1938.

VICTORIA

COUNTRY ROADS BOARD.

TWENTY-FIFTH ANNUAL REPORT

FOR YEAR ENDED 30TH JUNE, 1938.

PRESENTED TO BOTH HOUSES OF PARLIAMENT PURSUANT TO ACT No. 3662.

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DEATH OF MR. W. T. B. McCORMACK.

The death of Mr. W. T. B. McCormack, M.Inst.C.E., M.I.E.(Aust.), the Chairman of the Board, on the 23rd January last terminated an association with the Board since its inception, over a period of nearly 25 years.

In 1913 Mr. McCormack was appointed a Member of the Board and held that position until 1928, when he was appointed Chairman, following the death of Mr. William Calder.

Mr. McCormack was a man of vivid personality whose knowledge and ability enabled him to render valuable service to the State and the municipalities.

The passing of an esteemed colleague is greatly regretted and his loss deplored by his friends and associates in many activities which filled a long and honourable career.

COUNTRY ROADS BOARD.

TWENTY-FIFTH ANNUAL REPORT.

Exhibition Building,
Carlton, N.3,
24th November, 1938.

The Honorable G. L. Goudie, M.L.C.,
Minister for Public Works,
Melbourne.

SIR,

In accordance with the requirements of Section 96 of the Country Roads Act (No. 3662) the Board has the honour to submit to you for presentation to Parliament the report of its proceedings for the year ended 30th June, 1938, together with the report of the Chief Engineer on matters of technical interest.

BOARD APPOINTMENTS.

Mr. F. W. Fricke, who has been a Member of the Board since its inception in 1913, was appointed Chairman of the Board to fill the vacancy caused by the death of Mr. W. T. B. McCormack, and Mr. A. D. Mackenzie, M.Inst.C.E., M.I.E.(Aust.), formerly Chief Engineer of the Public Works Department, was appointed to fill the vacant position of member.

A RETROSPECT.

On the 31st March, 1913, the Country Roads Board was appointed under Act of Parliament No. 2415, so that the Board's operations have now extended over more than 25 years.

Prior to the constitution of the Board, road building was carried on by municipalities in a haphazard manner and the country roads system of the State, particularly in the hill country, was generally in a backward state. The potential use of the roads was not taken into consideration and no economic data were available on which the system of State roads could be designed, with the result that roads were located without regard to the needs of traffic. What roads existed were mostly narrow tracks consisting of earth formations on excessively steep grades, badly aligned, and in many instances corduroy tracks served the pressing needs of the settlers.

In other parts of the State, roads were constructed as funds became available either from Government grants or from municipal revenue, and in consequence roads were only in a partial state of development to meet the needs of slow-moving horse traffic, with little or no available funds for their maintenance. With the advent of motor traffic these roads became wholly unsuitable and quickly deteriorated until municipal resources were unable to cope with the problem.

On the appointment of the Board the planning of a road system as a whole was made on the basis of traffic requirements. With the co-operation of the municipalities the objects set out in the original legislative enactment have been achieved and a system has been built up from year to year by the addition of roads coming under the classification of State highways, main roads, developmental roads and tourists' roads, until to-day the mileage of roads under the jurisdiction of the Board is 2,307·7 miles of State highways, 6,685 miles of main roads, 3,431 miles of developmental roads, and 350 miles of tourists' roads. One can now travel from one end of the State to the other along serviceable roads kept in good condition under an organized system of maintenance, during any season of the year.

The system has been designed to connect with and supplement the feeder and lateral roads with the ultimate object of giving adequate facilities to every farmer to gain access to the State highways and main roads leading to railways and markets.

FINANCE.

For the construction and reconstruction of declared main roads in the metropolitan area an amount of £115,704 was available at the 1st July, 1937. Under Acts Nos. 4188 and 4414 a total amount of £250,000 was authorized for expenditure from loan funds and this sum was supplemented by an amount of £250,000 by Act No. 4498, thus bringing the total provision up to £500,000, the total amount contemplated when the first instalment of £100,000 was authorized in 1933.

The total loan expenditure on metropolitan roads was £58,286 during the year, leaving a balance of £307,418 of the total authorization on the 1st July, 1938, not including commitments entered into prior to that date.

The gross revenue from motor registration fees and fines paid into the Country Roads Board Fund was £1,718,991, representing an increase of £130,541 over that received from the same source during the previous year. The cost of collection and refunds totalled £110,112, making the net revenue £1,608,879 and a net increase of £128,607 over last year's figures.

The total amount expended in maintaining State highways, main roads, tourists' roads and Murray River bridges and punts amounted to £1,132,492 compared with £1,046,320 for the year 1936–37, representing an increase of £86,172.

Under the Federal Aid Roads Agreement, which was renewed in November, 1937, a sum of £676,929 was received, of which £113,117 was expended on main roads, £347,294 on works of a developmental nature, £7,913 on the construction of tourists' roads and the balance of £110,516 on the maintenance of roads previously constructed from Federal Aid Funds, restoring and rebuilding bridges and assisting municipalities in the maintenance of main and developmental roads constructed from loan and Federal Funds.

Under the terms of the new Federal-aid roads and works agreement the sum of £7,300 was set aside from funds available under the agreement for the maintenance and repair of public roads adjoining or approaching properties of the Commonwealth within the State of Victoria, but as this provision was not made until the latter part of the financial year the sum of £3 only was expended, and the balance of £7,297 carried forward to the new financial year.

The provision of £65,250 from unemployment relief funds, together with the sum of £94,255 brought forward from the previous year, again resulted in many important works being carried out. The total expenditure for the year was £138,184, and £21,321 was carried forward to the next financial year. This expenditure was supplemented by an amount of £12,169 from the Country Roads Board Fund and Federal Aid Funds.

STATE HIGHWAYS.

Consequent on the re-arrangement made last year of the work of maintaining and improving sections of State highways nearer to the metropolis by transferring control to the central district, more effective and economical work has resulted.

With the increasing and changing traffic the Board is constantly endeavouring to keep all highways in the best possible condition by improving surfaces, eliminating dangerous curves, super-elevating, widening narrow bridges, and marking the pavements with clearly defined traffic lines.

To meet the road requirements of the State in an economical manner planning of a definite programme has been practised by the Board in the work of road construction and maintenance. State highways in particular have been given close attention in this regard, with the result that last year 76 miles were reconditioned and surfaced with bitumen. With the work done in previous years 1,323 miles have been sealed with bitumen out of a total length of 2,307·7 miles. Although the total mileage is trafficable throughout the year, much remains to be done in the way of improving many sections to bring them to a standard suitable for the traffic using them, and this work is progressing year by year as funds become available.

Investigations have proceeded along the lines laid down in the original scheme with a view to evolving a plan for a comprehensive efficient and safe road system which can be dealt with by stages from year to year. Under this system it is possible to forecast annually what expenditure is necessary to carry through the programme efficiently and economically. The Board can in this way with a reasonable degree of accuracy prepare its estimates of expenditure each financial year.

Owing to the fact that the Federal Aid Roads Agreement has now been renewed for a further term of ten years, the Board is aware of the total amount likely to be made available for road purposes from the proceeds of petrol taxation, and this is of material assistance in the preparation of the annual estimates of expenditure.

An essential for road planning is accurate data relating to the traffic on the roads. To obtain the information required the Board followed its usual practice of taking traffic counts on all State highways and certain important main roads. The census was obtained over a period of seven days from the 28th February to the 6th March, 1938, and represented a normal count for the summer months.

It was found that all motor traffic is increasing with the exception of solid tyred traffic, which shows a rapid decrease, as only 125 vehicles or ·07 per cent. of the total vehicles recorded were fitted with solid tyres. Of this 64·4 per cent. were within 20 miles of the City of Melbourne and the remainder in close proximity to main towns.

The results revealed that horse drawn vehicles are also declining, the total number on State highways being 2,273 as compared with 3,413 in 1937. The reduction of 1,140 was 33 per cent.

Traffic on State highways, which is the highest on record, showed an increase of 13·21 per cent. on the figures for 1937.

The comparison between heavy and light motor trucks recorded on State highways is shown in the following figures :—

—	1934.	1935.	1936.	1937.	1938.
	%	%	%	%	%
Heavy trucks	43·3	47·1	58·1	61·3	63·2
Light trucks	56·7	52·9	41·9	38·7	36·8

It will be noted that in 1934 the percentage of light trucks was greater than that of heavy trucks, but in 1938 the position was reversed. Not only has the total number of trucks recorded increased to more than twice the number recorded in 1934, but the number of heavy trucks far exceeds the number of light vehicles.

The following table shows the increase and decrease in various classes of vehicles recorded on State highways :—

—	Increase.	Decrease.
	%	%
Private cars	9·97	..
Commercial vehicles	12·42	..
Motor omnibuses	5·21	..
Motor cycles	15·86	..
Hire cars	..	8·92
Solid-tyred vehicles	..	37·16
Horse-drawn vehicles	..	27·19

Figures, as under, obtained from the Motor Registration Branch of the Police Department show the increase in the registration of all types of motor vehicles during the twelve months ended 31st January, 1938, as compared with the registrations for the corresponding period of the previous year.

—	Twelve Months ended 31st January, 1937.	Twelve Months ended 31st January, 1938.	Increase.	Percentage Increase.
				%
Private cars	133,851	139,017	5,166	3·8
Commercial vehicles (including primary producers' vehicles)	63,916	74,635	10,719	16·8
Hire cars	1,995	2,029	34	1·7
Motor cycles	26,154	27,117	963	3·7
Total	225,916	242,798	16,882	7·5

The design and construction of roads and bridges are proceeding along the same lines as in previous years. The Board is constantly working towards the ideal of increasing the safety factor on roads wherever possible, and much has been done in this respect in the direction of widening highway pavements, improving curves, removal of hoardings and advertisements obstructing the driver's view or likely to distract his attention, and eliminating as far as possible any potential danger which may be likely to cause accidents.

Not only does an improvement in alignment render roads safer, but there is also a definite economic value in such improvements. Taking the common case of a right-angled bend in 1-chain road, and substituting for the sharp curve at the corner a modern transitioned curve, there is a saving in distance of approximately one-tenth of a mile in initial construction. The saving in construction costs alone generally pays for the cost of land compensation, fencing, &c. On a main road carrying say 100 vehicles per day, the annual saving in maintenance costs due to the shortening in distance would be about £10. Again, it is found that the maintenance costs on easy curves or straights is less per mile than on sharp curves, due to the loss of material, where cars tend to skid around curves, and on a normal gravel road it might be anticipated that there will be a further annual saving due to this cause of £10, making a total maintenance saving on the short length concerned of approximately £20 per annum.

In addition, the saving to motorists by the reduction in length would, for the conditions assumed, represent a saving of approximately £45 per annum in running costs.

In the designing of roads many requirements must be taken into consideration to ensure traffic safety. Besides good alignment, smooth pavements, wide shoulders, erection of white posts on curves and embankments, and superelevation of curves have to be considered in the light of modern traffic needs. Where the traffic warrants it separation of opposing traffic by traffic lanes marked by white lines has been introduced on State highways and some of the more important main roads ; 337 miles of traffic lines were painted on these roads during the year.

Since modern improvements on the highways were begun, widening of lengths in hilly country has been a continuous policy. Work done during the year under review comprised widening where the volume of traffic justified it, and noticeable improvements were carried out.

Another important factor in introducing safety into the highways is the provision of stock routes. In cases where the width of the highway impedes the passage of stock and causes danger to motor traffic, action has been taken to acquire a strip of land for the purpose of widening the road reserve, or stock bridges have been erected within the existing 3-chain reserve to avoid the necessity of driving stock along the pavement.

The expenditure of £1,546 from Unemployment Relief Funds during the year for clearing scrub growing on the sides of State highways allowed of valuable work being done on the South Gippsland Highway between Cranbourne and Nyora, and on the Prince's Highway East between Bunyip River and Picnic Point. This grant was an important contribution to the carrying out of much needed work, and as most of the expenditure was incurred in the employment of labour, provided means of relieving unemployment.

In this way much has been done to eliminate danger and remove inconvenience to traffic as well as to stock owners.

Bridges are now being designed so that the roadway width of the structure on highways carrying a large volume of fast traffic is 4 feet wider than the road pavement, with the result that no undue constriction occurs when two vehicles pass on the bridge.

As rapidly as possible the Board is eliminating narrow bridges on all State highways; handrails are being set back from the kerbs of the bridge to eliminate the possibility of motor vehicles hitting the rails.

On the Hume Highway, in particular, where a number of narrow bridges and culverts were in existence a few years ago, the whole of the bridge structures have been dealt with and action is now being taken to widen the culverts on the northern sections of the highway.

The maintenance of State highways becomes increasingly important each year as construction progresses. A constant endeavour is made to keep all highways in the best possible condition with a view to giving service and safety to traffic. Patrol maintenance which includes normal and routine maintenance is now costing an average of approximately £44 per mile.

Because of the loss of material under traffic on unsealed sections periodical resurfacing is essential, the quantity required varying from 40 to 260 cubic yards per mile according to the climate, material and volume of traffic.

The benefits accruing to the owners of motor vehicles by the improvement of the highways cannot be accurately determined. It is known that the cost of vehicle operation at the present time is much less than ten years ago, partly due to the improvement in the vehicle itself and its capacity for higher speed, and in part to the improvement of the highways. The substantial saving in time is also a factor which must be assessed as a direct benefit to the road user, which alone amounts to a tremendous sum each year, and it is only logical that the vehicle should be the basis of the tax that pays for the improvements. Any reduction in the amount of the tax would, therefore, lead to a reduction of expenditure on improvements and maintenance and a consequent curtailment of benefits to the road user.

Where the highways constructed with gravel or crushed rock, which are subject to heavy and concentrated traffic, show signs of rapid wear and the cost of maintenance is found to be excessive, the Board has followed its practice of treating the surface with bituminous materials with the object of reducing maintenance costs. Although the cost of first treatment averages about £440 per mile, it has been proved economical by reason of the reduction in costs during the subsequent years, and at the same time the highway has been improved to a higher standard capable of carrying the traffic.

To meet the growing demands of traffic bitumen surfacing was applied on State highways during the year at a total cost of £86,400 as compared with a cost of £63,570 during the previous financial year.

By stage construction, 107 miles of highways were reconditioned and existing surfaces improved; 141 miles were resealed at a cost of £62,000, and general maintenance by systematic patrol was carried out over 2,307·7 miles at an expenditure of £101,228.

With the improvement of the highways by methods of progressive improvement and reconstruction the highways are gradually being built up to a standard capable of carrying ordinary traffic without the cost of maintenance becoming unduly high.

Owing to the traffic increase in recent years, the Board has found it necessary to give greater attention to the shoulders on each side of the highway. Formerly the main purpose of shouldering was to afford support to the pavement and to allow horse-drawn vehicles to travel along the shoulder width. Modern speeds, however, demand that the shoulders shall be of adequate width and surfaced with suitable low-cost material. Rough and soft shoulders cause accidents and by forcing traffic over towards the centre of the pavement reduce the road capacity. Close attention is being given to this matter in the interests of road transport as well as public safety.

By proper grading and suitable planting on roadsides not only is the appearance of the highway improved but protection against erosion is assured and a free passage-way for stock is maintained. In the Board's opinion too much importance cannot be given to this matter, it being considered that the building of the roadways and the improvement of the roadsides should go hand in hand, as all the natural features along the highways should be preserved.

Plate No. 1.—Washout at Euchre Creek Valley.

Considerable damage was caused to roads and bridges in Eastern Gippsland by floods which occurred in March last, the greater part of the damage being confined to the Prince's Highway. In some parts of the district, where 30 inches of rain fell in three to four days, serious landslides and washouts were caused, and several bridges were damaged, involving extensive repairs. The bridge on the Prince's Highway at Reedy Creek about 4 miles beyond the Cann River was washed away together with the approaches to several other bridges, necessitating the construction of temporary side tracks.

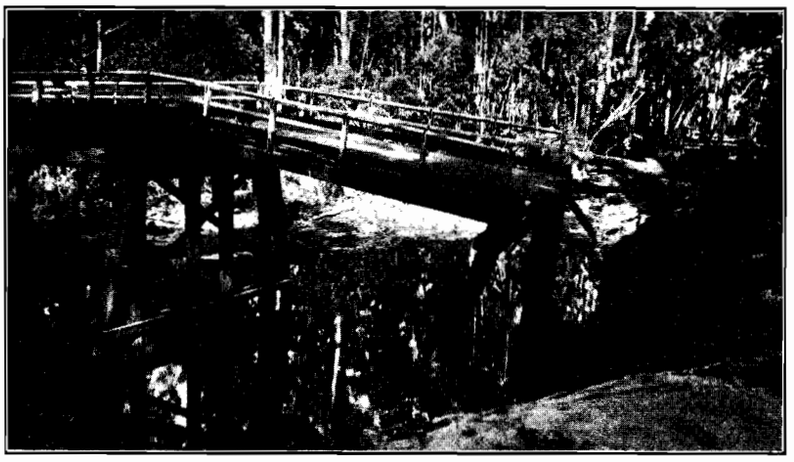


Plate No. 2.—Damage to Tonghi Creek Bridge on the Prince's Highway caused by floods.

The work carried out under the supervision of the Board's District Engineers comprised mainly maintenance and improvements.

Bairnsdale District.

In the Bairnsdale district the eastern section of the Prince's Highway from the town of Rosedale to New South Wales border covering a distance of 209·36 miles was systematically maintained and improvements effected by top dressing, grading, super-elevating curves, and sealing.

The Omeo Highway, extending for a distance of 18 miles, was maintained by patrolmen regularly employed on the work under the direction of the District Engineer. The remaining portions of this highway were similarly maintained under the direct supervision of the Omeo and Towong Councils over a total length of 167 miles. Improvement work included widening, re-aligning, regrading, surfacing and sealing with bitumen.

The Bonang Highway, from the old Orbost township boundary to the New South Wales border for a distance of 71·73 miles, was systematically maintained throughout the year, and sections were widened and improvements effected by super-elevating and gravelling.

The section of the South Gippsland Highway from Sale to Yarram, which is partly under the control of the Bairnsdale District Engineer for a distance of 16·45 miles, was maintained by patrolmen; improvements were made to sharp turns, two new concrete bridges were constructed and two old culverts replaced. The remaining section of this highway was maintained by a patrol gang under the supervision of the Shire Engineer of Alberton.

Benalla District.

The Hume Highway was maintained by a continuous patrol between Seymour and the Murray River with two truck patrols and general improvements were carried out. A reinforced concrete bridge was constructed over Fell Timber Creek near Wodonga.

Besides continuous maintenance work between Wodonga and the Upper Murray Shire boundary, considerable improvements were made on the Murray Valley Highway by sealing, providing improved facilities for the passage of stock, erecting a concrete bridge over the Kiewa River at Bonegilla, and various sections of the highway were formed and gravelled.

Improvement works involving realignment, construction of culverts and sealing, in addition to maintenance, were also carried out under the supervision of the Shires of Towong and Upper Murray.

Plate No. 3.—Showing improved alignment between Granya and Thologolong on the Murray Valley Highway.

On the Midland Highway, besides patrol maintenance, a length of ·99 mile was reconstructed and resheeted with sand, and a road-mix seal was placed over a section of 3·06 miles.

Bendigo District.

On the Calder Highway several old timber culverts were reconstructed and widened; sealing was extended from Warne towards Mildura, bad turns on the road were eliminated by deviating at the north end of Sea Lake, sand hills were graded and the general riding qualities of the limestone pavement between Sea Lake and Nowingi were considerably improved. Regular maintenance was carried out with a power grader.

Plate No. 4.—Section of Sturt Highway improved during last year.

The Murray Valley Highway, westerly from Echuca, was sealed from Lake Boga to Swan Hill and near Nyah, the total length now sealed between Echuca and Swan Hill being 110 miles.

Several narrow irrigation culverts were widened to provide safe traffic widths and general improvements besides ordinary maintenance were carried out.

On the Sturt Highway reforming and resheeting with limestone gravel was continued for a further 20·66 miles under the supervision of the Shire Engineer of Mildura. Improvements to the road consisted of light-grader formation, followed by surfacing with limestone gravel, 16 feet wide and generally 6 inches deep.

Central District.

On the Calder Highway patrol maintenance was carried out, and the construction of the section through the Black Forest was commenced south of Woodend. As this section contained many sharp turns and the pavement was slippery with a high crown a number of accidents have occurred on this length. The work in hand should eliminate present dangers to motor traffic traversing this part of the highway at high speeds.

On the Hume Highway, the western section of the Midland Highway, between Geelong and Ballarat, and the Prince's Highway East and West, the Western and South Gippsland Highways, routine maintenance was attended to under a patrol system.

A steep hill on the Prince's Highway West, west of Moriac, was regraded to provide improved visibility, and poor alignment and steep grades were eliminated by the reconstruction of the section of the Prince's Highway East between Warragul and Drouin.

Plate No. 5.—Showing regrading works completed on the Prince's Highway, east of Drouin.

On the Western Highway, 18·2 miles between Deer Park and Bacchus Marsh were surface-treated, and the South Gippsland Highway, between Lang Lang and the Main Coast Road over a distance of 2·75 miles, was sealed with bitumen. A further length of 2¼ miles was widened and surfaced with sand preparatory to sealing next spring.

Stawell District.

Plate No. 6.—Showing reconstructed section of Western Highway between Dobie and Mount Mistake.

Sections of the Western Highway were treated with a road-mix seal; reconstruction and widening were carried out and resheeting to the South Australian border was continued with a view to completing the sealed road to the border during 1938. The highway was regularly maintained by patrolmen.

Warrnambool District.

In addition to patrol maintenance, two short sections of the Prince's Highway, between Port Fairy Borough and Yambuk, were reconstructed and sealed, a section between Tyrendarra and Bolwarra was widened and surfaced with buckshot gravel and a section near Bolwarra was sealed; in the vicinity of Camperdown and Terang and between Port Fairy and Heywood resealing was completed.

For the use of pedestrians, footbridges have been added in previous years to a number of bridges on State highways. This is being done from time to time to safeguard pedestrians in or near the more important towns or where existing structures are not of sufficient width to take pedestrians and motor traffic at the same time.

A footbridge was built during last year on the bridge over the Indigo Creek on the Hume Highway at Barnawartha.

In view of the proved economy and efficiency obtained by the use of pneumatic-tyred power graders in maintaining sections of State highways, the Board purchased two additional machines of this type during the year. Five heavy compression ignition engine units are now permanently engaged on this work and others intermittently. The Board now has 32 power graders, five of the light type, twelve of the medium type, and fifteen of the heavy type.

Unsealed gravel roads have been considerably improved by the use of the units which, through savings effected in the cost of maintenance, and the more satisfactory and effective work performed as compared with that done under the old methods, have fully justified their purchase.

It is gratifying to report that since the Board introduced the light graders in 1926, 40 municipal councils have purchased machines of that class and 47 units are now used in maintaining roads under municipal control.

In order to encourage municipal councils to use plant of this description, the Board has hired its graders, when not required on its own works, for use on councils' roads, with the result that councils have been so impressed with the economy and efficiency of the units that they have purchased similar plant.

The extension of sealing on the various highways totalled 76 miles during last year.

The mileage of first seals and road-mix reseals carried out on the various highways was as follows :—

Prince's Highway West, between Footscray and the South Australian border	45·0	miles
Prince's Highway East, between Oakleigh and the New South Wales border	10·2	,,
Western Highway, between Footscray and the South Australian border	30·7	,,
Calder Highway, between Essendon and Mildura	24·6	,,
Northern Highway, between Bendigo and Echuca	·3	,,
Hume Highway, between Coburg and Albury	8·2	,,
Omeo Highway, between Bairnsdale and Tallangatta	1·4	,,
Murray Valley Highway, between Swan Hill and Corryong	61·0	,,
South Gippsland Highway, between Dandenong and Nyora	7·0	,,
South Gippsland Highway, between Sale and Yarram	6·1	,,
Midland Highway, between Geelong and Ballarat	7·2	,,
Midland Highway, between Shepparton and Mansfield	3·4	,,

MAIN ROADS.

During the past year 66·59 miles of new construction works were added to those of previous years, the expenditure incurred being £188,883. Of this amount £58,286 was expended from loan funds in reconstructing declared main roads and bridges in the metropolitan area. On country main roads an expenditure of £113,117 was incurred from funds derived from the State's share of petrol taxation under the terms of the Federal Aid Roads and Works Agreement and £17,480 from unemployment relief funds.

As, however, the amounts from Federal funds were supplemented by municipal councils, the mileage of roads constructed includes the additional works completed with municipal contributions. The works generally were carried out by councils, but the Board itself undertook construction works on several roads forming connexions between important towns in the north and north-western parts of the State.

The policy of constructing the low cost surface type of road suitable for the traffic in country districts was continued during the year. By this method greater mileages were constructed and an economical construction programme was carried through at a small initial cost. Whilst the expense of maintenance is not excessive, a surface is obtained capable of improvement to a higher standard as the requirements of traffic demand.

The regular maintenance of roads of this class, constructed to a proper standard, plays an important part in the cost of upkeep. By close co-operation with municipal councils, the majority of municipalities are now maintaining the main roads by a patrol system with very satisfactory results, considerable improvement in the condition of main roads being manifest throughout the country districts. It is gratifying to report that, generally, considerable progress has been made in extending roads to provide for all-weather traffic and to enable farmers to deliver stock and produce to market at most suitable times and in good condition.

The amount estimated by municipal councils as necessary for maintenance for the year was £1,081,584, but as the amount available from the Country Roads Board Fund was £772,166 only, it was necessary to supplement that sum by an amount of £72,100 provided from petrol taxation funds, so that the total amount available was £844,266, or £237,318 short of estimated requirements.

The expenditure incurred on the maintenance, improvement and restoration of 6,685 miles of declared main roads amounted to £731,479 for the year from the Country Roads Board Fund and Federal Aid funds, compared with an expenditure of £722,216 from the same sources during the previous year, representing an increase of £9,263. This expenditure, however, represents the amount that municipal councils are prepared to expend on maintenance rather than the expenditure required to keep the roads in good order, as in many instances the sum expended is governed by the amount the council is required to contribute during the following year.

As pointed out in previous reports, this is a weakness in the maintenance system, as many roads are allowed to reach a stage where partial reconstruction is required, owing to adequate maintenance having been neglected for a long period.

Plate No. 7 is an example of neglected maintenance of a constructed road.

An amount of £58,286 provided from loan funds under Acts Nos. 4188, 4414, and 4498, was expended on the reconstruction of declared main roads and erection of new bridges in the metropolitan area for the twelve months ended 30th June, 1938, as compared with an expenditure of £66,465 incurred from a similar source during the previous year.

For the maintenance of metropolitan roads, an expenditure of £10,922 was incurred during the twelve months as compared with £17,620 during the year ended 30th June, 1937.

Details of the reconstruction and maintenance works carried out on main roads during the year are given in Appendix " D."

By continuous attention by regularly employed patrolmen to surfaces, road shoulders, bridges and culverts, and filling in of pot-holes, efficient work can be done economically and at a much less cost than spasmodic maintenance.

It is gratifying to report, however, that councils generally are now alive to the fact that neglected maintenance is the cause of direct economic loss both to the municipality and the road user ; to the former by reason of the extra expenditure ultimately required to restore the road to proper condition, and to the latter by the increased cost of transport due to the additional wear and tear on the motor vehicle, extra fuel costs in its operation, and the longer time occupied on the journey.

With the assistance rendered by the Board municipal councils have received tremendous relief as far as the construction and maintenance of roads are concerned. The cost of maintenance of State highways is now borne solely by the Board ; in the case of declared main roads at least two-thirds of the cost of maintenance is paid by the Board. Substantial help is being given to maintain many main and developmental roads constructed from loan funds and from moneys provided from funds derived from petrol taxation. In addition, large amounts have been expended on the construction of developmental roads from unemployment relief funds.

With so much financial assistance the Board now feels that municipal councils should be in a position to maintain roads of a minor character without any undue burden on the ratepayers, otherwise money expended on their construction is wasted.

In the last year's report reference was made to the care and the preservation of the natural rights-of-way on each side of the road pavement. During its inspections in various parts of the State, the Board has observed an improvement in the appearance of the roadsides due to closer attention being given to this feature, but much still remains to be done in sloping off unsightly borrow-pits which have been dug for the purpose of securing material for the road formation and shouldering the pavement, and in levelling off the ground along the roadside after the work of road construction has been completed.

An example of the unsightly appearance of a neglected roadside as a result of excavating for material is depicted in Plate No. 8.

Plate No. 8.—Showing neglected appearance of roadside after construction.

A material factor in the improved condition of roads maintained by municipalities is the use of modern plant. Many councils have, during the past, purchased power-graders for use in carrying out general maintenance work, or have secured light pneumatic-tyred graders drawn by a patrol motor truck. In every case councils, having recognized that economical and efficient maintenance work is being carried out with these units, have purchased additional plant of this description, where the mileage of roads justified the expenditure. It is interesting to report that since 1935, when two power-graders were in use by municipalities and 20 by the Board, to-day councils operate 47 machines, whilst the Board has 32 in constant use.

By continuing experiments commenced during the previous year by the use of salt, it was found that roads so treated consolidated better under traffic and become more dense and stable than untreated sections. Main roads treated with calcium chloride did not consolidate under traffic as well as those treated with common salt, and it would appear that the use of the former, which costs five times more than common salt, has no advantages over the latter.

Details of the results of the experiments are set out in the report of the Chief Engineer.

Marked progress was made with the sealing of gravel roads carrying traffic through and between the more important country towns. The mileage of work done with the Board's plant under its own supervision on main roads within the several districts is as follows :—

District.	*Miles.*
Benalla	9·1
Bendigo	3·8
Central	23·0
Stawell	·3
Total	36·2

In addition, 507·3 miles of sealing was carried out by municipalities on main roads with the Board's plant, which was hired to them.

Noticeable improvement is now shown in the condition of main roads by a planned system of sealing from year to year, resulting in a reduction of maintenance costs. With the increasing difficulty of securing at a reasonable cost suitable supplies of gravel in parts of the State, serious thought will have to be given to sealing of many roads, even where the traffic is of a light nature.

In addition to the works for which funds were allotted by the Board, valuable projects were carried out with funds provided from unemployment relief funds, on which a sum of £17,480 was expended, supplemented by £2,221 from Federal Funds. The total length of roads completed or partially completed, in addition to the mileage constructed from other sources, was 226·46 miles, and employment was given to 191 men.

Owing to additional expenditure being necessary to maintain declared main roads carrying traffic not of local origin, the Board under the powers conferred under the Country Roads Act reduced the municipal contributions towards the cost of maintenance below one-third of the total cost. The extent of assistance given to councils on that account was £45,716 during the year.

For the past four years insistent demands have been made on the Board by councils for declaration of additional roads which are considered to be of sufficient importance to be main roads, with a view to assisting in their maintenance. Many of these roads, which were constructed from loan or other sources as developmental roads, have, owing to the increase in traffic, assumed

an importance which entitles them to be classified as main roads but, owing to its commitments in respect of loan expenditure and its liabilities for maintenance of State highways and gazetted main roads, the Board has been in a position to accede only to the most urgent of the requests. Recommendations were accordingly made to the Governor in Council that the following roads be declared main roads under the provisions of the Country Roads Act, and the necessary Orders in Council to give effect to the recommendations were passed. The following are the roads referred to :—

Arapiles and Kowree Shires	Harrow–Horsham Road.
Ararat Shire	Ararat–St. Arnaud Road.
Avoca Shire	Moonambel Road.
,, ,,	Ararat–St. Arnaud Road.
Avoca and Bet Bet Shires	Maryborough–Natte Yallock Road.
Avon Shire	Briagolong–Stratford Road.
,, ,,	Bengworden Road.
Bairnsdale Shire	Bengworden Road.
Ballarat Shire	Clunes–Creswick Road.
Ballarat City	Melbourne Road.
Beechworth Shire	Chiltern–Beechworth Road.
Benalla Shire	Lima Road.
Berwick and Upper Yarra Shires	Gembrook–Launching Place Road.
Box Hill City	Warrigal Road.
Buln Buln Shire	Drouin–Poowong Road.
Camberwell City	Warrigal Road.
Castlemaine Borough	Castlemaine–Maryborough Road.
Chiltern Shire	Chiltern–Beechworth Road.
,, ,,	Chiltern–Rutherglen Road.
Clunes Borough	Clunes–Creswick Road.
Cohuna Shire	Cohuna–Koondrook Road.
Creswick Shire	Clunes–Creswick Road.
Doncaster and Templestowe Shire	Warrandyte–Kangaroo Ground Road.
Eltham Shire	Warrandyte–Kangaroo Ground Road.
Flinders Shire	Bittern–Dromana Road.
Footscray City	Ballarat Road.
Glenelg Shire	Casterton–Penola Road.
Grenville Shire	Lismore–Pittong Road.
Hampden Shire	Lismore–Pittong Road.
,, ,,	Darlington–Terang Road.
Heytesbury Shire	Cobden–Scott's Creek Road.
Huntly Shire	Goornong–Colbinabbin Road.
Kara Kara Shire	Ararat–St. Arnaud Road.
Karkarooc Shire	Hopetoun–Ouyen Road.
Kerang Shire	Cohuna–Koondrook Road.
Korumburra Shire	Drouin–Poowong Road.
,, ,,	Jeetho West Road.
Maffra Shire	Briagolong–Stratford Road.
Malvern City	Warrigal Road.
Marong Shire	Loddon Valley Road.
Melbourne City	Ballarat Road.
Metcalfe Shire	Elphinstone–Harcourt Road.
Mirboo Shire	Mirboo North–Thorpdale Road.
Mortlake Shire	Darlington–Terang Road.
,, ,,	Ellerslie–Framlingham Road.
Morwell Shire	Morwell–Maryvale Road.
Mulgrave Shire	Warrigal Road.
Narracan Shire	Mirboo North–Thorpdale Road.
,, ,,	Trafalgar–Thorpdale Road.
Numurkah Shire	Numurkah–Nathalia Road.
Oakleigh City	Warrigal Road.
Orbost Shire	Orbost–Delegate Road.
Rodney Shire	Mooroopna–Undera Road.
Rosedale Shire	Rosedale–Heyfield Road.
Rutherglen Shire	Chiltern–Rutherglen Road.
South Gippsland Shire	Foster North–Mirboo South Road.
Stawell Shire	Ararat–St. Arnaud Road.

