	Constructing a second class road with bridges and Tunnels from Mullapoor on the south bank of the Kalanuddee or Black River viâ the Kygha Ghaut to Iddagoongy...	70,330

(Signed) H. FORBES,
Acting Secretary to Government.

Nellore.

No. 8662

23

Report upon a project for the improvement of the existing main irrigation Channel, called Jaffer Sahib Channel, and on the South bank of the Pennair, from the river Pennair, taken off immediately above the Anicut

Revenue

Improvement of River Channels from the Pennair Anicut upon the Southern bank of the river in the Nellore District.

Amount of Estimates.

	Rupees
Widening Jaffer Sahib Channel and improving the allipoore branch	34,000.
New Survapully channel	50000.
Improving Lacoor Channel New Channel to Nreda, mossilly and cut to Gungapatam Channel	15500.
Kistnapatam Main Channel and branches to 8 Villages	44,200
Total Rupees	143,700

One lac, forty three thousand, and seven hundred.

In

In sending up this project the District Engineer has reported minutely and in detail upon each of the works so that a farther discription could only be a mere repetition of his letter No. 1347/14122 of the 28th November 1856.

2. The main feature of the project may be understood by a reference to the Map upon which the existing Channels, the proposed new Channels, the Nellore Tank Channels and parts of old Channels proposed to be abandoned are distinctly Marked. The area of land for which it is calculated that water is required is 100 Square Miles, and the main or Jaffer Sahib Channel now in existence (and coloured blue on the plan, having its commencement immediately close to the Anicut) has been estimated to be widened to a breadth of 40 yards. which with a depth of 5 feet and fall of 6 inches per mile will in 5 months convey a sufficient supply of

water to irrigate 64,000 acres at 8,000 Cubic yards per acre, the secondary branches and minor irrigation Channels have been correctly regulated in capacity with reference to the areas requiring irrigation.

3. The slopes of the main Channels have been fixed with a view to rendering them navigable hereafter. and where the fall per mile is too great the level will be kept up by locks (to be Estimated for and proposed hereafter) in the mean while these falls will be constructed and protected in a temporary manner by pallmyras.

4. The first 750 yards of the present Jaffer Sahib Channel runs with a width of from 22 to 50 though hard laterite and varies in depth from 8 to 15 feet, the Estimated cost of repairing this and widening it to 120 feet will cost 23,243. in which an item of 2,454 Rupees is included for a dividing dam

dam for the two principal ducts. The remaining portion of the Estimate of Rupees 10,757 is for straightening and thoroughly repairing the Channel to Allipooram a distance of 3,830 yards.

5. The second Estimate of Rupees 50,000 is for cutting a new Channel with a width of 50. yards from the first Division Dam to the existing Suvarpilly Channel, the most important branch Channel under the anicut. Commanding an area of 40727 acres. it has a fall of 8" per mile and will give off two branch Channels one to irrigate 10,000 acres to the East ward of the Kistnapatam road

* See Estimate for Rupees 44,200.

and intended hereafter to form, by the construction of locks, the navigable Channel to Kistnapatam in connection with the Eastern Coast Canal.

6. The second branch is not yet estimated for.

7. By the construction of the 1st Channel, the whole of the tanks and lands now irrigated by the Suvarpilly Channel, the present entrance to which is to the north of the town of Nellore and uninfluenced by the anicut, will be brought under its influence.

8. The direct gain to Government, would, as calculated by the Collector, be, Rupees 7,483, which is the difference between the Ayacut and the highest years revenue, and Rupees 6,008 of fresh land brought under cultivation.

9. The Collector urges the construction of this Channel from the fact

fact, of the very marked difference there is in the state of the Crops under the Jaffersahib Channel, and these which have at present but a precarious supply — and is of opinion; that as the smaller branches are constructed, bringing Village after Village, under the influence of the River, there will be but little doubt of success in realizing the above expectations.

10. The 3d Estimate, amounts to Rupees 15,000, and is for the improvement and extension of Irrigation under the Alliparam branch of the Jaffersahib Channel; the first item in the Estimate is for a division head for the minor Channels; branching off just to the North of Goodyputty pand, but the Southern system of branch Channels from it, are proposed to be postponed, till a another year: Taking the northern branch Channels, it is proposed to abandon the Indaconpett Channel which

which is very sinuous and to widen the Labour Channel, making it serve for the lands under the two — the Channel will be extended to the lands of Reedamoosaly and Goodyvelly Pollium, which have at present no connection with the river, and the lands of which, are about 3 square miles in extent.

11. The new cut from Anacoopoor to Injipand and Samarazapully, will obviate the necessity of the erection of the Aqueduct across the Vaithee Perinaikem an Estimate for which, amounting to, Rupees, 6,130 was conditionally sanctioned by Government, on the 29th February 1856.

12. The cost of this cut is but 1,150 One thousand One hundred and fifty, Rupees, and brings the lands directly under the influence of the Anicut which the Aqueduct did not do

do- It will also supersede the old Gungapatam Channel from the Pen.
-nair, the head of which is 4 Miles below the Anicut, and should be aban.
-doned.

13. The 4th Estimate, amounts to Rupees 44000 Forty four, thousand and is for cutting a Channel from the Survapully new Channel near Nellore and close to where it crosses the Kistnapatam road to irrigate 8 Vil.
-lages situated between Bramadava.
-dum bridge and Kistnapatam.

14. This Channel will eventually be made navigable and form the connecting or junction Canal, between Kistnapatam, on the Eastern Coast Canal and Nellore, with this end in view, the slope has been laid out at 8" a Mile

and

4!

and the sites for the drops have been selected with a view to their ultimate conversion into locks. The ryots have agreed to cultivate at once, lands bearing an assessment of Rupees 6,808, the available land is 17 Square miles for which area the size of the Channel has been calculated..

15 The branches from this Channel have not been Estimated for entirely- and those that have been Estimated for, have been Calculated, as a com-
-mencement, to convey double the quantity of water, required for their present cultivation- the District Engineer states that want of Surveyors has compelled him to postpone the full development of the Channels till another year, and because he has not had time to Calculate with exactitude the size of his masonry heads, to minor channels, he has also omitted their cost.-

16 In addition to the estimates now for-
-warded, and which for the reasons above stated, as to

to depth of cutting and nature of soil, are comparatively expensive, the district Engineer calculates that for next year, Estimates will be submitted to the amount of 150,000 Rupees for fully completing the irrigation minor channels, Head. Sluices. bridges of Communication &c and 60,000 for the locks for the navigation South of the Pennaur.-

17. Looking at the above worked with regard to their revenue results. it may be stated with fairness that there will be 61,000 acres of land at 5 Rupees an acre giving a revenue of Rupees 320,000 from which is to be deducted 90,000, the present amount. Collection, there will be left 230,000 Rupees of profit from which probably 1/3 may be deducted as maintenance and 1/3 for maintenance, leaving a clear gain of Rupees 192,500.-

The outlay is as follows:-

Cost of anicut and repairs——113,000

Estimates now Submitted——————113,700

Estimates for next year——150,000.

Locks——&c——60,000.

4,66,700.

Thus there will be a gain of 42 per cent.

The Estimate and plans are prepared by Lieutenant Mullins and the Calculations of the Size of Channels with their Slopes and discharge have been carefully prepared by Lieutenant Mullins and Captain Retheridon, whose name is also attached to them, the expenses are fairly stated and the rate those at which it is calculated that the work may be expected to be done.-

I recommend the above Estimates, 4 in Number, viz. 34,000 Rupees. 50,000 Rupees 15500 Rupees and 44,200 each to be Sanctioned and entered in the Budget for 1857/58.-

Central Office of Public Works,
Fort Saint George,
6th December 1856.

Arthur Cotton Colonel of Engrs
Chief Engineer P.W.

Documents

Comp.
F.L.C.

Documents accompanying

1 Letter from District Engr. Ganjam dated 29th November 1856. No 1

1 do from Collr. of Vizagapatam No 335 dated 22d do No 2

1 do from do No 366 dated 26th do No 3

1 Statement of Ayacut Cultivation No 4

1 Table of Vizagapatam Channels &c No 5

1 Sketch of Channels under the Anicut No 6

4 Abstract Estimates Nos 7, 8, 9 & 10

2 Reports on Bridges Nos 11 & 12

11 Plans Nos 13, 14, 15 & 16, 17, 18, 19 20, 21 & 22 & 23

To

The Secretary to Government

F. W. D.

Recd

G-W Consltg 7th March/56 No 26 to 45

UUUUU

Public Works 1856 2d Department
Dt to Govt 1st Dec/57.
No. 2885.

VV

From
The Chief Engineer

To
The Secretary to Government M.P.D.

Date 6th December 1856.
Received 9th " "

No 8662

23 Enclosures Estimate
1 Map Returned

Forwarded for sanction, and entry in the Budget of 1857/58 - various Estimates amounting in the aggregate to Rupees 1,43,700/ One lac forty three thousand, seven hundred for improving the irrigation under the Cannais on the South side of the River in the District of Nellore.

No 35.

c 29 Dec

Madura District. No 8662

47

Public Roads.

Report on an estimate for repairing and improving Road No 2 in the Madura District, extending from Dindigul to the Amravaty River at the District boundary on route to Palghaut and Coimbatore, Rupees 27.000—

In letter to the Chief Engineer No 283 of the 20th October 1856.

1. This work is recommended by Lieutenant Scott, with the concurrence of the Collector; the length of road is about 47 miles, and the proposed expenditure amounts to about 565 Rupees per mile including all masonry works.

2. When this estimate is worked out, and the bridges over the Amravaty and Shunmoogum Nuddie completed, No 2 will be a very good and important road from Madura to the Western Coast, and the Railway.

Vide Return of Traffic accompanying

3. The traffic is already considerable being about 1660 Carts, and 900 pack bullocks in one month. The past expenditure has averaged 1960 Rupees per annum.

4. The principal masonry work is a bridge of 3 Arches over the Mangurie Nuddy deep and rapid mountain torrent 70 feet broad

for

for the construction of which ample provision appears to have been made.

5. The other works of Masonry are small and appropriate, due allowance has been made for Superintendence, and for Contingencies.

6. The rates appear rather high, but not more so than are probably required to secure the rapid and efficient execution of the work; and the estimate is accordingly recommended for entry in the Budget of 1857/58.

Central Office of C.E.
Fort Saint George
6th Decr. 1856.

A.R. Cotton Colonel.
Chief Engineer

To

The Secretary to Government
Public Works Department.

List of accompanying Papers.

One Letter from the District Engineer Madura
No. 283 of the 20th October 1856. ---------- F'1.
One Statement of Expenditure during the last 10 years. --- F'2
One Return of Traffic on Road No. 2. ---------- F'3.
One Abstract Estimate amounting to Rupees 27,000. -- F'4.
Five Plans. ---------- F'5, 6, 7, 8 and 9.

P.A. Mills

Pub. Works 856 Dept. Sept 57 F
Dto Aug 1st No 2766

From

The Chief Engineer

To

The Secretary to Government
Public Works Dept.

Dated 6th
Rec'd 9th } August 1856.

9 Encls. Returned 26 Encs 5-9-57

No 8662.

Forwarded for sanction & entry in the Budget of 1857/58 an estimate of Rupees (27,000) Twenty seven thousand for repairing and improving Road No 2, in the Madura District extending from Dindigul to the Aviramby River at the District boundary on route to Calghaut and Coimbatore.

No 36.

No 271

From

J. Bird Esquire
Collector of Trichinopoly

To

Lieutenant J. G. Pigues
District Engineer of Trichinopoly

Sir

I have no hesitation whatever in concurring with you in the expediency of thoroughly repairing the Coimbatore Road No 10, and metalling it throughout - I have the honor therefore to return Your Estimate amounting to Rupees 30,000, duly countersigned.

2 My letter No 101 of date the 10th May 1856 addressed to the Chief Engineer pointed out the necessity of heavy outlay and repair on this line of Communication - And Colonel Faber acquiesced in opinion with me, but for reasons set forth in his reply No 3485 dated the 23rd May last did not sanction immediate repair.

It seems unnecessary for me to say more on the subject.

3 Your Estimate for making this a

a metalled road is good policy, and will be the most economical for Government in the end.

Trichinopoly
Collr's Office
17th November 1836

I have &c.

/Signed/ J. Bird
Collector

/True copy/

H. Taylor. Lieut
District Engineer
Trichinopoly

Folio 6 Dec/16 No 8662

ZZZ2

Copy of the Collector's
Letter No. 971 dated
17th December 1856
Regarding Construction
Road Estimate

No 8662

Report on Estimate for repairing and
travelling the road from Trichinopoly
to Combatore within the limits of the
former Cudlack Rupees 30,000.-

Trichinopoly
District

Public
Roads

This piece of the most
important lines of road in the South,
and the traffic on it, is proportionably
great, viz 120 Carts, and an equal —
number of bullocks daily. The road in
has never been perfectly constructed —
but it is bridged, and tunnelled. throughout
out, and the object of the present esti-
mate is to give the surface a complete
coating of gravel, or measure in which
the Collector fully Concurs.-

As letter to the District
Engr No 271 dated 17th
November 1856 -

2. The work appears to be
one of those, the necessity of which —
cannot be questioned, and the rates
being as moderate as the distance
of Carriage admits, the estimate is re-
commended for Sanction.-

3. Lieutenant Rymer states that
on the completion of the work
a maintenance allowance of 105 Rs
per

per mile or Rupees 4200 for the whole line will be required for the roads an opinion in which I entirely agree, and for order to be indispensable for an ultimately economical management of a road suitable for promoting a regular traffic.—

Central Office of Pr.
Fort St. George
6th Decr 50.