Talbot Shire	Clunes–Creswick Road.
Traralgon Shire..	Traralgon Creek Road.
Tullaroop Shire..	Talbot–Eddington Road.
Upper Murray Shire	Upper Murray Road.
Walpeup Shire	Hopetoun–Ouyen Road.
Woorayl Shire	Foster North–Mirboo South Road.
Yackandandah Shire	Huon–Kiewa and Kergunyah Roads.

As a result of the declaration of these roads, provision will be made by the Board each year for their maintenance, as the councils interested will in future be required to contribute only one-third of the amount expended during the year following that in which the expenditure has been incurred. In this way the Board is using every endeavour to further assist councils in their maintenance problems, and hopes to render further assistance in this direction during the current financial year.

Whilst inspecting roads in country districts, it has been observed by the Board that the practice is developing in certain districts of dumping rubbish on the sides of the roads. As this is altogether foreign to the purpose for which roads may be used, besides presenting a most unsightly appearance, the attention of councils has been drawn to the matter with a view to discontinuing the practice.

Besides road construction and maintenance works, 56 bridges were erected to replace structures which had reached the end of their useful life, many of them having been in existence for over 50 years. In designing new structures to be erected on the more important main roads, the Board has adopted the practice of providing a width conforming with the pavement width of the road, with the object of ensuring greater safety to traffic, whilst obviating, as far as possible, damage to the handrails caused by vehicles colliding with same.

The more important of the bridges erected are described in detail under the heading "Bridges," as well as in the appended report of the Chief Engineer. The total expenditure involved during the year was £44,100.

Benalla District.

The Goulburn Valley Road was further improved by reconstructing and gravelling 2 miles in the Goulburn Shire, and sealing 4·95 miles. Considerable improvement was effected to the Murchison–Shepparton Road, in the Euroa Shire, by reforming, gravelling, and sealing 2·20 miles.

Plate No. 9.—Showing reconstructed section of the Goulburn Valley Road in the Shire of Goulburn.

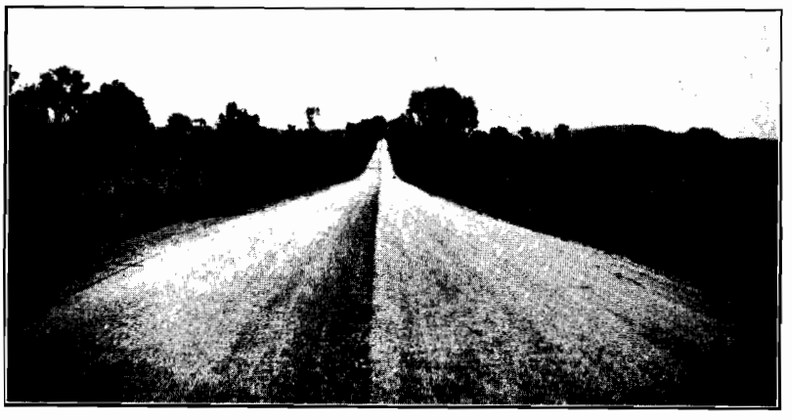


Plate No. 10.—Showing completed work on the Bonegilla Road.

The Bonegilla Road in the Wodonga Shire which forms an important interstate connexion between the Hume Weir and the Murray Valley Highway, was reconstructed and gravelled over a distance of 1·52 miles.

Bendigo District.

On the Castlemaine–Maldon Road 3·37 miles were reformed, sheeted, and sealed on improved alignments and grades. Similar work was carried out on the Kilmore–Heathcote–Bendigo Road north and south of Heathcote.

The deviation made on the Castlemaine–Maryborough Road, east of Joyce's Creek, has removed several short radius curves, and the replacement of a floodway by a culvert in Carisbrook has effected considerable improvement in the curve at the junction of the Majorca Road. Reconstruction of rough gravel and water-bound macadam sections of the Bendigo–Serpentine Road, near the aerodrome, was extended in a northerly direction for a distance of 3·73 miles.

The road from Yapeen to the mineral springs at Vaughan which was considerably improved by reshaping, sheeting and sealing for 2·30 miles, has now a good surface for its full length.

On the Loddon Valley Road three narrow irrigation culverts were widened. The bridge over the Waranga–Mallee channel at Bear's Lagoon was widened to 22 feet and provision made for pedestrians.

Reconstruction of the Elphinstone–Harcourt Road on suitable alignments and grades was commenced at Harcourt and extended as far as Faraday. With the completion of this work in the spring of 1938 a good surface will be provided for the full length of the road, and traffic proceeding to Bendigo and districts north of Bendigo will be removed from the winding route via the Calder Highway.

Central District.

The Anglesea Road in the Shire of Barrabool was further improved by the reconstruction of bridges on improved alignments over Spring Creek and Thompson's Creek. The completion of this work has now brought the road to a high standard between Freshwater Creek and the Ocean Road at Jan Juc.

A section of the Geelong–Portarlington Road, 1 mile in length, easterly from the Geelong City boundary was sealed, and a commencement made with the remaining unsealed length.

In the Dandenong Shire the bridge over the Dandenong Creek was widened to 30 feet, thus removing a dangerous bottle-neck on this thickly trafficked road.

The remaining unmade section of the Burwood Road leading to Ferntree Gully was widened to 20 feet; a wide bituminous surfaced road between Melbourne and the Dandenong Ranges now exists.

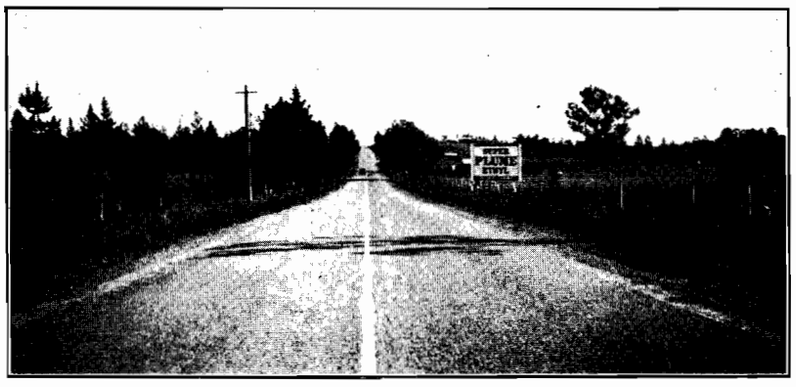


Plate No. 11.—Showing reconstructed section of the Burwood Road in the Shire of Blackburn and Mitcham.

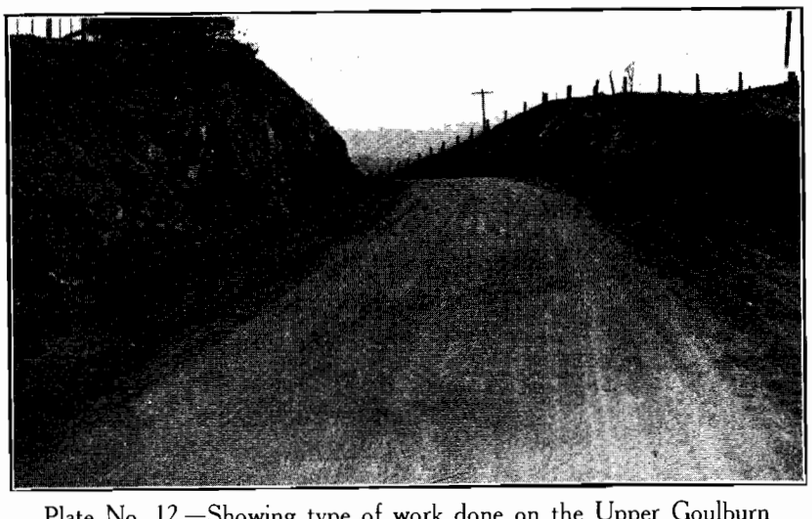


Plate No. 12.—Showing type of work done on the Upper Goulburn Road in the Shire of Alexandra.

A further length of 1·6 miles of the Mount Dandenong Road was widened to 30 feet and bitumen surfaced between Kalorama and Olinda.

On the Upper Goulburn Road in the Shire of Alexandra improvements were effected to the road under the supervision of the Shire Engineer. The work of cutting and filling 1·9 miles north-west of Alexandra improved the visibility at this point.

The new culvert constructed on the Upper Goulburn Road, near Thornton, under the supervision of the Shire Engineer of Alexandra cost, with approaches, £285.

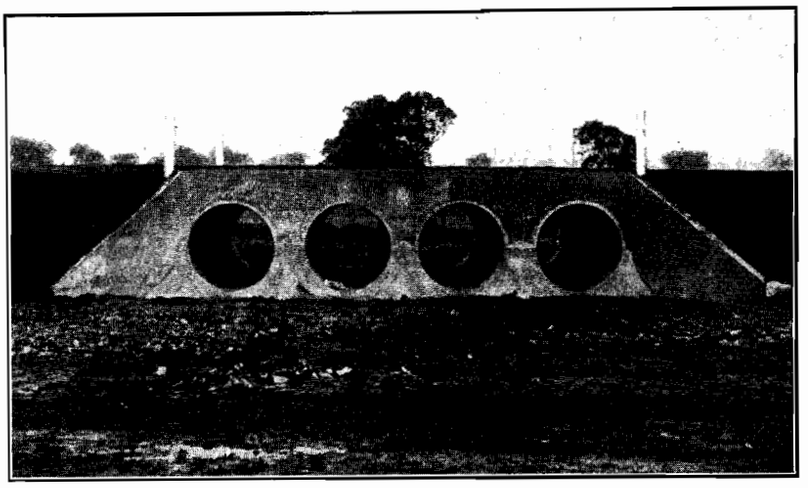


Plate No. 13.—Quadruple pipe culvert erected on the Upper Goulburn Road in the Shire of Alexandra.

WARRNAMBOOL DISTRICT.

Plate No. 14.—Showing work done on the Cobden–Port Campbell–Princetown Road in the Shire of Heytesbury.

The construction of a deviation on the Cobden–Scott's Creek Road, 1 mile south of Cobden, has not only shortened the distance to be travelled but has eliminated two railway crossings in close proximity.

On the Cobden–Port Campbell–Princetown Road in the Shire of Heytesbury 1·1 miles of double-coat sealing at Scott's Creek was completed under the supervision of the Shire Engineer.

DEVELOPMENTAL ROADS.

During the past five years road works have been extended by the addition of roads not included in the system of roads constructed and maintained under the provisions of the Country Roads Acts. The construction and improvement of such roads has become an urgent necessity in view of the growing needs of traffic. Long range planning is carried on with the object of evolving a scheme for a comprehensive, efficient, and safe road system which can be built up in stages year by year. On the basis of information supplied by municipal councils at the beginning of each financial year it is possible to forecast the annual expenditure necessary to carry through the programme of works efficiently and economically.

In this way municipal councils are being assisted with the construction of lateral roads which convey traffic to the State highways, main roads, and railways, and municipalities generally are in agreement with this policy.

As loan funds are no longer available for the construction of developmental roads, moneys derived from petrol taxation under the Federal Aid Roads Agreement are now utilized for their construction and, with the assistance granted from unemployment relief funds, considerable headway was made in extending this work during the past year.

Of the total amount of £477,326 expended on roads of a developmental character during the year £347,294 was derived from Federal Aid funds, supplemented by contributions totalling £59,577 from municipalities and £70,455 from the provision made under Act No. 4097 for the relief of unemployment.

The expenditure was distributed amongst 131 municipalities on 975 separate roads.

Whilst the funds available limit the works to be carried out each year, it is felt that the policy adopted by the Board during the past six years of extending, linking up constructed sections of developmental roads, and providing roads to isolated farms has been of great value to the primary producer, as with the improvement of State highways and main roads the road system is being broadened year by year with a view to the roads of a developmental nature becoming a component part of the highway system. The conditions that existed less than fifteen years ago, when no planned system of road construction was in force, present a marked contrast to the present-day organized methods under which so much progress has been made.

In order to assist councils as far as possible in the maintenance of constructed developmental roads, the Board allotted to municipalities from funds received under the Federal Aid Roads Act the sum of £32,412 of which £27,070 was expended to the 30th June.

The total amount for which application was made by municipal councils for the construction of developmental roads during the year was £1,396,980. As, however, the amount available was £416,130, approximately one-third only could be allocated. With contributions from municipalities totalling £74,880, the total amount available for expenditure was £491,010, of which £406,871 was expended to the 30th June, the unexpended balance representing commitments and balances carried forward to the following year.

The total mileage of new works completed or partially completed at the 30th June was 1,046·75 miles. The work done which was of the low cost type consisted of the extension and linking up of existing sections and the construction of new roads.

Under unemployment relief schemes financed from funds provided under Unemployment Relief Act No. 4097, 210·17 miles of constructed roads were added to the mileage of previous years.

Eleven bridges were erected on developmental roads, mainly to replace old structures, the total expenditure for which was £7,495. Reference to the principal projects is made under the heading of "Bridges."

Owing to the establishment of extensive paper pulp mills by the Australian Paper Manufacturers Pty. Ltd. within the Shire of Morwell, to which no adequate road access was available, it was necessary to make provision for constructing roads from the towns of Morwell and Traralgon to the mill.

The mill is being served by a railway for the purpose of transporting the mill produce, but it is intended to house the large number of employees in the adjoining towns of Morwell and Traralgon, so that the roads will be much used by them in proceeding to and from their work, as well as for the conveyance of timber to the mill.

With assistance from the Board access has now been provided between the mills and the two towns mentioned and considerable progress was made during the year in constructing the roads required. That in the Morwell Shire, known as the Morwell–Maryvale Road, has been formed and sanded for a length of 3¾ miles; whilst the road in Traralgon known as the Traralgon West Road has been constructed for a distance of 1¼ miles. A length of 3½ miles remains to be constructed to connect the road with the Morwell–Maryvale Road.

The expenditure incurred on the Morwell–Maryvale Road was £1,332 and on the Traralgon West Road £2,645. These works were carried out under the supervision of the respective councils.

The following comprises the major works carried out during the year under the direct supervision of the Board:—

Re-aligning and surfacing of the Lindenow–Dargo Road in the Shire of Bairnsdale for a distance of 1·54 miles.

In the Orbost Shire the extension of the Ambyne Settlement Road over a distance of 3·36 miles; grubbing, clearing, forming, and grading of the Black Mountain–Suggan Buggan Road over a length of 2·28 miles, and reconditioning and re-aligning of 13 miles of the Marlo–Cape Conran Road easterly from Marlo.

Completion of the road connecting Orbost and Bendoc by constructing 2·84 miles, surfacing 11 miles, and erecting bridges over the Bonang and Delegate Rivers; constructing 1·69 miles on the Orbost–Buchan Road, and extension of the Tamboon Road by the forming of a further 4 miles, thus bringing the road within 1 mile of the Top Landing at the Inlet.

Clearing, forming and partly surfacing 1·34 miles of the Upper Rose River Road. This work has provided the settlers with a reasonable outlet to the railway siding at Whitfield.

In the Kerang and Gordon Shires, roads linking the railway stations on the Bendigo–Kerang line to the Loddon Valley Road have greatly benefited the settlers by providing them with improved means of communication.

In the Bendigo area supervised by the Board's District Engineer greatly improved communications have been provided by construction works on the Wyuna–Shepparton Road, Elmore–Shepparton Road, Rushworth–Tatura, Elmore–Raywood, Pyramid–Boort–Charlton, Boort–Kerang, Dumosa–Quambatook–Kerang, Dumosa–Lalbert–Swan Hill, Ouyen–Pinnaroo and Kerang–Murrabit Roads.

In the Heytesbury Settlement an additional length of 5·4 miles of road was surfaced with gravel, bringing the total mileage of roads formed by the Board in the settlement, apart from main roads, to 102 miles, of which 90·5 miles have been lightly gravelled. The policy of constructing thin gravelled pavements, usually about 2 inches thick, has made possible the provision of all-weather outlets in the settlement. During the year 17·2 miles of pavements were strengthened by additional gravel.

The Glenfyne–Digney's Bridge Road was further extended, ·9 miles being formed and 3·2 miles gravelled, thus completing the construction of the road, excepting for the provision of a new bridge and approaches over Scott's Creek.

The Barramunga–Gellibrand Road was surfaced with crushed rock between Barramunga and the Gellibrand River, thereby giving settlers in the district an all-weather connexion.

Plate No. 15.—Showing completed work on the Newington–Ocean Grove Road.

In the Shire of Bellarine the reconstruction of the Newington–Ocean Grove Road was continued by a further length of 1½ miles. This road forms the direct connexion between Ocean Grove and Geelong and passes through a considerable area of fruit-growing country.

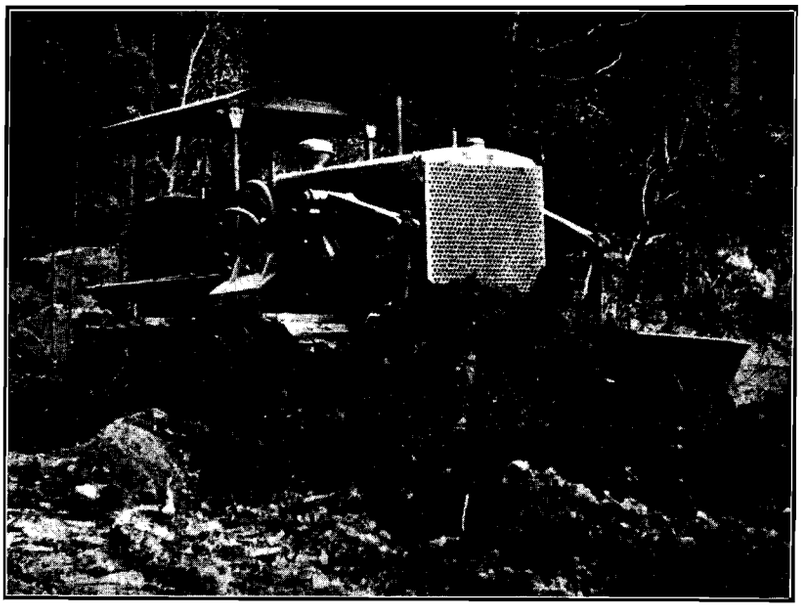


Plate No. 16.—Showing trail builder at work on the Keiwa Road.

By arrangement with the State Electricity Commission the Board undertook the construction of a road to serve the Kiewa Hydro-electric Scheme. Clearing, forming, and grading the first section of the road was commenced by day labour and a contract let for the erection of a timber and steel bridge over the west branch of the Kiewa River.

Four trail builders described in detail in the Chief Engineer's report were used on this work and proved efficient and economical in operation.

ROADS FOR ISOLATED SETTLERS.

Considerable headway was made during the year in constructing roads to serve farms isolated from the main system. With the provision of £64,569 from funds derived from petrol taxation much was accomplished in providing passable roads over which the farmer might transport his produce to railway, factory, and market at all seasons of the year.

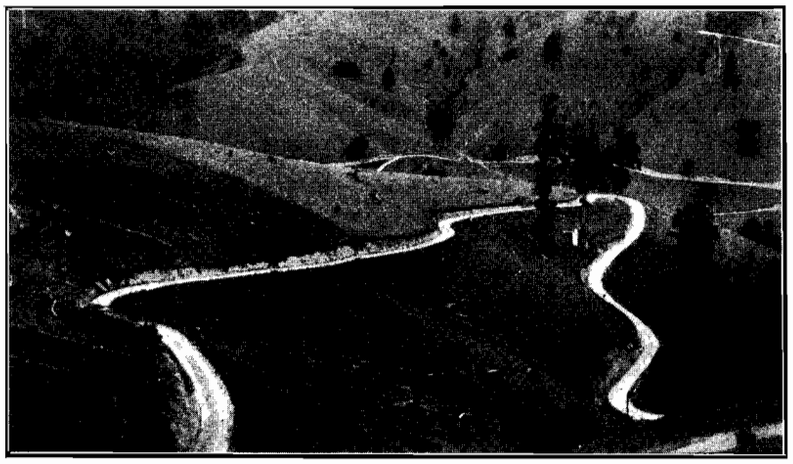


Plate No. 17.—Isolated settler's road known as Henry's Road in the Shire of Alberton.

In making provision for the construction of roads of this character, the Board recognizes that municipal councils are not in a position to undertake improvements involving heavy expenditure, as the traffic which is only of a light nature only justifies a small outlay for each settler.

Throughout the year the Board received requests from councils and settlers themselves urging the provision of funds for relief, but in view of the fact that a total sum of £64,569 only was available, and applications involving an expenditure of £123,150 were received, the Board could only provide for those cases considered the most urgent.

The total expenditure during the year was £44,722 on 634 roads. Of this sum £33,730 was provided from funds available under the Federal Aid Roads Agreement and £10,992 from unemployment relief funds. As the whole of the works were not completed at the end of the financial year, commitments were carried forward to the current year.

As the grant for each road was supplemented by councils or the settlers by a contribution from the council or the settler either in money, materials or work, the value of the completed work was approximately £50,000.

In this way the needs of individual farmers or groups of settlers are being catered for, longer lengths of serviceable roads are being constructed, facilities afforded for the cartage of farm produce, and the settler and his family given opportunities of enjoying the social amenities associated with the nearest town.

FEDERAL AID ROADS.

In last year's report reference was made to the fact that a new agreement, known as the Federal Aid Roads and Works Agreement, had been entered into between the Commonwealth and State Governments, under which provision was made for the distribution of an amount equivalent to a duty of 2½d. per gallon in respect of petrol imported into the Commonwealth, and an excise duty of 1½d. per gallon in respect of locally-refined petrol. The amount is to be distributed on the same basis as in the original agreement, excepting that the population basis was to be according to the respective populations of each State as at the 30th June, 1936.

In addition, the proceeds of an additional amount, equivalent to ½d. per gallon on petrol imported and on petrol refined in Australia, is to be distributed on a similar basis, and the additional amount is to be expended upon the construction, reconstruction, maintenance or repair of roads, or for other works connected with transport, as the State may think fit. It is also provided that, whenever required by the Commonwealth Minister for the Interior, the State will, to his reasonable satisfaction, make provision for the proper maintenance and repair to a standard necessary to meet the requirements of the Commonwealth and other traffic using such roads, of public roads adjoining or of approach to properties of the Commonwealth within the State, but the State shall not be required to make any provision in excess of an amount equivalent to one-twelfth of the moneys received from the extra distribution of ½d. per gallon.

The new agreement was ratified by the State Parliament in November, 1937, and is embodied in Act No. 4482.

With funds provided under the Federal Aid Roads and Works Agreement, the major portion of constructional works was carried out during the year. These works were of considerable importance to the municipalities and the State, as they mainly comprised the building of developmental roads and roads to serve isolated farms.

During the year, the sum of £588,089 was made available to the State under the new agreement. Supplemented by an amount of £53,277 brought forward from the previous year, an expenditure of £554,242 was incurred, and commitments totalling £87,124 were carried forward to the financial year 1938–39.

From the proceeds of the extra ½d., £88,840 was made available to the State, of which £15,074 was expended by the Board in the construction of developmental roads, £4,637 on main roads, and £4,954 on tourists' roads. Of the amount of one-twelfth to be expended on roads adjoining or approaching properties of the Commonwealth for which £7,300 was made available, £3 only was expended by the Board on maintenance and repairs.

Plate No. 18.—Showing type of work completed on Cordite Avenue leading to the Munition Factory at Maribyrnong.

In view of the necessity of extending the system of developmental roads, the greater part of the expenditure was incurred on roads of a developmental character. The total expenditure was £347,294, including £33,730 on roads to isolated farms; 886·88 miles of developmental roads were constructed.

On main roads £113,117 was expended on construction, reconstruction and improvement works. For the assistance of municipal councils in maintaining main and developmental roads previously constructed from Federal funds and loan funds, £55,307 was allotted during last year, of which £45,520 was expended to the 30th June. An expenditure of £64,865 was also incurred on the maintenance of declared main roads from the supplementary allotment from Federal funds.

UNEMPLOYMENT RELIEF FUNDS.

To relieve unemployment and to assist in the development of backward areas of the State many miles of roads were constructed and improved during the year from unemployment relief funds. In conjunction with work done in previous years, much has been accomplished in opening up inaccessible parts of the State and providing means of communication with markets and railways.

The recognition by successive governments that unemployment relief funds expended on road construction works meet the needs of the roads on the one hand, and supply suitable work on the other, has induced them to provide generous sums from time to time, and much valuable work has been done in providing roads in remote and inaccessible parts of the State, so that land has been developed, production increased, and much relief given to the settlers. In addition, municipal councils have been assisted by the increased development, whilst settlement and production have been placed on a better footing.

The sum of £65,250 was provided for the year ended 30th June, last, under Act No. 4097. Supplemented by the amount of £94,255 carried forward from the previous year, and the expenditure of £12,169 from the Country Roads Board Fund and Federal Aid funds for the purchase of materials, making of surveys, &c., the total expenditure was £150,353.

The works carried out, which comprise the construction of new roads to open up new areas for settlement, the extension and improvement of existing roads, roads to facilitate the cartage of timber from State forests, and for the development of tourists' resorts, all of which are supplementary to the Board's normal programme, are of great benefit to the municipalities and the State, in as much as they have already opened up considerable areas of valuable country and provided means of access to undeveloped areas, which under ordinary conditions would not have been dealt with for some time.

Particulars of the expenditure are set out in the following statement :—

—	Relief Grant.	Country Roads Board Fund.		Federal Grant.	Total.
		Main Roads.	State Highways.		
	£	£	£	£	£
State Highways	6,142*	..	1,000	..	7,142
Developmental Roads	70,455	..	..	8,280	78,735
Main Roads	17,480	..	..	2,221	19,701
Forest Roads	32,114	..	..	..	32,114
Roads for Isolated Settlers	10,993	..	..	668	11,661
Tourists' Roads	1,000	..	..	..	1,000
Total	138,184	..	1,000	11,169	150,353

* Includes £2,678 from Unemployment Relief Taxation.

The expenditure was distributed over 221 roads and 77 municipalities participated.

The work done, comprising mainly grubbing, clearing and earth works, provided employment for 3,117 men.

Work on the Noojee–Erica Road for which provision was made towards the end of the previous year, was extended, resulting in $7\frac{1}{4}$ miles of road being cleared and formed between Icy Creek and the Tangil River ; $2\frac{1}{2}$ miles were surfaced with crushed rock, between the post office and Brown's Mill. This road, which is designed to serve a valuable area of forest country, will, on completion, enable the sawmillers operating in the area to cart their timber to Noojee throughout the year, and will be the means of giving continuous employment to a large number of men employed in the mills.

Plate No. 19.—Type of work being carried out on the Noojee-Erica Road. Trail builder is shown in operation.

Valuable work carried out on the Licola Road, in the Shire of Maffra, by widening and re-aligning old formations over a total length of 9 miles, resulted in much benefit to the settlers in the district.

In addition to better facilities being given for the travelling of stock, a direct result of the construction of the road has been to considerably reduce cartage costs. Prior to the construction of this road, cartage rates to the Heyfield railway station were as high as 30s. per ton, but since the road has been constructed the rate has fallen to 8s. per ton.

In the Ardmona Settlement, where fruit growing is extensively carried on, an amount of £1,730 was expended in constructing roads for the use of the fruit growers in carting their fruit to the cannery. The Board has made a further allotment of funds during the current year to extend the work commenced last year.

The following are the more important works carried out during the year :—

Clearing and forming on the Suggan–Buggan Road, in the Shire of Orbost. This work is designed to serve the valuable area of country which is being thrown open for settlement by the Lands Department.

Formation works over a length of 2 miles on the Cape Patterson–Eagle's Nest Road between Cape Patterson and Inverloch ; forming and gravelling on the Buffalo–Waratah Road, in the Shire of Woorayl; continuation of construction works on the Lindenow–Dargo Road, in the Shires of Bairnsdale and Avon ; construction of the Yendon–Egerton Road by forming and gravelling, and construction of flood crossings in the Shire of Charlton.

Forming and gravelling the Boort–Charlton Road, in the Shires of Charlton and Gordon, thus completing the road and providing an all-weather communication between two important towns.

Widening side cuttings on the Mansfield–Wood's Point Road in the Mansfield Shire; and forming and gravelling the Ballan–Anakie Road, in the Shires of Bannockburn and Corio, for a distance of 2½ miles, with a view to providing an important connexion between Ballan and Geelong.

Reforming and surfacing between Elphinstone and Harcourt, in the Shire of Metcalfe. This road supplies an alternative and shorter route to Bendigo, and avoids the many sharp turns on the Calder Highway from Elphinstone to Bendigo.

Forming and reforming on the Ravenswood–Marong Road, in the Shire of Marong; construction of the western section of the Clear Creek Valley Road, in the Shire of Mirboo; extension of the Upper Rose River Road, in the Shire of Oxley, by clearing and forming; formation works on the Orbost–Buchan Road, in the Shire of Tambo; and clearing, forming, and surfacing the Nyah–Ouyen Road, in the Swan Hill Shire.

On the Darby River Road clearing, forming, and surfacing in extension of previous work. With the expenditure of a subsequent grant this road will be completed as far as the Darby River during the current financial year, thereby giving facilities to tourists to reach the Chalet at all times of the year.

On the Heathcote–Nagambie Road, between Costerfield and Graytown, in the Shire of McIvor, valuable work was carried out under the supervision of the Shire Council. The work consisted of clearing, forming, grading, and gravelling for a length of 10,100 feet, resulting in considerable improvement being made to the old road.

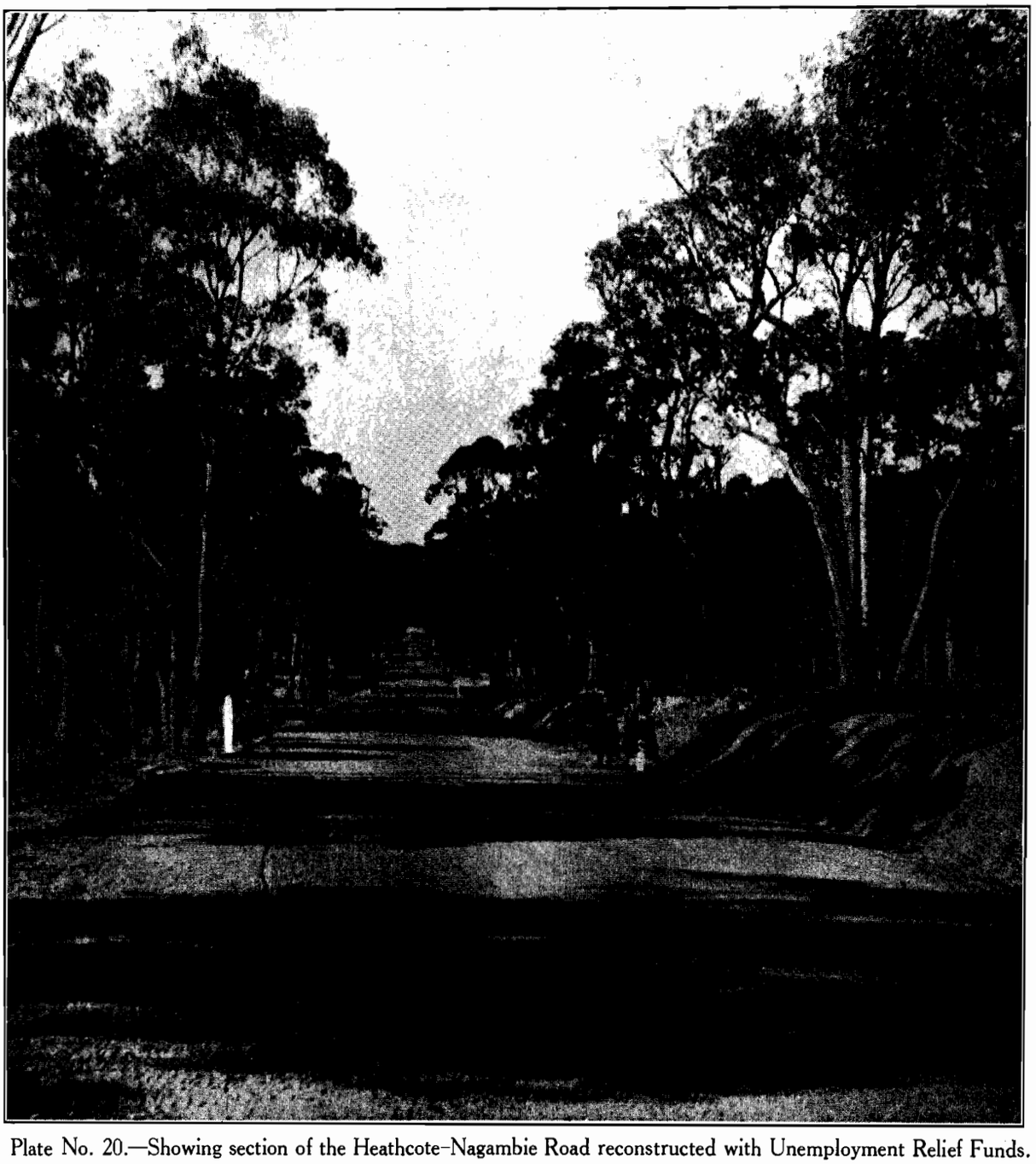


Plate No. 20.—Showing section of the Heathcote–Nagambie Road reconstructed with Unemployment Relief Funds.