Chief Engr

List of accompanying Papers
One Letter No. 475 of 15th Nov. 50. from District
Engr Trichinopoly ..... Z.Z.Z.1.
1 Original Copy of Colonel Letter No. 271 of 4th Nov. 50. Z.Z.Z.2.
1 Estt. of Rs. 30,000— ..... Z.Z.Z.3.

Lt. Mills

Comm 15th August/57 R.o 5-6.

ZZZ

Public Works 1856 Depart.
Dto Comm 1st Dec.r/57
No. 2838

From

The Chief Engineer

To

The Secy to Govern.t
Fort St. Geo.

Dated 6.
Recd 9th Dec.r/56
Enclosures 3

No. 8662

Forwards for sanction and entry in the Budget of 1857/58 an Estimate for Rupees (30,000) Thirty thousand, for repairing and gravelling the road from Tuckenapoly to Dindigul to extend within the limits of Tuckenapoly District

No 37.

c23. Inv.o 29.

59

North Arcot
District Engineers Office

No 415

From

Lieutenant J. B. Mayne,
Acting District Engineer
of North Arcot

To

Colonel C. E. Faber
Chief Engineer D. P. W.
Fort Saint George

Sir

With reference to a Memo: No 74 of the 27th Ultimo from the Acting Superintending Engineer Northern Circle I have the honor to submit an Estimate for constructing a 1st Class District Road from the Railway Station at Conjeveram in Chingleput District amounting to Rupees (29100 nine) Twenty nine thousand and one hundred.—

I have the honor to be
Sir,
Your Most Obedient Servant

North Arcot
District Engineers Office
Camp Arcot 26th March 1857

J. B. Mayne Lieutenant
Acting District Engineer

No 863.

North Arcot

and

Chingleput Districts

Public

Roads

Report on an Estimate prepared by Captain Barber Executive Engineer for constructing a 1st Class District road from the Railway Station at Conjeveram to Conjeveram, a distance of 17½ Miles.

1 Amount of Estimate Rupees (29,100) Twenty nine Thousand and one hundred. Comprising the following items

542700	C.Y.s Earth work at 1 per C.Y.	1429
105534	D° Gravelling at 2 D°	1319
280362	D° D° 6 D°	10514
23615	Sq.s C.s Turfing at 30 per Sq.s C.s	401
17½	Miles Avenue trees at 00.50 per Mile	875
17	Mile Stones each Rupees 3-8	60
6	Bridges from 3 Arches of 15 feet to 6 Arches of 30 feet Span	7440
32	Tunnels and Small bridges from 1 Vent of ½ feet to 10 feet Span	1953
	Road dams from 8 to 30 feet long	377
3	Road dams and tunnels combined from 20 to 150 feet long	955
	Superintendence and Sundries	1777
	Total Rupees	29100

2 The top Surface of the Road is to be 6 Yards in width, of which 4 Yards are to be gravelled 9 inches thick

the

What

To Govt of Fort St George dated 28th Jany 1863

From Captain [illegible] Executive Engineer acting Director Public Works Department

Dated 28th January 1857

Received 31st [illegible]

No 1115

Sir

I have the honor to transmit herewith for the sanction of Government Estimate for Rs 29100 for constructing a Road from the Railway Station at Conjeveram to Conjeveram a distance of 17½ Miles.

I have &c

Sd/ [illegible]

the side Slopes of the embankments are to have generally a Slope of 3 to 1, and where the Road is raised more than ½ of a Yard, are to be turfed.—

3 The bridge across the Nagavadoo Surplus Channel is to have 3 Segmental Arches of 20 feet Span - the foundations to be 6 feet in depth, resting on hard gravel - the height of piers and Abutments is to be 3 feet, and the versed Sine of the Arches 2½ feet - the Clear width of Roadway between parapet walls is to be 15 feet.—

4 The bridge across the River Nundiyaur is also to have 3 Segmental Arches, only of 15 feet Span, instead of 20 feet - the foundations to be 5 feet, in depth resting on clay - the height of piers and Abutments, the versed Sine of the Arches and width of Roadway to be the Same as for the Nagavadoo bridge.—

5 The bridge across the River Coortalier is to have 6 Segmental Arches of 30 feet Span - The foundations to be 6 feet in depth resting on Rock - the height of piers and Abutments is to be 7 feet, and the versed Sine of the Arches 7½ feet - the width of Roadway to be as for the Nagavadoo bridge.

6 The bridge across the Govindavady Surplus channel is to have 6 Segmental Arches of 15 feet Span - the foundations to be 4½ feet in depth resting on clay - the height of piers and Abutments the versed Sine of the Arches, and width of Roadway to be the Same as for the Nagavadoo bridge.

7 In all these bridges the foundations are to be of Rough Stone, and the Superstructures of Brick in Chunam.—

The

8 The Road proposed to be constructed will complete the line of communication from Trichinopoly and Pondicherry via Tinderanum, Wandewash, Conjeveram (crossing Trunk Road No. 1 between Baulchetty's and Rajah's Chaultries) to the Railway at Coompanypett, and thence to Tritany, Naggery, Curcumbaddy and so on to Cuddapah.—

9 The Road for which the Estimate is now forwarded, is one of those noticed in Ex: Mins: Cons: No. 2319 dated 16th December 1856, and as Government have observed that the Estimate will receive immediate attention, with reference to the Consulting Engineer's opinion, the Chief Engineer does not consider it necessary to enter further into details respecting it, beyond stating, that the rates allowed for the work are moderate and Sufficient.

10 For the other Road noticed in the order of the 16th December 1856, an Estimate of Rupees (13,180) thirteen thousand one hundred and eighty was Sanctioned for entry in the Budget of 1857/58, for the portion from Coompanypett to Tritany, and an Estimate of Rupees (19,040) Nineteen thousand and forty, for the remaining portion from Tritany to Naggery was directed to be resubmitted for entry in the Budget of 1858/59 Vide Ex: Mins: Cons: No. 1164 dated 4th March 1857.

Central Office of Works,
Fort Saint George,
12nd June 1857.

G. Chesney Colonel.
Chief Engineer.

Documents

Documents Accompanying.

1 Letter. No. 15 dated 26th March 1857. F, ✓

1 Abstract Estimate. F₂

1 Report. F₃

11 Plans. F. 4-5-6-7-8-9-10-11-12-13 and 14.

1 Survey. F₁₅.

15 v.

To,

The Secretary to Government

P. W. D.

Comm 16th March 57 No 1 to 28
" 16 Dec 56 — 103 to 106.

Pub Lr & Wks 57 Department
Dto Cons 1st Dept
No 1145

From, The Chief Engineer

To, The Secretary to Government C.W.D.

Dated 2nd } June 1857
Received 4th }

No 863.

Enclosures 15.

Report on an Estimate of Rupees (29100) twenty Nine thousand & one hundred prepared by Captain Barber Executive Engineer for constructing a 1st Class District Road from the Railway Station at [illegible] Canjeveram a distance of 17½ miles in the Districts of N. Arcot and Chingleput and recommending its sanction and entry in the Budget of 1857/58.

No 38.

District Engineers Office Malabar
Cannanore 3rd November 1857

No 1135

From

Lieutenant J. Bean
District Engineer
Malabar

To

Colonel C.E. Faber
Chief Engineer D.P.W.

Sir

I have the honor to reply to the instructions contained in your Extract of Proceedings × desiring me to report for the information of Government on the expenditure hitherto incurred for metalling and annual repairs of the Trunk Road No 4. agreeably to the 8th paragraph of their Minutes of Consultation No 1156 dated 29th August 1857.

× No 3445 dated 7th September 57

2. I have not replied sooner to your instructions because I had to make an Estimate for the repair and improvement of this Road, and to apply for certain accounts from the Collector as the Records of my Office afforded little information on the past expenditure. I wrote to the Collector on the 9th and 25th September on the subject but as yet have received no replies. In the last official year and prior to my taking charge of the District I find that

that a sum of Rupees 3940—5—2 was expended in Repairs out of the Annual allowance of Rupees 6800. but for this Amount owing to a want of proper Supervision very efficient Repairs were not undertaken, Sufficient Lengths of side drains and cuttings were not made, and the Road in many places not properly levelled and Sloped.

3 As regards the metalling which was to have been laid on the Ghaut agreeably to an Estimate of Rupees 11824—10—11 sanctioned by Government on the 2d December 1853. folio 26. it appears that Captain Francis in his Diary of March 1855 Remarked on this work which was then in progress, and Reported that inferior material was being brought to the Spot at the expence of 3 Annas a Cubic yard and Recommended that the Rate should be Raised.

4 I found on my joining the District in January last that on an Estimate of Rupees 5000 which was Sanctioned by Government on the 12th November 1856, a few heaps of stone were being collected on the side of the Perambaddy Ghaut for metalling the Road. This work was progressing as fast as the great dearth of Cooly labour in these unhealthy Jungles would allow, and

Rupees 2047—2—11 had been expended in Coorg and Malabar up to the 30th April, when I received orders from the Superintending Engineer Southern Circle to transfer the Coorg Division work, —

× Rs 6297—14— " amounting to the greater portion of the Estimate to the Chief Engineer Mysore which was accordingly done though I could not send the Amount remaining as balance, Rupees 14440—3 to that officer until

× Rupees 5000 " " the 10th September last. The Annual allowance for repairing the same portion of the Road was paid to Colonel Green on the 10th June.

× Rupees 2830 " 5 I have also the honor to enclose an Estimate for making the Road in an efficient state throughout, which includes the metalling of the worst portions of the Road, namely the Perambaddy Ghaut and near Canote and Trichy. The portion of this Estimate which falls within the Coorg District has been measured by the Overseer of the Mysore Division. As much Rain falls on this Line, and the Coast Monsoon is so violent in its action on all our Communications in Malabar, I do not think that an Estimate, other than one of large Amount, will suffice for effectually preserving the Road in

thorough

thorough good Repair.

6 The Ghaut throughout and portions of the Road are in very bad order and almost impassable in the Monsoon, and I believe this fact has again lately been brought to the notice of Government by the acting Collector. The Reasons, though traceable to a great extent to careless Supervision, are also the very heavy Rains which fall, and the great difficulty of procuring labour in Jungles where provisions are scarce and the climate most unhealthy. This latter difficulty has been felt in metalling the Road, and especially so in the absence of efficient Superintendents. I do not hesitate to say that money appears to have been wasted on the Road or ever unaccounted for, but I would observe that this Road has been most unfortunate in the class of men who have been over it. Mr. Church's career is well known, and when he left this District in July 1856 he had not been able for 6 months to superintend the work, and Conductor Drysdale who joined in December last died from the effects of intemperance on the 9th February. From that date I applied for special assistance for this Road and pointed out the important works which were to be

undertaken on it, but it was not until 4th June that I received the services of Corporal Thew Overseer Savejoy, and he was Remanded to his Regiment from the 1st. August last.

7 In the interval the work has been superintended by a Brahmin Maistry who owing to his long service of the Road has been still employed on it but of whose knowledge and efficiency I have the lowest opinion without my being able to replace him in this duty.

8 With the growing importance of this Military and Commercial line, I would urge the importance of any having the services of an Officer or Subordinate who's health could withstand the effects of a bad climate and who has had experience in Bridge building.

9 Besides the Kullarlodu Bridge on this line, Government in their Extract of Minutes of Consultation No. 1909 dated 10 October 1857 have sanctioned an Estimate amounting to Rupees 29,523-5-9 for the Irrity Bridge and the plan is to be a Wooden Truss which will require great care in its execution and for this work alone even a European Superintendent would be of some

Services

the service.

10 . Agreeably to the above order of Govern-
ment I also enclose a Sketch . Map Showing
the nature of the soil through which the Trunk
Road runs, with the metalled portions.

I have the honor to be
Sir
Your most Obedient Servt

J Rees

Dist Engr Malabar.

Revised Estimate of the probable expense of Metalling & Gravelling Kunuk Road 30½ between Inyene & Cannanore including the Bonnabarry Crunk. Length 68 Miles

	Rupees	
	Rup.	As. Rup.
42 Miles of Gravelling at 1500 Cyds		
½ Mile being 63,000 Cyds	6 per	23625 ..
26 Miles of Metalling at 1500 Cyds		
½ Mile being 39,000 Cyds	14 "	48750 ..
Contingencies		1325 ..
		73700 ..
Deduct amount Sanctioned on the 12th November 1856 and 29th August 1857		12700 ..
Total Company's Rupees Sixty one thousand		61000 ..

Estimate Office 22nd Sept. 1857

Exd. S. George Lt. Engrs

Offg Supt. Surveyor

Offg Supt. Engr. S. Circle

Examd

Offg. Supt. Engr. S. Circle

Comp. H

Dupl.

Estimate of the Probable Expense of Repairing and Metalling Road from Kunuk Cannanore to Tellicherry 18½ Miles

S. George Lt. Engrs

Offg Supt. Surveyor

Dated 12th November 1856

Examd

Offg Supt. Engr. S. Circle

Approved and Estimate sanctioned to the same.

Offg Supt. Engr. S. Circle

Public. (roads) [New Work]

Abstract of Estimate № of 185 /5

Trunk Road № 4.

District. Malabar

Work. Metalling and Gravelling Trunk Road № 4 agreeably to the order of Government under date the 29th Aug 1857 Rs 1856-

Quantities	Description of Work	Rate Rs	as	P.	Amount Rupees	Amount for each part Rupees
C. Yds.						
26,400	Metalling Road ———	1	"	"	26.400	
	Gravelling Do ———	"	4	"	13200	
	Superintendence for 2 years				1440	
					41,040	
	Deduct Amount Sanctioned on the 12th Sept 1856 & 29th August 1857				12,700	
	Total Company's Rupees					28,340

Examined & Recommended for Sanction

Dy Conservator of Forests Canara

12th Sept 1857.