BRIDGES.

During the year marked progress was made in the replacement and reconstruction of a number of bridges and culverts which were unsafe for traffic by reason of inadequate load carrying capacity, narrow width, or dangerous approaches. The work was undertaken by the Board in addition to the routine maintenance on State highways and several main roads.

Prior to the commencement of the year, 2,010 bridge projects had been carried out by the Board and municipal councils. At the 30th June last, 2,195 bridges had been completed, so that the total for the year was 185. Of these, 47 were constructed under the direct supervision of the Board and 138 by municipal councils in conjunction with the Board's staff. Close co-operation between municipal engineers and engineers of the Board enables the accumulated experience of the municipalities and the Board to be made available for each project.

During the year the Board assumed partial responsibility for work on two bridges, one near the new weir at Yarrawonga and the other over the Murray River at Nyah.

In conjunction with the Department of Main Roads, New South Wales, a new stock bridge is being erected on the foundations of the new weir at Yarrawonga. The actual work was designed and is being constructed by the State Rivers and Water Supply Commission at the joint expense of the Board and the Department of Main Roads.

The structure, which will be of ten spans of 47 feet each, consists of steel beams and a reinforced concrete deck. The width will be 23 feet, divided between a roadway of 20 feet width and a footway of a width of 3 feet.

The total estimated cost, including a slight widening of the weir embankment so as to provide for road traffic, is £15,000. A view of the partially completed work is shown in Plate No. 21.

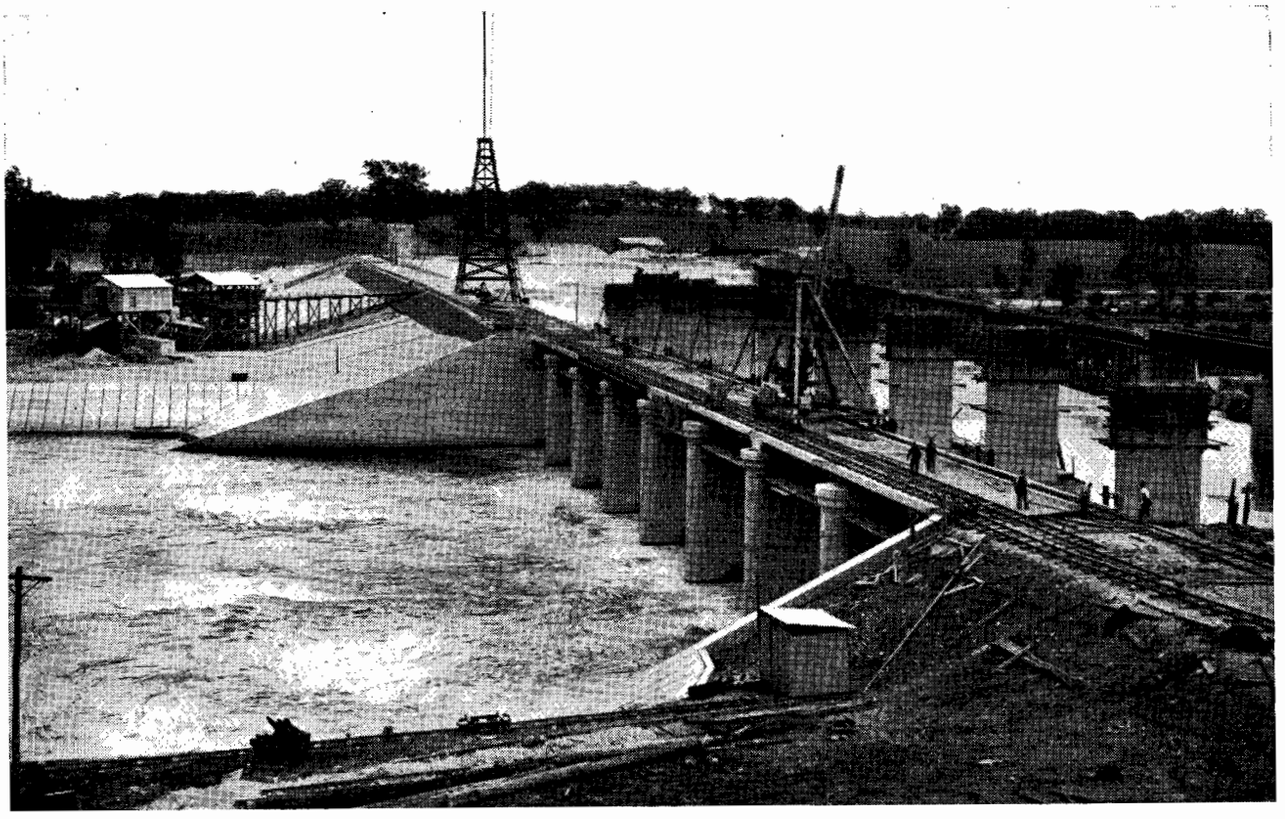


Plate No. 21.—View of Yarrawonga Weir stock bridge in course of construction.

Following an agreement between the Governments of Victoria and New South Wales, the Department of Main Roads and the Country Roads Board are co-operating in the construction of a bridge over the Murray River at Nyah to replace a punt which, for some years, has carried the traffic across the river. The delays which are inseparable from this method of transportation have caused considerable loss of time and dissatisfaction.

The two States will share in the cost of the new bridge which has been designed by the Department of Main Roads of New South Wales for a total length of 342 feet and a width of 20 feet between kerbs. A lift span is to be provided to meet navigation requirements on the river.

Plans and specifications have been prepared by the Department of Main Roads following complete surveys of several available sites, and tenders have been called for the erection of the bridge, but owing to the tenders received being considered excessive none was accepted. It is proposed by the Department to again invite tenders towards the end of the calendar year.

Two bridges over the Latrobe River and adjacent flats on the Prince's Highway at Rosedale, which were described in last year's Report, were completed by direct labour under the supervision of the Board. The total cost of the work was £30,328.

A view of the larger structure is shown in Plate No. 22.

Plate No. 22.—New bridge erected over the Latrobe River and adjacent flats at Rosedale.

The old timber bridge over Darlot Creek near Tyrendarra, on the western section of the Prince's Highway, was replaced by a flat slab reinforced concrete structure 107 feet in length.

Plate No. 23.—New bridge erected over Darlot Creek on the Prince's Highway West.

The bridge over the Hopkins River on the Hopkins Falls Road, near the Hopkins Falls in the Shire of Warrnambool, was constructed by direct labour under the supervision of the Shire Engineer of Warrnambool, from plans prepared by the Shire Engineer and the Board's Engineers in conjunction. This structure, which is of steel and reinforced concrete, consists of six spans of 52 feet each with a width of 18 feet between kerbs.

The bridge replaces the old stone ford which, because of its proximity to the falls, was a source of danger and the scene of some accidents. Development to the west of the Hopkins River was impeded by lack of direct communication and the new bridge should greatly aid the farmers in this area.

On the Hume Highway a reinforced concrete bridge, having a length of 35 feet and a width of 22 feet, was erected over the Fell Timber Creek near Wodonga at a cost of £561.

A reinforced concrete bridge on the Kiewa River Flats at Bonegilla was completed at a cost of £1,500. This structure has a length of 106 feet and a traffic width of 22 feet.

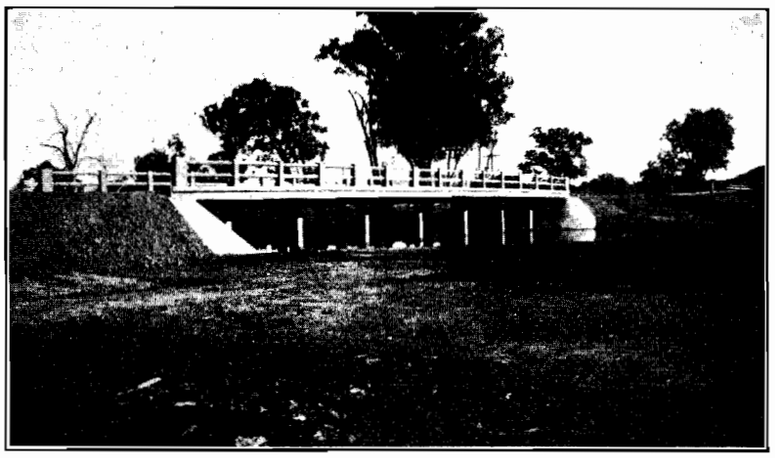


Plate No. 24.—Showing new bridge erected on the Kiewa River Flats at Bonegilla.

On the Midland Highway East a reinforced concrete bridge was constructed south of Swanpool, and the approaches to the new bridge north of Swanpool, were completed. The cost was £1,457.

Plate No. 25.—Bridge over the Loddon River at Serpentine.

A new bridge over the Loddon River on the Serpentine Road on the boundaries of the Shires of Korong and East Loddon was erected at a cost of £4,116. It is constructed of timber, except for rolled steel joist stringers over the main portion of the stream, and concrete abutment sheeting.

On the Echuca–Cohuna Road a new bridge consisting of composite piles with the remaining sub-structure and super-structure of reinforced concrete was erected at a cost of £1,000. The bridge has a total length of 79 feet.

Plate No. 26.—Showing new bridge erected on the Echuca–Cohuna Road in the Borough of Echuca.

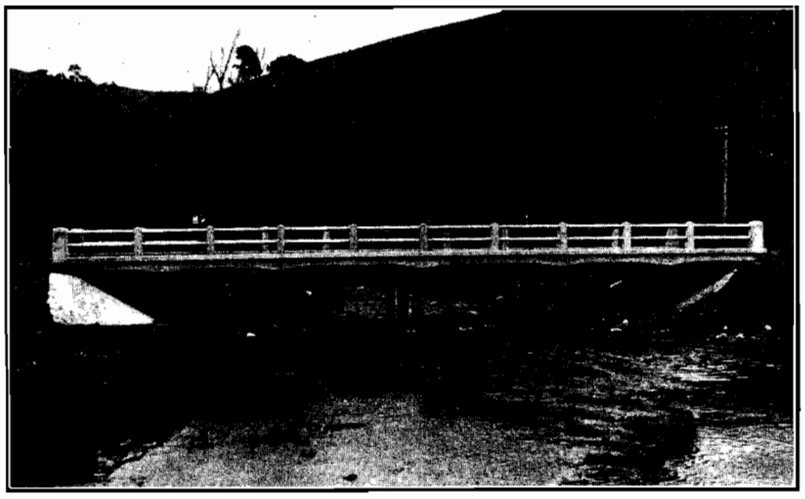


Plate No. 27.—Showing new bridge erected over Little River at Taggerty.

In the Shire of Alexandra a reinforced concrete bridge was erected under the supervision of the Shire Engineer, over the Little River at Taggerty. The structure is of the flat slab type and cost £1,050.

The Patterson River bridge at Carrum, on the Point Nepean Road, shows how rapidly traffic has developed in general and on this road in particular. Ten years ago a concrete bridge having two footways, each 5 feet wide and a roadway of 22 feet, was provided. Experience showed that it was necessary to widen the bridge to take three lanes of traffic, and this work was undertaken by direct labour by the Board's staff. The bridge as previously constructed had footways of lighter construction and at a higher level than the remainder of the bridge and it appeared to be necessary to sacrifice these portions in order to widen the bridge. However, by resorting to a new method, the footway portions were severed from the roadway and moved out on to widened piers in one operation by a distance of 10 feet. New roadway beams and deck were then cast in this 10-ft. space, and no loss of previous work was experienced.

In the Shire of Dandenong, within the township (main road) section of the Prince's Highway, the bridge over Dandenong Creek was widened from 22 feet to 32 feet. The work was done from maintenance funds by direct labour. The method of widening was to cut through between the footway and the roadway and then, after widening the abutments, the footway, parapet and footway girder, were slid bodily across to make room for the new section of the roadway to be constructed. Five men pushed over the 35-ton unit in a few hours with simple jacks.

All roads leading to Ferntree Gully from the metropolis have been subject to flooding at times, with severe dislocation of holiday traffic. In conjunction with the Councils of Blackburn and Mitcham and Ferntree Gully Shires, a new bridge was designed for the crossing of the Dandenong Creek on the Burwood Road to eliminate this trouble. The new bridge, which is of reinforced concrete, has a width of 30 feet and a total length of 100 feet. It is thus more than double the length of the old narrow timber bridge which it replaces and will eliminate the adjacent flood sections, allowing the roadway to be raised. This latter work, including culverts, will be done shortly by the Ferntree Gully Shire Council. The new bridge is of the flat slab type which was developed by the Board's engineers.

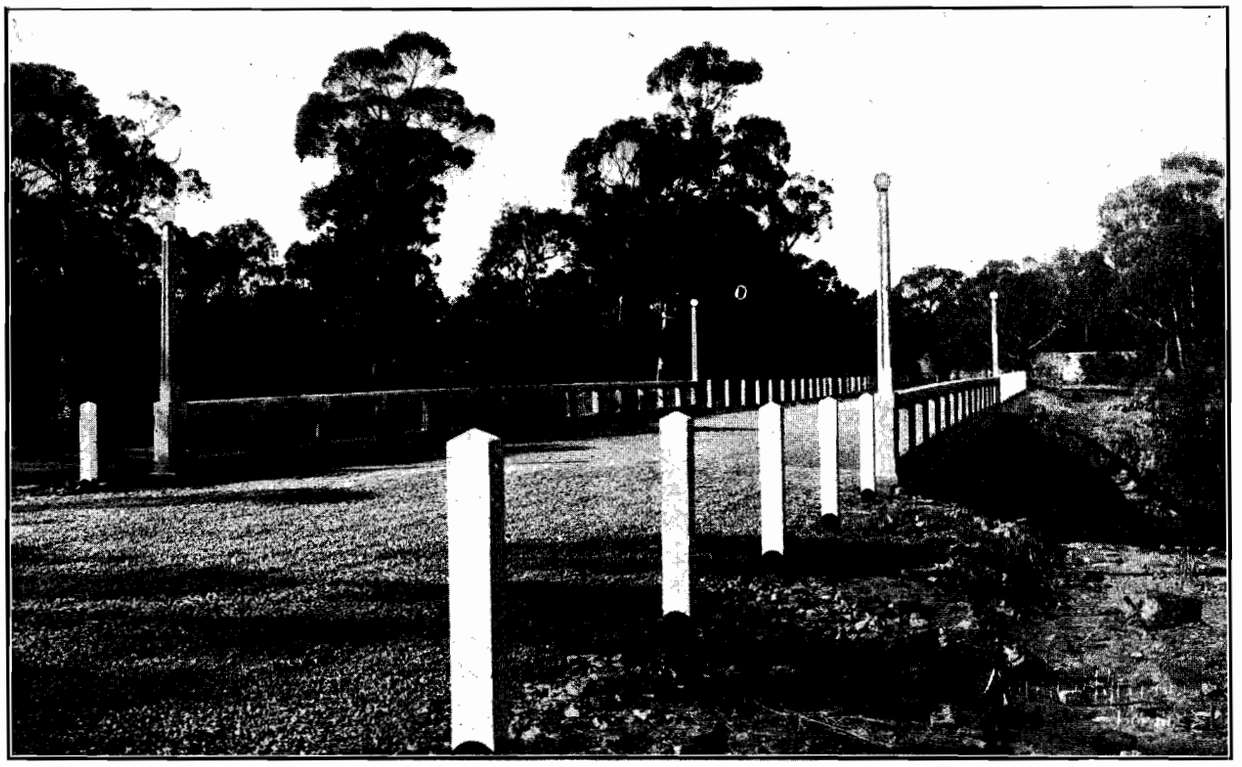


Plate No. 28.—New bridge erected over the Dandenong Creek on the Burwood Road.

At the junction of the municipalities of Hampden and Mortlake a new bridge on the Vite Vite Road was constructed over the Mount Emu Creek under the supervision of the Hampden Shire Council. The new bridge, which consists of a concrete sub-structure, has steel beams and a timber deck. There are three spans each of 40 feet and the width between kerbs is 18 feet.

The old timber bridge over the Avon River known as Guthrie's Bridge, controlled jointly by the Shires of Dunmunkle and Donald, had reached the end of its useful life. From Federal Funds provided by the Board a new bridge 160 feet long and 16 feet wide, of timber piers and decking and with steel beams, was constructed under the supervision of the Shire of Donald.

A new bridge was built over the Mount Emu Creek, of concrete piers with steel joists and timber deck, in the Shire of Hampden, to replace the old Castle Carey Bridge. The length of the new structure is 200 feet and the width between kerbs is 26 feet. The work was supervised by the Shire of Hampden.

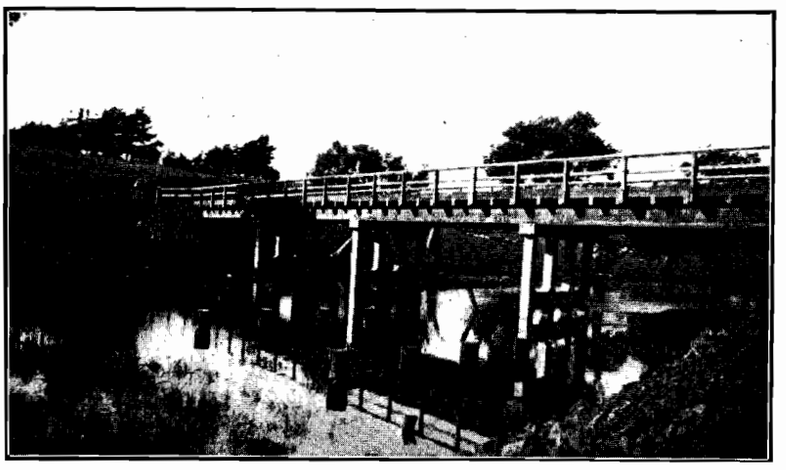


Plate No. 29.—New bridge erected over Mount Emu Creek in the Shire of Hampden.

A new timber and steel bridge on the Don Road over the Yarra River was built by the Shire of Upper Yarra near the Main Warburton Road. The structure has a length of 100 feet and consists of two spans each of 50 feet.

During the year the concrete bridge over the River Yarra on the Main Healesville Road at the boundaries of the Shires of Lilydale and Healesville was widened. The old bridge which had high balustrades of almost solid concrete was only 16 feet wide, and because of a sharp dip in the approaches and curves near the bridge visibility was very restricted and insufficient room for traffic was provided.

New open-work parapets of chain mesh set in concrete were provided, and the bridge was widened to 22 feet between the kerbs. The improved structure is shown in Plate No. 30.

Plate No. 30.—Showing widened bridge over the Yarra River on the Main Healesville Road.

Under the provisions of the *Country Roads Act* 1936 (No. 4458) a number of bridges, punts, ferries, &c., over the Murray River together with approaches was maintained by the Board in conjunction with the Railways Department and the Department of Main Roads, New South Wales. In accordance with the agreement between the two States and the Victorian Railways Commissioners, each State is to bear half the cost of maintenance of crossings over the Murray River, except where the railway crosses the structures, in which case a proportion is borne by the Railways Commissioners. The amount expended by the Board during the financial year was £2,841.

Particulars of bridges erected in the metropolitan area are set out under the heading of "Metropolitan Roads and Bridges."

TOURISTS' ROADS.

Work on declared tourists' roads, the total mileage of which is 350, consisted of reconstruction, improvement, and maintenance works, the total expenditure for the year being £44,132.

Particular attention is being given to progressively improving the worst sections and adequately maintaining the work done so that these roads will be in good trafficable condition within the next few years.

The Alpine Road in the Shire of Bright, between Harrietville and Mt. Hotham was improved by installing a number of culverts and maintaining this section by a full-time patrolman. Improvements of a similar nature were also carried out on the length of road in the Omeo Shire under the supervision of the Shire Engineer.

The Mount Buffalo Road was substantially improved by widening the narrow sections near the Chalet, together with widening, reforming and gravelling 3 miles between Porepunkah and Eurobin Falls, with a view to sealing next summer. The whole section of 18 miles was kept in good order by a truck patrol.

Plate No. 31.—Showing improved section of the Grampians Road.

The Grampians Road between Stawell and Hall's Gap was surfaced with gravel for a length of 10·1 miles and sealed with bitumen. In preparation for sealing during 1938, a further length of 5 miles between these points was resheeted with gravel.

In addition 2·7 miles of construction were completed southerly from the Borough Huts, and new timber and steel bridges erected over the Bovine Creek and Wannon River.

On the Wartook Road 1·25 miles were cleared and ·6 mile formed.

For the maintenance of the Ocean Road over a length of 42·2 miles between Laver's Hill and Peterborough, a truck patrol was established at Princetown. Lengths of 4 miles east of Port Campbell and 7 miles between Port Campbell and Peterborough were treated with sandy gravel with limestone marl added, and excellent results were achieved.

In addition to general maintenance of other sections of the Ocean Road the bituminous surface was extended from Anglesea to Airey's Inlet and from Big Hill to Stoney Creek. At Mount Defiance the road was widened to give increased safety to traffic.

Owing to the increase in traffic on the Acheron Way a length of 2 miles near Narbethong was widened and reconstructed.

Six miles of the Donna Buang Road between Panton's Gap and Donna Buang was treated with crushed rock to increase the safety and comfort of traffic during wet weather.

Under Section 7 of the *Country Roads (Tourists' Roads) Act* 1936, No. 4405, provision is made for the appointment of the Country Roads Board as a committee of management under the Land Acts in respect of Crown Land adjacent to any tourists' road, but no provision has been made for expenditure on maintenance or improvements, with the result that as a committee of management the Board's expenditure is restricted to the receipts from the reserves.

In order to remedy to some extent the insanitary conditions, the Board erected temporary sanitary accommodation on the Cumberland and Wye River reserves along the Ocean Road, but as the receipts from these reserves were inadequate to meet the cost, the Board was compelled to expend a small sum from the Country Roads Board Fund in providing the service.

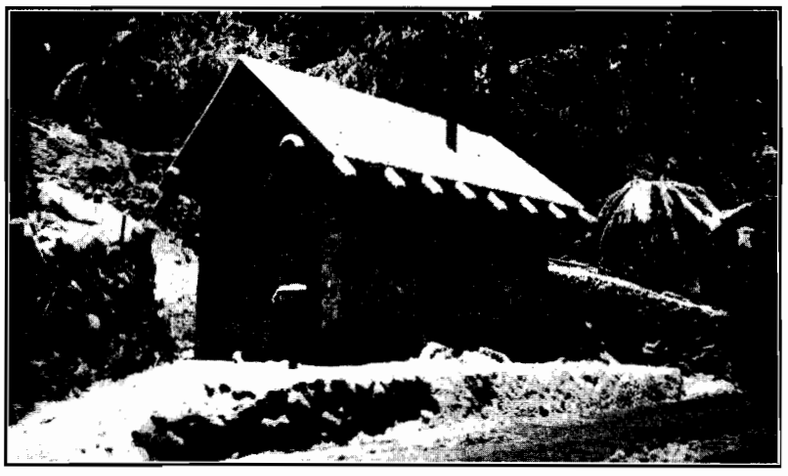


Plate No. 32.—Showing sanitary accommodation provided on the Acheron Way. Photograph was taken after a fall of snow.

To meet public requirements on the Acheron Way proper sanitary conveniences were erected by the Board with local stone, by the expenditure of an amount provided by the Tourists' Resorts Committee, and appreciation has been expressed by tourists of the excellent accommodation provided.

Plate No. 32 depicts the type of building erected on the Acheron Way at Cement Creek.

TREE PLANTING AND ROADSIDE IMPROVEMENTS.

With the co-operation of municipal councils, progress associations, the Country Women's Association, the League of Youth and other bodies, the Board was greatly assisted in its efforts to improve the appearance of the roadsides by the planting of suitable trees. Denuded areas along State highways were planted by the Board over a total length of 110 miles, whilst municipal councils and others were responsible for planting 70 miles of main roads.

The scheme launched by *The Sun News-Pictorial* three years ago for the planting of trees by pupils of the State Schools throughout the State made considerable progress during last autumn. Previously the planting was confined to the State highways on which the schools were situated, but in view of the progress made during the past two seasons the scheme was extended to include the schools situated on main roads.

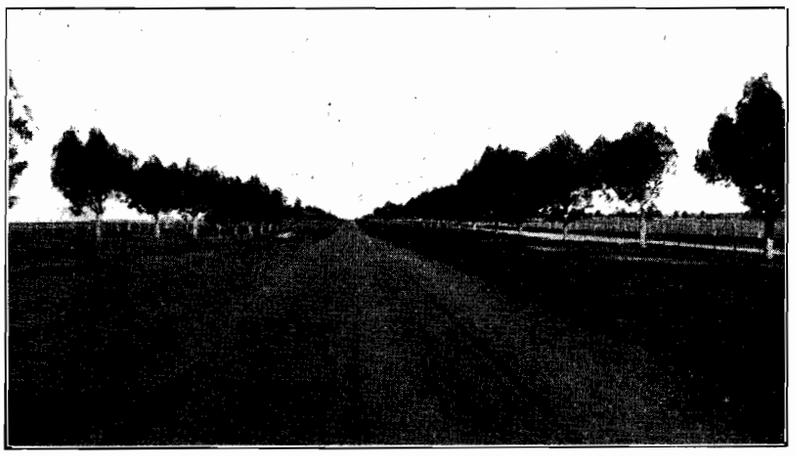
The result of the efforts of the pupils was that 1,750 trees were planted on State highways over a distance of 15 miles and on main roads over a total distance of 20 miles. One hundred schools took part in the planting.

Judging for *The Sun* competition for the best planted and maintained trees in each of the Education Department's districts, which were competed for during the previous season, has not yet been completed.

During the autumn of 1937, 53 schools competed in planting 1,850 trees along the various State highways in the vicinity of the schools.

Owing to the keen and practical interest taken by the various branches of the Country Women's Association, the planting of trees and the beautification of the roadsides, especially in the vicinity of country towns, was considerably advanced. The co-operation of the Association is much appreciated by the Board and the municipal councils, as local effort of this kind is a factor in helping forward and stimulating interest in the work.

The total number of trees planted during the 1937 season was 14,120 over a distance of 160 miles.



Plates Nos. 33 and 34.—Showing section of highway denuded of trees, and length planted.

The following statement sets out the number of trees planted on State highways and main roads, including those planted under *The Sun News-Pictorial* scheme, during 1938 :—

—	No. of Trees Planted.	Approximate Mileage Planted.
State Highways—		
Prince's Highway West	600	4
Prince's Highway East	730	6
Western Highway	1,240	11
Calder Highway	980	10
Hume Highway	250	11
Omeo Highway	80	1
Murray Valley Highway	2,600	45
South Gippsland Highway	60	2
Midland Highway	800	10
Northern Highway..	570	10
Main Roads	7,640	70
Total	15,550	180

The Board's patrolmen are responsible for the care and maintenance of the trees as soon as they have been planted.

The cost of planting and maintaining trees during the financial year ended the 30th June last was £8,541, of which £2,678 was provided out of the amount of £6,000 provided by the Government from Unemployment Relief Funds for the extension of tree planting on roads, and £5,863 from the Country Roads Board Fund.

In connexion with the erection of electricity transmission lines along roads under the jurisdiction of the Board, the State Electricity Commission has closely co-operated with the Board with a view to avoiding as much as possible the destruction of trees. Where the destruction or cutting of trees could be avoided by the acquisition of easements through private property, the Commission has willingly chosen that course, with the result that there is now the least possible interference with indigenous timber growing on the roads.

From the proceeds of the sale of dead and fallen timber on main roads and State highways, additional trees were planted, and trees cut down on account of their interference with telephone and electricity transmission lines were replaced. The amount collected from the sale of timber was £24.

In the selection of trees which is made by the Forests Commission in co-operation with the Board, preference is given to indigenous evergreens, but to lend variety of colour in the foliage exotics are planted in suitable localities. Planting is being carried out in groups or as isolated units, away from country towns, and in lines in or adjacent to centres of population.

METROPOLITAN ROADS AND BRIDGES.

Roads.

Considerable progress was made during the year in the construction, reconstruction, and improvement of outer metropolitan roads situated between declared main country roads leading to the metropolis and tramway termini, or connecting with through metropolitan roads. The total expenditure for the year was £69,208, of which £58,286 was on account of permanent works charged to loan funds, and £10,922 for maintenance charged to the Country Roads Board Fund.

The total loan expenditure on these projects since the *Country Roads (Borrowing) Act* 1933 (No. 4188) came into force is £192,582 to the 30th June last, leaving a balance of £307,418 available from the existing authorization of £500,000. During the same period a total expenditure of £47,812 was incurred on maintenance from the Country Roads Board Fund.

Reconstruction works on the Warrigal Road were continued in the City of Box Hill, from Riversdale Road to Burwood Road, and from Highbury Road to the bridge in course of erection over Gardiner's Creek. With the completion of the bridge over Gardiner's Creek, on the boundaries of the Cities of Malvern and Camberwell, and the Shire of Mulgrave, great improvement has now been effected to this road. The sections referred to were reconstructed with fine crushed rock with a view to priming and sealing at a later date, the width being 35 feet from kerb to kerb.

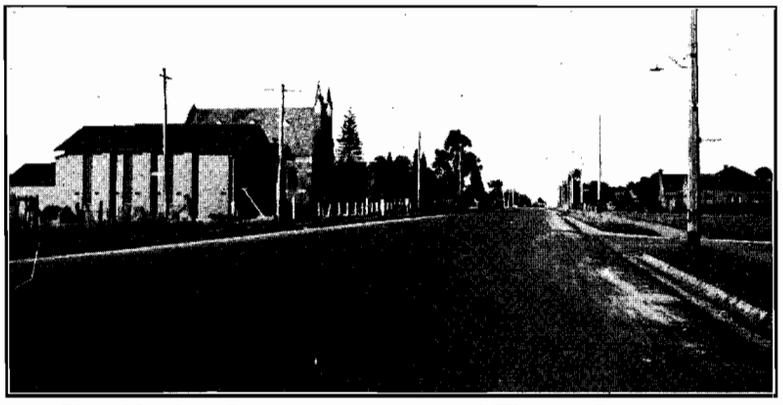


Plate No. 35.—Reconstructed section of Warrigal Road in the City of Box Hill.

Between Gardiner's Creek and the Prince's Highway the road is in bad condition, and a commencement was made by widening the section adjacent to Scotchman's Creek preparatory to the reconstruction of the pavement. As soon as additional funds are available it is intended to complete the reconstruction southerly to the Prince's Highway

The section between North Road and the Centre Road, on the boundary of the Cities of Oakleigh and Moorabbin, was widened to 20 feet and resurfaced.

The cost of these works was charged to loan funds in accordance with the provisions of the Country Roads Act, by which half the cost is borne by the Board and the other half by the municipalities. The amount expended on the maintenance of Warrigal Road during the twelve months was £754.

In Preston City, Epping Road, which was in a bad condition between Dundas Street and Junction Street, was completely reconstructed, a rolled concrete base having been completed in March last. It is intended to surface it with a bituminous top in 1939. On the same road the section between Junction Street and Bell Street where there was excessive cross-fall to old channels, the channels were re-laid to higher levels and the edges built up with plant mixed bituminous material spread with a drag. Between Murray Street and Edgar Road a length of ·6 mile was surfaced with drag spread bituminous material and brought into good condition. The total expenditure on this road during the year was £9,342, £7,327 having been provided from loan funds and £2,015 from the Country Roads Board Fund.

On the Heidelberg Road in Collingwood City, between the Clifton Hill railway gates and the Merri Creek Bridge, and in Heidelberg City from the Merri Creek Bridge to the Golf Links Road, the pavement was surfaced with drag spread plant mixed bituminous material.

On the Beach Road in the City of Sandringham a commencement was made on the section between Royal Avenue and Balcombe Road, this being the only portion which had not been put in order since its declaration as a main road. As the existing pavement of cement penetration macadam had a considerable salvage value, its demolition was avoided by raising the channels as high as possible and providing for drainage where necessary with stormwater drains. New kerbing and channelling was laid throughout the section and the pavement widened with fine crushed rock, primed and sealed. The work will be completed next financial year.

The cost of the work was £3,950, which was provided from loan funds.

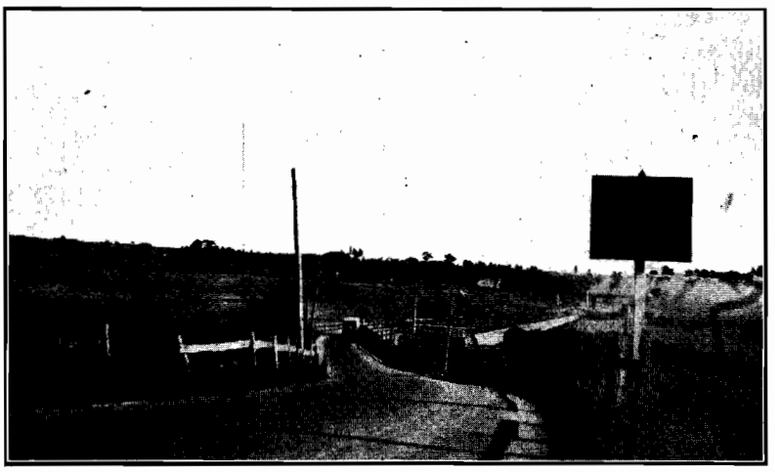
BRIDGES.