(Sd) A Bean

Dy Supt Malabar

True Abstract

(Sd) [illegible]

Supg Supt Sth Cn.

Examined

(Sd) [illegible]

Supt Sth Cn.

Examined

(Sd) [illegible]

Secy to Govt

9th Oct 1857

Enclosure

Inv. Report

From The Chief Engineer
To The Secretary to Government
1857

Dated 12th Nov. 1857.
Rec'd.

No. 5184

No 2248/57

Abstract Estimate for metalling and Gravelling Trunk Road between Mylapore and Pannamcaree including the Prambadi Thank in the District of Malabar.

Amounting to Compd Rupees 28340.

Report by the Superintending Engineer Southern Circle on an Estimate for metalling and Gravelling Trunk Road from including the Prambadi Thank prepared agreeably to the orders of Government recorded in Ex: Mins: Cons: No. 1656 dated 29th August 1857.-

Malabar District

Public.

1. Lieutenant Bean has not fully complied with the order quoted above inasmuch as he as not furnished any satisfactory accounts of the past expenditure on the Road, but his reasons for the failure are perfectly valid.

2. The present estimate of Rupees 28,340 is in my opinion insufficient as the dimensions 4 yards in width allowed for metal and Gravel are not such as the importance of the Road and traffic requires, nor do I think the Ratio are high enough.

3. I beg to annex a Revised estimate amounting to Rupees 61,000. which differs from my former calculation by my having allowed 9 inch metal

metab for only a portion of the distance 126 miles and having measured the Slabs proportionally. The quantity of Metal and Granite allowed for each mile is 1500 Cubic Yards as before.

4. Lieutenant Brandreth on the necessity of placing these works under the Superintendence of a qualified Officer or Subordinate and I need not add my Passport to his views on this point.

5. With reference to Lieut. Brandreth's Plan and Estimate I beg that he received orders from me to transfer the Corps Division work to the Chief Engineer of Malabar, I may observe that he has previously been instructed to do so by the Chief Engineer Dr. as shewn in my Minute of the 2d November 1857.

6 I am of opinion that this work is urgently necessary and that no time should be lost in carrying it into execution after the Commencement of 1858/59 in the beginning of which

which it should be entered.

Central Office of P.W.
Fort St George
12 Nov 1857

Lt Colonel
Supg Engr Southern Circle

Lieut Fisher Colonel
Chief Engineer,

To
The Chief Engineer Dr. P.W.

List of Papers accompanying
1 Original Letter from the Dy Engr Madura
No 1135 of 3d Nov/57.
1 Abstract Estimate Rs 61.000
1 Sketch Map.
1 Abstract Estimate Rs 28340

W. Brereton

4565 | 135854

Public Works 1857 Coimbatore
No 216 Coimbatore 2nd November. No. 2245.

From The Chief Engineer
To The Secretary to Govt
P.W.D.

Date 12th
Rec'd 13th Nov 1857.

No 5184

Encl: 4 Returned
Encl: 1/13

Forwarded for orders
the Board 16th Nov 1857
Recommended Estimate
Rs 16,000 of Expenditure thereon
for metalling & fencing
from the Road Metal
in the Coimbatore Collectorate
in the Secretary Section

No 216

District Engineer's Office 85
Coimbatore 2nd November 1857

From

Captain C. M. Francis
District Engineer
Coimbatore

To,

Colonel C. E. Faber
Chief Engineer
D.P.W.
Fort St. George

Sir,

I have the honor to submit an Estimate for metalling the new Jackatallah road as well as for parapets in obedience to Extract of Minutes of Consultation No 1993 dated 23 Octr 1857

The metalling is for the whole road from Coonoor bridge to Lascelles Lake.

6th October 1853
22d Septr 55
19th Octr. 55 Margin but no metalling was included
Sanctioned and in the original Estimates.

31,477
3759 Expenditure

This road was sanctioned as per

I have the honorable
Sir,
Your most Obedt. Servt
Francis
District Engineer

Rept N. Parsons

4563 | 135854

Central Office of Rys
Fort St. George
16 November 1857

No. 5240.

From

The Chief Engineer

To

The Secretary to Government Pro.

Sir,

With reference to Pro. Mins. Cons. No. 1993, dated 23rd October 1857, I have the honor to forward an Estimate amounting to Rupees 32,000/ thirty two thousand, for metalling and constructing parapet walls to the road between Coonoor, Sockatallah and Cotacamund.-

2. The road has been Rupees 37,596 in construction without metal; but its dangerous and yet important character demands that its efficiency be completed, and the parapet walls are also very much required for the protection of passengers and traffic as the line runs along some steep precipices.-

I.

Public.

Enc 2.

4563 | 1858½

No. 5240 dated 16th Nov 1857

From
The Chief Engineer

To
The Secretary to Government

Dated Fort St. George 16th November 1857

Received 21st

Entered

Assistant

Submitting Estimate for Rupees 32,000 for metalling and constructing parapet walls on the road between Coonoor, Sockatallah and Cotacamund.

3. I beg to recommend the Estimate the Value of which are satisfactory for entry in the Budget of 1858/59.

4. The total amount Sanctioned for the Construction of this Road is Rupees 31,477, under the following dates viz;

6th October 1853 No 376 } 15,000-
5 " 1857 5 " 3334-8

19th Oct/58 No 701 " 13,143.

Rupees 31,477.

I have the honor to be
Sir,
Your most obt Servt

Fort St George
16th Octr/58

Lt Col. Asstt Qr Mr Genl
Chief Engr

S. S. S. Circle

To The Secretary to Government
P.W.D.

Comp HH

10th	Moore in Chittoor					4563	13585½

Central Office of Pub: Works.
Fort St. George 5 September 1857.

No. 3704

From The Chief Engineer

To The Secretary to Government
Public Works Department

Sir,

In Extract Minutes Consultation No. 770, dated 23d April 1857. Government directed Estimates to be prepared, and submitted in time for entry in the Budget of 1858/59. for establishing a water communication between Masulipatam and the Godavery, and for making provision to facilitate the export of salt from the Buntomilly pans, by improving the existing creek between the Ooroolair and the Buntomilly swamps.—

The District Engineer of the Kistnah Division in his letter No. 69, of the 4th Ultimo, now submits an Estimate for the formation of a Navigable Canal [length 30-5-129-] with its necessary masonry works, from the Pettah basin at Masulipatam to the Ooroolair, at a point opposite Yalloorpandi, where the Seeed Channel from the Godavery falls into that drainage, and for a junction Cutting, 2000 Yards in length, from the main Canal near Looraimparide, to the tidal creeks between the Ooroolair and the Buntomilly swamps.

to

Public Navigable Canals

Encls 5. (Vide the Index of this letter for particulars)

Rec'd 16 Sept. 1857.
No 5240.
Enclosure 2.

Estimate for establishing an Ordinary Canal between Masulipatam and the Godavery.

Rec'd 16 Sept. 1857.
No 5241.
Enclosure 3.

Sketch Plan of Canal from Masulipatam to the Godavery.

Rec'd 16 Sept. 1857.
No 5242.
Enclosure 4.

Sketch Plan of Canal from Masulipatam to the Godavery.

Rec'd 16 Sept. 1857.
No 5243.
Enclosure 5.

Sketch Plan of Canal from Masulipatam to the Godavery.

No 440.

to complete the navigation from the Nurrapoor Channel by means of the Ootacolair, with the Salt pans.—

3. The Estimate as shown in the accompanying Abstract provides.—

Excavating Main Channel	Rupees	103930--
——do——Junction——do.		6075-
——do——outside drain		2885--
Constructing Locks with bridges over the basin at Masulipatam		11182--
——do——do——for junction Canals		11182--
——do——do——Locks into Ootacolair		9000-
——do——2 Caliguluks each Rs 3974-14-		7950--
——do——2——do——each——2681		5362-
——do——1——do		3394--
Contingencies Sundries Rs at 10 p.c Agent		16440--
Total Rupees		178000-

One lac and Seventy eight thousands.—

4. The approval of the Local authorities to the project having been communicated to Government with a letter No. 1058. dated 9th February 1857. from the Acting Superintending Engineer on Northern Circle, then in Charge of the Central Office it appears unnecessary to recapitulate what has already been fully stated. and it merely remains for me to observe, that I consider the proposed arrangements most skilful, and judicious, and that the Estimate is framed on moderate and sufficient data.—

As

5. As the aggregate required by this project is in excess of the competency of the Government of India, and as the improvement is one, the importance, not to say necessity of which has already been fully admitted. I venture to take the liberty of proposing, that as special application be at once made for the allowances of this project by the Home authorities, so that on being included in the Budget for 1858/59, it may at once be authorized for execution with the already received sanction of the Honorable Court.—

I have the honor to be,
Sir,
Your most Obedient Servant

W. Fraser Colonel
Chief Engineer

To
W. Sec. Govt. M.C.

To
The Secretary to Government
Public Works Department

List of Enclosures.
1 Letter from the D. Engr M.C. dated 4th Augt 1857 No 69.
1 Abstract Estimate
3 Plans.

10th	Mound in Channel	Rupees			4565	135854
	Contingent Allowance					

Public, (roads) (New Work)

Abstract of Estimate No. of 185 .5

Road No.

District. Masulipatam

Work for Constructing a Navigable Canal from the Pettah Basin at Masulipatam to the Oopputair with the Necessary Masonry drainage works & for a Junction Canal near Poomilly, with a Saltwater creek connecting with the Oopputair & Narsapore Canals –

Quantities	Description of Work	Rate Rs.	Rate As.	Rate P.	Amount	Amount for each part
C. Yds.					Rupees	Rupees
1st yd. 1160156⅔	Earthwork — per C. yd.	"	"	9	54382	
2nd yd. 727934⅔	Do. — Do.	"	"	11	41705	
115830	Do. Do. — Do.		1	1	7843	103930
3rd yd. 64800	Do. Do. — Do.	"	1	6	6075	6075
61548⅓	— Do. — Do.	"	"	9	2885	2885
	Constructing Lock with the Addition of a Bridge near the Basin at Masulipatam					
1419½	Stone in Chunam — per C. yd.	4	8	"	6388	
24	Brick in Chunam — Do.	4	"	"	96	
204	Cut Stone — Do.	10	"	"	2040	
	94 Wells — Each	7	"	"	658	
	2 Sets of Gates complete				1000	
	Excavating foundation baling water &c.				1000	
	Forming approaches to Bridge				300	
						11482
	Constructing another similar Lock for the Junction Canal					11482
	Constructing Lock					
1014	Stone in Chunam — per C. yd.	4	8	"	4563	
	Carried over				4563	135854

Cons. 28th Apl/59 No. 50 & 61.

Public Works 1858 Department

No. 1864.

From The Chief Engineer

To The Secretary to Government

Dated 5th September 1857

Public Abstract

Quantities	Description of Work	Rate			Amount	Amount for each part
C Yds.		Rs	As	Ps	Rupees	Rupees
	Brought forward				4563	135854
190½	Cut Stone ——— ₱ Cyd	10	"	"	1905	
	76 Wells ——— Each	7	"	"	532	
	2 Sets of Gates complete				1000	
	Excavating foundation Calingulah water Way ———				1000	9000
	Calingulah 150 feet waterway with Salfacing Shutters					
579	Stone in Chunam ——— ₱ Cyd	4	8	"	2606	
71½	Squares of Plastering ——— ₱ Sq	2	8	"	179	
320	Loose Stone ——— ₱ Cyd	1	"	"	320	
40	Iron Posts ——— Each	10	"	"	400	
30	Shutters ——— Do	3	"	"	90	
30	Beams over Piers ——— Do	6	"	"	180	
	Palmyra planking for Bridge Railing ₱ Yard				100	
	Excavating foundation ———				100	
					3975	
	For another Similar Calingulah				3975	7950
	Calingulah of 150 feet Waterway					
574	Stone in Chunam ——— ₱ Cyd	4	8	"	2583	
64½	Squares of Plastering ——— ₱ Sq	2	8	"	161	
270	Loose Stone ——— ₱ Cyd	1	"	"	270	
30	Beams over Piers - Each	6	"	"	180	
	Palmyrah planking for Bridge Railing ₱ Yard				100	
	Excavating foundation ———				100	
	Calingulah of 100 feet Waterway					3394
453	Stone in Chunam ——— ₱ Cyd	4	8	"	2039	

Quantities	Description of work	Rate			Amount	Amount for each part
	Brought forward				2039	156198
55	Squares of Plastering ——— ₱ Sq	2	8	"	137	
215	Loose Stone ——— ₱ Cyd	1	"	"	215	
	30 Beams over Piers ——— Each	5	"	"	150	
	Palmyra Planking for Bridge Railing ₱ Yard				60	
	Excavating foundation ———				80	
					2681	
	For another similar Calingulah				2681	5362
						161560
	Contingencies Sundries ₱ Year at 10 ₱ Cent					16440
	Total Company's Rupees					178000

Central Office of P.W.
Fort Saint George
15 September 1857

Alex Taylor Colonel
Chief Engineer D.P.W.

W
A.D.C. Engr. to C.

Enclosure

Encl. Letter

From

The Chief Engineer
D. P. W.

To

The Secretary to Govt.
D. P. W.

Dated 15th Dec 1864

Received 3rd Jan 1865

No 1864/57

No 3764

Abstract Estimate for Constructing a Navigable Canal from the Pettah Basin at Masulipatam to the Doshpootair with the Necessary masonry drainage works, and for a junction Canal near Buntoomilly with a salt water creek connecting with the Doshpootair and Divisalore Canals in the District of Masulipatam.—

Amounting to C. Rs. 1,78,000—

Public (roads). (New Work.)

Abstract of Estimate No. of 185 1/5

Road No.

Districts Cuddapah and Bellary.

Work. Constructing a road from Cuddapah to Bellary.

Quantities	Description of Work	Rate			Amount	Amount for each part	Total.
6701		Rs	as.	p.	Rupees	Rupees	Rupees.
	Cuddapah.						
	For completing the road from Cuddapah to beyond Tala Poolatoor on the Bellary frontier.						
3326	C Yds. of Gravel	"	1	6	312		
73,512	C Yds. of Earthwork.	"	1	"	4,594		
1,500	" of clearing sand.	"	4	6	47		
85,307	" of Metalling	"	8	"	42,653		
72,815	Sq Yds. of Turfing.	"	"	4	1,934		
2,294	C Yds. of Revetment	"	5	"	717	50,257	
	Masonry works.						
	A Bridge of 6 feet span.						
1,389	C ft. of Rough stone in chunam	"	1	"	87		
148.	" of Brick in chunam	"	1	6	14		
210.	" of Archwork.	"	2	"	26		
748.	Sq ft. of Plastering with 2 coats of chunam	2	8	"	19		
	Sundries				14	160	
	Carried over						50417

Quantities	Description of Work	Rate Rs.	a.	p.	Amount Rupees	Amount for each part Rupees
C.Yds.	Brought over					50417
	A Tunnel of 1 vent 4½ X 3 feet.					
886	C Ft of rough stone in Chunam	"	1	"	55	
12	Covering stones	"	12	"	9	
407	Sq Ft of Plastering with 2 coats of Chunam	2	8	"	10	
	Sundries				5	79
12	Tunnels as per above particulars					948
	A Tunnel of 1 vent 4½ X 3 feet.					
868	C Ft. of rough stone in Chunam	"	1	"	54	
12	Covering stones	"	12	"	9	
320.	Sq Ft of Plastering with 2 coats of Chunam	2	8	"	8	
	Sundries				7	78
7	Tunnels as per above particulars	78	"	"		546
	A Tunnel of 4 vents 4½ X 3½ feet.					
2466	C Ft of rough stone in Chunam	"	1	"	154.	
48	Covering stones	"	12	"	36.	
816	Sq Ft of Plastering with 2 coats of Chunam	2	8	"	20	
	Sundries				16	226
	A Tunnel of 1 vent 3 X 3 feet.					
756.	C Ft of rough stone in Chunam	"	1	"	47	
12	Covering stones	"	8	"	6	
	Carried over				53	52294

Quantities	Description of Work	Rate Rs.	a.	p.	Amount Rupees	Amount for each part Rupees	Total Rupees
C.Yds.	Brought over				53	52294	
	Plastering & Sundries				7	60	
20	Tunnels as per above particulars. A Tunnel of 1 vent 3 X 3 feet.	60	"	"		1200	
570	C Ft. of Rough stone in Chunam	"	1	"	36		
11	C Yds. of Metalling for foundation	"	6	"	4		
12	Covering stones	"	8	"	6		
	Sundries				3	49	
17	Tunnels as per above particulars. A Tunnel of 1 vent 3 X 3 feet.	49	"	"		833.	
588	C Ft. of Rough stone in Chunam	"	1	"	37		
12	Covering Stones	"	8	"	6		
	Sundries				5	48	968
2	Tunnels as per above particulars. A Tunnel of 2 vents 4 X 3 feet	48	"	"		96	64
1128	C Ft. of Rough stone in Chunam	"	1	"	71		
24	Covering stones	"	12	"	18		
497	Sq: Ft of Plastering with 2 coats of Chunam	2	8	"	12		
	Sundries				8	109.	
9	Tunnels as per above particulars. A Tunnel of 2 vents 4 X 3 feet.	109	"	"		981	
1487	C Ft of Rough stone in Chunam	"	1	"	93		
24	Covering stones	"	12	"	18		
696	Sq Ft of Plastering with 2 coats of Chunam	2	8	"	17		
	Carried over				128	55670	

Quantities	Description of Work	Rate. Rs.	As.	P.	Amount Rupees	Amount for each part Rupees	Total. Rupees
Subjrs	Brought over				128	55670	
	Sundries				10	138	
	A Road dam 40 feet long.						
1420	Cft. of Rough stone in chunam	"	1	"	89		
53	Cbs. (Roadway)	"	8	"	27		
	Sundries				4	120.	
7	Road dams as per above particulars	120	"	"		840.	
	A Road dam 25 feet long.						
410	Cft. of Rough stone in chunam	"	1	"	26.		
40	Cbs. (Roadway)	"	6	"	15		
	Sundries				1	42	
1	Road dam as per above particulars					42	
	A Road dam 15 feet long.						
570	Cft. of Rough stone in chunam	"	1	"	36		
20	Cbs. (Roadway)	"	8	"	10		
	Sundries				3	49	
4	Road dams as per above particulars	49	"	"		196.	
	A Road dam 10 feet long.						
140	Cft. of Rough stone in chunam	"	1	"	9		
7	Cbs. (Roadway)	"	8	"	3		
	Sundries				1	13.	
13	Road dams as per above particulars	13	"	"		169.	
	A Road dam 15 feet long.						
1146	Cft. of Rough stone in chunam	"	1	"	[illegible]		
133	Cbs. (Roadway)	"	5	"	42		
	Carried over				1114	[illegible]	

Quantities	Description of Work	Rate. Rs.	As.	P.	Amount Rupees	Amount for each part Rupees	Total. Rupees
	Brought over				114,	57279	
	Sundries				10	124.	
7	Road dams as per above particulars	124	"	"		868	
	A Road dam 10 feet long.						
170	Cft. of rough stone in chunam	"	1	"	11		
10	Cbs. (Roadway)	"	8	"	5		
	Sundries				2	18	
1	Road dam as per above particulars					18	
	A Road dam 10 feet long.						
60	Cft. of rough stone in chunam.	"	1	"	4		
7	Cbs. (Roadway)	"	8	"	3		
	Sundries				2	9	
	A Bridge of 7 arches of 15 ft span.						
12298	Cft. of Brick in chunam	"	1	6	1153.		
5292	" of Archwork	"	3	"	992.		
8065	Sq Ft. of Plastering with 2 coats of chunam	"	2	8	221		
366	Running ft. of Cornice work	"	2	"	46		
126	Cbs. (Roadway)	"	8	"	63		
	Contingencies				164		
	Sundries				154	2710	
	A Bridge of 8 arches of 15 ft span						
13462	Cft. of Brick in chunam	"	1	6	1262		
6048	" of Archwork	"	3	"	1134		
9055	Sq ft of Plastering with 2 coats of chunam	"	2	8	226		
408	Running ft. of Cornice work	"	2	"	51		
126	Cbs. of Roadway	"	8	"	63		
	Carried over				2741	61026	

Quantities	Description of Work	Rate Rs	Rate as	Amount Rupees	Amount ? each part Rupees	Total Rupees
	Brought Over			2741	61026	
	Centrings			100		
	Sundries			139	2980	
1	Bridge as per above particulars				2980	
	A Bridge of 11 arches of 21 feet Span.					
19106	Cft. of Brick in chunam	"	1 6	1791		
9009	" of Archwork	"	3 "	1689		
14259	Sqft. of Plastering with 2 coats of chunam	2.	8.	356		
612	Running ft. of Cornice work	"	2 "	77		
204	Cdgs. of Metalling for Roadway	"	8 "	102		
	Centrings			90		
	Sundries			195	4310	
	A Bridge of 5 arches of 10 ft Span					
3393	Cft. of Rough Stone in chunam	"	1 "	212		
1113	" of Brick in chunam	"	1 6	104		
3314	Sqft. of Plastering with 2 coats of chunam	2.	8.	83		
164	Running ft. of Cornice work	"	2 "	21		
2205	Cft. of Archwork in chunam	"	2 "	276		
	Sundries			34	730	
	A Bridge of 1 arch of 18 ft. Span.					
4375	Cft. of Rough Stone in Chunam	"	1 "	273		
975	" of Brick in chunam	"	1 6	91		
756	" of Archwork	"	3 "	142		
1942	" of Plastering with 2 coats of chunam	2.	8.	49		
	Sundries			45	600	
	A Bridge of 1 arch of 12 ft. Span.					
2593	Cft. of rough stone in chunam	"	1 "	163		
468	" of Brick in chunam	"	1 6	44		
472	" of Arch work with brick in "	"	2 6	74		
1135	Sqft. of Plastering with 2 coats of chunam	2.	8.	28		
	Sundries			21	340	
	A Bridge of 13 arches of 30 ft. Span.					
24638	Cft. of Brick in chunam	"	1 6	2310		
	Carried over			2310	72956	

Quantities	Description of Work	Rate Rs	Rate as	Amount Rupees	Amount ? each part Rupees	Total Rupees
	Brought Over			2310	72956	
15470	Cft. of arch work with brick in chunam	"	3 "	2900		
23906	Sqft. of Plastering with 2 coats of chunam	2.	8.	598		
984	Running ft. of Cornice work	"	2 6	154		
	Centrings			150		
328	Cdgs. Roadway & Sundries	"	5 "	388	6500	
	A Bridge of 7 arches of 25 ft. Span.					
19415	Cft. of Brick in chunam.	"	1 6	1820		
7357	" of arch work with brick in "	"	3 "	1379		
10931	Sqft. of Plastering with 2 coats of chunam	2.	8.	273		
579	Running ft. of Cornice work.	"	2 6	60		
10206	Cdgs. of Stone in chunam	"	1 "	638		
160	Cdgs. of Roadway	"	8 "	80		
	Centrings			100		
	Sundries			150	4528	
	A Bridge of 8 arches of 18 ft. Span.					
14172	Cft. of Brick in chunam.	"	1 6	1329		
5292	" of Arch work	"	3 "	992		
8745	Sqft. of Plastering with 2 coats of chunam	2.	8.	219		
408	Running feet of Cornice work	"	2 "	51		
136	Cdgs of Roadway	"	8 "	68		
	Centrings			80		
	Sundries			101	2850	
	A Bridge of 4 Arches of 18 ft Span					
5953	Cft. of Rough stone in Chunam	"	1 "	372		
2641	Cft of Brick in Chunam	"	1 6	264		
2646	Cft of Arch work	"	3 "	496		
4713	Sqft of Plastering with 2 Coats of Chunam	2	8 "	118		
240	Running feet of Cornice work	"	2 6	30		
80	Cdgs of Roadway	"	8 "	40		
	Centrings			110	1730	
	Carried Over			1400	86796	

86796

Quantities	Description of Work	Rate		Amount	Amount for each part	Total
	Brought Over			1400	86796	
	Sundries				84	1480
	1 Bridge as per above for Abutments					1480
	A Bridge of 2 Arches of 15ft Span					
4717	Cft of Rough Stone in Chunam	"	1	295		
1824	Cft of Brick in Chunam	"	1 6	456		
3323	Cft of Arch Work	"	2 6	207		
2720	Sqft of Plastering with 2 coats of Chunam	2	8	68		
136	Running feet of Cornice work	"	2	17		
52	Cyds Roadway	"	8	26		
	Sundries			31		
	Centrings			40	840	
	A Bridge of 3 Arches of 15ft Span					
4285	Cft of Rough Stone in Chunam	"	1	268		
1253	Cft of Brick in Chunam	"	1 6	117		
1606	Cft of Arch work	"	2 6	251		
2943	Sqft of Plastering with 2 coats of Chunam	2	8	74		
157	Running feet of Cornice work	"	2	20		
52	Cyds of Roadway	"	8	26		
	Centrings			30		
	Sundries			36	820	
	A Bridge of 2 Arches of 12ft Span					
2698	Cft of Rough Stone in Chunam	"	1	169		
662	Cft of Brick in Chunam	"	1 6	62		
945	Cft of Arch work	"	2 6	145		
1625	Sqft of Plastering with 2 coats of Chunam	2	8	46		
32	Cyds Roadway	"	8	16		
	Sundries			21	454	
	A Bridge of 3 Arches of 12ft Span					
1127	Cft of Rough Stone in Chunam	"	1	203		
1665	Cft of Brick in Chunam	"	1 6	151		
	Carried Over			284	91876	

Quantities	Description of Work	Rate		Amount	Amount for each part	Total
	Brought Over			284	91876	
1417	Cft of Arch work	"	2 6	221		
2678	Sqft of Plastering with 2 coats of Chunam	2	8	67		
44	Cyds Roadway	"	8	22		
134	Rft of Cornice work	"	2	17		
	Sundries			29	640	
	A Bride of 1 Arch of 12ft Span					
1935	Cft of Rough stone in Chunam	"	1	121		
383	Do of Brick in Chunam	"	1 6	36		
472	Do of Arch work	"	2	59		
938	Sqft of Plastering with 2 coats of Chunam	2	8	23		
56	Rft of Cornice work	"	2	7		
18	Cyds Roadway	"	8	9		
	Sundries			15	270	
	A Bridge of 5 Arches of 25ft Span					
15626	Cft of Brick in Chunam	"	1 6	1465		
6480	Cft of Rough Stone in Chunam	"	1	405		
5250	Do of Arch work	"	3	984		
8193	Sqft of Plastering with 2 coats of Chunam	2	8	205		
363	Rft of Cornice work	"	2	45		
120	Cyds Roadway	"	8	60		
	Centerings			160		
	Sundries			146	3410	
					96196	
	Contingences at about 5 per Cent				4984	
	Superintendence				5820	107000
	Carried Over					107000