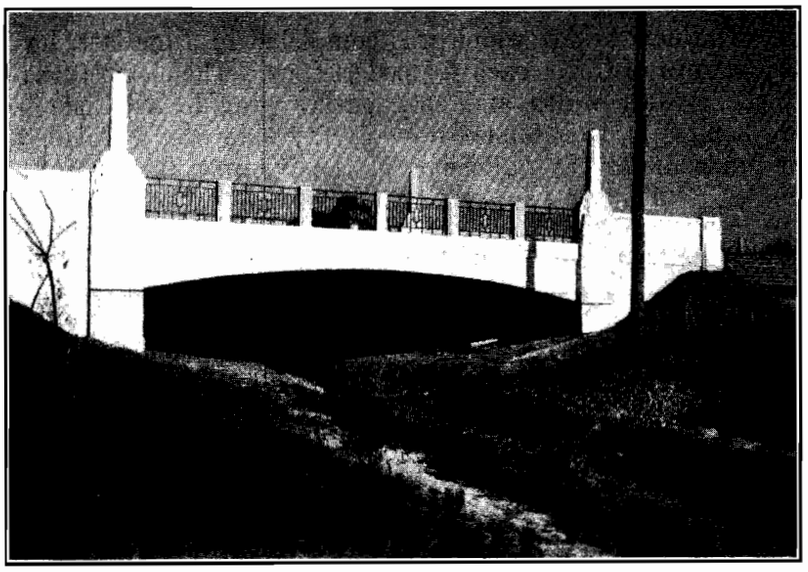
Owing to the old bridge over Gardiner's Creek on the Warrigal Road having reached the end of its useful life, it was necessary to replace the old structure. Plans and specifications for a new bridge were prepared by the Board, and after consultation with the municipal councils of Mulgrave, Camberwell and Malvern, it was agreed that the work should be carried out as a permanent work under the provisions of the Country Roads Act and financed from loan funds.

The section of the roadway on which the old bridge was built was on a very bad alignment, and provision was therefore made in the plans for the new structure to be built on an improved alignment immediately downstream of the present bridge.

The new bridge has a central span of 50 feet, with two cantilever end spans of 17·5 feet. The width for road traffic is 30 feet, and for foot traffic, 6 feet, making a total width of 42 feet. Provision has been specially made for the support of public utilities in the form of water pipes for the Melbourne and Metropolitan Board of Works and electric conduits for cables for the Postmaster-General's Department and the State Electricity Commission.

A contract was entered into for the erection of the new bridge at a cost of £3,231, which, together with the cost of materials to be supplied by the Board, and supervision, will approximate £4,100.





Plates Nos. 36 and 37.—Showing bad alignment of old bridge, and new bridge erected over Gardiner's Creek.

During the year the whole of the sub-structure was completed and the bridge made available for traffic early in the current year.

Views, showing the bad alignment of the old bridge and the new structure are reproduced in Plates Nos. 36 and 37.

Plate No. 38.—Showing original bridge on the Main Heidelberg Road.

Following the development of the Heidelberg and Ivanhoe districts the old bridge on the Main Heidelberg Road formed a serious obstruction to traffic, as the old bridge only provided for two lanes. Provision was therefore made for widening the existing bridge to allow of a traffic-way of 40 feet for vehicles and two footways of 5 feet each for pedestrians.

The original bridge, which is shown in Plate No. 38, shows the wingwalls of the bridge with a large area of dressed masonry.

In view of the heavy cost of widening the bridge in the old style of construction, the extra width was obtained by cantilevering out from a point over the abutment of the arch and at the ends of the wingwalls. From these transvere concrete cantilevers, new longitudinal beams were built along each side of the old bridge and reinforced concrete slab decking was cast.

The work was done by direct labour, under the supervision of the Board, at a cost of £1,889, or at the rate of slightly less than £1 per square foot.

The completed bridge is shown in Plate No. 39.

The widening of the road approaches will be completed in the current financial year.

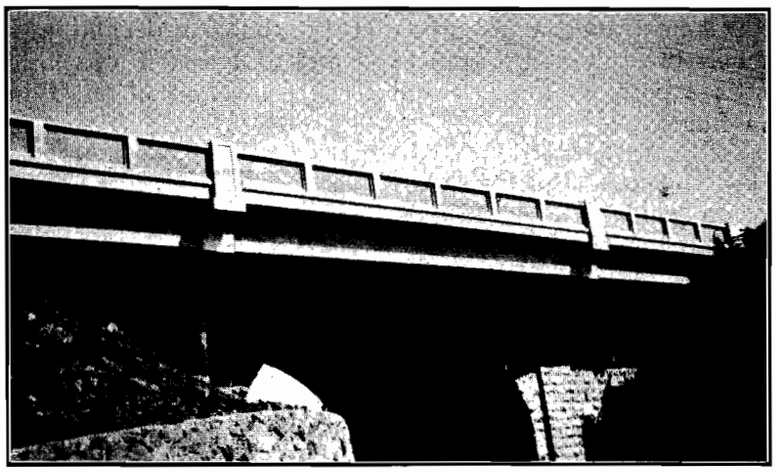


Plate No. 39.—Showing bridge on the Main Heidelberg Road after completion of widening.

Work on the bridge over the Maribyrnong River (known as Lynch's Bridge) on the Ballarat Road on the boundary of the Cities of Melbourne and Footscray, was continued during the year.

The new bridge which was completed in June last, has a roadway width of 40 feet, and two footways of 6 feet each for pedestrians. The sharp turns on the road have been eliminated and the greater width and easy curves provide a satisfactory route for heavy traffic. The bridge and approaches on the Footscray side cost £38,846, which amount was provided from loan funds under the provisions of the Country Roads Act.

The parapet, which consists of wrought ironwork panels, supported by reinforced concrete posts, cost less than concrete parapets.

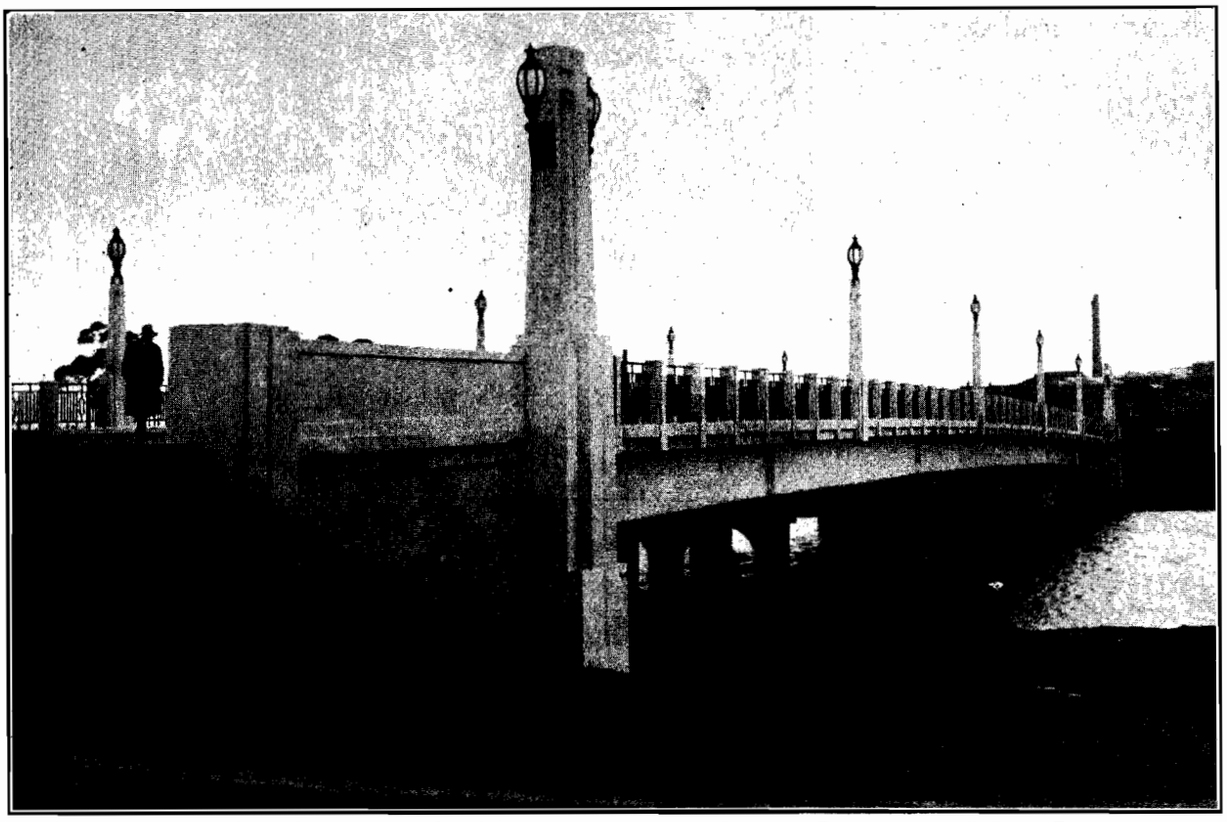


Plate No. 40.—Showing completed bridge over the Maribyrnong River on the Ballarat Road.

The bridge over the Yarra River, at Punt Road, which by agreement between the Board and the Melbourne City Council, is to be named the Hoddle Bridge, in memory of Robert Hoddle, the surveyor who was responsible for the lay-out of Melbourne, was considerably advanced during the year.

Tenders were invited for the sub-structure, which included the driving of 240 concrete piles and the construction of four river piers. During the year the contractor drove all the piles and completed one pier, but owing to the slow rate of progress the contract was determined and the work completed by direct labour under the Board's engineers. As no satisfactory tender was received for the construction of the abutments and super-structure the work was put in hand by the Board by direct labour.

This new bridge will provide a much needed additional outlet from the city to the south-eastern suburbs, whilst the construction of a new road between the Melbourne Cricket Ground and the railway, and the widening of Punt Road, will considerably improve the usefulness of the new bridge.

It is anticipated that the new bridge will be opened for traffic at the end of the present calendar year. Plate No. 41 shows the work in progress.

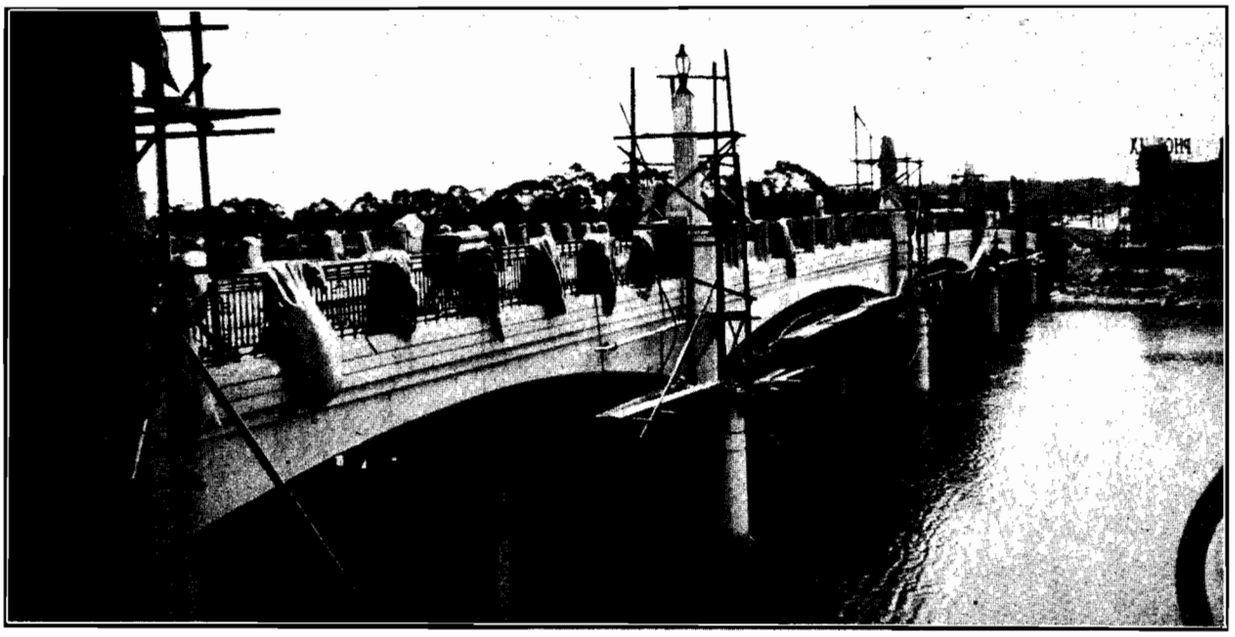


Plate No. 41.—Showing new bridge in the course of erection over the River Yarra at Punt Road.

SAFETY OF THE ROAD.

Within the limits of the funds at its disposal, the Board has used every endeavour to design and construct the highways to accommodate present-day traffic and its normal future increase, and at the same time take every means of introducing safety into the road.

In the last Annual Report of the Board the measures taken by the Board for making the roads safer for traffic were referred to, emphasis being laid on the necessity of eliminating all potential sources of danger by straightening and widening, by providing for separate lanes of traffic, flattening curves, and generally improving highway conditions.

A considerable amount of work of this description was carried out during the past year with a view to meeting the requirements of modern traffic and in continuing to keep pace with the development of the motor vehicle.

In pursuance of its policy of making the highways safer for traffic, the Board erected a large number of special signs in suitable places alongside the pavements.

As the type of warning sign considered suitable some years ago, in the form of a red triangle with words denoting the danger ahead displayed above it, was not sufficient to meet the requirements of present day traffic, the Board in common with the road authorities of other States of the Commonwealth adopted new types of warning signs, more legible for modern traffic.

The new sign consists of a red triangle beneath which is a yellow diamond disc measuring 2 feet square, the lowest point being 2 feet from the ground, so that at night the board will be in the direct beams of headlights. The nature of the danger ahead is shown either by a symbol or in words. Changes of direction have symbols on the boards in the form of arrows which show by their shape the direction of the curve. For locations where warnings of a less usual type are necessary such as cross roads, crests of hills with limited visibility, and narrow bridges, the need for caution is given by words, as illustrated in Plate No. 42.

Erection of these signs will be a gradual process, but the erection of the new type of warning signs at necessary points is being proceeded with as rapidly as possible.

Steps have also been taken by the Board to erect as a general guide " stop " signs on main roads and highways and undeclared roads meeting main roads and highways. In the metropolitan area the traffic code requires a " stop " sign at certain places and any " stop " signs erected at these situations have a legal value. Elsewhere, however, " stop " signs have at present only a moral value and it was, therefore, decided to restrict their use and to reserve them for locations where disregard of them would be especially dangerous. At other road junctions and cross roads the appropriate warning " T junction," " road junction," or " cross roads " will be used if any warning is necessary. The " stop " sign is being erected at the left-hand side of the minor road at a distance of 10 feet from the edge of the formation of the major road.

Plate No. 42.—Showing new type of warning sign.

Plate No. 43.—Showing type of " stop " sign being erected.

" Stop " signs are being used generally on the minor roads at road junctions or cross roads where the visibility is restricted, where the major road is heavily trafficked and the minor road carries a considerable amount of traffic.

" Heavily trafficked major road " is being defined as one for which the most recent census count gives a traffic intensity of 500 or more vehicles (both directions included) per 12-hour day, whilst the term " minor road carrying considerable traffic " is being defined as a road carrying 100 or more vehicles per 12-hour day.

With a view to ensuring greater safety on the roads, the Board has also adopted the practice of marking the centre of the sealed pavements of State highways and heavily trafficked main roads having a pavement width of not less than 20 feet with a single white line and with a double line on horizontal and vertical curves with limited sight distances.

To date each State highway has been so treated within a radius of approximately 70 miles of the City of Melbourne, whilst the Point Nepean Road has been dealt with for a distance of approximately 10 miles, the Main Healesville Road for a length of 28 miles, and the Burwood Road for a distance of 14 miles.

In view of the density of the traffic during week-end and holiday periods on the Point Nepean Road and portion of the Main Healesville Road between Tunstall and Mitcham and at Ringwood, three traffic lanes have been marked out. The centre lane is intended for use only when passing another vehicle proceeding in the same direction or in case of emergency.

The object of marking the roads in this manner is to indicate to the drivers of motor vehicles that they are to keep to the left of the single line excepting when overtaking another vehicle travelling in the same direction, and in the case of the double lines on curves that the driver must not in any circumstances cross these lines.

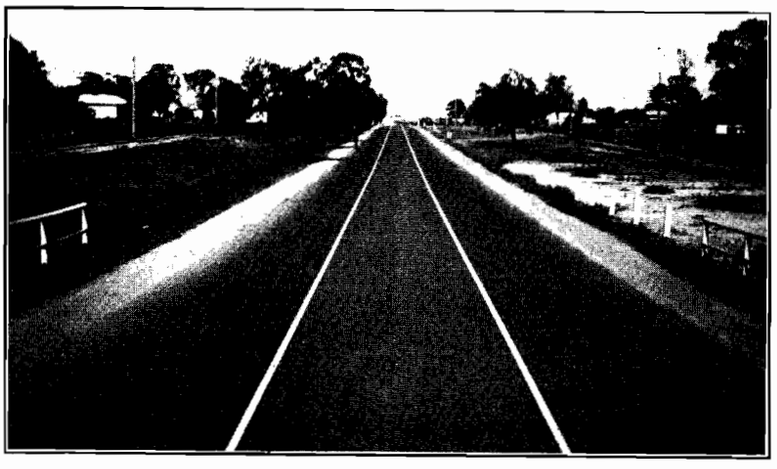


Plate No. 44.—Showing traffic lines marked on the Main Healesville Road.

As, however, there was no statutory obligation on the driver to observe these rules, a bill was recently introduced in Parliament providing that the Governor-in-Council may, from time to time, make regulations for regulating traffic on State highways, main roads and tourists' roads in relation to the lines and prescribe penalties for breaches of the regulations, and this bill has since become law.

The Board's records show that during the past year 442 accidents occurred on State highways, of which 56 were fatal. Information obtained from the Government Statist indicates that during the year ended 30th June, 1938, there were 4,160 accidents on roads outside the city and suburban radius, resulting in injury to 2,329 persons ; 204 persons sustained fatal injuries as against 190 last year. Comparing these figures with those of the corresponding period of last year it is observed that there was an increase of 269 accidents, equivalent to 6·9 per cent., and the number of fatalities increased by 14, equal to 7·37 per cent.

It was not foreseen that the very improvements in consequence of wider, smoother, and straighter highways, which should make for safety, would permit of an increase in accidents.

The following statement prepared by the Government Statist relating to traffic accidents which occurred on public thoroughfares throughout the State during the twelve months ended 30th June last is of interest :—

Place of Occurrence.	Number of Accidents in which Persons were Killed or Injured.	Number of Persons Killed.	Number of Persons Injured.	Number of Accidents in which no Person was Killed or Injured.	Total Number of Accidents.
City of Melbourne	1,457	47	1,559	4,225	5,682
Metropolitan Area (excluding City of Melbourne)	3,511	185	3,794	5,952	9,463
Total Metropolitan Area	4,968	232	5,353	10,177	15,145
Country	1,803	204	2,329	2,357	4,160
Grand Total	6,771	436	7,682	12,534	19,305

Note:—The above statement is confined to accidents reported to the Police.

The following statement also prepared by the Government Statist indicates the causes of accidents attributable to drivers or riders, vehicles, pedestrians, and other causes :—

Stated Cause.	Number of Accidents.		
	Fatal.	Non-fatal with Injured.	Total.
Driver or Rider—			
Skidding on roadway	17	312	329
Failure to exercise care at intersection	27	491	518
Excessive speed	27	165	192
Not keeping to left	24	271	295
Swerving to avoid vehicle or other object	5	180	185
Stopping or turning in front of other vehicle or leaving kerb without warning	13	279	292
Obscured vision	4	136	140
Dazzled by sun or light	10	125	135
Careless, negligent, or inefficient driving	68	1,052	1,120
Hit and run motorist	9	131	140
All other	27	691	718
Total	240	4,137	4,377
Vehicle—			
Defective mechanism and tyres	14	203	217
No lights	6	38	44
Other	..	6	6
Total	20	247	267
Pedestrian—			
Walking or running on roadway or crossing without care	80	1,099	1,179
Alighting from or boarding vehicle in motion	5	78	83
Stepping on to road without care	4	76	80
Other	24	322	346
Total	113	1,575	1,688
Other—			
Horses shying, bolting, or stumbling	13	39	52
Falling from moving vehicle	6	31	37
Other (including not known)	27	323	350
Total	46	393	439
Grand Total	419	6,352	6,771

Under the powers conferred on the Board under Act No. 4332, the Board is empowered to impound cattle grazing or found wandering on State highways without the consent in writing of the Board and without some person in attendance. The number of offences reported to the Board by its ranger was 1,209; 1,526 cattle and horses were impounded during the year; 31 persons were cautioned by letter and numbers of others were warned by the ranger. Prosecutions were launched against 110 persons who ignored the caution given. The action taken to rid the highways of unattended stock has had the effect of greatly diminishing dangers to traffic, but constant vigilance is still required to prevent owners of stock turning them on to the highways, particularly at night.

The ready co-operation of municipal councils and the efforts of municipal officers have been of great assistance to the Board's officer in carrying out his work.

PLANT.

In the economical and efficient maintenance of roads the use of suitable plant is an important factor. The reduction of maintenance costs and securing good surfaces on gravelled and even on unsurfaced roads has been given close attention by the Board.

On many of the highways power graders have generally superseded trucks formerly used by patrolmen on short sections, resulting in longer lengths of roads being effectively dealt with at a minimum of cost.

By the savings thus effected, funds are available for other roads and the men formerly engaged on motor trucks are employed on other work made available from the money saved.

The purchase during the year of a heavy power-operated grader equipped with a 12-ft. blade, operated by a 6 horse-power petrol engine, was the outcome of the trip to America of the late Chairman of the Board, Mr. W. T. B. McCormack. This unit has already done much efficient work and is proving economical in operation.

The Board has now 32 power graders constantly at work in different parts of the State.

Two 60 horse-power tractors equipped with trail builders, which were added to the Board's plant during the year, have carried out effective work in mountainous country. A considerable saving will be effected by the operation of these units in suitable localities.

Particulars of these machines, and the type of work capable of being done with them, are given in the report of the Chief Engineer.

Plate No. 45.—New grader trimming batters with mechanically-operated blade.

RESEARCH WORK.

It has been found that much of the time of the staff of the Board's laboratory has been occupied with testing the routine samples which must be taken during the course of the works in order to check their performance.

This has overtaxed the facilities and space available at the head office of the Board, and it has been found necessary to provide facilities for carrying out simpler routine tests at each of the five outer district offices. This course enables the District Engineers to maintain closer control over materials used in their districts. Routine work for the central district is carried out in the head office laboratory, as well as tests on materials supplied from Melbourne for use over the whole State. By this measure of decentralization, it is hoped that more time will be available in the central laboratory for the investigational work on which all progress must be based.

The "Los Angeles" abrasion test which was mentioned in the Board's Twenty-third Annual Report is now being used, with certain modifications, as a standard test for the quality of road metal and gravel.

Investigations have been made for the design of concrete mixes, and a method has been evolved which combines features of several earlier methods of design and which promises to be very useful.

In collaboration with officers of other State Road Authorities, the Board's officers have prepared reports setting out the status of road construction and research in Australia, for discussion at the Hague Congress of the Permanent International Association of Road Congresses.

The exchange of information between State Authorities incidental to preparation of these reports is of considerable value in checking procedures adopted in circumstances peculiar to Australia. The similar reports of work in other countries received after the International Conference which was held in June, 1938, are also of great assistance in securing early application of special processes developed abroad. At the conference, Australia was represented by Mr. J. R. Kemp, M.Inst.C.E., Commissioner of Main Roads in Queensland, and it is anticipated that his personal observations will be made available as far as possible to other State Authorities.

The study of the properties of soils is of fundamental importance to all engaged in the construction of roads, bridges, dams, and other structures, of which subject the Board's engineers have made a specially close study.

In the solution of the many problems relating to the design and construction of roads, valuable work was carried out in the Board's laboratory during the past year. The results achieved have been of considerable advantage in the selection of suitable materials and for the construction of roads with cheaper and more lasting surfaces.

Owing to the introduction of new materials into road construction and maintenance, and the development of traffic during recent years, investigations into the behaviour of materials under traffic conditions has become an essential part of the work of road building.

Apart from special investigations, routine tests were carried out as shown in the following summary :—

SUMMARY OF NUMBER OF TESTS CARRIED OUT FOR TWELVE MONTHS ENDED 30TH JUNE, 1938.

—	Number of Samples.	Number of Tests.
Soil, gravel, concrete aggregates	1,150	1,800 (approx.)
Bituminous and tarry materials	650	1,121
Lubricating oils	31	42
Traffic marking lacquer	49	98
Miscellaneous	32	171
Total	1,912	3,232

The total expenditure incurred on testing and research, including the purchase of new equipment and the salaries of officers engaged exclusively on this work, was only £2,508 or ·13 per cent. of the total expenditure on work carried out under the Board's control during the financial year.

Details of special investigations made in the Board's laboratory are given in the Chief Engineer's Report.

CONFERENCE OF STATE ROAD AUTHORITIES.

The Fifth Annual Conference of State Road Authorities was held in Hobart in March last, at which matters of common interest to the States concerning the construction and maintenance of roads and bridges were discussed. Resolutions were adopted relating to administration, technical, and financial matters connected with the road problem.

Among the subjects discussed were the question of adjusting taxation of motor vehicles which do not contribute to the funds provided under the Federal Aid Roads and Works Agreement, securing uniformity in alignment and guide post marking throughout the Commonwealth, adoption of standard statistical forms, and the method of collection of statistical data, and destruction of trees on roadsides.

Several technical problems were referred to the Conference of Senior Technical Officers which was held in Brisbane in August last.

CONFERENCE OF ENGINEERS.

A Conference of the Board's District Engineers was held in Melbourne in August last, when matters concerning supply of materials and equipment, methods of design and other subjects were discussed, and advantage was taken of the opportunity of inspecting works in progress in the central district.

It is felt by the Board that conferences of this nature afford an opportunity of exchanging ideas and much valuable information is gained by the Engineers, which is ultimately passed on to the Shire Engineers with whom the Board's Engineers are in frequent contact.

Shire Engineers in turn are able to transmit the results of their knowledge and experience of local conditions, and in this way the joint work of the municipalities and the Board is facilitated.

OFFENCES UNDER ACTS AFFECTING THE BOARD.

A number of offenders was proceeded against under the provisions of the Motor Car Act for exceeding weight and speed limits for motor cars carrying goods for hire or in the course of trade on State highways and declared main roads. Fines were inflicted in 465 cases for travelling at speeds in excess of the limits allowed, and against 165 persons for carrying excessive weights.

For carrying loads in excess of the carrying capacity of the motor vehicle as shown by the certificate of registration 225 cases came before the courts and fines and costs were imposed.

Five drivers were also convicted for carrying on their vehicles loads in excess of the regulation width.

The total number of prosecutions during the year was 995, the total fines imposed being £2,797, and costs £326 12s.

Particulars of the cases dealt with are set out in the following table :—

LIST OF OFFENCES REPORTED AND ACTION TAKEN.

Nature of Offence.	Warned.	Convicted and Fined.	Fines Imposed.			Costs.		
			£	s.	d.	£	s.	d.
Motor Car Acts.								
Speeding (freight)	7	464	1,510	0	0	152	6	9
Speeding (passenger)	..	1	2	0	0	0	14	6
Exceeding six (6) tons	25	59	262	0	0	30	18	2
Exceeding eight (8) tons	40	52	131	0	0	13	14	6
Exceeding ten (10) tons	..	2	6	0	0	0	5	0
Exceeding thirteen (13) tons	10	47	178	10	0	12	2	6
Exceeding eight (8) feet in width	5	5	13	0	0	3	8	9
Exceeding twelve (12) feet in height	1	..	..			..		
Exceeding carrying capacity	53	225	492	15	0	70	12	4
Exceeding three (3) tons on trailer axle	2	1	2	0	0	0	6	0
Tyres not in good condition	..	1	1	0	0	0	2	6
Refusing to allow truck to be weighed	..	4	22	0	0	1	12	6
Failing to comply with conditions of special permit	3	3	8	0	0	0	15	0
Stating false name and address	..	1	3	0	0	..		
	—146	—865			2,631	5	0	286	18	6
Country Roads Act.								
Exceeding load limit on road	1	4	9	0	0	2	3	6
Carting on closed road without permit	6	4	5	0	0	3	3	6
Using trailer on closed road without permit	..	..	..			..		
Destroying or removing timber	..	6	4	5	0	2	17	6
	— 7	— 14			18	5	0		8	4	6
Justices Act.								
Aiding and abetting	..	4			26	10	0		2	11	0
Damage to Roads, By-law No. 3.								
Using traction engine with bars on wheels, without permit	..	2			7	0	0		0	15	0
Country Roads (Impounding of Cattle) Act.								
Wandering stock	31	110			114	0	0		28	3	0
Totals	184	995			2,797	0	0		326	12	0

EMPLOYMENT AND WAGES.

During the past year 7,245 men were provided with employment over varying periods on works carried out under the direct supervision of the Board. Of this number 1,641 were engaged under unemployment relief conditions and 5,604 on ordinary works. The daily average number employed was 2,211, 729 of whom were regularly employed throughout the year on patrol maintenance work.

An amount of £387,547 was paid in wages to men employed directly by the Board, which represents 39 per cent. of the total wages paid, namely £987,443, in respect of direct road works carried out by the municipalities and the Board. Works undertaken by the municipalities and the Board by contract represent an expenditure of £459,239, of which it is estimated that £275,543 was expended on wages. The total estimated amount expended on wages was, therefore, £1,262,986, during the twelve months.

In July, 1937, the Arbitration Court granted the Australian Workers' Union and other industrial organizations the benefit of the prosperity loading of 6s. per week on the basic wage, paid in two instalments of 3s. in July and 3s. in October. This was supplemented in January last by the Full Court's decision to reduce working hours from 48 to 44 per week, in respect of employees engaged under the terms of the Australian Workers' Union Award.

In consequence of these decisions labour costs, on a man-hour basis, increased during the twelve months by 21 per cent. or a total amount of £159,680, which is greater than the total increase in the motor registration fees collected during the year.

STORES AND WORKSHOPS.

At the Board's central storeyard, established at Montague Street, South Melbourne, the maintenance and repair of the whole of the Board's plant is carried on under the control of the Plant Engineer, who is directly responsible to the Chief Engineer.

The major improvements effected at the storeyard were the installation of a hot water service and wash basins for employees, and the conversion of that part of the building formerly used as a mess-room into a tool store, thus enabling tools and workshop equipment to be readily accessible when required.

Workshop equipment was added to by the addition of a much needed punch and shearing machine by means of which grader blades, angles, bridge plates, &c., can be cut and punched more expeditiously.

A routing machine for cutting letters in signboards was installed in the carpenters' shop.

At No. 2 storeyard the old building was temporarily strengthened and the crane overhauled, while some extra flooring was laid and shelving for stores and equipment erected.

In addition to maintenance of plant, a considerable amount of experimental work is carried out in designing, developing and building new types of equipment for use in road-building. Details of these works are set out in the report of the Chief Engineer.

The book values of the major units of plant in operation at the 30th June, 1938, are as follows :—

Unit of Plant.	Number.	Value.
		£
Air compressors	10	2,155
Bitumen heaters	135	9,367
Bitumen sprayers	17	4,750
Horse graders	88	4,563
Motor trucks	58	14,291
Power graders	29	21,580
Rollers—power	45	5,770
Rotary brooms	39	2,869
*Tractors	14	6,476*
Trail builder	1	631

* This figure includes £1,789, the cost of tractor No. 19, which is used as a power unit for trail builder No. 1.

To provide for depreciation, the original cost of the plant has been written down from time to time to the above values.

ANNUAL MUNICIPAL CONFERENCES.

It has become an established custom for country municipal associations of various districts in the State to hold their annual meetings in towns within the area embracing the municipalities. The Board is usually represented at these conferences, as the value of making closer contact with municipal councils and their officers, as well as having the opportunity of discussing with them matters connected with road problems in their districts, is fully realized.

At these gatherings many questions of importance to the Board are dealt with and projects affecting the road policy of the State have originated.

AMENDING LEGISLATION.

During the year the following Acts affecting the Board were passed by Parliament :—

Act to amend the Country Roads (Murray Diversion) Act 1935, No. 4477.

The original Act authorized the Country Roads Board to construct works for the diversion of the course of the river Murray near Howlong through land in the parish of Howlong, New South Wales, for the purpose of preventing destruction of a section of the Chiltern–Howlong Road by erosion, within the State of Victoria. The works on completion, are to be handed over to the New South Wales Conservation and Irrigation Commission. The amended Act provides for the Governor of the State of Victoria to enter into an agreement with the Governor of the State of New South Wales, whereby the State of Victoria shall indemnify the State of New South Wales against any claim or demand for compensation for land resumed incidental to the works. Any moneys required to be paid by the State of Victoria under any indemnity are to be paid out of consolidated revenue, which is to be recouped from the Country Roads Board Fund.

Federal Aid Roads and Works Act 1937, No. 4482.

Owing to the expiry of the original agreement entered into between the Commonwealth and the States in 1926, a new agreement was entered into as from the 1st July, 1937.

The new agreement provides for the distribution of the amount derived from taxation of petrol on the same basis as in the original agreement, but the population basis is to be according to the respective populations of each State as at the 30th June, 1936.

Provision has also been made for the distribution in the same proportion as hitherto of the proceeds of an additional amount equivalent to ½d. per gallon on petrol imported into and on petrol refined in Australia. It is also provided that the additional amount shall be expended upon construction, reconstruction, maintenance or repair of roads, or other works connected with transport, as the State may think fit.

In addition, it is stipulated that, whenever required by the Commonwealth Minister for the Interior, the State will, to his reasonable satisfaction, make provision for the proper maintenance and repair to a standard necessary to meet the requirements of the Commonwealth and other traffic using such roads, all public roads adjoining or approaching the properties of the Commonwealth within the State, but the State shall not be required to make any provision in that respect in excess of an amount equivalent to one twelfth of the moneys received from the extra distribution of ½d. per gallon.

Act No. 4482 ratifies the agreement entered into as from the 1st July, 1937, and operates for a period of ten years.

Country Roads (Borrowing) Act 1937, No. 4498.