Quantities	Description of work		Rate		Amount	Amount for each part	Total
	Brought over				"	"	107000
	Bellary						
	For Constructing a Road from the Cuddapah frontier Via Royalcherroo and Tadputree to Gooty						
494995	Cyds	of Earth work		1	30937		
120230	Cyds	of Metalling		1/4	89451		
408920	Sqyds	of Tamping		1/4	8519		
10041	Cft	of Revetment		1/4	105		
	Avenue trees to fillup gaps				500		
38	Mile Stones		Each	12	28		
	Removing 29 Trees		Do	1	29		
	Removing projections of Houses at Tadputree				400	129969	
	Masonry works						
	A Bridge of 2 Arches 12 ft span						
6000	Cft	of Burnt Stone in Chunam		1	375		
693	Do	of Floor of Drain rough stone		2	7		
882	Do	of Arch work		4	221		
3043	Sqft	of Plastering at		1/4	38		
	Excavating & Contingencies				40	681	
	A Bridge of 1 Arch 15 ft span						
5142	Cft	of Burnt Stone in Chunam		1	321		
567	Do	of Arch work		4	142		
2136	Sqft	of Plastering		1/4	27		
	Excavation				5		
	Carried Over				495	130650	107000

Quantities	Description of Work	Rate		Amount	Amount for each part	Total
	Brought Over			495	130650	107000
	Contingencies at 5 p Cent			25	520	
	A Bridge of 2 Arches 18 ft span					
9379	Cft of Burnt Stone in Chunam	"	1	586		
2268	Do of Arch work	"	4	567		
4161	Sqft of Plastering	1	4	52		
36	Rft of Centrings	5	"	180		
	Excavation			10		
	Contingencies at 5 per Cent			70	1465	
	A Bridge of 2 Arches 9 ft span					
3534	Cft of Burnt Stone in Chunam	"	1	221		
673	Do of Arch work	"	4	168		
2014	Sqft of Plastering	1	4	25		
	Excavation			5		
	Contingencies at 5 per Cent			25	444	
	A Bridge of 3 Arches 10 ft span					
6708	Cft of Burnt Stone in Chunam	"	1	419		
1229	Do Arch work	"	4	307		
3156	Sqft of Plastering	1	4	40		
	Excavation			9		
	Contingencies at 5 per Cent			39	814	
	A Bridge of 3 Arches 18 feet span					
17697	Cft of Burnt Stone in Chunam	"	1	1106		
2811	Do of Arch work	"	4	703		
6306	Sqft of Plastering	1	4	79		
54	Rft of Centrings	5	"	270		
	Carried over			2158	133893	107000

Quantities	Description of work	Rate	Amount	Amount for each part	Total
	Brought Over		2158	133893	107000
	Excavation		26		
	Sundry Charges at 5 per cent		109	2293	
2	Bridges as per above portion at 2292	1 2 3	.	4585	
	A Bridge of 3 Arches 15 ft. Span				
14337	Cft. of Burnt Stone in Chunam	" 1 "	896		
1890	Do. of Arch work	" 4 "	472		
6031	Sqft. of Plastering	1 4 "	75		
45	Rft. of Centering	5 " "	225		
	Excavation		18		
	Sundry Charges at 5 per Cent		35	1771	
2	Bridges as per above particulars	1770 1 4 5	.	3542	
	A Bridge of 3 Arches 21 ft. Span				
23133	Cft. of Burnt Stone in Chunam	" 1 "	1446		
2977	Do. of Archwork	" 4 "	744		
7692	Sqft. of Plastering	1 4 "	96		
63	Rft. of Centring	5 " "	315		
	Excavating Foundation		34		
	Sundry Charges at 5 per cent		132	2767	
	A Bridge of 3 Arches 18 ft. Span				
20160	Cft. of Burnt Stone in Chunam	" 1 "	1260		
1268	Do. of Archwork	" 4 "	317		
7216	Sqft. of Plastering	1 4 "	90		
54	Rft. of Centring		270		
	Excavating Foundation		29		
	Sundry Charges at 5 per cent		98	2064	
	A Bridge of 3 Arches 22 ft. Span				
26998	Cft. of Burnt Stone in Chunam	" 1 "	1687		
3087	Do. of Archwork	" 4 "	772		
	Carried Over				107000

Quantities	Description of work	Rate	Amount	Amount for each part	Total
	Brought Over		2459	150915	107000
8484	Sqft. of Plastering	1 4 "	106		
66	Rft. of Centring	5 " "	330		
	Excavating Foundation		36		
	Sundry Charges at 5 per cent		147	3078	
	A Drain of 1 Yard wide				
2	Cyds of Stone in Chunam	1 11 "	3		
18	Covering Stones	" 12 "	14	17	
5	Drains as per above particulars	16 14 "		84	
	A Tunnel of 1 Vent				
841	Cft. of Burnt Stone in Chunam	" 1 "	53		
50	Do. of Rough Stone	" " 2	1		
20	Covering Stones	" 12 "	15		
352	Sqft. of Plastering	1 4 "	4		
	Contingencies		6	79	
36	Tunnels as per Above particulars	79 7 8	.	2862	
	A Tunnel of 2 Vents				
2143	Cft. Burnt Stones in Chunam	" 1 "	134		
330	Do. of Rough Stone	" " 2	3		
20	Covering Stones	" 12 "	30		
1005	Sqft. of Plastering	1 4 "	12		
	Excavating Foundation and				
	Contingencies		27		
				206	
6	Tunnels as per above particular	205 4 " "		1235	
				158476	
	Superintendence			1680	
	Sundries			1544	161700
	Carried Over				268700

Quantities	Description of Work	Rate	Amount	Amount for each part	Total
	Braught Over				268700
	Bellary				
	For Making a Road from Gootty to Bellary.				
23100	Cyds of Earth work	" 2 .	2887		
57180	Do	" 1 .	3574		
21560	Cyds of Metalling	" 8 "	10780		
615	Do	" 4 .	154		
70210	Cyds of Gravelling	" 12 .	52658		
14373	Do	" 4 .	3593		
3247	Do	" 2 .	406		
1747	Cyds of Revetting	" 4 "	437		
260316	Sqr yds of Tamping	" " 4	5423		
22440	Sq. Yards of Clearing Jungle	" . 4	467		
6160	Do of Clearing Stones	" 1 "	385		
6772	Cyds of Removing Rock	" 8 .	3386		
				84150	
	Masonry works				
4	Bridge of One arch of 20 ft Span	600 " "		2400	
3	Bridges of One arch	950 " "		2850	
1	Bridge of 2 Arches of 30 ft Span	2100 " "		2100	
5	Bridges of 2 Arches of 15 ft Span	1000 " "		5000	
1	Bridge of 3 Arches of 35 ft Span	4300 " "		4300	
1	Bridge of 3 Arches of 12 ft Span	1700 " "		1700	
5	Bridges of 5 Arches of 30 ft Span	3500 " "		17500	
	Carried Over			120000	268700

Quantities	Description of work	Rate	Amount	Amount for each part	Total
	Brought Over			120000	268700
1	Bridge of 4 Arches of 35 ft Span	4300 " "		4,300	
1	Bridge of 6 Arches of 40 ft Span	18000 " "		18,900	
5	Bridges of 7 Arches of	1700 " "		8,500	
1	Bridge of 7 Arches of 40 ft Span	19860 " "		19,860	
1	Bridge of 15 Arches of 9 ft Span	4400 " "		4,400	
33	Tunnels of 1 Vent No 1	88 " "		2904	
9	Tunnels of Do No 2	81 " "		729	
6	Tunnels of 3 Vents No 6	240 " "		1440	
4	Tunnels of 4 Vents No 7	231 " "		924	
7	Tunnels of 3 Vents No 5	190 " "		1330	
18	Tunnels of 2 Vents No 3	151 " "		2718	
8	Tunnels of 3 Vents No 4	164 " "		1312	
3	Tunnels of 5 Vents No 8	341 " "		1023	
	Repairing 9 Drains	" " "		106	
				188046	
	Superintendence			1296	
	Sundries			1258	
	For Repairing 25 Miles of Made Road at 400 Rs ℔ Mile	"		10000	
					200600
	Grand Total Company's Rupees				469300

Central Office of P. W.
Fort Saint George
10th November 1857

W. H. Paltt Colonel
Chief Engineer D. P. W.

Enclosure
In a Letter

From
The Chief Engineer
D.P.W.

To
The Secretary to Govt.
D.P.W.

Dated 10th November/57.
Received

No 5723.
pd 293/57

Abstract Estimate for
Constructing unfinished portion
of the Work and Completing
the line of Road from
Cuddapah to Bellary.—

Amounting to Rs 469300—

No 5723

Central Office of P.W.
Fort St George
10th November 1857

From.
The Chief Engineer.

To
The Secretary to Government P.W.D.

Sir.

In para 30 of the letter from Colonel Baker dated 11th July 1856 No 3173 the Government of India remarked with reference to items Nos 24 and 26 of Statement No 1 of the Budget for 1856/57 that they were essentially isolated portions of a project for one work viz a road from Cuddapah to Bellary, that no substantial reason existed for treating them separately, and that neither item was shown to be worthy of execution, otherwise than as a part of the whole line, and they directed that a complete project for the whole line should be submitted, sanction being meanwhile withheld to both projects.

2 In pursuance of these orders an Estimate for the Cuddapah portion of the line was submitted to Government with my report dated 6th December 1856

№ 8662 (the entire line being situated in two Districts) but the above paper was returned in Ex: Mun: Con: 12th June 1857 №1131 with directions that Estimates for the whole line should be simultaneously laid before Government.— The Estimates for the Bellary portions having been received in the Central Office only lately,— I have now the honor again to recur to the subject.—

3 The Estimate now prepared in abstract and submitted with this report exhibits the expenditure on the whole line at one view namely:-

From Cudalapah to the frontier of Bellary (67¾ miles) Rupees 1.07.000

From the Bellary frontier to Gooty (38¼ miles) 161.700

From Gooty to Bellary 57¼ miles — 200.600

4.69.300

making Rupees 4.69.300 for the entire road viz 141 miles from Cudalapah to Bellary.

4 As the distance between these towns has been the subject of a former correspondence it is necessary to mention that that reported in my letter of the 26th Aug: 1857 №3180 appears to be incorrect.— The distances there given viz 150¼ miles was taken it will be seen from the Quarter

Ex. Mun. Con. 12th Nov. 1857 No 1132. to Govt 26th Aug/57 № 3184

Master General's statement in the Fort St. George Gazette dated 30th January 1857 and upon this hypothesis the distance between the Gooty and Cudalapah frontier was deduced to be 48 miles, whereas from the Estimate now submitted, it seems to be no more than 38½ miles.. The Quarter Master General's report is probably founded upon whole measurements of the line but the tortuosity that existed in former years has been much corrected by recent improvements, particularly towards Bellary, and it is believed that the distance has in consequence been much reduced.—

5 The Estimate for the first portion of the line in question, or that from Cudalapah to the Bellary frontier having been reported upon on the 6th December 1856 №8662 it is unnecessary to touch upon it again.— The Estimate for the second portion viz that from the Bellary frontier to Gooty provides, it will be seen not only for the formation of the line, but for the necessary masonry works, which alone were estimated for in №26 of Statement №1 of the Budget of 1856/57.— for the portion between Royalcheroo and Gooty.—

6th Para. The District Engineer has not furnished with his plans and Estimates a report upon the line, but this is scarcely necessary considering that the importance of forming a good communication between Cuddapah and Bellary does not admit of a moments question, this line not only forming a portion of the shortest communication between the Presidencies of Madras and Bombay but being in itself the main outlet to the eastern coast, of the cotton and other produce of the Bellary District through Cuddapah, besides being the trunk to which other important lines of internal communication

Some doubt, however exists as to the course which the road should take from Gooty to Bellary, there being two rival propositions on this subject. The District Engineer has estimated for the line from Gooty via the southern point of the Yerratimmapheroo reservoir, Penukachevoo, Goondacoul, Guddakul and Permadanenhully, but considers that if the large reservoirs proposed to be erected at Goomanoor and Donaoul should ever be carried into effect, the line would probably come within the water spread of those tanks

and therefore recommends for consideration the line via Nagasamoodrum, Mudgir Carroor and Iddapenoor. In answer to remarks made by the Collector on this line, he further observes that beyond being on a higher level than the country through which the present line passes and thereby affording a fertile soil and better material, the Nagasamoodrum line possesses no advantage while on the contrary it is not only somewhat longer, but there is reason to apprehend that there would be a scarcity of water along the line. After duly considering the advantages and disadvantages of both lines I am of opinion that preference should be given to the present road for which the District Engineer has adapted his plans and Estimates. The construction of the reservoirs at Goomanoor and Guddakul is of future contingency which need not now be taken into account while by placing their bunds a little lower down the streams which they are intended to store, it is not unlikely that the difficulty referred to, may be obviated or greatly lessened. On the contrary the scarcity of water prevailing in the black cotton soil Talooks of Bellary is an evil

which ought to be averted at any cost, as it will be difficult for large bodies of men or troops, or even for large quantities of traffic to move along the line without subjecting the men and cattle to great inconvenience and hardship. For those reasons they recommend the line as more eligible for.—

8— The rates appearing in the Estimate are moderate and sufficient and if the Govt approve of my recommendations, I would suggest that their amount viz (Rupees (4,69,300) Four lacs sixty nine thousand three hundred be sanctioned for entry in the current Budget of the ensuing year.

I have the honorable
Sir.
Your most Obedt
and Faithful Servt
Chief Engineer

Central Office of W.
Fort Alleroge
10th November 1887

List of documents accompanying.