This Act extends the borrowing powers for the construction of main roads by £250,000. The money is to be utilized for the carrying out of permanent works on such roads as have been declared main roads under the provisions of the Country Roads Act in the metropolitan area.

The total amount now authorized for the construction of main roads in the metropolitan area is £500,000.

Country Roads Board Fund Act 1937, No. 4500.

Provision is made in this Act for—

(1) Fees for licences to drive motor cars paid under the Motor Car Act during the financial year 1937–38 not to be paid into the Country Roads Board Fund. Similar provision was made in previous enactments in respect of the years 1933–34, 1934–35, 1935–36 and 1936–37.

(2) Suspension of annual payment of £50,000 from consolidated revenue into the Country Roads Board Fund for the year 1937–38.

In the original Act £10,000 was to be used for the maintenance of main roads and State highways and £40,000 for distribution among certain municipalities towards the construction, renewal and maintenance, &c., of streets or roads.

STATEMENT OF ACCOUNTS.

Statement of accounts for the year ended 30th June, 1938, of the Country Roads Board Fund and balance as at that date appear in Appendix " A."

The statement shows that the gross revenue of the Fund amounted to £1,718,991, including fines totalling £19,799, imposed under the Motor Car Act, whilst the cost of collection and refunds totalled £110,112, made up as follows :—

Motor Registration Branch—		
Salaries and wages	£30,253	
Number plates, &c.	2,373	
Rent of offices	1,246	
Office equipment	4,270	
Miscellaneous	830	
		£38,972
Police Patrol—		
Wages and travelling allowances	24,248	
Motor expenses, Purchase of motor cars and cycles	11,572	
		35,820
Postage, printing, and stationery		13,089
Registration fees and fines refunded		22,231
Total cost of collection and refunds		£110,112
The net revenue under the Motor Car Act was, therefore		£1,608,879
Add amount contributed by municipalities towards maintenance, and sundry receipts from other sources		195,521
Leaving a total amount available for meeting interest and sinking fund charges and maintenance of State highways, main roads and tourists' roads, of		£1,804,400

The following statement sets out the payments made from the Country Roads Board Fund during the financial year ended 30th June, 1938, to meet interest and sinking fund charges, including an amount of £245,634 by which country municipalities were relieved in respect of loan expenditure of £11,219,625 on declared main and developmental roads.

	£ s. d.	£ s. d.
Main Roads—		
Interest	190,544 4 4	
Sinking Fund contribution	9,471 7 9	
Exchange	16,744 4 5	
Loan conversion	796 15 6	
Recoup to National Debt Sinking Fund on London loan conversion	433 18 9	
		217,990 10 9
Developmental Roads—		
Interest	255,098 14 5	
Sinking Fund conversion	12,708 2 8	
Exchange	22,432 8 6	
Loan conversion	1,069 1 1	
Recoup to National Debt Sinking Fund on London loan conversions	582 4 5	
		291,890 11 1
		509,881 1 10
State Loan Repayment Fund		29,552 14 2
Developmental Railways Account, Section 83 of Act 3662		2,288 12 11
Total		541,722 8 11

After meeting these payments and making provision for plant, administration and other expenses, the amount available for maintenance, improvement, and restoration of main roads, State highways, tourists' roads, and Murray River bridges and approaches, was £1,133,468 of which £1,132,492 was expended during the year. The balance—£976—represents commitments carried forward to the present year.

In addition, the sum of £110,385 was expended from funds available under the Federal-Aid Roads Agreement for the maintenance and reconstruction of roads, making the total expenditure on maintenance, &c., £1,240,037.

For the maintenance, improvement, and restoration of main roads and State highways, the estimated requirements totalled £1,815,991 for the year, but as the municipal contribution is governed by the amount expended, the expenditure incurred by certain councils on main roads was insufficient to meet requirements. On the basis of the estimates submitted, the funds fell short of requirements by £577,598.

The total amount expended during the year from loan was £58,286 all of which was spent on declared main roads in the metropolitan area ; the proportion of interest and redemption charges expended to 30th June last totalled £2,322.

The relief granted to country municipalities on account of interest and sinking fund payments in respect of main and developmental roads for the year under Act 4415 was £245,634.

The municipal liability in the metropolitan area on account of expenditure incurred out of loan on the construction and reconstruction of main roads and bridges was £96,291 as at the 30th June last, to which they will be required to contribute 6 per cent. per annum, including 4½ per cent. interest and the balance sinking fund, over a term of 31½ years.

Statement of expenditure on road construction and maintenance, including expenditure under special appropriations, is set out below in summarized form, from which it will be noted that the total for the year was £1,907,999 6s. 1d.

—		Under Board's Supervision.			Under Municipal Supervision.			Total.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	
1. State Highways—										
Maintenance and reconditioning ..	..		..	344,737	9	9	74,167	8	7	418,904 18 4
2. Main Roads—										
Construction and restoration ..	170,422	5	10	..			..			..
Maintenance and reconditioning ..	749,945	17	0	154,530	3	5	765,857	19	5	920,388 2 10
3. Developmental Roads—										
Construction, &c.	341,902	5	2	..			..			..
Roads for isolated settlers ..	33,729	15	2	47,630	5	4	328,001	15	0	375,632 0 4
4. State Unemployment Relief Works—										
Main and developmental roads, &c.	..		..	88,831	6	4	49,353	1	4	138,184 7 8
5. Tourists' Roads—										
Construction, &c.	7,913	12	2	..			..			..
Maintenance and reconditioning ..	44,132	3	7	46,695	6	1	5,350	9	8	52,045 15 9
6. Murray River Bridges and Punts—										
Maintenance	..		..	2,741	11	8	99	9	0	2,841 0 8
7. Roads adjoining Commonwealth Properties—										
Maintenance	..		..	3	0	6	..			3 0 6
Totals	..		..	685,169	3	1	1,222,830	3	0	1,907,999 6 1

Towards the expenditure on the construction, reconstruction, maintenance, &c., of main and developmental roads an amount of £578,843 was expended under the provisions of the *Federal Aid Roads Act* 1931, and the *Federal Aid Roads and Works Act* 1937.

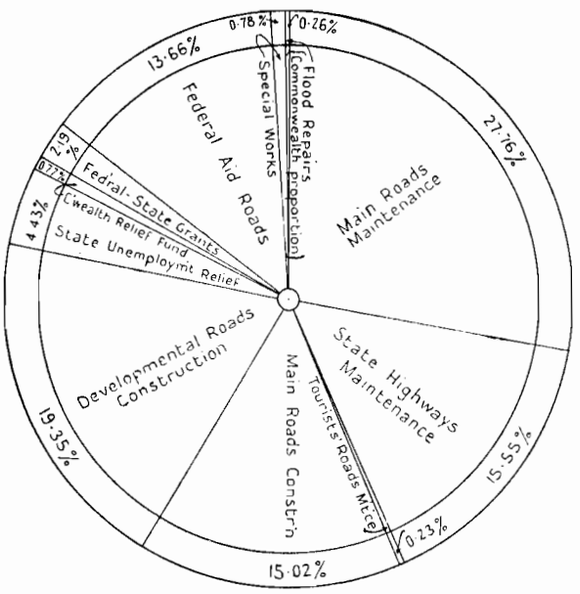
Owing to the fact that the grants from Unemployment Relief Funds could be used for labour only, it was necessary for the Board to contribute the sum of £12,169 from the Country Roads Board Fund and from funds provided under the Federal Aid Roads Agreement for the supply of equipment, pipes, making of surveys, &c., in order to make the work effective.

The expenditure by the Board of funds from various sources is indicated by percentages in the diagrams on page 45.

Diagram No. 1 shows the percentage of expenditure under the several headings for the year ended 30th June last, and Diagram No. 2 gives similar information since the inception of the Board to the end of the financial year.

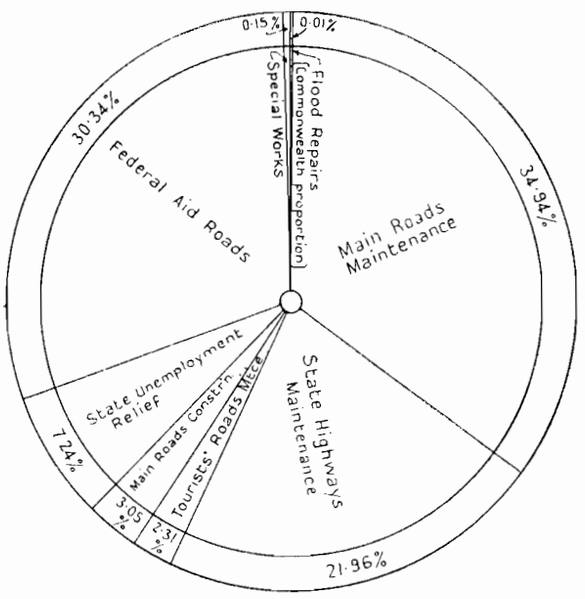
Diagrams showing comparative sectional total Expenditure on Road Works

No 1.



Percentages of
Total Expenditure since inception of Board
to 30·6·1938

No 2.



Percentages of
Expenditure for Financial Year
1937-38

APPORTIONMENT OF COSTS.

In accordance with the provisions of section 287 of the *Country Roads Act* 1928, the cost of permanent works and maintenance was apportioned for the year ended 30th June, 1937; £24,912 was apportioned to municipalities in respect of permanent works and £156,077 on account of maintenance.

The only council in arrears with its contribution at the 30th June last, was the Shire of Walpeup, but the amount owing has since been paid.

MOTOR REGISTRATION.

During the year 255,010 motor cars were registered, the following classes of vehicles being included in the total:—

Private cars	143,015	
Commercial motor vehicles	32,995	
Primary producers' vehicles	44,579	
Hire cars	2,164	
Licensed under Omnibus Acts	369	
Trailers	4,217	
Traction engines, &c.	338	
		227,677
Motor cycles		27,333
Total		255,010

Registrations for the year increased by 17,828 in comparison with those of the previous year. The increase is equivalent to 7·5 per cent., as against the increase of 6·4 per cent. for the year ended 30th June, 1937.

The number of registered private cars increased by 7,182, or 5·3 per cent.; commercial vehicles increased by 1,224, equivalent to 3·8 per cent.; whilst the number of primary producers' vehicles shows an increase of 7,675, or 20·8 per cent.

Motor cycles increased in number by 670, equal to 2·5 per cent.; and hire cars increased by 112, or 5·4 per cent.

The total amount allowed on account of payment of concessional registration fees on primary producers' vehicles, under Act No. 4285, was approximately £90,000 for the year.

The number of trailers used for the carriage of goods increased by 876 during last financial year, equivalent to 26·2 per cent. A large increase in the number of caravan trailers is noticeable on the roads, but no record is kept of the number used, as these vehicles are not required to be registered.

The net revenue from motor registrations during the year was £1,608,879, as compared with £1,480,272 for the previous year.

Under Act No. 4500 an amount of £85,149 representing fees for licences to drive motor cars was paid into consolidated revenue instead of being credited to the Country Roads Board Fund, as was done prior to July, 1932, for use in maintaining main roads and State highways.

In last year's Report mention was made of the fact that a weighbridge had been installed and an office building erected in the vicinity of the Motor Registration Office at the Exhibition Building, at a total cost of £785, with a view to ascertaining the accurate weight of motor vehicles presented for registration.

The amount of revenue collected from the weighbridge for the twelve months was £531, the cost of operating and supervision being £312, so that the net amount received was £219, representing 27·9 per cent. of the capital cost.

VISIT OF LATE CHAIRMAN TO AMERICA.

The late Mr. W. T. B. McCormack as Chairman of the Board, who left Melbourne on a visit to the United States of America in April, 1937, returned in August of that year.

The results of the late Mr. McCormack's investigations into road problems in that country are embodied in a valuable report which he submitted to the Government in November, 1937.

APPENDICES.

The following statements appear in the Appendices :—

(*a*) The amount received and expended during the year under the provisions of the Country Roads Act.

(*b*) The apportionment of expenditure in connexion with the construction and maintenance of main roads for the year ended 30th June, 1937.

(*c*) The expenditure on the construction and maintenance of main roads, tourists' roads, and State highways during the year ended 30th June, 1938.

(*d*) Mileage, locality, &c., of main roads constructed and maintained during last year.

(*e*) Mileage, locality, &c., of State highways reconstructed and maintained.

(*f*) Mileage, locality, &c., of tourists' roads reconstructed and maintained.

(*g*) List of unemployment relief works put in hand during the year ended 30th June, 1938.

We have the honour to be, Sir,

Your Obedient Servants,

F. W. FRICKE, Chairman.

W. L. DALE, Member.

A. D. MACKENZIE, Member.

R. JANSEN,
Secretary.

CHIEF ENGINEER'S REPORT.

Country Roads Board,
Exhibition Buildings,
Carlton, N.3.
1st December, 1938.

The Chairman,

Sir,

I have the honour to submit herewith a discussion on the points of technical interest arising in the work carried out by the Board during the year ended 30th June, 1938.

CONTINUOUS TRAFFIC LINES.

During the year 337 miles of continuous traffic lines were painted on the heavier trafficked sections of State Highways and Main Roads. These traffic lines serve to regulate traffic at all times and, from the somewhat limited evidence available, have already tended to decrease accidents due to "side swiping." They are of greatest value it is felt for night travelling, particularly during foggy or wet weather, when they very considerably decrease the strain as well as increase the safety of traffic. The cost of painting these lines with the line marking machine shown in Plate 46 is approximately £10 per mile for the first striping, including the cost of setting out the line, and £5 to £6 per mile for repainting. The compressor, paint container, and spraying outfit were units which had been used for some time by the Board for painting centre lines on curves, with a painting attachment fixed to the side of the truck. The building of a spray gun and discs into a separate chassis as shown has made for very much more effective work, and the results obtained appear to be quite satisfactory. The chassis was manufactured locally to plans secured by the late Chairman from the Washington Highway Commission of the U.S.A.

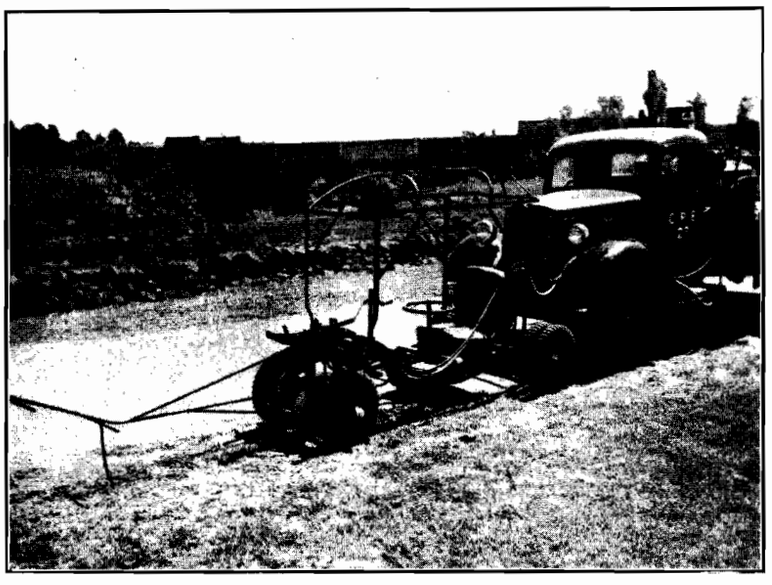


Plate No. 46.—Traffic Line Marking Machine.

In addition to painting single continuous white lines, the use of double white lines 3 inches wide, separated by a 3-inch black strip, at points where overtaking is dangerous, has been largely extended, particularly over sharp vertical curves, or blind horizontal curves with a speed value considerably less than the speed value fixed for the road.

ROAD ALIGNMENT.

In the Annual Report for the year ended June, 1935, details of the methods used for setting out transition curves, the principles involved, and an alignment chart for design were given, together with the Board's practice in their application. These details have been used on State Highways during the last three years and have also been widely adopted by Municipal Engineers on the more important roads where new works or reconstruction have been undertaken by Councils. As a result of this experience, and taking cognizance of similar rules developed by road authorities in other parts of the world, and notably by the Bureau of Public Roads of U.S.A., a slight revision of some details of design has been made during the year. The necessary amendment to "Instructions to Municipal Engineers" has now been prepared and is appended to this Report. (See Appendix H.)

The constants for rates of changes of acceleration and friction set out in the 1935 Report have been adhered to except for speeds below 50 m.p.h., where the rate of change of acceleration of 2.0 feet per sec.^{3} instead of 1.5 feet per sec.^{3} has been adopted. It is found that at lower speeds the change from the tangent to the circular curve can be more rapidly made, without departing from the traffic lane, than is possible at the higher speeds. The consequent shortening of the transition length is convenient in country where topography makes the lower speed values necessary, and it decreases the difficulty of "fitting in" curves where tangent points are close together, or where common tangents may be necessary.

The coefficient of friction adopted (.15) has been retained. While roads very rarely develop a coefficient of friction as low as this under the climatic conditions of Victoria, the purposes of using a comparatively low value is to design for comfortable rather than purely safe travel. This has the effect of encouraging traffic to keep to its own traffic lane, instead of "cutting the corner" to reduce the discomfort of an unbalanced side force which may be well within the limits of safety.

The use, therefore, of varying coefficients of friction with varying road surfaces is not considered necessary, and would not be consistent with this argument.

A good deal of progress has been made in the past three years in assessing speed values for different sections of roads. New works (or reconstruction) falling within these sections have been redesigned for these speed values, but funds available have not allowed the general reconstruction of horizontal or vertical curves of low speed value on otherwise soundly constructed sections. However, particularly bad lengths have, in many cases, been re-aligned, and in other cases standard warning signs have been used.

WARNING SIGNS.

The State Road Authorities, at their meeting in March last, decided to adopt a new policy regarding warning signs indicating hazards on roads under their control. It was decided to adopt the principle of indicating the nature of the hazard instead of, as was quite general in the past, merely indicating the presence of an unspecified hazard. The diamond-shaped board with yellow background, on which the nature of the hazard is shown either by a symbol or by a legend, is bold and arresting, and it is considered should be suitable for modern traffic conditions. The well-known warning symbol, the red triangle, is being retained, and typical signs are shown in Fig. A.

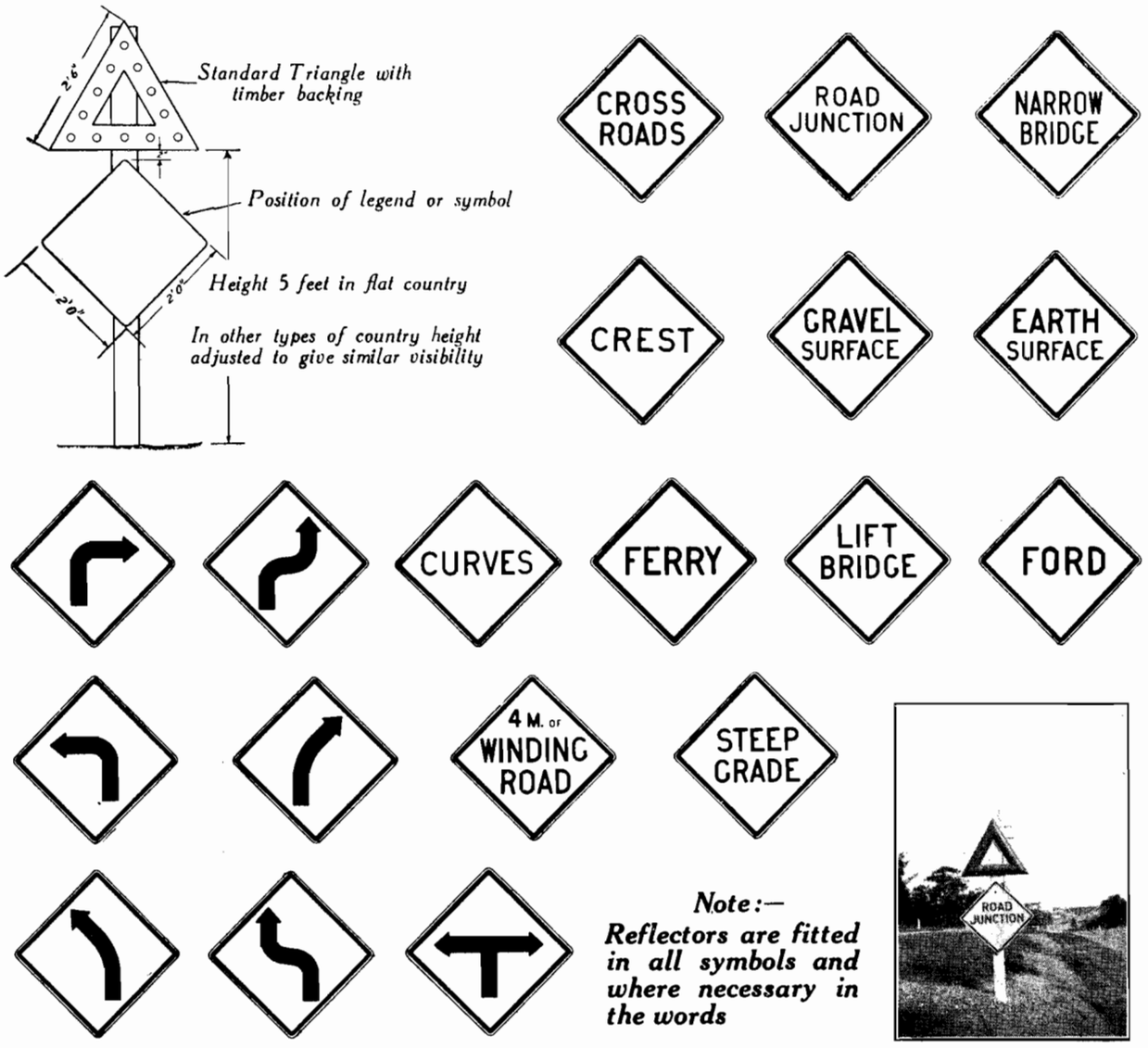


Fig. A.—New Type Warning Signs Showing in Bottom Right Corner "Road Junction" Sign on Roadside.

THREE-LANE ROADS.

On some sections of important roads leading into the metropolis from popular tourist resorts, the Board has widened the old 16 feet to 20 feet road to 30 feet, and divided it into three lanes by continuous traffic lines. Some criticism has been levelled at this work, but the criticism is based on apparent ignorance of the purpose of this particular type of design, which has been specifically restricted to roads where the peak traffic is always in one direction: invariably traffic on week-ends or public holidays is moderately heavy from Melbourne in the morning, and very intense between 5 and 7 o'clock in the evening. The case is quite different from that of a heavily trafficked road with dense traffic in both directions. A typical case is Point Nepean-road, where Foundation Day traffic exceeded 14,000 vehicles per twelve hours, with a maximum rate of 37 per minute: 92 per cent. of the peak traffic being in the direction of Melbourne.

The provision of three-lane roads for these conditions has made a tremendous difference to the free flow of traffic, particularly on Point Nepean-road, and no accidents which can be even partly attributable to the use of the centre lane have yet been reported.

SOIL STABILIZATION.

Some further work has been done on soil stabilization with bituminous materials on roads in the Wimmera district. The natural earth formation was a black clay having the following soil constants:—

Clay.

Lower liquid limit	58
Plasticity index	26
Percentage of clay (less than ·005 mm.) ..	51%

Loam.

Lower liquid limit	16
Plasticity index	0
Percentage of clay (less than ·005 mm.) ..	12%

On certain sections a sandy loam having approximately the properties shown was mixed with the sub-grade soil, and various quantities of water and the bituminous

materials were used; in this case a horizontal retort tar crude was mixed in varying proportions. The methods of mixing tried were discing with disc harrows, manipulation with a farm scarifier, and blading with a power grader. The latter method was found the most successful and appears to be the most promising method of mixing both the water and the tar with the soil, provided a sufficiently powerful grader is used. A small old grader only was available, and consequently, a thickness of more than about 2 inches could not be readily handled. Owing to limitations of plant available and comparatively short sections, the tests were somewhat inconclusive as between the various amounts of tar used. It would seem, however, that the Board's general experience in soil stabilization was repeated; that is, that the sand-clay mixture could be satisfactorily compacted with water only, and when surface sealed would be as serviceable and cheaper than either the mixtures of sand clay and tar or the clay-tar mixtures containing, of course, a considerably greater proportion of tar. However, it is proposed to extend the experiments next financial year, when more adequate plant will be available, and the experiments can be taken through to completion more rapidly. In view of the experience gained it will probably be found desirable to limit the experiments to surface sealing of sand-clay mixtures, and tar-clay mixtures without sand. The sandy loam is, in certain areas in which the future experiments are to be done, rather costly owing to the distance it has to come. It appears obvious that in all cases sealing at a fairly early date after consolidation is essential, particularly where tar is the bituminous binder.

SALT STABILIZATION.

Several sections were treated with salt in the autumn of 1937, and at intervals of several months samples were taken to ascertain the moisture content and the amount of salt remaining, and observations made of the relative condition of sections treated with various salts.

On Bellarine Peninsula between Geelong and Ocean Grove, there is available "buckshot" ironstone gravel, of about ¾-in. maximum size, with 30 per cent. to 50 per cent. passing No. 36 B.S. sieve, and 10 per cent. to 18 per cent. elutriable, poorly graded and difficult to maintain. On sections of the Newington–Ocean Grove Road, during resheeting with this gravel in 1937, imported calcium chloride was applied, also common salt (brine) and the waste "Mother Liquor" from the adjacent works of the Cheetham Salt Pty. Ltd. Typical results for the upper 2 inches of the pavement from sections treated at 1½ lb. crystalline solids per square yard are given in Table A, showing that less than half the original concentration remained after nine months.

TABLE A.

Date.	Calcium Chloride.		Common Salt.		Mother Liquor.		No Treatment.	
	Percentage Moisture.	Percentage Chloride (Cl.).	Percentage Moisture.	Percentage Chloride (Cl.).	Percentage Moisture.	Percentage Chloride (Cl.).	Percentage Moisture.	Percentage Chloride (Cl.).
	%	%	%	%	%	%	%	%
27th May, 1937	6·6	0·197	9·4	0·380	6·1	0·295	..	..
8th July, 1937	5·8	0·189	8·2	0·147	6·2	0·150	..	..
5th October, 1937	5·3	0·160	4·5	0·140	4·0	0·138	3·3	·017
1st February, 1938	2·6	0·089	3·1	0·114	2·5	0·027	2·8	..

To study the lateral dispersion of salt in the sandy soil, samples were taken on 5th October, 1937, across the road reserve at one place on the section treated with common salt at 1½ lb. per square yard. The results shown in Table B indicate considerable loss from dispersion.

TABLE B.

Depth	At Centre Line.		Below Table Drain, 16 feet South of C.L.			At Fence Line, 35 feet South of C.L.	
	0–2 in. Gravel.	2–4 in. Ironstone.	0–4 in Red Loam.	4–7 in. White Sandy.	14-in. Clay (Sandy) Loam.	0–3 in. Sandy Loam.	12–15 in. Sandy Loam.
Moisture percentage ..	4·5	4·8	13·9	10·9	31	4·6	11·3
Chloride (Cl.) percentage ..	0·14	0·077	0·052	0·024	0·068	0·012	0·005

The treatment with "Mother Liquor" (which contains a mixture of sodium chloride and magnesium chloride and sulphate) is of course very cheap in this locality and appeared very satisfactory. The common salt section was somewhat easier to maintain than either the untreated section or those sections treated with other salts. In the winter the calcium chloride section tended to become slushy during and following rain.

On Mt. Dandenong-road two sections of fine crushed rock (Toscanite) were treated in June, 1937, shortly after spreading, one with common salt and one with calcium chloride at 1½ lb. per square yard. The section treated with salt consolidated better under traffic, and became more dense and stable than untreated sections, or than the section treated with calcium chloride. The latter section tended to remain slushy on the surface after rain. Tests were made in July and September indicating a reduction of chlorides from 0·095 to 0·031 in the top of the calcium chloride section, and from 0·314 to 0·058 in the salt section. In the September test the moisture in the top of the salt section was 4·7 per cent. and in the calcium chloride and untreated sections 3·9 per cent. The road was primed and sealed in October, 1937.

Similar tests were carried out on the Castlemaine–Ballarat-road by co-operation of the Shire Engineer, Creswick, on a section of road which had been resheeted in 1935. Mine tailings stabilized by mixing them with silty loam had been used, resulting in a well-graded material with moderately cohesive binder. Treatments with flaked calcium chloride and common salt crystals were applied in July 1937. Tests made in July and September, 1937, showed a diminution in concentration to about one third, and tests made in February, 1938, showed a further diminution to about one-fifth of the original concentration. Even at the low residual concentrations the treated sections were still resisting corrugations under traffic to a greater extent than untreated gravel.

Elsewhere continued use has been made of salt to facilitate consolidation of dusty fine crushed rock, and minimise watering in urban areas preparatory to priming and sealing. This appears to be now well established as an economical and satisfactory practice.

LABORATORY.

During the year a method for the design of concrete mixes has been developed which combines features of several known methods, but which is based principally on the work of Prof. J. Bolomey of the University of Lausanne. By means of sieve analyses, the fineness modulus of each aggregate is determined. The coarse aggregates are divided into three size groups, e.g. $\frac{3}{16}$ to $\frac{3}{8}$ inch, $\frac{3}{8}$ to $\frac{3}{4}$ inch, and $\frac{3}{4}$ to $1\frac{1}{2}$ inch, and are combined, by the use of a Feret triangle, to give a combined coarse aggregate of maximum density, the grading of which would be represented by the curve $P = 100 \dfrac{\sqrt{d} - \sqrt{3/16}}{\sqrt{D} - \sqrt{3/16}}$

where P = percentage passing any sieve

d = aperture of sieve in question in inches

D = maximum size of aggregate in inches

Similarly the sands are divided into groups "finer than No. 52 mesh", "No. 52 to No. 14 mesh" and "No. 14 to $\frac{3}{16}$ inch", and are combined by means of a Feret triangle to give a fine aggregate such that the final mix, including cement, will approximate to Bolomey's curve.

$$P = A + (100 - A) \sqrt{\frac{d}{D}}$$

Where A has the values.

Type of Aggregate.	Consistency of Concrete.		
	Damp Earth.	Pasty.	Fluid.
Rounded (gravel)	$A = 8$	$A = 10$	$A = 12$
Angular (crushed stone) ..	$A = 10$	$A = 12$	$A = 14$

The use of the Feret triangle provides a means for calculating the proportions in which any number of aggregates should be combined to give the correct proportions of three size groups (i.e. to fit a predetermined grading curve at four points). A fit can be obtained as a rule by using three aggregates and if four aggregates are used more than one solution is possible.

Having combined the individual aggregates into well graded coarse and fine aggregates, the latter may be combined with the cement to give a total mix approximating as closely as possible to Bolomey's curve, by using the fineness modulus as a method of curve fitting, as set out below. It should be understood that the use of the fineness modulus is a means whereby two graded aggregates may be combined to give the best fit to a predetermined curve. For more than two aggregates this method is not suitable, hence the preliminary combination above into fine and coarse aggregates using Feret triangles.

For any maximum size of aggregate D, the fineness modulus of the combined aggregate + cement can be calculated from Bolomey's curve and has the value :—

$$M = (100 - A) \frac{\left[\log_{10} \frac{D}{d} - 2 (\log_e 10) \left(1 - \sqrt{\frac{d}{D}}\right)\right]}{100 \log_{10} 2}$$

where $d = 0{\cdot}00424$ inches

for which the approximation—

$$M = (100 - A) (0{\cdot}031 \log D + 0{\cdot}052)$$

may be substituted without appreciable error.

It has been shown by Bolomey that for any one type of aggregate and consistency of concrete the amount of water required, expressed as a percentage by weight of the total dry weight of aggregate + cement, is approximately inversely proportional to the fineness modulus of aggregate + cement, that is :—

$E = \dfrac{b}{M}$ where E is amount of water expressed as a percentage by weight of the total dry mix, and where b has values as follow :—

Consistency of Concrete.	Gravel.	Crushed Stone.
Damp earth (rammed concrete) ..	$b = 32$ to 34	$b = 38$ to 41
Pasty (reinforced concrete) ..	$b = 35$ to 38	$b = 42$ to 45
Fluid (poured concrete)	$b = 40$ to 44	$b = 48$ to 52

Knowing the value of M from the formula given above the percentage of water can be calculated, while the amount of cement per cubic yard is usually specified. The volume in cubic feet occupied by the cement can be calculated (equal to $0{\cdot}486$ multiplied by the number of bags per cubic yard $= 0{\cdot}486\ B$).

Hence if Va is the absolute volume of the aggregate and S its specific gravity we have—

$$Va = 27 - 0{\cdot}486B - E \frac{(SVa + 3{\cdot}1 \times 0{\cdot}486B)}{100} \text{ cubic feet.}$$

Hence $Va = \dfrac{(27 - 0{\cdot}486B\ (1 + 0{\cdot}031E))}{1 + 0{\cdot}01SE}$

From this the weight of aggregate is—

$$Wa = 62{\cdot}4 \times Sx \frac{27 - 0{\cdot}486B\ (1 + 0{\cdot}031E)}{1 + 0{\cdot}01SE}$$

Since the weight of cement is known, the weight of water can be calculated, and therefore the weights of the component water, cement and aggregate are known.

Since the fineness modulus of the cement is zero, and the fineness modulus of the cement + aggregate is "M"

$$M(94B + Wa) = 94BxO + Ma \times Wa$$

Therefore the fineness modulus of the aggregate

$$Ma = \frac{M(94B + Wa)}{Wa}$$

The fine and coarse aggregates previously obtained (by combining the individual sands, &c.) are now proportioned to give the required value of Ma by the formula

$$Ma = xMf + (1 - x)\ Mc$$

where x = the amount of fine aggregate expressed as a fraction of the whole aggregate—

Ma = the fineness modulus of the whole aggregate.

Mf = the fineness modulus of the fine aggregate.