1 Brief letter from the Dy Engr Cuddapah dt 29 Nov 56 No 779
1 Do ——— Do Bellary — 24 Dec 56 No 733
3 Detailed Estimates containing Surveys—
2 Do ——— Do ——— for masonry works.
14 Plans ———
1 Specification
1 Abstract Estimate for Local Work
1 Report.

238

Central Office of P. Works
Fort Saint George.
4 November 1857.

No. 4958

From,
The Chief Engineer

To
The Secretary to Government of M.P.

'Public'

Enclosures 16

Sir,

I have the honor with reference to Paras 5 and 6 of Extract from the Minutes of Consultation No 7168 dated 23rd April 1857, to submit for entry in the Budget of 1858/59, the following Estimates.

1st Rupees (9,800) Nineteen Thousand eight hundred for the Road from the Post to join the Walton Road (Trunk Road No 1) at Nagapattinam. Length 6½ miles.

2nd Rupees (95200) Ninety five Thousand two hundred for the Road from Arni to Polur to the boundary of the Chittoor District at Gollapalli, viz Cuddapah. Length 25½ miles.

3rd Rupees (15700) fifteen Thousand and one

Public Works 1857 Departt
Dy to Cons 1st Dec
No 2293.

From
The Chief Engineer.

To
The Secy to Govt. M.P.

Dated 10
Rec'd 13 November 1857

No 5123

Encls: 24
23 Returned
Submitting further correspondence from the Dy Engineer of Bellary & Cuddapah with Estimates for constructing unfinished portions of the Work and completing the line of Road from Cuddapah to Bellary amounting to Rupees 160,300 recommends the same for entry in the Budget of 1858/59.

No 42.

one hundred for the road from the Palaur Annaut to Timery-length 4 3/4 miles.—

2 Accompanying the 2d. Estimate, are a Sketch Map and traffic returns, with a Report on the necessity of so expensive a description of road, as required in Ex: Mins: Cons: No. 2121 dated 13th. November 1856 Para 4.

3 Accompanying the 1st. Estimate, is a Comparative Statement, shewing the cause of its excess over the Estimate of Rupees (15,208.) fifteen thousand four hundred and eight, originally submitted to Government.—

4 These projects have been already reported upon and no further remarks therefore are now necessary.—

I have the honor to be,
Sir,
Your most Obt. Servt.
Alfred Taylor Colonel
Chief Engineer

Central Office of P.W.
Fort St. George
4 November 1857.

To
The Secretary to Government P.W.D.

Dep.to Cons.n 28th April/57 N.38
" 18th Nov.r/57 58

Public Works 1857 Department
D.to Cons.n Dec.r N.2250

From

The Chief Engineer.

To,

The Secretary to Government
N.W.P.

Dated 4
Received 14th } November/57

N.4958

1 Enclosures N.
13 do Returned

Submits for entry in the
Budget of 1858/59, 3 Estimates.

1. Rs 19,800, for the Road from old Arcot to join the Wallajah road at Arrapaukum.—
2. Rs 9,200, for the road from Arnee to Polore to the boundary of the N. Arcot Dt at Pollypat or Calispaukum.
3. Rs 15,100, for the road from the Palaur anicut to Timery.—

No 43.

Comparative Statement Shewing the difference between the Original Estimate prepared by Captain G. C. Collyer and Revised one by Captain Johnston for Constructing a Road from old Arcot to Joni the western Trunk Road No 7 at Arrupaukum in the District of North Arcot / 6. 7. @ 198 & 6 = 3 = @ 178 /-

	Original Estimate			Revised Estimate			Decrease			Increase			Remarks.
	Contents Cyds.	Amount R	a/c	Contents Cyds.	Amount R	a/c	Contents Cyds.	Amount R	a/c	Contents Cyds.	Amount R	a/c	
Earthwork at 1 anna-	41165	2572	13 4	63145	3946	9 6	a	a	a a	21980	1373	12 2	
Gravel at 6 annas-	14600	5475	a a	10517	2629	4 -	4083	2845	12 a	-	-	- -	*at 4 annas.
Turfing at 2 Pice	36960	385	- -	43582	1361	15 3	a	a	- a	6622	976	15 3	*at 6 pice
Bridges, Road Dams & Drains	-	6073	15 6	a	11127	a -	a	a	- -	a	5053	- 6	
Planting trees for 7 Miles at 20 Rupees.	-	140	- -	-	-	- -	a	140	- -	-	-	- -	
7 Miles Stones at 4 Rupees	-	28	- -	a	a	a a	a	28	a a	a	a	a -	
Superintendance & Sundries	a	733	3 2	a	735	3 3	a	a	a a	a	2	- 1	
Total Rupees	-	15478	- -	-	16800	- -	a	3013	12 -	-	7405	12 -	
										Deduct decrease	3013	12 -	
										Net Increase	4392	- -	

Central Office of P. W.
Fort St George, 4th November 57.

Alex Taylor Colonel.
Chief Engineer.

Enclosure in a letter from the
Chief Engineer.
To, The Secretary to Government
P.W.D.
Dated 4th } November 1857.
Received }

No. 4958.

P.W. 2250/57

Comparative Statement shewing the difference between the original Estimate prepared by Captain G.C. Collyer, and Revised one by Captain C.C. Johnston, for constructing a Road from old Arcot, to join the Western Trunk Road No 1, at Arapaukum, in the District of North Arcot.

Public, (roads) [New Work]

Abstract of Estimate No. of 185 /5

Road No.

District. North Arcot

Work. Constructing Road from Arcot 6/8 Mile of Trunk Road No 1.

Quantities	Description of Work	Rate Rs.	a.	p.	Amount Rupees	Amount for each part Rupees
C Yds.						
63,145	Cubic Yards of Earthwork @	"	1	.	3947	
12,517	" " of Gravel "	"	4	.	2629	
43,582	Square " of Turfing @	"	6	.	1362	
	Sundries				471	8409
	Bridges Tunnels &c.					
	Bridge of 1 Arch 20 ft Span					
5279	Cubic Feet Rough stone in Chunam @	"	1	.	330	
4345	" " Brick in Chunam "	"	1	4	362	
926½	" " " " "	"	1	6	87	
3025	Square Feet of Flooring @	"	1	2	53	
764	Cubic Yards of Earthwork @	"	1	.	48	
	4 Guard stones				4	
	Centering				20	
	Baling				15	
	Sundries				26	965
	Bridge of 1 Arch 10 ft Span					
482½	Cubic Feet of Rough stone in Chunam @	"	1	.	112	
1715	" " of Brick per Chunam	"	1	2	143	
	per Cubic Foot					
418½	" " of Flooring per Chunam	"	1	6	39	
	per Cubic Foot					
	Carried Over				331	9374

Quantities	Description of Work	Rate			Amount	Amount for each part
C. Yds.		Rs	As	P.	Rupees	Rupees
	Brought Over				331	9,374
1558	Square Feet of Plastering @ 3/4	1	12		24	
386	Cubic Yards of Earthwork @ 1/2	"	1	"	24	
	4 Guard Stones				4	
	Centering				10	
	Baling				8	
	Sundries				21	422
2	Bridges as per above particulars					844
	Bridge of 1 Arch 12 ft Span					
2690	Cubic Feet of Roughstone in Chunam @ 1/16	"	1	"	168	
2078	" " of Brick in Chunam @ 1/16	"	1	4	173	
492	" " of Brick in C. @ 1/16	"	1	6	46	
1851	Square Feet of Plastering @ 1/16	1	12	"	32	
	Excavating Foundation				26	
	Centering				20	
	Sundries				23	488
	Bridge of 1 Arch 10 ft Span					
2855	Cubic Feet of Roughstone in Chunam @ 1/16	"	1	"	178	
264½	" " of Brick in Chunam	"	1	4	221	
418	" "	"	1	6	39	
1,975½	Square Feet of Plastering @ 1/16	1	12	"	35	
	Excavating Foundation				25	
	Centering				21	
	Sundries				26	644
2	Bridges as per above particulars					1288
	Carried Over					12,760

Quantities	Description of Work	Rate		Amount	Amount for each part
C. Yds.		Rs	As.	Rupees	Rupees
	Brought Over				12,760
	Bridge of 3 Arches of 15 ft Span				
7362	C. Ft. Roughstone in Chunam @ 1/16	"	1	480	
5758	" " Brick in Chunam	"	1	480	
1080	" " "	"	1	170	
6052	Square Feet of Plastering @ 1/16	1	12	106	
979	C. Yds. of Earthwork @ 1/2	"	1	61	
	4 Guard Stones			4	
	Centering			45	
	Baling			35	
	Sundries			69	1455
	Bridge of 3 Arches 20 ft Span				
9009	C. Ft. of Roughstone in Chunam @ 1/16	"	1	563	
6280	" " of Brick in Chunam	"	1	523	
2777	" " "	"	1	261	
7162	Square Feet of Plastering @ 1/16	1	12	125	
1198	C. Yds Earthwork @ 1/2	"	1	75	
	4 Guard Stones			4	
	Centering			60	
	Baling			50	
	Sundries			83	1764
	Bridge of 2 Arches of 15 ft Span				
5826½	C. Ft. of Roughstone in Chunam @ 1/16	"	1	365	
3590	" " Brick in Chunam	"	1	299	
1206½	" " "	"	1	113	
3972	Sq. Ft. of Plastering @ 1/16	1	12	70	
769	C. Yds of Earthwork @ 1/2	"	1	48	
	4 Guard Stones			4	
	Centering			35	
	Carried Over			934	15,959

Quantities	Description of Work	Rate	Amount	Amount for each part
No. yds.		Rs as p.	Rupees	Rupees.
	Brought Over		934.	15.959.
	Baling		25	
	Sundries		48.	1007
2	Bridges as per above particulars			2014
	Tunnel 1 Vent 5 ft Span			
634	C.R. Roughstone in Chunam Ft 6	1	40	
735	Brick in Chunam	1 4	69	
2	Covering Stones ——— each	2	42	
	Plastering		15	
	Excavating Foundations		8	
	Sundries		9	174
1	Tunnel as per above particulars			174
	Tunnel 1 Vent 3 x 3 feet			
391½	C.R. Roughstone in Chunam Ft 6	1	24	
377	Brick in Do	1 4	31	
2	Covering Stones ——— each	1 8	31	
	Plastering		8	
	Excavating foundations and roadway		5	
	Sundries		5	104
1	Tunnel as per above particulars			104
				19536
	Metre Establishment			264
	Total Rupees			19800

For Lt Govr
Central Office of P.W.
4 Nov 57

Wm Fabert Colonel
Chief Engineer D.C.P.W.

Enclosure
In a Letter

From

The Chief Engineer
L.D. & W.

To

The Secretary to Govt.
L.D. & W.

Read 4th Jan/57
Received
P.P. 2250/57

No 4958.

Abstract Estimate for constructing Road from Arnee to 7 3/8 Miles of Trunk Road No 1 in the District of North Arcot. Amounting to £4,0 Rs 19,500.

Extract from a letter from Captain C.C. Johnston Civil Engineer 1st Division to Lieutenant Colonel C.E. Haber, Engineer, Chief Engineer D. P. W. dated 9th January 1856 No 1923.—

Sir,

I have the honor to submit for sanction, the accompanying list of Estimates, numbered from 1st to 13.—

* * *

No 5 of Rupees 95200 improving 2nd Class Road No 6, from the Seeyaur River North of Arnee to Polore 17 Miles, and Branch Road No 11 from Polore to Palipet, on the South Arcot boundary, towards Tirumally 7 1/2 Miles.

The Survey and Estimate for this same line of Road from the Seeyaur River north to Arcot, is nearly completed.—

2 The line is important as completing the communication from the South Arcot District with Trunk Road No 1 and the Railway, and connecting the large towns of Polore, Arnee, Arcot, Ranepet & Wallajahnugger &c.

3 The present state of the Road from the River to the South Arcot boundary, is described in the accompanying

accompanying copy of a letter № 33 dated 27th Ultimo from Assistant Surveyor Mr Dick. The Estimate provides for 48 Tunnels varying in size from 1 Vent of 1 foot to 3 Vents of 6 feet, 31 Road dams from 8 to 40 Yards in length, and three bridges one of 13 arches, of 44 feet span, across the Cheyaur River near Arnee Rupees 19,287, one of 13 Arches of 50 feet span across the Cheyaur river near Calasapaukum Rupees 20,256. and one of 6 arches of 30 feet span across the Koonahcalvay Cuddapah Rupees 1,942. The Abstract accompanying the Estimate exhibits clearly the cost of each description of work.—

* * *

Civil Engineer's Office,
4th Division,
Camp Arcot,
9th January 1856.

I have &c
(Signed) C.E. Johnston, Capt.
Civil Engineer 4th Div.

№ 33

From,
W.H. Dick, Assistant Surveyor,
in charge of 5th Division of the 4th Division.

To,
Captain C.E. Johnston,
Civil Engineer 4th Division.

Sir,

I beg to forward an Estimate amounting to Rupees 93,067 for improving the Road from the River near Arnee, to the limits

limits of Polour Talook, a distance of 25 miles, which is almost impassable in the wet season, and even in the dry, the communication is very little better, for there is not a single difficulty on the line save the Koonah Calvah and Arnee and Cheyaur Rivers, which are rendered impassable during wet weather for days together, which require to be bridged. the whole Road is a wretched condition from the numerous Nullahs crossing it, particularly the cultivated parts, and Bandies in consequence make short stages with light loads carrying quantities of cotton, indigo, and other valuable produces, yearly to Madras and other places from South Arcot and Salem Districts. Considering the level character of the Country I made no alteration on the line, but followed the old Road, making it as straight as possible. Five pieces of this Road have recently undergone Repair at a cost of Rupees 10,425.8.9 of which 3 are entirely neglected, as no metal of any Kind has been applied; Bridges and tunnels have been built, but the approaches are cut away by the rains, leaving them inaccessible, and consequently useless, so that very little good has been done by the outlay, the other two portions are only partially metalled.