Mc = the fineness modulus of the coarse aggregate.

Hence the weights of the individual aggregates may be calculated. A more detailed explanation of this method has been published in technical journals.

Los Angeles Abrasion Test.

In the Board's Twenty-third Annual Report brief mention was made of the Los Angeles Abrasion Test then being investigated. This test, which the Board is now using in place of the Deval Abrasion Test, has been adopted as a tentative standard by the Americal Society for Testing Materials, and is included as an alternative test in the draft Australian Standard Specification for Stone for Road-making Purposes. As standardized by the A.S.T.M., the test may be carried out on machine-broken or hand-broken stone of the following gradings :—

Grading—Square Hole Sieves.	A.	B.
Passing 1½ inches and retained on 1 inch	1,250 gm.	..
Passing 1 inch and retained on ¾ inch	1,250 gm.	..
Passing ¾ inch and retained on ½ inch	1,250 gm.	2,500 gm.
Passing ½ inch and retained on ⅜ inch	1,250 gm.	2,500 gm.
Total weight ..	5,000 gm.	5,000 gm.
Abrasive charge used—Number of 1⅞-in. cast-iron balls ..	12	11
Weight of cast-iron balls ..	5,000 ± 25 gm.	4,583 ± 25 gm.

The results given by machine and hand-broken stone are, however, not the same, though the amounts of loss in the two cases are in a fairly constant ratio.

In order to expedite the preparation of samples, and to ensure than samples broken in the laboratory from spalls, will give results equal to those obtained by testing materials crushed in the field from the same stone, a small drum crusher has been installed in the laboratory. The test is now performed always using machine-broken material of the grading B above and, in order to avoid differences due to the manner of operating the crushers, the stone passing ¾ inch and retained on ½ inch is sieved on a screen having slots 0·375 inch wide, while that passing ½ inch and retained on ⅜-in. screen is sieved on a screen having slots 0·263 inch wide. The test sample is made up from the material remaining after the " flakes " of stone (passing those slotted screens) have been removed. The results in the abrasion test are intermediate between those obtained with cubicle hand-broken stone and those for machine-broken stone from which " flakes " have not been removed, but are more free from personal error than the former and more consistent than either.

PLANT.

Trail Builders.

During this financial year the Board purchased two 60 horse-power crawler tractors equipped with trail builders for earthworks, and very effective work has been done by these units in mountain country. These units both " get " and " place " earth at a very low cost up to leads of about 150 to a maximum of 200 feet, working either as a trail builder in which the material is moved both forwards and sideways, or as a bulldozer in which material is moved forward into a fill.

No grubbing and clearing is necessary in ordinary construction since for small timber, say under 9-inch diameter, it is possible generally to cut these small trees off about waist high, when the trail builder will in the course of its earthworks operation, move the trunk and stump as required. For varying leads from 30 feet to 200 feet which are fair average conditions in mountain country, earthwork costs seldom exceed 6d. per cubic yard.

In rocky country where drilling and blasting has to be used for loosening, the placing of the rock is also very cheaply and conveniently done by these units which are an outstanding contribution to road construction in mountainous or hilly country. Except for unemployment relief work, the Board has not for some time carried out any heavy earthworks of this type, consequently the purchase of this type of plant has not previously been justified. Certain projects carried out during the past year by normal funds, however, made the purchase of this type of plant economical, and Mr. McCormack paid special attention to these units when abroad. Results have so far exceeded expectations, and even for moderately heavy realignments in hill country, if the cost of getting these heavy units on to the job is not excessive, it appears that considerable savings will be possible by the use of trail builders. (See Plates 47 and 48.)

Hydraulic Scoops.

The Board ordered during the year one 5–6 cubic yard pneumatic-tyred hydraulic scoop which, however, was not delivered until after the end of the financial year. This unit is moderate in size as modern scoops of the " carryall " type go, and is intended for work on leads from 200 to 600 or 700 feet, and should be very useful for regrading work in undulating country.

Plate No. 47.—Trail Builder Placing Rock.

Plate No. 48.—Trail Builder grading road after preliminary clearing has been carried out.

POWER OPERATED GRADER.

The Board also purchased during the year one heavy power-operated drawn grader weighing approximately 10,000 lb. and equipped with a 12-ft. blade, operated by a small 6 h.p. petrol engine through power controls similar to those used on one-man power graders. This machine is shown in Plate 49 and it will be noted that the blade can be swung into such a position that table drains and batters can be readily cut and trimmed.

Plate No. 49.—Power-operated Grader showing blade in position for trimming batter.

Rippers.

The rippers owned by the Board are of the mechanically operated type which have to be set by hand for any given penetration, and then are mechanically operated by the wheels of the ripper when the relevant levers are pulled by the tractor operator. These rippers have been found very useful for light and medium ripping in decomposed rock or earth. The Board in carrying out the Upper Kiewa-road for the Electricity Commission, recommended that the Commission should purchase for this work a large hydraulically operated ripper, which is shown in Plates 50 and 51. This ripper weighs about 3 tons and is capable of doing excellent work in quite hard but jointed rock. The machine was locally manufactured and has given excellent service.

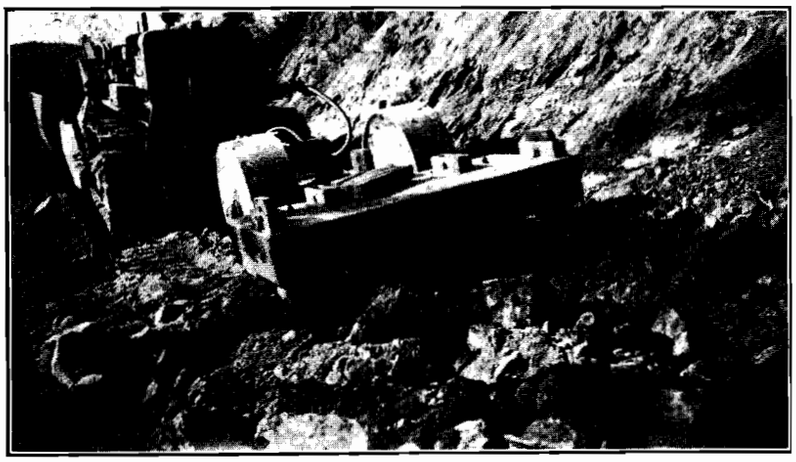


Plate No. 50—Ripper with tynes lowered being drawn by a crawler tractor.

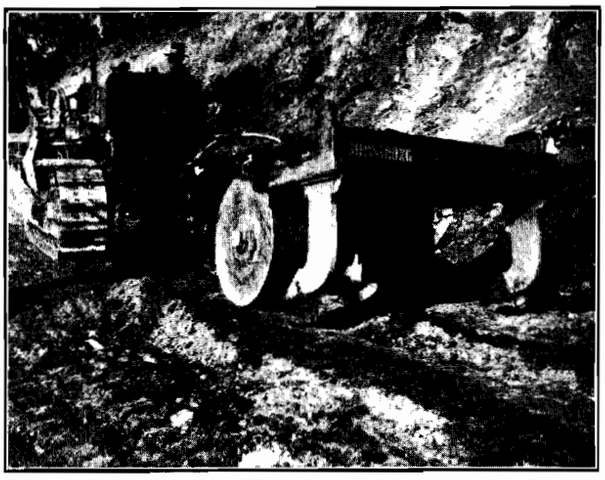


Plate No. 51.—Ripper with tynes raised.

Aggregate Loader.

The small aggregate loader designed by the Board's staff was constructed in 1936, operated through the last spraying season with spraying plant, and during the winter was used for loading gravel in gravel pits. Mechanically it was quite satisfactory and its output was on an average about 1 cubic yard per minute when loading. The unit, which is shown in Plate 52, is designed to be towed behind a truck on the two pneumatic tyres shown, and is readily towable at normal road speeds. The loader feeds itself into heaps, but no provision was made for steering during crowding, and any adjustment in direction has to be made by twisting the machine by hand, which was found rather laborious. The machine is therefore being amended for next spraying season to provide steering clutches. The output is not considered high enough for most spraying jobs, and consequently a larger machine has been designed, and will be constructed next season. This will be attached to a truck chassis and will use a power take-off from the truck engine as a motive power. It is designed to have a capacity of 2 to $2\frac{1}{2}$ cubic yards per minute.

Plate No. 52.—Aggregate Loader.

Multi-Wheeled Roller.

A multi-wheeled roller based on a design noted in the U.S.A. by Mr. McCormack, was built during the year. This can be ballasted by both water and gravel to a maximum of about 7 tons on 9–16 x 6.00 tyres. Wheels are all on roller bearings and are individually mounted. The roller can be towed at high speed and is particularly suited to the consolidation of gravel roads in the absence of reasonable traffic, or for edge consolidation. It will be tried for bituminous surface work next season. A small pneumatic-tyred tractor is probably the most economical tractive device for use with this roller, which is shown in Plates 53 and 54.

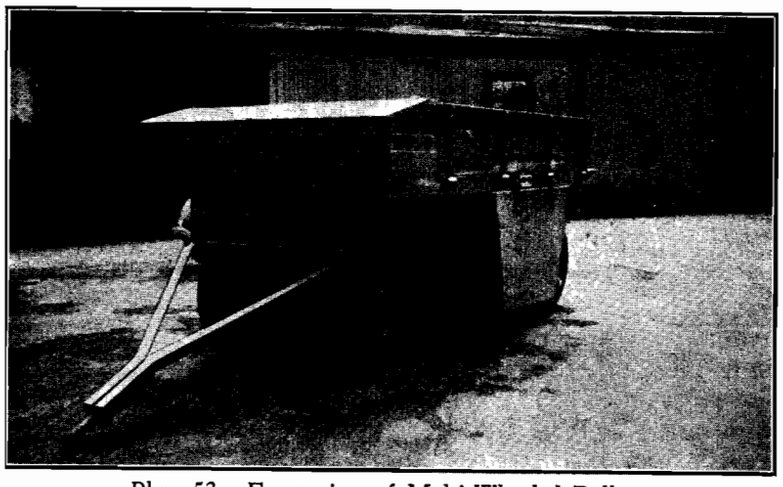


Plate 53.—Front view of Multi-Wheeled Roller.

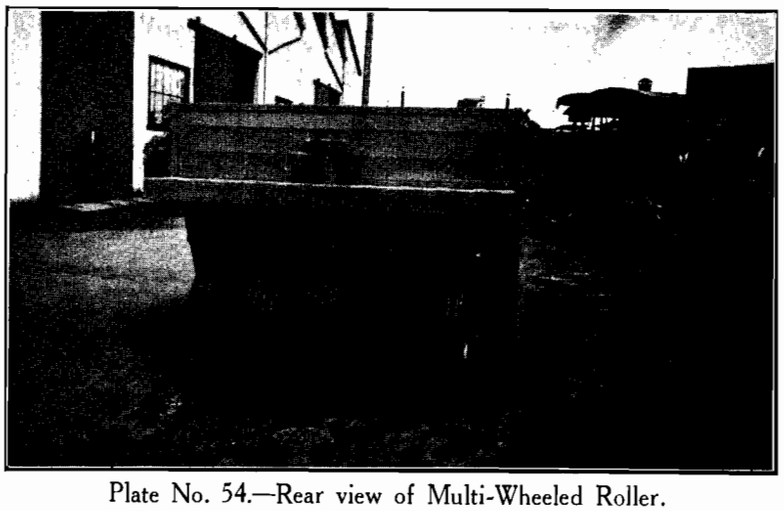


Plate No. 54.—Rear view of Multi-Wheeled Roller.

Sheepsfoot Roller.

A sheepsfoot or tamping roller weighing 3 tons empty or $5\frac{3}{4}$ tons ballasted with water ballast was designed and constructed during the year. It follows conventional lines and has been used for compacting machine placed fills. It is shown in Plate 55.

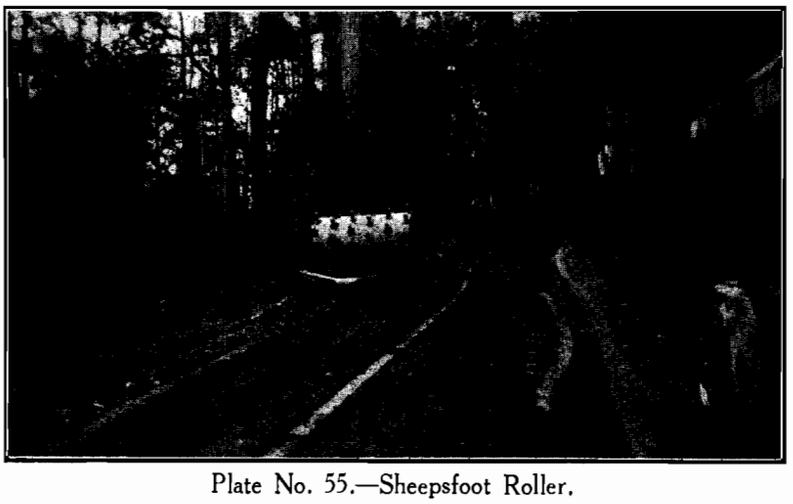


Plate No. 55.—Sheepsfoot Roller.

BITUMINOUS SURFACE TREATMENT.

1. Type of Work Carried Out During the Season of 1937-38.

(*a*) FIRST SEALS.

(i) *Primer and Binder.*—The types and viscosity of primers and binders reported in the 24th Annual Report were again used. The rates of application reported at being used during the latter portion of the 1936–37 season remained unchanged throughout 1937–38.

(ii) *Aggregate.*—Three gradings were used. These were—

No. 1.—"One size" stone. Maximum size, $\frac{7}{8}$ inch square.

No. 2.—"One size" stone. Maximum size, $\frac{3}{4}$ inch square.

No. 3A.—Stone graded from $\frac{5}{8}$ inches square to No. 8 sieve.

The field in which each of the three gradings of aggregate used on first seals is considered satisfactory is as follows :—

Aggregate No. 1.—This material is satisfactory for first seals on macadam, well consolidated fine crushed rock or hard well-bound stony gravel. When good conditions prevail at the time of carrying out the work, a long life and good waterproofing can be expected of a seal using this aggregate. Aggregate No. 1 shall not be used when any of the following conditions prevail or are likely to occur :—

(i) Deformation of the pavement is expected in the first four years after sealing.

(ii) The work will require a roadmix seal early in its life.

(iii) The material in the pavement is soft limestone.

(iv) The aggregate will be damp or the weather cool when the first seal is applied.

(v) Where the number of curves with radii less than 250 feet is too great to allow of individual treatment, either by the use of No. 3A aggregate, or special binder or treatment after sealing.

(vi) On roads carrying very light traffic.

(vii) On a pavement into which for any reason, this large aggregate might be forced by the weight of the road roller or the traffic.

(viii) The stone used will have a Los Angeles percentage of wear greater than 18.

(ix) The surface of the aggregate will be coated.

(x) The aggregate will contain a high percentage of elongated or flaky pieces.

Aggregate No. 2.—This material is satisfactory on macadam, well consolidated fine crushed rock or good gravel, where a mat as thick as would be produced by No. 1 aggregate is not considered essential or desirable. The advantages of this material are that it can be used under some of the conditions set out above as being unsuitable for the use of aggregate No. 1.

It should be used where aggregate No. 3A has generally been used previously except where any one or more of the following conditions exist :—

(i) The pavement is of limestone, poor buckshot or scrub gravel.

(ii) The binding material in the pavement is not good enough to prevent penetration of the aggregate into the surface under road roller or traffic.

(iii) On hill roads where there are a large number of curves having a radius of 150 feet or less.

Aggregate No. 3A.—This aggregate shall always be used for first seals on poor buckshot or scrub gravels and on limestone. First seals using this type of material should be used where a thick, flexible mat with a high binder content is desired, or where aggregates No. 1 or No. 2 might damage the pavement itself.

(*b*) RETREATMENT (ROADMIX SEALING).

(i) *Binder.*—Viscosity.—No change was made in the range of viscosities of the medium curing cut-back binder used on roadmix seal work.

The cut-backs used were designed to have a viscosity of 200–230 poises at the average air temperature when used.

Weather.	Shade Temperature.	Mixture, 80–100 Bitumen.	Parts by Volume.		Viscosity in Poises at 122°F.	Viscosity.	
			Dehydrated Tar.	Power Kerosene.		Temperature.	Poises.
Hot	85°F.–95°F.	100	26	15	16–25	90°F.	220
Normal	75°F.–85°F.	100	26	20	9–14	80°F.	215
Cool	65°F.–75°F.	100	26	25	6–8·5	70°F.	230
Cold	60°F.–65°F.	100	26	30	4·5–5·5	62½°F.	205

Bitumen, Mexican Mexphalte, Dehydrated Tar, Viscosity at 122°F., 0·5–0·75 poise.

Rates of Application.—The rates of application under normal weather conditions used each year since 1933 34 are as under :—

RATE OF APPLICATION OF CUT-BACK IN GALLON PER SQUARE YARD.

Year.	Loose Depth of Aggregate.		
	½ inch. 1 c. yd. to 72 sq. yds.	¾ inch. 1 c. yd. to 48 sq. yds.	1 inch. 1 c. yd. to 36 sq. yds.
1933–34	..	0·35–0·40	0·45–0·50
1934–35	0·2–0·25	0·25–0·30	0·30–0·35
1935–36	0·2	0·25	0·30
1936–37	0·22	0·27	0·33
1937–38	0·25	0·30	0·37

Owing to unravelling which has occurred with ¾-inch road-mix seal coats, it is proposed to increase the rate of application of the binder and to use asphaltic oil instead of dehydrated tar as a flux during the season 1938–39.

When the viscosity of the cut-back was altered from 9–14 poises at 122° F. to meet prevailing weather conditions, the rate of application was varied to maintain a constant rate of application of residue as below :—

RATE OF APPLICATION OF CUT-BACK IN GALLONS PER SQUARE YARD.

Weather.	Shade. Temperature.	Cut-back.			Loose Thickness of Aggregate.		
		80–100 Bitumen.	Dehydrated Tar.	Power Kerosene.	½ inch.	¾ inch.	1 inch.
Hot	85–95°F.	100	26	15	0·24	0·29	0·36
Normal	75–85°F.	100	26	20	0·25	0·30	0·37
Cool	65–75°F.	100	26	25	0·26	0·31	0·38
Cold	60–65°F.	100	26	30	0·27	0·32	0·39

(ii) *Aggregate.*—The grading of aggregate on roadmix seal work used under average conditions since 1933–34 is as under :—

Year.	Material.	Mechanical Analysis Percentage Passing Square Mesh Screens.					
		⅝ inch.	⅜ inch.	¼ inch.	$\frac{3}{16}$ inch.	No. 8.	No. 36.
1933–34	Screenings or crushed gravel	100	40–80	..	0–15	0–5	0–2
	Screened gravel	100	50–85	..	0–15	0–5	0–2
							No. 18.
1934–35	Screenings or crushed gravel	100	50–90	..	20–65	0–5	0–2
	Screened gravel	100	50–90	..	20–65	0–15	0–3
1935–36	Screenings or crushed gravel	100	50–90	..	10–40	0–5	0–2
	Screened gravel	100	50–90	..	20–65	0–15	0–3
1936–37	All aggregate	100	45–85	15–45	..	0–10	0–2
1937–38	All aggregate	100	60–85	25–55	..	2–12	0–2

For the years 1933–34 to 1935–36, circular screens were used, but the grading quoted has been changed on the following basis :—

$\frac{3}{4}''$ circular = $\frac{5}{8}''$ square.
$\frac{1}{2}''$ circular = $\frac{3}{8}''$ square.
$\frac{1}{4}''$ circular = $\frac{3}{16}''$ square.

Unravelling mentioned when discussing the binder has been accentuated by segregation of various sizes of aggregate during mixing. Efforts to avoid this by altering the design of mixer have been unsuccessful. It is therefore proposed to use aggregate in which the variations in size are less than hitherto.

2. PLANT DEVELOPMENT.

(*a*) AGGREGATE SPREADERS.

For some time it has been realized that spreading aggregate by means of rotating disc spreaders has been unsatisfactory. Variations in application along the road can be minimized by skilled operation, but variations across the road cannot be avoided.

A " Buck-eye " rotating drum-type of spreader, imported from America, was found to be satisfactory for applications of fine material of 1 cubic yard to 100 square yards or less, but unsatisfactory for heavier spreading. A type of spreader in which the rotating drum is replaced by a short belt carried on two rollers 10 feet in length has been developed. The belt is driven from the road wheels carrying the spreader. Aggregate is delivered into the hopper, which forms part of the machine, from an end-tipping truck, and thence is fed on to the belt. The thickness of the layer delivered by the belt from the hopper to the road is controlled by an adjustable gate. Photographs on the opposite page show the machine. (Plate Nos. 56 to 59.)

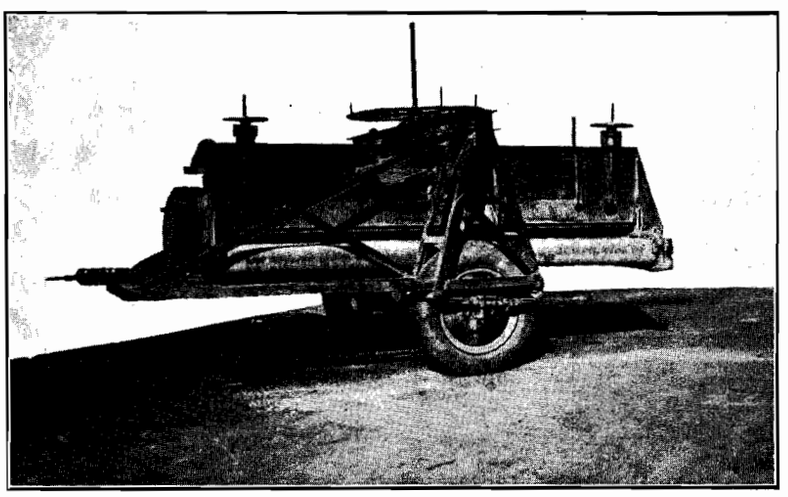


Plate No. 56.—Rotating Belt Aggregate Spreader Mounted on Carrier.

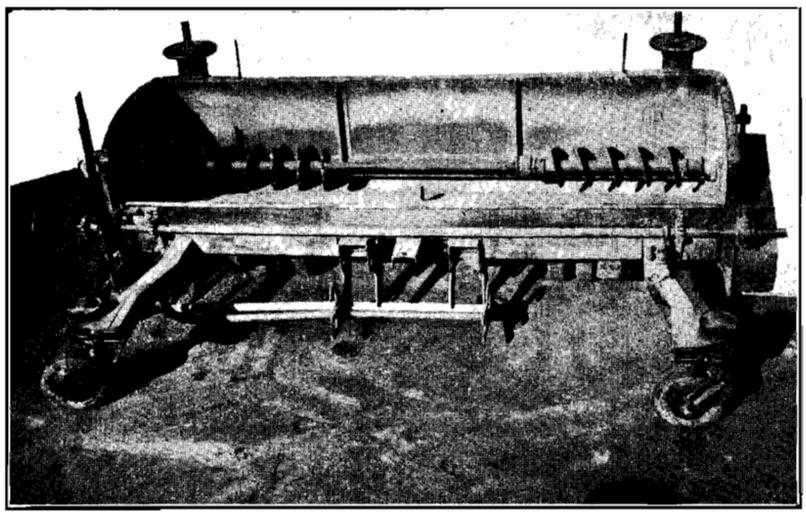


Plate No. 57.—General Arrangement of Spreader.

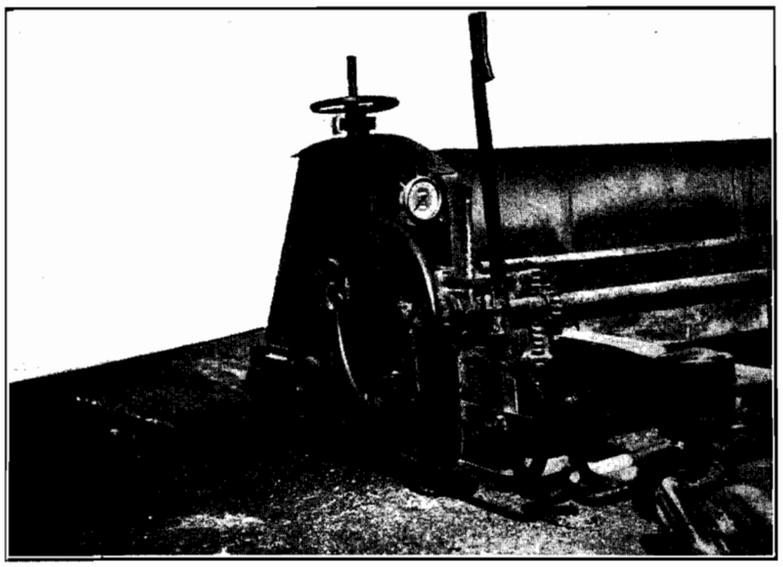


Plate No. 58.—Spreader Controls.

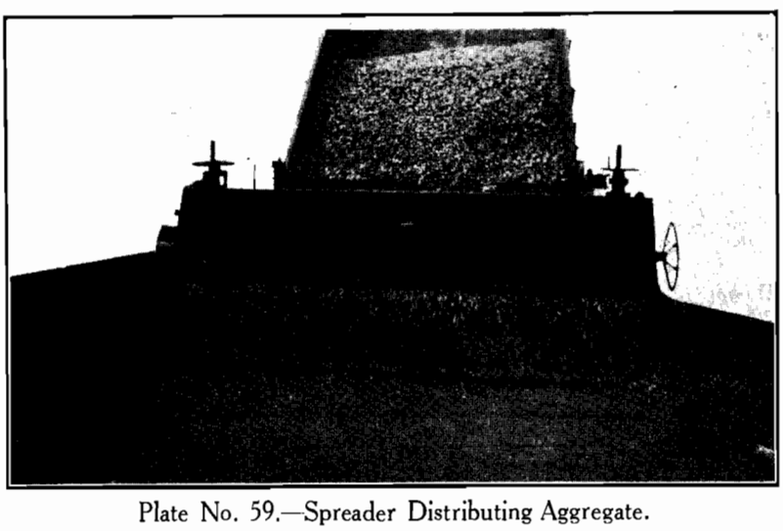


Plate No. 59.—Spreader Distributing Aggregate.

The rate of application is very satisfactory. Comparison of the variations in transverse distribution obtained with a rotating disc spreader and with a belt spreader are shown in Figs. B and C. Variations in rate of application, due to working up and down a grade, are shown in Fig. D. A contract has been let for a further twelve of these machines.

(*b*) ROAD MIXING MACHINE.

In the Annual Report for the year ending 30th June, 1936, there is a photograph of a roadmix seal machine attached to a "Fordson"-engined power grader. This was not satisfactory owing to the tractor having insufficient power. This attachment and others similar to it have proved very satisfactory when attached to a Diesel-engined grader having a draw-bar horse-power of 45 or more. (See Plate No. 60.)

Roughometer readings show that the riding qualities of the work done by these attachments are not quite as good as those for work carried out with a long independent machine. The order of the difference is not great and the ease of control, particularly on roads in bad repair, enables a very much better finish to be obtained with the attachment. The majority of work during the coming year will be carried out with this type of mixing machine.

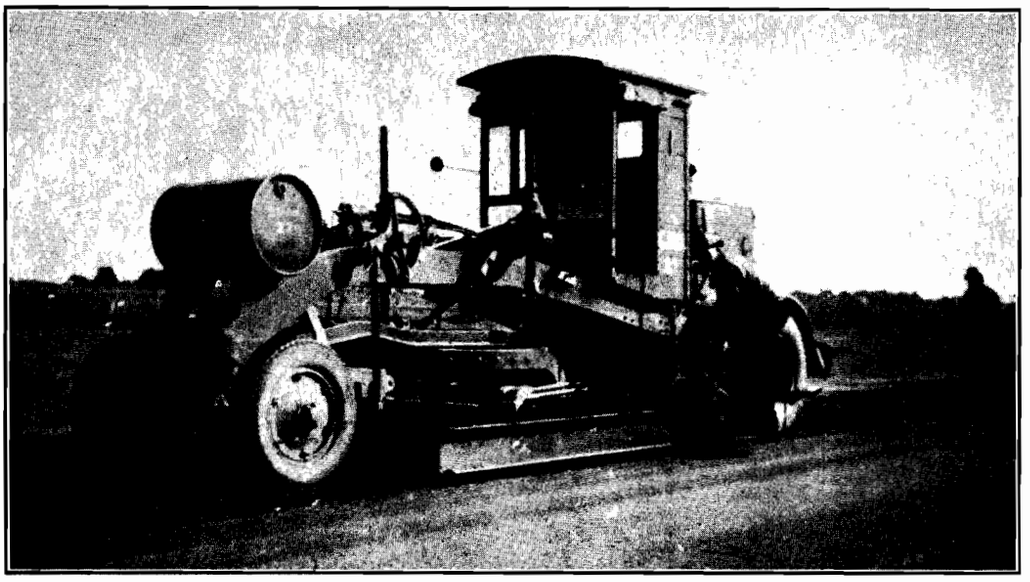


Plate No. 60.—Diesel Engined Power Grader fitted with Road-Mix Seal Attachment.

3. PLANT USED.

The following sprayers were in operation during the season :—

(i) 300-gallon (non-automotive)	3
(ii) 400-gallon (old type)	4
(iii) 400-gallon (new design)	7
Total	14

4. WORK EXECUTED.

(*a*) WORK CARRIED OUT BY C.R.B. PLANT.

(i) *Length of work carried out—*

For each five-year period since 1922–23, the average annual mileage on C.R.B. roads is as set out below :—

1922–23 to 1926–27 ..	135 miles
1927–28 to 1931–32 ..	310 miles
1932–33 to 1936–37 ..	720 miles

For the last five years, the total annual mileage on C.R.B. roads and average is as follows :—

Season.	*Miles.*
1933–34	835
1934–35	574
1935–36	740
1936–37	793
1937–38	837
Total	3,779

Average for the five years, 756 miles.

Details of length of jobs, &c.

All Sprayers, All Work.	Season. 1935–36.	1936–37.	1937–38.
Mileage—			
C.R.B. .. .. miles	..	..	837
Council roads .. miles	..	..	27
Total .. miles	740	793	864
Number of jobs	451	502	527
Longest job .. .. miles	23·57	12·5	23·7
Shortest job .. .. miles	0·07	0·04	0·02
Average job .. .. miles	1·64	1·57	1·64
400-gallon units only—			
Number of dumps	..	209	279
Average mileage done from each dump .. miles	..	3·3	3·1

(ii) *Nature of work on C.R.B. roads carried out by C.R.B. plant.*

Type of Sprayer.	Miles of Each Class of Work. First Seal.	Reseal.	R.M. Seal.	Experimental.
	miles	miles	miles	miles
400-gallon	522·05	6·32	265·13	4·12
300-gallon	28·49	0·42	10·37	..
Total ..	550·54	6·74	275·6	4·12

Total .. .. 837 miles
Plant-mix seals .. 13·64 miles

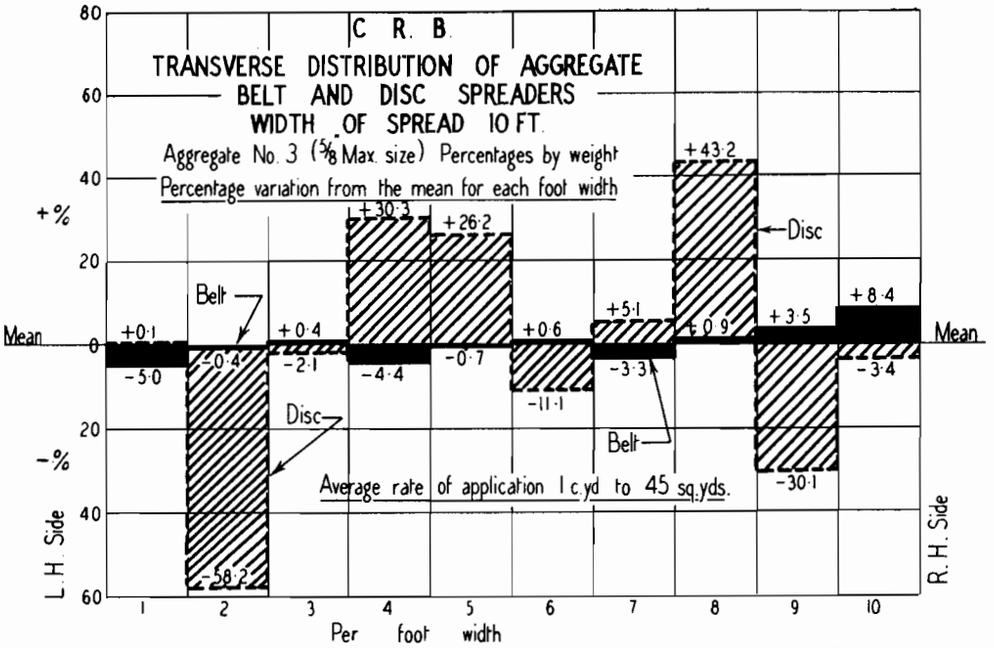


Fig. B.—Comparisons of Variations in Transverse Distribution obtained with Rotating Disc Spreader and a Belt Spreader (Aggregate No. 3).