From

From Arnee to the end of the limits of Cirkum-
-baudy, a distance of 9½ miles, the bridges will have to be built
of brick, as the difficulty of procuring stone is great beyond
which it is easily had, the road will be made 7 Yards
broad on cultivated grounds, and 8 Yards on uncultivated;
metalling to be 6 + ⅛ yards which is only provided for in parti-
-cular places, and gravelling throughout of the same width
and thickness, these materials are to be had within 3 miles
of the road, Chunam without any difficulty.—

Trivettoor Talook
Cheyaud 27th Dec 1755

I beg to remain &c
(Signed) H. Brick
Assistant Surveyor 1st Div.

True Copy
Signed C C Johnston Captain
Civil Engineer 1st Div.

A True Extract and Copy

A C Fisher Colonel.
Chief Engineer.

Encl B.

Enclosure in a letter from
the Chief Engineer
to the Secretary to Govt
P.W.D.

Dated 4 th November 1856
Recd 7 th Nov 1856
No 2250/56

Copies of correspondence
on the subject of the road
from Aluar Rd Colar to the
boundary of the S. Arcot
Dt at Collegal or Caliyur
Num: —

Madura District.

Public Roads.

No 8662

Report on an Estimate for
Repairing and improving the Road
from Kanivattoor to Sayelgoody
in Madura Rupees 40,000/ Forty
Thousands.

This estimate has been prepared under
the orders of Government contained in Extract
Revenue Consultations No 1970 dated 25 th October 56

2 It is the main Salt road of the
Province and the improvement is a necessary work
in connection with that of the road from Madura
to Kanivattoor sanctioned under the above date.

3 The present road is a mere imperfect
track running through well cultivated country,
with a mixed soil of sand and clay, and the
total length being 18¼ miles, the average cost is
about 2,200 Rupees per mile.

4 The surface is to be 8 yards wide
with 6 yards of gravel 9 inches thick.

5 No bridges of any size are required.

Per

6

The importance of the work having been already acknowledged by Government it only remains for the Chief Engineer to recomd his recommendation of the estimate, the rates of which are moderate, and sufficient.

Central Office F.W.
Fort Saint George
6 December 1856

A.W. Street Colonel
Chief Engineer

List of accompanying Papers

1 Letter No. 333 dated 13th Novr 1856 LLL.1
from District Engineer Madura,

1 Report on Roads No. 16 from Cumbum to Sayelgudy LLL.2

1 Estimate of Rupees 40,000 LLL.3

1 Plan of proposed Bridges and Tunnels LLL.4.

Compd. W.

2d to 6me 28th October 56 to 67 68
— 26th augt — 23 " 24 " 67 68
— 18th Decr — 6 " 7 " 68

Pub. Works 1856 Dept. LLL
Dto Cons 1st Decr 57.
No 2824

From
The Chief Engineer
&
Officiating Secretary to Govt
Pt Wks Dept

Dated 6th
Received 9th 23d Decr 1856

No 8662
4 Enclos. Returned.

Memd for entry
in the Books of 185 58.
an Estimate of Rupees
(40,000) Forty thousand,
for repairing and im-
proving the road from
Nannoolee to Pylegardy
in Madura - Madura
District.

No 44.

e 23 June Rg.

147

Public. (roads) [New Work]

Abstract of Estimate No of 185 5

Road No

District. Canara.

Work. Constructing a 2d Class Road from the South Bank of the Sadashigar River to Hidagooddy.

Quantities	Description of Work	Rate			Amount	Amount for each part
C. Yds.		Rs	as	P.	Rupees	Rupees
103433	Earthwork ——— @ 6 cyds	"	2	"	12929	
83938	Gravelling ——— @ 6 cyds	1	"	"	13990	
335754	Sqr Yards of Tamping ——— @ 1 yd	"	"	3	5246	
8800	Running Yds Clearing Jungle 5 faths	250	"	"	1250	
	31 Mile Stones ——— Each	1	"	"	31	
	2 Small Bridges of 1 Arch of 12 feet Span ———				1000	
	5 Do Do of 2 Do 15 ft Span				5621	
	2 Do Do of 2 Do 20 ft Do				2669	
	2 Timber Bridges of 2 Do 25 ft Do				5985	
	1 Bridge of 1 Arch 35 ft Span				3355	
	37 Tunnels varying in size from 1 Vent of 6 feet Span to 3 Vents of 9 feet Span				14910	
	Sundry 5 Rupees per Cent				3344	
					Total Company's Rupees	70330

Central Office of D. H.
Fort Saint George
26th September 1857

A. H. Baker Colonel
Chief Engineer D. D. H.

Enclosure

Canara

From

The Chief Engineer
D. P. W.

To

The Secretary to Govt.
D. P. W.

Dated 26th September 1857
Received

P. W. 2003/57

No. 4033

Abstract Estimate for Constructing a 2nd Class dry weather road from the South Bank of the Sedasheguen River to Soldagoondy in the District of Canara.—

Amounting to C. Rs. 70330

Canara

Public Roads.

No. 4033

157

Report on an Estimate prepared by the District Engineer of Canara, for constructing a 2nd Class road from Mullapoor on the South bank of the Kalanadee, or Black River, via the Kyga Ghaut to Soldagoongy Miles 31-6-79.

Amount of Estimate Rupees 70330) Seventy thousand three hundred and thirty. Comprising the following items.—

03433	C. Yds Earthwork	R. 12929
83938	—do— Gravelling	13990
335754	—do— Jungle	5246
	Clearing Jungle	1250
2	Bridges each of 1 Arch of 12 ft span	1000
5	—do— 2 Arches of 15 ft span	5621
2	—do— 2 Arches of 20 ft	2669
1	—do— 1 of 35 ft	3355
9	Culvert Bridges each of 2 Bays of 25 ft span	5985
37	Culverts varying in size from 1 Vent of 6 feet to 3 Vents of 9 feet	4910
31	Mile Stones	31
	Sundries	3364
	Total Rupees	70330

1. The surface of the road is to be 9 yards in width of which 6 yards are to be gravelled

gravelled 9" thick, the side slopes of the embankments are to have generally an inclination of 1 to 1. and where the soil requires it, are to be turfed.—

2.— The object of the proposed road is to connect the Hullihal, and hence the Dharwar Country, and Raichore Doab with the projected Harbour at Bantcool to which from Mullapoor the Black river is navigable.—

3.— At Idalagoonjy, the Western terminus of the road is some 1500 feet above the level of the sea. The Ghaut presents an unbroken ascent of nearly 8½ miles, the remaining distance being a succession of ascents and descents, and the country throughout nearly the entire length of the line is clothed with dense forest & jungles.

4.— The road passes through the Villages of Soolagoddas - Hurroor - Kullestay - Thumanany - Coollayguddas - Dullonaguddas - Tulkaybyle - Bonnayguddas - Wasserhully - and Hullayguddas - but at present there is no traffic on it.—

5.— Idalagoonjy is at the head of the Tulkaybyle Ghaut, whence a road is made south via Gellapoor and Hullihal to Dharwar, and again East from Gellapoor to Noondagoda on the line from Sirsy near

Amounting £37 230—

near the head of the Devanaunny and Nulcound Ghauts to Hoobby, Dharwar &c.

6 The projected improvements to the Ports of Coompta - Tuddree and Sedasheghur are referred to in the District Engineers letter No 170, dated 13 July 1857, the latter being the one immediately connected with the Kyga Ghaut line of communication, and the convenience thus offered to the Cotton Merchants, of conveying their raw produce by a good road to the coast, and there obtaining direct shipment for it to England will be a great boon. At present, the cotton is not only taken by circuitous routes to the coast, but as observed by Lieutenant Goddard is then sent to Bombay in Patemars for final shipment.—

7.— The opening up of the Kyga Ghaut and of the Sungawara line to the north of the Black river will, as observed by the Collector of Canara in his letter of the 16th July, be most important, both with reference to their direct influence on the development of the Bantcool Harbour scheme, and their more remote, but no less certain action on the extension of the cotton trade.—

8.— The Kyga Ghaut will also be of

15

ge of great service by relieving the Dassanummy
en and Arbyle lines from a great portion
clof the at present heavy and increasing
gun traffic on them, as evinced by the State-
2.. ment given by the Collector. the value
is of the exports at Tudalree from 1851/52 to 1856/57.
the having increased from Rupees 94,988. to
wit Rupees 561891. and of the Imports from
to Rupees 27,810 to Rupees 61,963.-
ew 9.. It will be observed that both
3.. Mr Robinson and Lieutenant Cadalard
of fully appreciate the great importance
len of the projected improvements to the
an Tudalree Harbour, as referred to by the
the Right Honorable the Governor in para 154
f.c of His Minute, communicated to the
the Central Office with Govt Genl Minutes
of Consultation No 163, dated 13 March 1857.
10.. A separate report No 1 on the
f several Masonry works to be constructed
f on the proposed road is herewith sub-
mitted.-
11.- The rates allowed for the
s works are moderate and sufficient,
5. and the Estimate as recommended
by the Chief Engineer for entry in
D the Budget of 1858/59, as providing
to for an approach to the Harbour
of

Amounting to

of Bartool from the Dharwar
District, in accordance with the
desire expressed in para 163 of the
Right Honorable the Governor's
Minute before referred to.-

Central Office of R.W. } Lieutenant Colonel
Fort St George } Chief Engineer
26th Sept 1857.

Up
Dy Supt Engr N.C.

The Secretary to Government
R.W. Department

List of Enclosures.
1 Letter from the Dy Engineer - Canara
No 178 dated 17th July 1857 with 2 Enclosures 2 pp
1 Do from the Collector - Canara do -
dated 16th July 1857. & 1 from Dy Engr No 170 - 13 July 57
1 Report No 1
1 Abstract Estimate
7 Plans & Sections of Bridges, Tunnels &c
3 Surveys of Roads.

Cons: 17th March/57 No. 1647.

Public Works 1857 Dept.
Dto Cons 1st Dec. No. 2008

From
The Chief Engineer &
To
The Secretary to Government
R.W. Department

Dated 26th Sept/57
Rec'd 8th October "

15 Enclosures
14 Returned.

No. 4033

No 45.

Report on an Estimate of Rupees 70330/ Seventy thousand three hundred and thirty prepared by the District Engineer of Canara for constructing a 3d Class road from Mullapoor on the South bank of the Halaiundee or Black River, via the Village of Soledagoonjy. Miles 31-0-79.

Amounting

No. 2192. Dept.

Ltr. from the Minutes of Cons.
under date the 27th Nov./57
Read the following papers.

Report from the Chief Engr. (Here enter 6 Dec. 1856 No 8662 WWWW)
Do. Do. (Do. Do. F)
Do. Do. (Do. Do. Z.Z.Z)
Do. Do. (Do. 2 June 1857 No 863 F.)
Do. Do. (Do. 12 Nov. 1857 No 5184)
Letter from Do. (Do. 16 Do. " 5240)
Do. Do. (Do. 15 Sept. 1857 " 3704)
Do. Do. (Do. 10 Nov. " " 5123)
Do. Do. (Do. 4 do. " 4958)
Report from Do. (Do. 6 Dec. 1856 No 8662 ZZZZ)
do. H do. (Do. 26 Sept. 1857 No 4033.

G.

Report, VVVVV, dated 6th Dec. 56, on four estimates aggregating Rs 1,43,700.

Of the four estimates submitted with the above report, for the improvement of the channels under the Pennair Annicut

in Nellore the Govt consider ~~two of~~ the very desirable works which were ~~pressing in the existing budget~~ the two resubmitted by Col Faber in his select list dated 24th Jan. last, viz: one for widening and improving the main, or Jaffer Sahib's channel at a cost of 34,000 Rs, & the other for the improvement & extension of the irrigation under the Allipooram branch of Jaffer Sahib's channel at a cost of 15,500 Rs. The latter apparently provides for dividing dams across the existing subsidiary branches, and for new cuts to carry water to the more distant lands, so as to bring them under the influence of the Pennair channel. It is observed that one of these cuts, viz the one from the Indracoopetta branch to the Myfaud and Comaragapilly lands, estimated at 1150 Rs supersedes the necessity for the aqueduct and bridge on an old course of the Pennair, estimated at 6,300 Rs, and entered in Statement No 2 of the Budget of 1856/57, but omitted in that of 1857/58, and which was designed to carry water to these very lands. It is also observed that

the Colr strongly approves of the projected improvements, especially as in regard to Jaffer Sahib's channel, as tending to the increase of cultivation; but as the four estimates have been taken together as a whole, in considering the revenue results, and the proable ~~the advantage~~ ~~of the proposed~~ inaccurate, it is impossible for the Govt to form any idea of the extent of benefit to be derived from the two portions approved by them. They therefore request that the Chief Engr will be good enough to lay before them, with the least practicable delay, a complete report confined to these two estimates; and that he will, at the same time, draw up a fresh plan of the channels, shewing them as at present existing, and as proposed to be improved to the extent now approved by Govt. The report is also desired to explain to Govt, to furnish materials for their own report to be submitted to the Supreme Govt, and the fresh plan called for is requisite

~~both for this foot and the foot~~
~~of Indore~~ to enable Col Baber
to furnish the sketch of the
channels as now required, the
original plan will be returned
to him with these proceedings.

Report Iˢᵗ, 6ᵗʰ Dec/56, on estimate amounting to 27,000 Rs for the improvement of the Dindigul and Palghaut road within the limits of the Madura District.

It is proposed, at a
cost of 27,000 Rs, to put into
proper order that portion of the
high road leading from Dindi-
gul to Palghautcherry, which falls
within the Madura boundary
at the Amravatty river; the
total distance to be improved
being nearly 48 Miles. On the
completion of this improvement,
and of the bridges over the Amra-
vatty and Shunmooga Nuddy,
both of which, the first to observe, were
provided for in the Budget of 1856/
57, at an estimated cost of Rs 21,520
and 15,425 Rs respectively, the
road will become highly impor-
tant ~~in a line of traffic and~~
~~communication~~. It is said
that almost all the trade of

the Madura District, flowing
westward, finds its way to the
west coast along this route; and
that its importance will be
further enhanced on the construc-
tion of the Madras Railway to
Palghautcherry. From a traffic
return furnished by the Collr,
which was taken in the Dyanpully
talook for the months of Nov & Dec/55,
it is seen that 1,596 laden bandies
and 922 laden cattle passed along
the road during that months,
the aggregate value of the articles
transported being reckoned at
1,21,507 Rs. The road has been partly
kept in repair from time to time
at trifling cost, the aggregate out-
lay of nine years from 1846 to
1854, as shewn in a statement
supplied by the Collr, being 17,645
Rs, or an average of 1,960 Rs per
annum, though in 1851 no outlay
was incurred at all, and in 1849
the expenditure rose to as much
as 4,834 Rs.

The estimate provides
for a bridge of 3 arches of 26 feet
span and 6 feet rise over the

Manjuri Nuddee in the Nellacottah taluck, for 4 Platform bridges of from 3 to 6 vents, 50 side dams of from 5 to 60 yards in lengths, 3 pavements of 15 yards, and repair of 9 others, and the repair of one side dam and sluice, besides earthwork, superintendence and contingencies; the total amounting 27,000 Rs, or an rate of ~~about~~ about 565 Rs per mile, as stated by ~~the~~ Lieut Scott. Of all the masonry works provided for, the only one of importance is the bridge of 3 arches over the Manjuri Nuddee, which is represented to be a deep and rapid mountain torrent about 70 feet in breadth. Both the Col and Chief Engr are strongly in favor of the project. The latter considers the rates, which appear rather high, to be no more than requisite to ensure a rapid and efficient execution of the work. The estimate is accordingly sanctioned for entry in the ensuing budget. It must be remarked that this project has not been illustrated by a sketch map, a convenience which is the more especially necessary in cases requiring to go before the Govt of India.

Report ZZZ, 6th Dec/56, on estimate of 30,000 Rs, for reforming and metalling Trichinopoly and Combatore road within the limits of the Trichinopoly District.

The road here proposed to be improved is 40 miles in length, and, it is presumed, is the one that runs from Trichinopoly along the right bank of the Cauvery to the town of Carour, gaining access to the latter place by a bridge across the Amraravaty, which here joins its waters to those of the Cauvery. It is represented to be a very important road, not only connecting two such large towns, as Combatore and Trichinopoly, but forming the only means of communication between the former District and the sea board of Tanjore, while it is the direct route from Trichinopoly and Tanjore to the Neilgherry hills. The District Engr states that the traffic returns taken in one month, as furnished by

the Colr, gave an average daily result of 120 bandies, the like number of pack bullocks, and between 400 and 500 foot passengers, of whom more than half were laden coolies; or in all, a daily traffic of about 50 or 60 tons; and that this makes no allowance for bandies or bullocks that might have passed unnoticed. St. Aynes adds, that on the occasion of great feasts at Scringham, he has seen this road thronged with bandies, foot passengers, bullocks, bullock coaches, & palkees, all pouring into Trichinopoly. The road, which is bridged and tunnelled throughout, is however, said to be at present in a wretched state. The object of this estimate is to reform the surface of the road, and to gravel it along the entire length of 40 miles; and when it is thus restored, it is said that a maintenance allowance of 4200 Rs per annum, or a rate of 105 Rs per mile, will be required

3.

at the beginning to maintain it in order, the allowance being susceptible of increase as the traffic increases. The project has the entire concurrence of the Colr; and the Chief Engr recommends the estimate, considering the rates to be moderate, even those for the Gravel, which has to be brought from a distance, as the road runs close to the Cauvery on one side, and paddy fields intervene between it and the quarries on the other.

5 — The Govt approve and sanction the above estimate of 30,000 Rs for entry in the Budget of 1858/59; and they likewise sanction the maintenance allowance of 4,200 Rs per annum required to keep the road in order after its restoration. They must observe that, as in the previous case, they have felt difficulty in dealing with the project in the absence of a sketch.

Report F, dated 2nd June/57, on estimate of 29,100 Rs for a 1st class road from Companypett to Conseveram.

This estimate ~~of 29,100 Rs~~ provides for a short line of road, 17½ miles long, from the town of

Conjeveram to the Railway station at Conjeveram, in North Arcot. Col Pears brought to notice the importance of this road as a feeder, in his letter of the 18th Nov/56, No 249; and a petition was also forwarded by him on the 24th of the same month, from the Tahsildar and 91 other residents of Conjeveram, representing the great want of a traffic line from that town to the Railway, as at present the merchants could not get access to the line, without the certain risk of having their carts upset, and the valuable goods with them more or less damaged, to the heavy loss of the owners. The importance of this road as a feeder to the Railway is not limited however to the town of Conjeveram; for on its formation, it will complete the communication southwards from Pondicherry and Trichinopoly, in the one case by Tindevanum and Wandiwash, and in the other by trunk road No 8, thus affording uninterrupted access to the Railway by these distant marts of traffic. On the north

E. M.C. 16 Dec/56, No 2319.

also, the communication will be open to Cuddapah by the Raygery and Kircumbady road, on the formation of the intervening links between Conjeveram and Pettay and Pettay and Kattany and Kattany and Naggery. The proposed Conjeveram and Conjeveram-pettu road will further cross the high western trunk road from Madras to Bangalore. Under these circumstances therefore, of general convenience, expediency and commercial advantage, the Govt approve of the outlay of the estimate in the Budget of 1858/59.

It is observed that the estimate provides for a road 6 yards wide, to be gravelled however to the extent of 4 yards only, with several tunnels and road dams, and 4 bridges of from 3 arches of 15 feet span to 6 arches of 30 feet span; and the rates are considered by Col Faber to be moderate and sufficient.

It is also observed that for the space northwards from Conjeveram-pettu to Pettay, an estimate of 13,180 Rs was entered in the Budget of 1857/58; and that for the continuation to Naggery, an estimate of 19,000 Rs

it was directed in Ex: Mins: Cons: 4th March /57, No 414, & be re-submitted for insertion in the ensuing budget. It does not appear however that the Chief Engr has resubmitted this estimate as directed, but unless he does so, and the continuation is provided for, the communication to Cud. Dafaik will be incomplete, by the hiatus which would be left between Trittany and Saggery. The Chief Engr has sent up a cursory survey, but he has omitted a Sketch map. In all cases, a Sketch of the country ought to accompany the projects submitted for consideration, not only to indicate the immediate locality, but to shew the bearing of the projects in respect to the surrounding country. If such a sketch has not been sent up by the District Officer, it ought to be the business of the Chief Engr on all occasions to supply the omission, as it is very inconvenient to refer to a general map encumbered with other details. A Sketch for reference is more especially necessary, in cases of projects having eventually to be submitted for the orders of the Govt of India.

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Report dated 12th Novr /57 on estimate of 61,000 Rs for the improvement of the Perumbaddy Ghaut and road.

This estimate is submitted in pursuance of the orders of Govt in para 8 of Ex: Mins: Cons: 29th Augt last No 1656. They were there induced, on Major Lawfords report of the unsatisfactory condition of the Perumbaddy Ghaut and road, to call for an estimate of the actual outlay necessary to put the line into efficient state. The estimate now recommended for metalling and fencing the road, amounts to 61,000 Rs, and has been prepared by the Supt Engr of the Southern Circle, in supersession of one of 28,340 submitted by the District Officer, as Major Lawford considers the latter wholly insufficient for a road, whose importance and traffic requires that it should be established on a more liberal and substantial scale, than that provided for in the superseded estimate. Lt. Beans explanations regarding

the unsatisfactory condition of the Chaunt and Road, and of the accounts of expenditure, will be separately considered in disposing of the Chief Engrs Proceedings of the 5th Nov/57. but in the meantime the Govt direct the entry of Major Lawford's estimate of 61,000 Rs in the ensuing Budget, for keeping in view his representation of the continued necessity which Cannanore will be subjected, by this route ~~of supply~~ being allowed to remain almost impassable, they consider in a military point of view, it highly necessary to put the Communication into thorough order at an early date, & they are further led to adopt Major Lawford's estimate, as they observe from the sketch map sent up by Lt Beaun, that only a very small portion from Cannanore to Chirakal somewhat shorter by Coodally is Ravelled and appears to be in good condition, while all the remaining portion, to the boundary between Coorg and Mysore or nearly

the whole of the road, it consists of clay and sand or stone, and cotton soil.

Letter dated 16th Nov/57, No 5240, submitting estimate of 32,000 Rs for putting the road between Coonor, Jackatallah and Cotacamund into efficient order.

10 The estimate of 32,000 Rs submitted with the above letter, is in substitution of a smaller one of 10,140 Rs laid before Govt on the 24th Sept last. The latter provides only for building parapet walls to the dangerous parts of the road from Jackatallah to Cotacamund, but as it was observed by Govt that the road was treacherous and slippery in the wet weather from not being metalled, and that the parapet walls would thus be but an imperfect protection against accidents, they concurred in ~~approved~~ Col Faber's opinion that the metalling of the road was as important as the construction of parapets, and accordingly called for a complete estimate. The present one of 32,000 Rs provides for both objects, viz, metalling the road, and building parapet walls, and is strongly recommended by Col Faber for entry

Letter N° 3704 dy 15th September 1857
do " 5123 dy 10th November 1857
do " 4958 dy 4th do
Report " 8662 dy 6th December 1856 L.I.
do " 4033 dy 26th September 1857

The projects submitted with the above letters and reports, are those which were called for by Govt after some correspondence with the Chief Engineer, but the Govt are not disposed to take them at present into consideration as the amount of the Estimates already sanctioned for the Districts for which the above projects have been proposed is large. It will be useless to admit any more Estimates for the Budget in those Districts as there is very

in the ensuing Budget, as the protection is very much needed for the safety of passengers & traffic, the road running along steep precipices. The Govt approve the entry of the estimate of 32,000 Rs in the forthcoming Budget, and request that a sketch of the road may be prepared & sent to this Office for transmission to the Govt of India. The road, it is remarked, has already cost 37,596 Rs, though the authorized estimated expenditure was only 31,477 Rs, sanctioned on two different occasions as follows.

Ex: Mins: Cons: 6th Oct/53, No 376.
Completion of Kaity Cut and thorough repair of road to junction with the new road to the Dacka-tulla Barracks ———

Ex: Mins: Cons: 6th Oct/53, No 377.
Difference between the above amount and actual estimate of 18,334. 8-. ——— 3,334.

Ex: Mins: Cons: 3rd Oct/55, No 701.
Supplemental estimate for completing the work ——— 13,143-
Total Sanction 31,477

New estimates, however, it is said, did not include metalling.

very little probability of their being sanctioned by the Govt of India under the present financial circumstances. The Estimates are questionable, as specified below, together with the papers sent up, will therefore be returned to the Chief Engineer, to be resubmitted hereafter ~~at a future~~ date.

Date of Chief Engineers letter & report	Works	Amount of Estimate
	Masulipatam	Rs
Letter No 3704 d/15 Sept/57	Forming a navigable Canal with its necessary masonry works from the Ocklur Basin at Masulipatam to the Dopotair opposite Yaleswaram and for a junction cutting from the main Canal to the tidal creek between the Dopotair and the Bundar milly Swamps ----------	175,000
	Cuddapah and Bellary	
Letter No 5723 d/10 Nov/57	Completing the entire line of road from Cuddapah to Bellary ----------	409,300
	North	
Letter No 4958 d/4 Nov/57	Constructing road with the requisite masonry works from old Arcot to join Trunk road circ at Arapauttum ----------	19,500
	Constructing do with do from Arnee through Polore to the boundary of the South Arcot District at Pollypet to Calistraum	9,200
	Constructing do with do from the Pankar Annicut to Tennery ----------	15,000
	Madura	
Report No 662 d/5 Dec/56 I.S.L.A.	Reconstructing the road from Tamootha to Sayalgoody and ... structing masonry works ----------	40,000
	Canara	
Report No 4053 d/28 Sept/57	Constructing a Second Cop road with bridges and Culverts from Mulla poor on the South bank of the Kalamuddee or black river and the Nyglon Ghaut to Siddapoorgy ----------	19,330

30 Copies to the Chief Engr. C 28
with 4 Packets of No 1864-
23 —— 2293-
13 —— 2250 2303-
4 —— 2824-
1 Plan of 5 Sheets
3 —— Rd of Stw- 5

Public Works 1857 Depth.
Do to Govt 1st Decr

No 2192.

Extract Letter of Govt:

27th Novr 57.

Extract from Chief Engr 20th Novr
58 No 130 in Govt 9 Feb.

From Do — Do 26th July 58 C.W. 413
19 Brown

From the Do Do 15th Sept 58
C No 2154 in Govt
Sept 14

From the Chief Engr 8 - 30 June
Can 1644

Ordering the entry of
Estimates in the Budget
1858/59.

No 35 to 46

From the Chief Engineer 22 Sept

201 Prov No 223