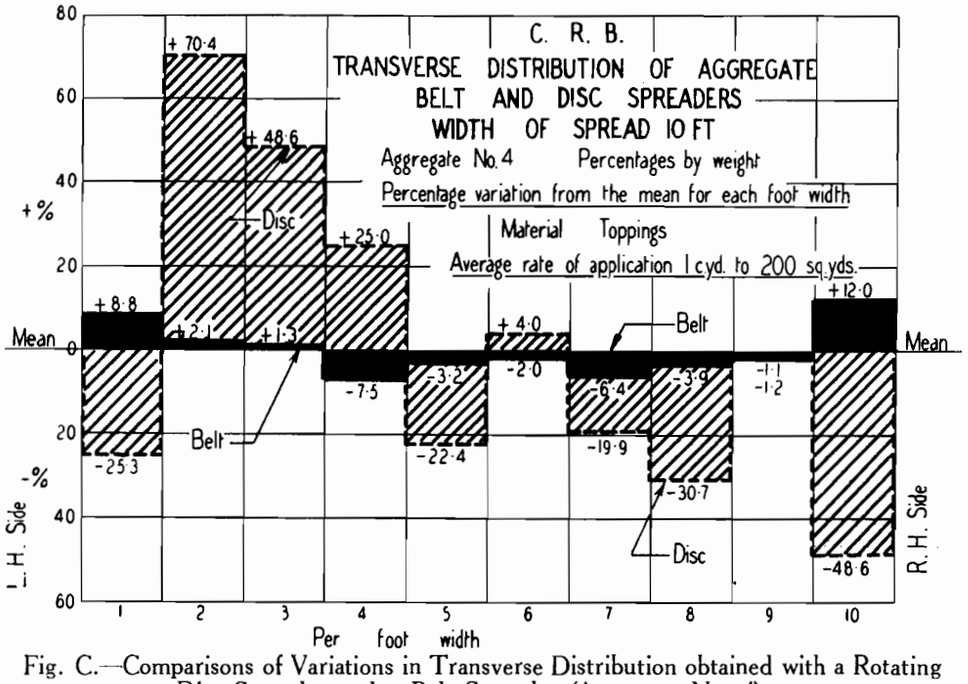


Fig. C.—Comparisons of Variations in Transverse Distribution obtained with a Rotating Disc Spreader and a Belt Spreader (Aggregate No. 4).

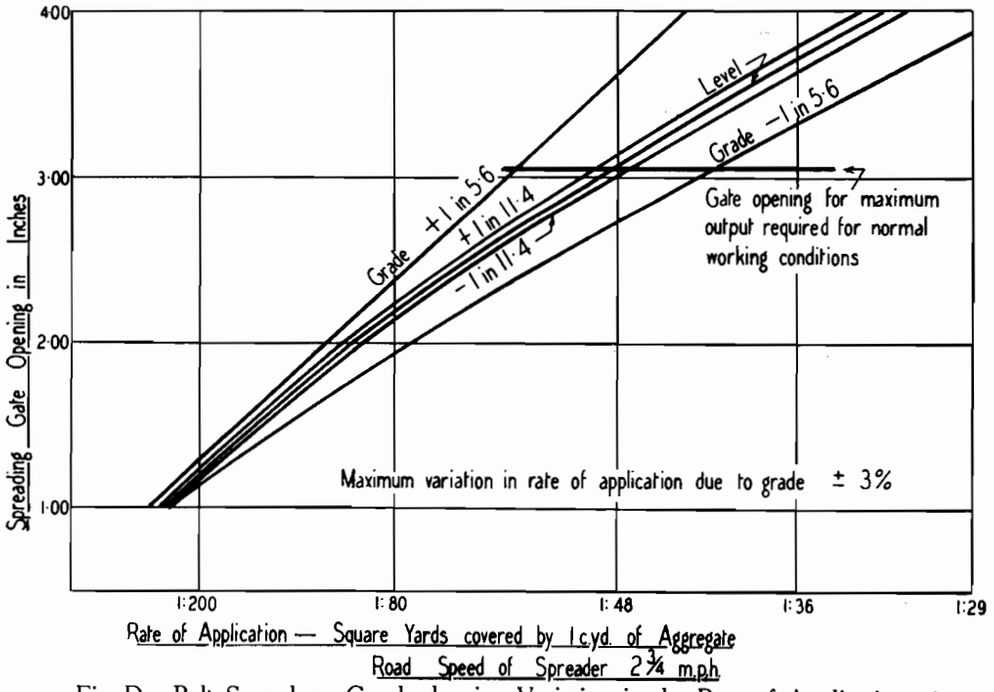


Fig. D.—Belt Spreader. Graph showing Variation in the Rate of Application of Aggregate due to Differences of Road Grade.

(*b*) WORK ON C.R.B. ROADS CARRIED OUT BY MUNICIPALLY-OWNED PLANT.

Approximate mileage of each class of work.

First Seal.		Reseal.	R.M.S.	Mod. Macadam.
S.S.	D.C.			
	miles	miles	miles	miles
14·96	25·77	29·11	6·44	2·08
Total ..	40·73	29·11	6·44	2·08

Total .. 78·36 miles

(*c*) TOTAL MILEAGE (EXCLUDING SUNDRY DEBTORS' WORK BY C.R.B. PLANT ON COUNCIL ROADS) BUT INCLUDING WORK ON C.R.B. ROADS BY MUNICIPAL PLANT.

	Miles.	Miles.
First Seals—		
Single seals	14·96	
Double coat	576·31	
		591·27
Reseals		35·85
Road-mix seals		282·04
Plant-mix seals		13·64
Mod. macadam		2·08
Experimental work		4·12
Total		929

5. ANALYSIS OF OPERATIONS.

The following three tables show for C.R.B. 400-gallon sprayers proportion of time spent in various operations or in idleness.

(*a*) ANALYSIS OF OPERATION OF EACH UNIT.

Operation.	400-gallon Sprayer No.—											Average.
	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	
Spraying	51·2	40·8	33·3	44·7	47·5	45·0	39·6	53·5	46·1	53·3	43·7	45·4
Moving	16·9	25·9	13·0	14·5	20·3	13·5	11·2	13·2	16·6	11·8	14·6	15·6
Weather	14·8	9·0	25·0	12·9	4·7	14·0	20·1	11·9	12·6	11·4	21·2	14·3
Holidays	6·4	6·5	8·2	6·2	7·3	9·4	8·0	8·4	8·9	6·9	7·7	7·6
Mechanical delays ..	1·6	1·3	1·2	1·2	2·5	2·0	0·3	3·0	..	2·3	2·6	1·6
Avoidable delays ..	9·3	17·4	19·3	20·5	18·3	17·7	20·8	10·8	15·8	14·8	10·2	15·9
Total ..	100·2	100·9	100·0	100·0	100·6	101·6	100·0	100·8	100·0	100·5	100·0	100·4

(*b*) ANALYSIS OF OPERATION OF ALL 400-GALLON UNITS 1935–36 TO 1937–38.

Operation.	Season—		
	1935–36.	1936–37.	1937–38.
Spraying	39·9	41·9	45·4
Moving	13·6	13·6	15·6
Weather	14·0	19·1	14·3
Holidays	7·6	8·7	7·6
Mechanical delays	2·4	2·4	1·6
Avoidable delays	24·1	14·6	15·9
Total	101·6	100·3	100·4

(*c*) AVOIDABLE DELAYS SET OUT IN (*a*) AND (*b*) ABOVE FOR 1937–38 ARE GIVEN IN DETAIL BELOW.

Delay.	400-gallon Sprayer No.—											Average.
	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	
Poor organization ..	..	..	..	0·4	2·2	4·3	5·0	1·3	2·4	1·2	1·6	1·7
Long leads	0·7	0·4	0·9	2·4	2·0	1·4	2·7	1·1	4·2	2·9	1·2	1·8
Short sections ..	7·7	10·2	11·3	9·5	6·3	3·6	6·9	6·3	6·7	3·3	5·7	7·1
Road not ready ..	..	2·2	4·7	6·0	2·0	6·3	2·7	1·5	2·5	6·6	0·8	3·2
No aggregate ..	..	1·7	0·6	0·9	0·5	0·6	0·3	0·3	..	0·8	0·6	0·6
No bitumen materials ..	0·2	0·3	..	..	2·8	0·3	..	..	..	..	..	0·3
Special materials ..	..	..	..	..	..	..	..	..	..	..	0·3	..
Labour and equipment	0·7	2·6	1·8	1·3	2·5	1·2	3·2	0·3	..	..	..	1·2
Total ..	9·3	17·4	19·3	20·5	18·3	17·7	20·8	10·8	15·8	14·8	10·2	15·9

AVOIDABLE DELAYS FOR 1935–36 TO 1937–38.

Delay.	Season— 1935–36.	1936–37.	1937–38.
Poor organization	2·8	0·2	1·7
Long leads	0·9	2·3	1·8
Short sections	8·2	7·1	7·1
Road not ready	6·3	3·1	3·2
No aggregate	1·3	0·6	0·6
No bitumen materials ..	0·7	0·4	0·3
Special materials	0·8	0·3	..
Labour and equipment ..	2·4	0·6	1·2
Total	23·4	14·6	15·9

6. Costs.

(*a*) AVERAGE COST OF DOUBLE COAT FIRST SEALS.

Cost in pence per square yard.

—	Season— 1935–36.	1936–37.	1937–38.
Area costed in square yards ..	3,061,286	3,750,966	4,770,668
Materials	6·40	5·49	6·23
Labour	1·33	1·38	1·32
Stores	0·26	0·24	0·22
Plant charges	0·60	0·61	0·84
Total	8·59	7·72	8·61

(*b*) AVERAGE COST OF ROAD-MIX SEALS.

Cost in pence per square yard.

—	Season— 1935–36.	1936–37.	1937–32.
Loose thickness of aggregate ..	½ inch	¾ inch	1 inch
Area costed in square yards ..	290,384	2,327,851	34,422
Material	5·07	7·06	8·54
Labour	1·64	1·73	2·32
Stores	0·23	0·24	0·47
Plant charges	0·93	0·93	1·59
Total	7·87	9·96	12·92

(*c*) AGGREGATE.

Total quantity costed—148,394 cubic yards.

Average price—13s. 5d. per cubic yard.

Average price per cubic yard of aggregate for season 1935–36 to 1937–38.

—	Season— 1935–36.	1936–37.	1937–38.
Quantity costed	111,559 cub. yds.	130,250 cub. yds.	148,394 cub. yds.
Average cost per cubic yard ..	s. d. 12 11	s. d. 12 3	s. d. 13 5

(*d*) BINDER.

Purpose.	Material.	Supplier.	Contract Number.	Tons.	Basic Price Per Ton Net— Bitumen, f.o.w.: all other *ex* Store, Melbourne. Including Drums.	Excluding Returnable Drums.
					£ s. d.	£ s. d.
Basic	Bitumen, 80–100 ..	Shell Company	00/459	10,000	6 18 0	..
				10,000		
Heavy flux ..	Dehydrated tar ..	Albion Quarrying Company	00/454A	450	5 11 3	4 7 3
	Dehydrated tar ..	Brighton	00/454B	794	4 16 0	3 12 0
	Dehydrated tar ..	J. Forbes	00/454C	541	5 11 3	4 7 3
	Dehydrated tar ..	Duratar	00/454D	449	5 11 3	4 7 3
	Asphaltic oil ..	C.O.R.	00/452	185	7 17 0	5 14 6
				2,419		
Patching ..	Bituminous emulsion	Shell Company	00/451	559	9 8 1	6 19 9
				559		
Light flux oil ..	Power kerosene ..	Various oil companies ..	00/460	827	..	10½d. per gallon
				827		
		Total	..	13,805		

(*e*) PRIMER.

Purpose.	Material.	Supplier.	Contract Number.	Tons.	Basic Price Per Ton Net— Delivered *ex* Store, Melbourne. Including Drums.	Excluding Returnable Drums.
					£ s. d.	£ s. d.
Light grade primer ..	Cold tar ..	Albion Quarrying Company ..	00/456A	508	4 14 0	3 9 7
		Brighton	00/456B	1,467	3 10 0	2 5 7
		Metropolitan Gas Company ..	00/456C	2,816	4 7 6	3 3 1
		W. M. Black	00/456D	6	..	2 18 0
		Total	..	4,797	..	..

(*f*) MISCELLANEOUS.

Purpose.	Material.	Supplier.	Contract Number.	Tons.	Basic Price Per Ton Net—Delivered *ex* Store, Melbourne.	
					Including Drums.	Excluding Returnable Drums.
					£ *s.* *d.*	£ *s.* *d.*
Oil fuel	Fuel oil ..	Atlantic Union Oil Company	00/458	262	8 13 11	5 17 8
Cleaning sprayers ..	Cleaning oil ...	Albion Quarrying Company ..	00/457A	61	8 10 0	7 4 6
	Cleaning Oil ..	Duratar	00/457B	46	9 18 10	8 12 4
Timber preserving ..	Creosote ..	J. Forbes	00/475	36	13 11 3	11 4 0
				405	..	..

(*g*) TOTAL MATERIALS USED.

Nature of Material.	Tons.	
	Petroleum Products.	Tar Products.
Binder	11,571	2,234
Primer	..	4,797
Miscellaneous	262	143
	11,833	7,174
Percentage	62·3%	37·7%
Total	19,007	

BRIDGES.

Maribyrnong River Bridge.

This structure together with the approaches was completed and opened to traffic during the year. The general arrangement of the structure, which was described in the 23rd Annual Report, provided for five visible spans each 70 feet long, with a roadway of 40 feet and two footways each 6 feet wide. Six rows of steel plate girders made integral with the concrete deck by steel stirrups welded to the top flange of the girder were provided. During the year, concrete for the five river spans was placed. The girders were supported at their ends on the concrete piers, and at the third points from a series of three panel steel trusses so as to keep the dead load of the newly placed deck concrete off the girders and to allow for the composite concrete and steel sections to take dead load forces as well as those from live load. During the casting of the deck, it was found necessary to adjust the supports between the trusses and the girders continuously, as the added load caused an elastic deflection of the trusses. The adjustment was conveniently done by pairs of heavy steel wedges 2 feet long and 3 inches wide having a taper of 1 in 12. This arrangement enabled an accurate control to be kept for loads up to 20 tons in a very simple manner.

The parapet for this structure consisted of metal grilles carried between concrete posts. The general arrangement which combines strength with lightness is shown in Plate No. 61. It will be noticed that the view of the water and river banks is not appreciably obscured with this type of parapet. The finish on the metal was obtained by cleaning the surface with compressed air and particles of chilled cast steel so as to remove all rust and mill scale. The grille was then treated in a tank to impregnate the metal with a phosphatic compound, which is rust resistant. The surface was then painted in the normal manner. This treatment cannot be applied to heavy structural steel girders because of the limited sizes of treatment tanks available. After the deck had been completed, most of the mill scale on the girders had become loose and in parts rusting had commenced.

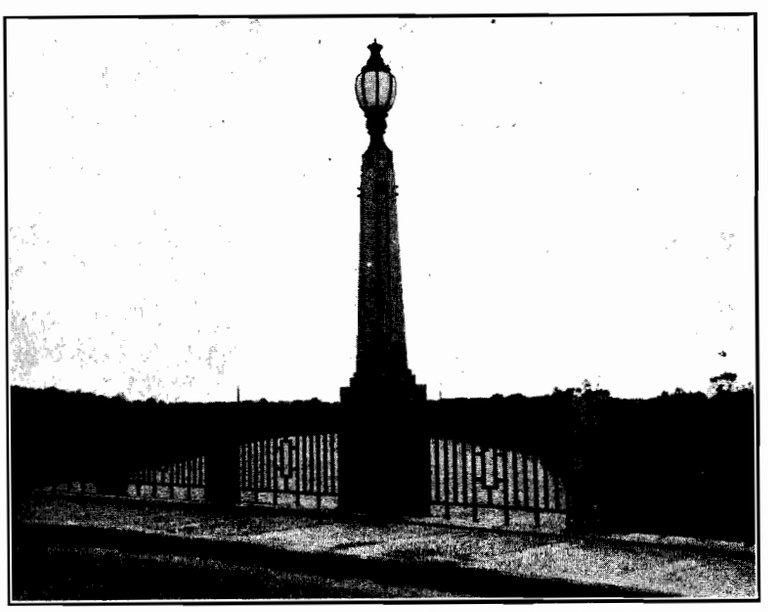


Plate No. 61—Maribyrnong River Bridge—Showing Parapet and Lamp Standard.

It is noticed that there is a wide range in the tenacity of mill scale on structural steel and by the time that some areas of mill scale become loose, other areas are deeply rusted. As the surface of steel must be quite free of rust and mill scale before it can be successfully painted, a difficult problem arises. In this bridge, the surfaces of the girders were cleaned with rotating steel wire brushes driven by a compressed air tool which removed the scale from the recalcitrant areas and the rust from the other areas. The surface produced was very good.

Experience in the painting of girders shows that those areas exposed to the sun and rain require much better protection than those areas sheltered by the deck of a bridge. The outer faces of girders were therefore given two coats of red lead and raw linseed oil followed by two coats of aluminium paint. The inner faces were given two coats of a horizontal tar-pitch mixture fluxed with a very volatile spirit to a cold painting consistency for the particular weather conditions. The use of benzol and naptha has been discontinued as a flux due to danger of poisoning from fumes. The flux now used consists of a mixture of other petroleum volatile oils.

The surface finish of concrete was given considerable attention in the more visible parts of this structure. Careful proportioning of concrete with special attention paid to the fine sand from 100 mesh to 36 mesh is of the first importance. These finer grain sizes have a considerable influence in preventing the bleeding of mortar from the coarse aggregate and are of great assistance in controlling segregation. Mechanical vibration will ensure that the forms are completely filled and the stripped finish will be as good as the carpentry work on the forms. To improve this latter aspect and to minimize the danger of leaks through the forms, special ply woods having the layers fastened together with waterproof glues have been found to be very successful. Finally, after stripping, the concrete faces are wetted and then ground with a power driven carborundum stone. By these means, it appears to be possible to cast almost any architectural shape in solid concrete. The lamp standards at this bridge were treated in this way.

Hopkins Falls Bridge.

This bridge, which consists of six spans each 52 feet long, with a width of 18 feet between kerbs, was constructed by direct labour under the supervision of the Shire Engineer. The velocity of water in the channel at this site is very high, and the bridge is situated a very short distance above the falls. Long spans were, therefore, desirable because of the danger of accumulated debris piling up against the bridge and the bridge being swept away.

The superstructure design provides for composite T-beam construction of the type developed by the Tasmanian Public Works Department. By means of a series of square steel bars welded to the top flange of standard rolled steel joists, the joists are securely tied to the concrete deck, which is subsequently cast. While there has been from the earliest days of concrete design a doubt regarding the value of the elastic modulus of concrete, this lack of knowledge has not been very serious for slabs or normal concrete girders, particularly since concrete working stresses have always been conservatively low, and the relatively low values of the elastic modulus assumed have always been on the safe side for stresses in reinforcement. Where, however, a composite T-beam is used, these conditions should demand a more accurate knowledge of the elastic modulus of concrete. It is usual to pre-stress the steel joist before casting the concrete slab, so as to decrease the tension in the steel and increase the tension in the concrete. Variations in the value of the concrete modulus in this case have much greater effect in determining the actual distribution of stresses. In this bridge the deflection of the composite structure was observed when the props used to support and prestress the joists were released. The span length from centre to centre of piers is 52 feet, but between the centres of supports to joists is 51 feet. The deflection on removal of props was $\frac{3}{8}$ inch. By equating the actual deflection to that determinable in terms of the applied moments and physical characteristics of the beam spans and moment of inertia, it is found that the moment of inertia per beam is in the order of 18,000 in 4 units of equivalent steel section.

By trial and error, it would appear that Es/Ec is in the order of 4·3 and Ec = 7,000,000 lb. per square inch. The effect of these values is to produce a dead load compression in the concrete of approximately 600 lb. per square inch, and a tension in the lower flange of the joist of 3,000 lb. per square inch. With full live load and impact the concrete stress is 1,075 lb. per square inch and the steel stress in the lower flange is only 11,000 lb. per square inch.

There is thus a considerable difference between the original design stresses of 800 lb. per square inch, and 16,000 lb. per square inch for concrete and steel respectively. No harm has been done in this case and the ultimate strength of the composite section is considerably higher than was anticipated as test results showed very high strength concrete in the structure.

Hoddle Bridge.

During the year, the contractor drove all the piles required for the piers and abutments. The type of pile and pier designed for this structure were shown in the last Annual Report. No difficulties were experienced in driving the hollow piles other than those incidental to driving any large heavy concrete pile.

The junction between the piles and the base of the piers, which was at a level of 6 inches below extreme low water level, was up to 5 feet below high tide level, and seldom less than 3 feet below normal low tide level. Specifications provided for building a box around the piles in each pier and sealing the box with 6 inches of concrete placed under water. The top of the seal reached to the junction line between piles and the base of the pier.

Considerable trouble was experienced by the contractor in making a watertight seal by this means, mainly due to uneven placing of batches under water. When the contract was some months overtime, the Board found it necessary to determine it and completed the pier work by direct labour. Great care was taken with the boxes and sealing of pier bases. The concrete used consisted of equal parts of well graded sand and stone up to 1 inch maximum size. Eight bags of cement per cubic yard of concrete were used and the concrete was placed through a tremie in depths of $3\frac{1}{2}$ feet to 4 feet of water. A thickness of 7 inches to 8 inches of concrete was placed and lightly but very thoroughly rammed under water. Experience showed that the slight loss of cement from the surface of the concrete following the ramming was more than offset by the extra density of the concrete immediately below the surface. By using "Ciment Fondu," the seal was hard enough to pump out in two days. Small areas of defective concrete were then cut out and resealed. Leakage through the seal was very small in spite of the fact that 40 piles having a total perimeter of nearly 240 feet protruded through the seal, and that a junction line of 225 feet around the edge of the box was unavoidable. After the pile heads had been broken down to the seal level, reinforcement for the base was placed and the whole concreted up to the top of the base in one continuous operation directly on to the seal concrete and against the boards of the box. Tongued and grooved kiln dried hardwood was used for the box sides and was entirely watertight even with heads of up to 5 feet of water.

This method of construction is a very economical one as the coffer dam box is required in any case for formwork of the pier base. The only extra cost of such a junction with piles in water as compared with that above water is the seal concrete and pumping together with greater cost of ensuring as perfect fitting forms as possible. Compared with a coffer dam extending through the water and into the river bed, the cost is very small even where the depth to the river bed is relatively shallow. Where the depth to river bed is considerable, for example 10 feet or more, and where any stones or debris occur in the underlying strata, complete cofferdam work would be extremely costly both in time and in money. The general arrangement of the construction details is shown in Plate 62.

The concrete in each pier was placed in one continuous cast. The whole of the outer formwork was first completed and reinforcement placed. The vertical studs for inner forms were then placed in position and, as concreting proceeded, the boards were placed in lifts of one foot at a time.

At the end of the financial year—30th June, 1938—practically all piers were completed and a start was made on the formwork for the superstructure. This latter consists of five continuous spans of reinforced concrete T-beam construction 385 feet long. Beam soffits are curved and the depth of beams varies from 7 feet 6 inches at the piers to 3 feet 4 inches at mid span. Due to the skew of 45 degrees any square cross section of the bridge cuts through some beams at their point of maximum depth.

Because of the great difficulty in providing construction joints in such deep beams with the heavy negative reinforcements at deck level, and also because of the uncertainty in making satisfactory construction joints in beam bridges, the whole of the superstructure was formed up complete and all reinforcement placed before concreting commenced so that a truly monolithic result would be achieved. The whole of the staging and formwork was designed to give the least disturbance to river traffic during construction. Provision was made for driving heavy timber piles to bed rock to support 100 lb. steel joists made continuous by welding. These joists in turn upported 10 inches by 7 inches hardwood beams for carrying the beam and deck shutters. The steel joists and 10 inches by 7 inches timber beams will be removed after completion and used for the construction of other smaller bridges throughout the State.

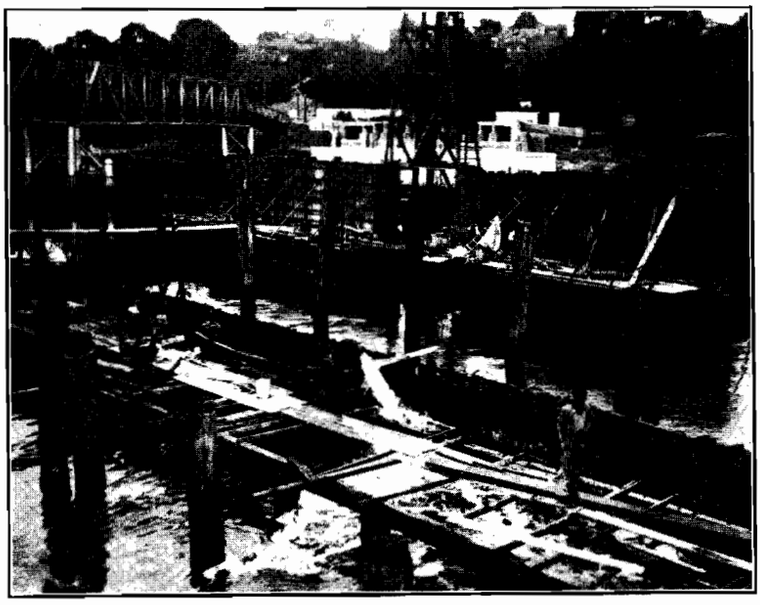


Plate No. 62.—Hoddle Bridge—General Arrangement of Construction Details.

Gardiner's Creek Bridge—Warrigal Road.

The new bridge over this creek was constructed by contract at a cost of £4,100. Previously this section of road was subject to flooding to such an extent that traffic was completely blocked after heavy rain and the embanked approaches considerably damaged by flood waters each time.

The new bridge has a clear span of 50 feet and is 4 feet above the level of the old bridge, which was only 40 feet long with a centre pier. All flood waters may now pass under the new bridge and the road level may be safely raised. The actual bridge, which is shown in Plate 37, follows recent trends in American practice. It shows that with simple treatment and a slight accentuation of line, a pleasing form of bridge is made possible without the necessity for resorting to deliberate ornamentation.

Darebin Creek Bridge.

A spandrel filled bluestone arch bridge having a height from bed level to deck level of 40 feet was built on the Heidelberg Road about 70 years ago. Provision for only two lanes of traffic was made in the arch. The top course of the stone parapets had been thrown into the creek by vandals over a number of years, but the remainder of the masonry was in fair condition. To have widened the bridge even on one side would have been costly in the original type of construction, and as both sides needed widening, the cost of retaining walls and stone facing was prohibitive. The bridge was widened by placing a reinforced concrete beam across the full width of the road at both abutments and at the wingwall extremities. This beam cantilevered beyond the old masonry and supported a concrete beam and deck slab clear outside the old masonry in the manner shown on Plates 38 and 39. The widening which provided for a 40 feet roadway and two footways each 6 feet wide and a total length of 100 feet, involving 2,200 square feet of new bridge and 200 lineal feet of handrailing, cost £2,100. The work was carried out by direct labour with a traffic intensity of 7,000 vehicles per day. The completed work is shown in Plate 40.

ROLLED STEEL JOIST BRIDGES.

In spite of an increase in price of 10s. per ton of the cost of steel joists, this form of structure has been found to be very satisfactory for many sites throughout the State. The steadily increasing difficulty of obtaining stringers of satisfactory species and length has rendered this form of construction almost a necessity in many cases. During the year two long bridges were constructed at sites over the Loddon River, viz., Serpentine (280 feet) and Newbridge (430 feet). A further structure over the Mitchell River in Bairnsdale Shire having a length of 480 feet was constructed to replace the old timber truss bridge which was destroyed by floods. This latter bridge consisted of 60 feet spans made continuous by electric arc welding.

For main road bridges, spans of 42½ feet are possible with simply supported spans and standard "A" Class (16 ton) loading. Spans may be increased a little over 50 feet for inner spans where continuity is provided.

For less important roads where no steam rollers or any heavy tractors are expected in excess of 10 tons on two axles (Class B loading), the span may be increased to 60 feet provided the joists are made continuous.

Joists have been made continuous by drilling, plating and splicing with field bolts and by electric arc welding. The latter is cheaper provided that the work is not too far away and there are a reasonable number of splices required, as otherwise transport on heavy portable welding plant increases costs unduly.

Yours obediently,

L. F. LODER,

Chief Engineer.

APPENDIX A.

COUNTRY ROADS BOARD FUND.

Dr. RECEIPTS. *Cr.*

1937.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
July 1. To Balance				9,607 5 8
1938.				
June 30. ,, Motor Car Act 3741—				
Registration Fees ..	1,699,192 3 0			
Less Refunds	22,203 9 3			
		1,676,988 13 9		
Fines ..	19,799 9 7			
Less Refunds	27 5 0			
		19,772 4 7		
		1,696,760 18 4		
Less Cost of Collection		87,881 10 10		
			1,608,879 7 6	
,, Motor Omnibus Act 3742—				
Fines		.. ..	5 5 0	
,, Country Roads Board Acts 3662 and 4332—				
Registration of Traction Engines		654 12 8		
Fees and Fines		551 19 6		
		1,206 12 2		
,, Acts 3741 and 4332—Costs ..		292 13 11		
			1,499 6 1	
,, Municipalities' Repayments—				
Permanent Works—				
Outer Metropolitan Roads ..	2,322 2 5			
Relief Acts 4140 and 4415—				
Main Roads	143,632 16 11			
		145,954 19 4		
Maintenance		156,667 5 1		
			302,622 4 5	
Hire of Plant		49,595 12 2		
Stores and Materials		208,511 16 2		
Sundries		82,892 4 4		
			340,999 12 8	
				2,254,005 15 8
				2,263,613 1 4

PAYMENTS.

1938.	£ s. d.	£ s. d.	£ s. d.
June 30. By Maintenance (Appendix)			1,129,651 10 8
,, Interest and Sinking Fund—			
Municipalities' Repayments			118,210 16 8
Interest and Sinking Fund—			
Great Ocean Road			1,000 0 0
Recoup to Revenue—Act 3944—			
Interest—Main Roads	104,208 4 3		
Developmental Roads	155,385 8 6		
Sinking Fund Contributions	23,195 13 7		
Exchange	39,176 12 11		
Loan Conversion Expenses	1,865 16 7		
		323,831 15 10	
,, Relief to Municipalities—Acts 4140 and 4415 ..		.. ..	245,634 15 9
,, Stores and Materials	210,697 16 4		
,, Motor Expenses	5,669 0 4		
,, Plant Purchase and Repairs	53,401 12 4		
,, Storeyard	33,599 11 11		
,, Sundry Debtors	44,383 19 2		
,, Traffic Administration—			
Motor Car Acts	3,641 9 7		
Country Road Acts	1,560 12 8		
Act 4332 (Impounding of Cattle)	621 18 9		
Murray River Bridges	2,841 0 8		
General Expenditure (Salaries, &c.)	87,890 13 8		
		444,307 15 5	
Balance	.. ..	976 7 0	
			2,263,613 1 4

RECONCILIATION.

	£ s. d.
Balance as per Treasury Books	939 3 4
Add Outstanding Transfers	1,364 7 7
	2,303 10 11
Deduct Accounts in Transit	1,327 3 11
Balance as per Country Roads Board Accounts	976 7 0

REVENUE ACCOUNT, 30TH JUNE, 1938.

1938.		£ s. d.	£ s. d.	£ s. d.
June 30.	To Maintenance Works—General		658,747 14 6	
	Mansfield–Wood's Point Road ..	2,554 0 7		
	Walhalla Road	2,445 12 9		
	Wood's Point Road	2,867 0 11		
	State Highways	418,904 18 4		
	Tourists' Roads	44,132 3 7		
			470,903 16 2	
				1,129,651 10 8
	„ Contribution to Sinking Fund		29,552 14 2	
	„ Interest on Loans		88,658 2 6	
				118,210 16 8
	„ Recoup to Revenue—Act 3944—			
	Interest—			
	Main Roads	104,208 4 3		
	Developmental Roads ..	155,385 8 6		
			259,593 12 9	
	„ Sinking Fund Contributions		23,195 13 7	
	„ Exchange		39,176 12 11	
	„ Loan Conversion Expenses		1,865 16 7	
				323,831 15 10
	„ Interest and Sinking Fund—Great Ocean Road—Act 4395		.. ..	1,000 0 0
	„ Relief to Municipalities		.. ..	245,634 15 9
	„ Audit Fee		487 17 6	
	„ Experimental Works		213 5 2	
	„ Insurance of Employees		123 12 11	
	„ Gravel Sites and Metal Investigations		228 18 11	
	„ Instruments		141 9 5	
	„ Motor Expenses		5,669 0 4	
	„ Offices Exhibition Building		141 9 5	
	„ District Storeyards		737 4 1	
	„ Office Expenses		6,408 6 11	
	„ Office Furniture		605 16 8	
	„ Patrolmen's Cottages and Engineers' Residences		3,987 4 6	
	„ Patrol Garages		648 17 8	
	„ Plans—Purchase		869 1 8	
	„ Plant Purchase		26,874 1 1	
	„ Postage and Telegrams		1,731 11 3	
	„ Printing and Stationery		2,399 1 4	
	„ Salaries		56,652 2 1	
	„ Storage Sites		4 0 9	
	„ Telephones		1,092 10 8	
	„ Testing Materials		1,141 13 0	
	„ Travelling Expenses		1,476 5 1	
	„ Motor Car Acts 3741, sections 11-13 and 3901, sections 24-36		3,641 9 7	
	„ Country Roads Act		1,560 12 8	
	„ Act 4332 (Impounding of Cattle)		621 18 9	
	„ Investigation Surveys		96 5 7	
	„ Advertising (Government Printer)		421 0 5	
	„ Legal Work Crown Solicitor (Annual Fee) ..		300 0 0	
	„ Direction Boards and Warning Signs		1,760 6 7	
	„ Insurance of Hire Trucks (Third Party Risk) ..		291 5 9	
	„ Traffic Census		406 2 6	
	„ Incidentals		39 17 2	
				120,772 9 5
	„ Murray River Bridges and Punts		.. ..	2,841 0 8
	Balance		.. ..	344,167 6 0
				2,286,109 15 0

1937.		£ s. d.	£ s. d.	£ s. d.
July 1.	By Balance		.. ..	332,832 7 9
1938.				
June 30.	„ Motor Car Act 3741—			
	Registration Fees	1,699,192 3 0		
	Less Refunds	22,203 9 3		
		1,676,988 13 9		
	Fines .. 19,799 9 7			
	Less Refunds 27 5 0			
		19,772 4 7		
		1,696,760 18 4		
	Less Cost of Collection ..	87,881 10 10		
			1,608,879 7 6	
	„ Motor Omnibus Act 3742—			
	Fines		5 5 0	
	„ Country Roads Board Act 3662—			
	Registration of Traction Engines		654 12 8	
	Fees and Fines		551 19 6	
	„ Costs, Acts 3741 and 4332		292 13 11	
	„ Camping Fees		45 9 8	
	„ Plans, Sale of		62 16 0	
	„ Plant Earnings	49,910 10 1		
	Deduct Working Costs ..	26,527 11 3		
			23,382 18 10	
	„ Rents		1,038 19 0	
	„ Royalty on Gravel and Metal		403 16 9	
	„ Old Roads, Sale of		192 4 10	
	„ Storeyard		487 13 9	
	„ Timber, &c., Revenue Account		24 6 3	
	„ Maintenance Works—			
	Contributions Payable by Municipalities	170,789 5 5		
	Adjustment	506 8 1		
			170,282 17 4	
	„ Permanent Works—			
	Contributions Payable by Municipalities—			
	Outer Metropolitan Roads ..	3,304 1 5		
	Other Main Roads ..	143,668 4 10		
			146,972 6 3	
				1,953,277 7 3
				2,286,109 15 0

BALANCE-SHEET AT 30TH JUNE, 1938.

LIABILITIES.	£	s.	d.
Contractors' Deposits	7,826	3	8
Sundry Liabilities	5,111	6	0
Revenue Account	344,167	6	0
	357.104	15	8

ASSETS.	£	s.	d.	£	s.	d.
Country Roads Board Fund				976	7	0
Maintenance Expenditure—						
Contributions Payable by Municipalities	170,789	5	5			
Contributions Payable by Municipalities (in arrears)	1,770	11	3			
				172,559	16	8
Permanent Works—						
Contributions Payable by Municipalities—						
Outer Metropolitan Roads	3,304	1	5			
Other Main Roads (subject to Relief)	143,668	4	10			
				146,972	6	3
Outstanding Accounts				8,045	12	8
Meterials—Stock—						
Storeyard	15,746	10	7			
Branches	4,977	18	10			
				20,724	9	5
Trust Fund				7,826	3	8
				357,104	15	8

SUMMARY OF BOARD'S ASSETS CHARGED TO FUND AS AT 30TH JUNE, 1938.

	£	s.	d.
Patrolmen's Cottages	17,446	6	11
Workshop Tools, Fittings, &c.	2,632	18	0
Furniture and Fittings	6,971	18	4
Testing Laboratory Equipment	791	10	4
Works Film	5	0	0
Survey Instruments	469	17	8
Pistols	19	15	0
Cars	5,794	0	0
Motor Car Accessories	30	0	0
Loadometers	600	0	0
Concrete Pipe Tester	10	0	0
Carried forward	34,771	6	3

	£	s.	d.
Brought forward	34,771	6	3
Storeyard No. 1	4,187	0	0
Storeyard No. 2	10	0	0
Police Motor Cycles	600	0	0
Motor Registration Branch	7,587	9	9
Motor Testing Branch	26	18	6
Motor Accessories (Police)	30	0	0
Police Sergeant's Office	14	17	0
Police Inquiry Section	12	2	0
Weighbridge	636	0	0
Police Motor Cars	5,060	0	0
	52,935	13	6
Working Plant at Valuation	91,440	13	11
	144,376	7	5

COUNTRY ROADS BOARD LOAN ACCOUNT, ACT No. 3662.

RECEIPTS.		£	s.	d.
1937. July 1.	To Balance	313	17	8
1938. June 30	„ State Loans Repayment Fund	57,972	3	4
		58,286	1	0

PAYMENTS.		£	s.	d.
1938. June 30.	By Permanent Works (Appendix)	58,286	1	0
		58,286	1	0

BALANCE-SHEET AT 30TH JUNE, 1938.

LIABILITIES.	£	s.	d.	£	s.	d.
Interest on Permanent Works				35,312	2	5
Loan Securities Issued	4,859,355	17	9			
Less Amount Repaid	80,000	0	0			
	4,779,355	17	9			
Deduct Discount and Expenses	70,488	1	11			
	4,708,867	15	10			
Less Securities Purchased and Cancelled from National Debt Sinking Fund	222,422	5	7			
	4,486,445	10	3			
Less Redemption Funds: 85,219 1 1						
Main Roads Sinking Fund: 285,688 7 7						
Repaid to State Loans Repayment Fund: 325,618 10 5						
	696,525	19	1			
				3,789,919	11	2
State Loans Repayment Fund				277,582	18	3
Contributions to National Debt Sinking Fund	244,317	13	8			
Less Net Loss on Repurchase of Securities (including Exchange)	11,823	9	1			
				232,494	4	7
Loan Redemption as Itemized Above				696,525	19	1
				5,031,834	15	6

ASSETS.	£	s.	d.
Permanent Works	4,986,450	14	1
Interest Capitalized on Permanent Works (Act 3662)	35,312	2	5
National Debt Sinking Fund (Cash in Hand)	10,071	19	0
	5,031,834	15	6

DEVELOPMENTAL ROADS LOAN ACCOUNT, ACT No. 3662.

BALANCE-SHEET AT 30TH JUNE, 1938.

LIABILITIES.

	£ s. d.	£ s. d.
Loan Securities Issued	6,297,088 1 4	
Deduct Discount and Expenses	111,226 16 6	
	6,185,861 4 10	
Less Securities Purchased and Cancelled from National Debt Sinking Fund	333,538 16 8	
	5,852,322 8 2	
Less Redemption Funds	646,386 7 4	
Developmental Roads Sinking Fund	55,083 0 2	
	701,469 7 6	
		5,150,853 0 8
Treasury—Development Railways Act 3662 (sec. 83/16)	4,125 0 0	
Consolidated Revenue Act 3662 (sec. 84/17)	15,125 0 0	
		19,250 0 0
Interest, Act 3662 (sec. 86/1)	77,251 18 10	
Contributions Postponed	16,656 13 7	
		93,908 12 5
State Loans Repayment Fund		239,896 6 1
Contributions to National Debt Sinking Fund	366,372 12 7	
Less Net Loss on Repurchase of Securities (including Exchange)	17,730 3 0	
		348,642 9 7
Loan Redemption as Itemized Above		701,469 7 6
		6,554,019 16 3

ASSETS.

	£ s. d.	£ s. d.
Permanent Works Expenditure		6,425,757 10 11
Contributions Payable by Municipalities, Act 3662 (sec. 83/16 and sec. 84/17) (subject to Relief)		19,250 0 0
Contributions Payable by Municipalities, Act 3662 (sec. 86/1) (subject to Relief)		93,908 12 5
National Debt Sinking Fund (Cash in Hand)		15,103 12 11
		6,554,019 16 3

DEVELOPMENTAL ROADS INTEREST—ACT 3662—(SECTIONS 83/16, 84/17, AND 86/1.)

RECEIPTS.

1938.	£ s. d.	£ s. d.
June 30. To Interest on Account of Municipalities Provided by Relief (Acts 4140 and 4415)—		
Act 3662—83/16	5,500 0 0	
84/17	19,250 0 0	
86/1	77,251 18 10	
		102,001 18 10
		102,001 18 10

PAYMENTS.

1938.	£ s. d.
June 30. By Payments to Treasury (Relief)	102,001 18 10
	102,001 18 10

AUDITOR-GENERAL'S CERTIFICATE.

The accounts have been audited and compared with the books with which they agree Reconciliations have also been made with the books of the Treasury.

I certify that the statements submitted are correct.

E. A. PEVERILL, Auditor-General.
29th November, 1938.

E. J. HICKS, Accountant.
29th October, 1938.

APPENDIX B.

COUNTRY ROADS BOARD.

STATEMENT OF APPORTIONMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE OF MAIN ROADS FOR THE YEAR ENDED 30TH JUNE, 1937.

Name of Municipality.	Permanent Works.		Maintenance.
	Principal.	Interest.	Amount.
	£ s. d.	£ s. d.	£ s. d.
Alberton Shire ..	426 10 0	13 5 0	3,836 10 1
Alexandra Shire ..	..	..	1,099 17 11
Arapiles Shire ..	..	..	570 1 3
Ararat Shire ..	..	..	2,989 4 10
Ararat Town ..	..	..	31 17 9
Avoca Shire ..	..	..	896 13 4
Avon Shire ..	..	..	139 2 8
Bacchus Marsh Shire	..	..	1,208 1 5
Bairnsdale Shire	..	..	2,098 18 9
Ballan Shire ..	..	..	1,053 3 0
Ballarat Shire ..	..	..	736 15 5
Bannockburn Shire	..	..	663 14 7
Barrabool Shire ..	..	..	1,388 18 5
Bass Shire ..	..	..	1,300 9 0
Beechworth Shire	..	..	967 17 10
Belfast Shire ..	..	..	336 0 9
Bellarine Shire ..	..	..	1,081 7 11
Benalla Shire ..	..	..	958 17 10
Berwick Shire ..	..	..	1,100 11 0
Bet Bet Shire ..	..	..	487 16 8
Birchip Shire ..	..	..	154 0 7
Blackburn and Mitcham Shire	..	..	953 10 4
Box Hill City (O.M.)	914 10 11	19 10 2	1,343 8 6
Braybrook Shire	..	..	495 2 2
Bright Shire ..	..	..	1,599 3 9
Brighton City (O.M.)	81 17 1	..	..
Broadford Shire ..	..	..	22 6 9
Broadmeadows Shire ..	..	..	54 4 5
Bulla Shire ..	..	..	580 12 3
Buln Buln Shire	471 16 9	15 5 7	2,477 6 11
Bungaree Shire ..	..	..	201 12 6
Buninyong Shire	..	..	212 11 10
Camberwell City (O.M.) ..	159 3 1	1 6 8	627 19 9
Castlemaine Borough ..	..	..	99 5 0
Charlton Shire ..	..	..	1,083 13 11
Chelsea City ..	..	..	536 2 4
Chiltern Shire ..	..	..	343 5 2
Clunes Borough ..	..	..	6 0 7
Coburg City (O.M.)	3,413 15 4	111 9 6	..
Collingwood City (O.M.) ..	5,296 1 8	173 12 0	8 2 0
Cohuna Shire ..	..	..	122 9 7
Colac Shire ..	..	..	1,532 13 0
Corio Shire ..	..	..	452 14 2
Cranbourne Shire	117 19 2	3 16 4	730 19 11
Creswick Shire ..	..	..	1,125 6 4
Dandenong Shire	..	..	1,317 1 4
Daylesford Borough	..	..	570 14 4
Deakin Shire ..	..	..	970 9 8
Dimboola Shire ..	..	..	1,220 10 8
Donald Shire ..	..	..	706 0 7
Doncaster and Templestowe Shire (O.M.) ..	159 3 1	1 6 8	..
Doncaster and Templestowe Shire ..	..	..	408 13 4
Dundas Shire ..	..	..	2,077 19 4
Dunmunkle Shire	..	..	1,580 3 8
Carried forward	11,040 17 1	339 11 11	46,560 5 1

Name of Municipality.	Permanent Works.		Maintenance.
	Principal.	Interest.	Amount.
	£ s. d.	£ s. d.	£ s. d.
Brought forward	11,040 17 1	339 11 11	46,560 5 1
Eaglehawk Borough	..	..	917 14 6
East Loddon Shire	..	..	185 9 6
Eltham Shire ..	..	..	475 12 8
Essendon City (O.M.) ..	273 9 2	11 5 7	840 16 1
Echuca Shire ..	..	..	21 14 6
Euroa Shire ..	..	..	1,796 19 6
Ferntree Gully Shire	..	..	2,085 3 4
Flinders Shire ..	..	..	2,569 13 6
Footscray City (O.M.) ..	3,159 10 10	48 12 0	238 8 9
Footscray City ..	..	..	1,412 17 3
Frankston and Hastings Shire..	..	..	2,145 12 0
Geelong City ..	..	..	37 18 6
Gisborne Shire ..	..	..	598 7 6
Glenelg Shire ..	..	..	3,549 11 8
Glenlyon Shire ..	..	..	1,169 7 1
Goulburn Shire ..	..	..	350 7 4
Grenville Shire ..	..	..	1,071 14 3
Hamilton Town	..	..	114 13 8
Hampden Shire ..	..	..	2,383 6 0
Healesville Shire	..	..	743 13 7
Heidelberg City (O.M.) ..	5,296 1 7	173 12 1	..
Heidelberg City ..	..	..	1,652 4 6
Heytesbury Shire	..	..	1,663 16 2
Horsham Town ..	..	..	113 15 2
Huntly Shire ..	..	..	60 10 7
Inglewood Borough	..	..	3 12 11
Kara Kara Shire	..	..	1,190 13 9
Karkarooc Shire	..	..	1,022 14 11
Keilor Shire ..	..	..	67 13 11
Kilmore Shire ..	..	..	450 11 4
Koroit Borough ..	..	..	74 15 9
Korong Shire ..	..	..	234 11 2
Korumburra Shire	..	..	2,784 4 4
Kowree Shire ..	..	..	1,418 13 8
Kyneton Shire ..	..	..	484 16 7
Lawloit Shire ..	..	..	739 1 4
Leigh Shire ..	..	..	726 10 11
Lexton Shire ..	..	..	342 10 8
Lillydale Shire ..	..	..	898 5 4
Lowan Shire ..	..	..	782 9 3
Maffra Shire ..	..	..	3,050 6 7
Maldon Shire ..	..	..	636 13 10
Mansfield Shire ..	..	..	1,605 19 8
Marong Shire ..	..	..	318 11 10
Maryborough Borough ..	..	..	0 10 4
Melton Shire ..	..	..	355 2 5
Metcalfe Shire ..	..	..	296 9 11
Mildura Shire ..	..	..	943 3 6
Mildura City ..	..	..	335 9 5
Minhamite Shire	297 1 9	11 1 4	1,422 19 5
Mirboo Shire ..	..	..	889 5 9
Moorabbin City (O.M.) ..	..	..	1.466 4 10
Moorabbin City ..	..	..	339 7 6
Mordialloc City (O.M.) ..	..	..	77 3 2
Mordialloc City ..	..	..	8 3 2
Mornington Shire	..	..	1,111 12 9
Mortlake Shire ..	..	..	1,110 1 8
Carried forward	20,067 0 5	584 2 11	97,948 4 3

STATEMENT OF APPORTIONMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION OF MAIN ROADS, ETC.—*continued.*

Name of Municipality.	Permanent Works.		Maintenance.	Name of Municipality.	Permanent Works.		Maintenance.
	Principal.	Interest.	Amount.		Principal.	Interest.	Amount.
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
Brought forward	20,067 0 5	584 2 11	97,948 4 3	Brought forward	24,912 3 10	684 12 2	124,037 15 10
Morwell Shire ..	..	..	1,321 4 6	Shepparton Borough ..	..	..	63 6 9
Mount Rouse Shire	..	..	2,128 6 11	South Barwon Shire	..	..	782 18 7
Mulgrave Shire ..	..	..	250 17 11	South Gippsland Shire	..	..	1,452 6 3
McIvor Shire ..	..	..	853 1 6	St. Arnaud Borough	..	..	405 19 4
Narracan Shire ..	..	..	2,533 3 5	Stawell Shire ..	..	..	1,460 18 11
Newham and Woodend Shire	..	..	441 10 7	Stawell Borough ..	..	..	335 8 2
Newstead and Mount Alexander Shire	..	..	750 7 4	Strathfieldsaye Shire	..	..	668 19 5
Newtown and Chilwell Town ..	..	..	14 8 3	Swan Hill Shire ..	..	..	592 15 7
Numurkah Shire	..	..	1,056 8 6	Talbot Shire ..	..	..	337 17 7
Oakleigh City (O.M.) ..	..	..	3 4 6	Tambo Shire ..	..	..	410 3 2
Oakleigh City ..	..	..	371 9 5	Towong Shire ..	..	..	377 3 2
Omeo Shire ..	..	..	705 8 0	Traralgon Shire ..	..	..	1,034 8 9
Orbost Shire ..	..	..	819 15 7	Tullaroop Shire ..	..	..	767 19 6
Otway Shire ..	..	..	1,055 17 6	Tungamah Shire	..	..	675 6 8
Oxley Shire ..	..	..	1,529 10 11	Upper Murray Shire	..	..	637 1 7
Phillip Island Shire	..	..	115 10 5	Upper Yarra Shire	..	..	415 11 9
Port Fairy Borough	..	..	35 11 9	Violet Town Shire	..	..	317 15 2
Portland Shire ..	..	..	2,131 8 5	Walpeup Shire ..	..	..	159 12 0
Preston City (O.M.)	253 11 7	0 19 0	946 0 4	Wangaratta Shire	..	..	324 7 2
Preston City ..	..	..	117 17 11	Wangaratta Borough ..	..	..	22 14 4
Pyalong Shire ..	..	..	174 4 9	Wannon Shire ..	..	..	1,423 5 11
Queenscliffe Borough ..	..	..	210 3 11	Waranga Shire ..	..	..	2,529 15 3
Ringwood Borough	..	..	661 11 1	Warracknabeal Shire	..	..	5,535 8 11
Ripon Shire ..	..	..	997 5 5	Warragul Shire ..	..	..	634 19 3
Rochester Shire ..	..	..	823 12 3	Warrnambool City	..	..	1 11 1
Rodney Shire ..	..	..	1,602 8 10	Warrnambool Shire	..	..	787 15 5
Romsey Shire ..	..	..	487 7 6	Werribee Shire ..	..	..	58 4 5
Rosedale Shire ..	..	..	700 4 8	Whittlesea Shire	..	..	1,035 0 11
Rutherglen Shire	..	..	305 18 8	Wimmera Shire ..	..	..	804 13 6
Sale Town ..	..	..	1,254 12 0	Winchelsea Shire	..	..	1,515 6 4
Sandringham City (O.M.) ..	4,591 11 10	99 10 3	321 17 1	Wodonga Shire ..	..	..	229 19 4
Sebastopol Borough	..	..	72 3 6	Wonthaggi Borough	..	..	76 9 3
Seymour Shire ..	..	..	690 11 9	Woorayl Shire ..	..	..	3,650 13 10
Shepparton Shire	..	..	606 6 6	Wycheproof Shire	..	..	387 3 4
				Yackandandah Shire	..	..	952 19 5
				Yarrawonga Shire	..	..	216 13 0
				Yea Shire ..	..	..	956 8 3
Carried forward	24,912 3 10	684 12 2	124,037 15 10	Totals ..	24,912 3 10	684 12 2	156,076 17 1

APPENDIX C.

COUNTRY ROADS BOARD.

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE OF MAIN ROADS, TOURISTS' ROADS, AND STATE HIGHWAYS FOR YEAR ENDING 30th JUNE, 1938.

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
UNDER MUNICIPALITIES.				
ALBERTON SHIRE—	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Albert River–Welshpool Road	..		692 8 3	
Balook–Yarram Road	..		704 1 8	
Carrajung–Gormandale Road	..		3,202 19 5	
Foster–Yarram Road	..		364 6 3	
Yarram–Boolarra Road	..		1,622 10 6	
Yarram–Port Albert Road	..		2,424 17 6	
Yarram–Won Wron Road	..		1,408 13 7	
				10,419 17 2
ALEXANDRA SHIRE—				
Cathkin–Mansfield Road	..		1,741 1 6	
Healesville–Alexandra Road	..		5,084 12 8	
Terip Terip	..		106 0 5	
Upper Goulburn Road	..		3,433 1 11	
Yarck Road	..		151 5 3	
				10,516 1 9
ARARILES SHIRE—				
Horsham–Hamilton Road	..		1,950 4 11	
Horsham–Natimuk–Edenhope Road	..		1,951 7 4	
				3,901 12 3
ARARAT TOWN—				
Avoca Road	..		17 11 10	
Ballarat–Stawell Road	..		30 17 2	
Port Fairy	..		11 0 6	
				59 9 6
ARARAT SHIRE—				
Ararat–Elmhurst Road	..		2,363 11 0	
Ararat–Warrnambool Road	..		4,186 19 0	
Ballarat–Hamilton Road	..		793 11 8	
Maroona–Glenthompson Road	..		1,464 17 5	
				8,808 19 1
AVOCA SHIRE—				
Ararat Road	..		398 1 5	
Ballarat–St. Arnaud Road	..		2,677 1 5	
Bealiba Road	..		68 16 11	
Landsborough Road	..		24 8 5	
Maryborough Road	..		1,533 1 3	
				4,701 9 5
AVON SHIRE—				
DARGO ROAD—Sec. A., £382 5s. 2d.; Sec. B., £494 17s. 1d.	..		877 2 3	
Maffra–Sale Road	..		49 3 4	
Maffra–Stratford Road	..		397 2 10	
Princes Highway	..		18 9 11	
				1,341 18 4
BACCHUS MARSH SHIRE—				
Bacchus Marsh–Balliang Road	..		1,794 1 2	
Ballarat Road	..		47 3 4	
Geelong-Bacchus Marsh Road	..		987 19 4	
Gisborne Road	..		1,811 18 10	
				4,641 2 8
BACCHUS MARSH AND CORIO SHIRES (Joint Works)—				
Bacchus Marsh–Balliang Road	..		14 19 10	
				14 19 10
BAIRNSDALE SHIRE—				
Bairnsdale–Lindenow Road	..		359 7 8	
Bairnsdale–Paynesville Road	..		1,065 9 1	
Bullumwaal–Tabberabbera Road	..		1,200 16 4	
Princes Highway	..		297 7 2	
				2,923 0 3
BALLAN SHIRE—				
Daylesford Road	..		528 7 11	
Gordon–Meredith Road	..		782 19 2	
Mount Wallace Road	..		876 11 11	
Spargo Creek Road	..		588 18 2	
				2,776 17 2
BALLAN AND BUNINYONG SHIRES (Joint Works)—				
Gordon–Meredith Road	..		0 16 0	
				0 16 0
Carried forward	..			50,106 3 5

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..		..	50,106 3 5
BALLARAT SHIRE—				
Ballarat–Lexton Road	..		400 16 7	
Maryborough–Ballarat Road	..		996 17 5	
				1,397 14 0
BANNOCKBURN SHIRE—				
Gordon–Meredith Road	..		164 14 0	
Inverleigh Road	..		1,607 11 4	
Shelford–Bannockburn Road	..		1,135 2 9	
				2,907 8 1
BARRABOOL SHIRE—				
Anglesea Road	..		1,869 8 4	
Hendy Main Road	..		1,243 7 6	
				3,112 15 10
BASS SHIRE—				
Almurta Road	..		270 6 8	
Almurta–Grantville Road	..		98 15 1	
Anderson–Dalyston Road	..		798 9 1	
Dalyston–Glen Forbes Road	..		620 17 1	
Dalyston–Wonthaggi Road	..		117 2 11	
Inverloch–Wonthaggi Road	..		1,121 1 7	
Korumburra–Wonthaggi Road	..		2,718 18 6	
Main Coast Road	..		1,195 15 11	
Wonthaggi–Loch Road	..		934 1 10	
				7,875 8 8
BASS SHIRE AND WONTHAGGI BOROUGH (Joint Works)—				
Loch–Wonthaggi Road	..		59 16 6	
				59 16 6
BEECHWORTH SHIRE—				
Beechworth Road	..		1,928 8 11	
Bright Road	..		785 3 9	
Chiltern–Beechworth Road	..		49 1 11	
Everton–Myrtleford Road	..		2,493 11 10	
Myrtleford–Yackandandah Road	..		91 1 4	
Stanley Road	..		921 14 0	
				6,269 1 9
BEECHWORTH AND WANGARATTA SHIRES—				
Beechworth Road	..		121 1 3	
				121 1 3
BEECHWORTH AND BRIGHT SHIRES—				
Bright Road	..		6 1 3	
				6 1 3
BELFAST SHIRE—				
Hamilton Road	..		1,556 6 10	
Penshurst Road	..		780 9 5	
				2,336 16 3
BELLARINE SHIRE—				
Geelong–Queenscliffe Road	..		433 8 1	
Geelong–Portarlington Road	..		644 19 3	
Portarlington–St. Leonards Road	..		229 9 10	
				1,307 17 2
BENALLA SHIRE—				
Benalla–Shepparton Road	..		17 11 9	
Goorambat Road	..		756 6 9	
Goorambat–Thoona Road	..		315 11 1	
Kilfeera Road	..		415 2 4	
Lima Road	..		0 9 1	
Sydney Road	..		279 0 10	
Tatong–Tolmie Road	..		367 3 5	
				2,151 5 3
BERWICK SHIRE—				
Beaconsfield–Emerald Road	..		756 16 4	
Cockatoo–Gembrook Road	..		180 2 3	
Emerald–Cockatoo Road	..		0 13 0	
Gembrook Road	..		858 19 5	
Gembrook–Beenak Road	..		92 19 1	
Hallam–Emerald Road	..		75 6 4	
Kooweerup–Longwarry Road	..		89 12 7	
Gembrook–Launching Place Road	..		33 7 3	
Nar Nar Goon–Longwarry Road	..		1,136 4 8	
Woori Yallock–Pakenham–Kooweerup Road	..		1,314 17 8	
				4,538 18 7
BIRCHIP SHIRE—				
Beulah–Birchip–Wycheproof Road	..		509 17 1	
Donald–Birchip–Sealake Road	..		412 4 0	
				922 1 1
BET BET SHIRE—				
Avoca–Bealiba Road	..		702 13 9	
Betley Road	..		62 12 2	
Dunolly Road	..		398 16 1	
Dunolly–Eddington Road	..		80 3 3	
Maryborough–Dunolly Road	..		1,574 8 8	
				2,818 13 11
Carried forward	..		..	85 931 3 0

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	..	..	85,931 3 0
BET BET AND TULLAROOP SHIRES (Joint Works)—				
Dunolly–Eddington Road	..		53 14 2	
Maryborough–Dunolly Road	..		19 3 8	
				72 17 10
BLACKBURN AND MITCHAM SHIRE—				
Burwood Road	..		4,866 1 11	
Main Healesville Road	..		1,483 4 5	
				6,349 6 4
BOX HILL CITY—				
Burwood Road (O.M.)	..		2,721 13 7	
Healesville Road (O.M.)	..		1,041 9 8	
Warrigal Road (O.M.)	380 16 11		..	
		380 16 11		3,763 3 3
BOX HILL AND CAMBERWELL CITIES (Joint Works)—				
Warrigal Road (O.M.)	689 13 6		420 1 2	
		689 13 6		420 1 2
BRAYBROOK SHIRE—				
Ballarat Road	..		124 8 0	
				124 8 0
BRIGHT SHIRE—				
Bright Road	..		2,860 9 6	
Harrietville Road	..		976 19 0	
Kiewa Valley Road	..		329 13 10	
Myrtleford–Yackandandah Road	..		391 13 5	
				4,558 15 9
BRIGHTON CITY—				
Beach Road (O.M.)	..		3 17 1	
				3 17 1
BROADMEADOWS AND KEILOR SHIRES (Joint Works)—				
Lancefield Road	..		210 9 0	
				210 9 0
BROADMEADOWS SHIRE—				
Sydney Road	..		1,322 9 1	
				1,322 9 1
BULLA SHIRE—				
Melbourne–Lancefield Road	..		3,220 10 0	
Sunbury Road	..		93 4 10	
The Gap Road	..		963 10 8	
				4,277 5 6
BULLA AND KEILOR SHIRES—				
Melbourne–Lancefield Road	..		54 9 10	
				54 9 10
BULN BULN SHIRE—				
Bloomfield Road	..		49 4 9	
Fumina Road	..		370 19 1	
Kooweerup–Longwarry Road	..		58 0 11	
Loch Valley Road	..		184 12 3	
Longwarry–Drouin Road	..		136 9 1	
Main Neerim Road	..		466 4 10	
Main South Road	..		2,495 1 11	
Neerim East Road	..		758 13 10	
Neerim North–Noojee Road	..		40 7 5	
Princes Highway	..		3,254 0 0	
Westernport Road	..		350 13 8	
				8,164 7 9
BULN BULN AND BERWICK SHIRES (Joint Works)—				
Kooweerup–Longwarry Road	..		210 2 2	
				210 2 2
BUNGAREE SHIRE—				
Daylesford–Ballarat Road	..		709 10 9	
				709 10 9
BUNINYONG SHIRE—				
Ballarat–Rokewood Road	..		664 3 5	
Elaine–Mt. Mercer Road	..		493 14 6	
				1,157 17 11
CAMBERWELL CITY—				
Doncaster Road (O.M.)	..		844 18 5	
Warrigal Road (O.M.)	..		47 15 0	
Warrigal Road (O.M.)	643 1 6		..	
		643 1 6		892 13 5
CAMBERWELL CITY AND MULGRAVE SHIRE (Joint Works)—				
Warrigal Road (O.M.)	844 10 8		..	
		844 10 8		..
CASTLEMAINE BOROUGH—				
Melbourne–Bendigo Road	..		912 19 11	
				912 19 11
CHARLTON SHIRE—				
Bendigo Road	..		261 0 7	
Donald Road	..		990 15 10	
St. Arnaud Road	..		1,328 19 8	
				2,580 16 1
CHARLTON AND DONALD SHIRES (Joint Works)—				
Donald Road	..		364 11 8	
				364 11 8
Carried forward	..	2,558 2 7	..	122,081 5 6

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,558 2 7	..	122,081 5 6
CHELSEA CITY—				
Point Nepean Road	..		911 9 7	
Springvale Road	..		32 4 10	
				943 14 5
CHILTERN SHIRE—				
Chiltern–Howlong Road	..		393 1 3	
Barnawartha–Howlong Road	..		307 0 0	
Sydney Road	..		18 18 3	
				718 19 6
CLUNES BOROUGH—				
Maryborough–Ballarat Road	..		14 16 0	
				14 16 0
COHUNA SHIRE—				
Cohuna–Leitchville Road	..		2,925 4 5	
				2,925 4 5
COLAC BOROUGH—				
Prince's Highway	..		262 16 4	
				262 16 4
COLAC BOROUGH AND COLAC SHIRE (Joint Works)—				
Colac–Forrest Road	..		90 13 4	
				90 13 4
COLAC SHIRE—				
Colac–Ballarat Road	..		298 13 7	
Colac–Beech Forest Road	..		606 11 5	
Cororooke Road	..		535 8 11	
Colac–Forrest Road	..		2,620 10 6	
Cressy–Inverleigh Road	..		611 2 3	
Swan Marsh Road	..		1,818 7 7	
Prince's Highway	..		97 19 10	
				6,588 14 1
COLLINGWOOD CITY—				
Heidelberg Road (O.M.)	..		30 7 11	
				30 7 11
CRANBOURNE SHIRE—				
Cranbourne–Frankston Road	..		670 19 0	
Kooweerup–Longwarry Road	..		373 13 10	
Kooweerup–Pakenham Road	..		1,216 4 7	
Main Coast Road	..		715 9 3	
Westernport Road	..		472 5 0	
				3,448 11 8
CORIO SHIRE—				
Geelong–Bacchus Marsh Road	..		17 2 9	
				17 2 9
CRESWICK SHIRE—				
Castlemaine–Ballarat Road	..		3,052 8 10	
Daylesford–Ballarat Road	..		2,069 7 10	
				5,121 16 8
DANDENONG SHIRE—				
Cheltenham Road	..		238 15 10	
Prince's Highway	..		142 16 4	
Springvale Road	..		648 14 8	
				1,030 6 10
DANDENONG AND CRANBOURNE SHIRES (Joint Works)—				
Dandenong–Frankston Road	..		355 0 2	
				355 0 2
DAYLESFORD BOROUGH—				
Ballan Road	..		100 16 10	
Ballarat Road	..		545 3 1	
Castlemaine Road	..		507 15 4	
Daylesford–Hepburn Road	..		65 17 1	
Daylesford–Trentham Road	..		59 4 11	
Malmsbury–Daylesford Road	..		32 15 2	
				1,311 12 5
DEAKIN SHIRE—				
Echuca–Cornella Road	..		188 4 0	
Echuca–Picola Road	..		160 7 0	
Kyabram–Nathalia Road	..		615 19 7	
Kyabram–Tongala Road	..		52 10 3	
Rochester–Kyabram Road	..		1,192 6 0	
				2,209 6 10
DEAKIN AND NUMURKAH SHIRES (Joint Works)—				
Echuca–Picola Road	..		47 2 8	
				47 2 8
DEAKIN AND RODNEY SHIRES (Joint Works)—				
Kyabram–Tongala Road	..		12 5 2	
Rochester–Kyabram Road	..		343 10 1	
				355 15 3
DIMBOOLA SHIRE—				
Hopetoun–Rainbow Road	..		5 4 1	
Horsham Road	..		2 0 11	
Rainbow Road	..		3,051 18 3	
Rainbow Rises Road	..		186 9 6	
Rainbow–Beulah–Birchip Road	..		1,233 12 10	
Warracknabeal Road	..		1,710 18 4	
				6,190 3 11
Carried forward	..	2,558 2 7	..	153,743 10 8

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,558 2 7	..	153,743 10 8
DIMBOOLA AND KARKAROOC SHIRES (Joint Works)—				
Hopetoun–Rainbow Road	..		61 9 2	
				61 9 2
DONALD SHIRE—				
Donald–Charlton Road	..		1,038 8 7	
Marnoo–Donald Road	..		1,495 4 1	
St. Arnaud–Birchip Road	..		2,558 12 9	
				5,092 5 5
DONALD AND CHARLTON SHIRES (Joint Works)—				
Donald–Charlton Road	..		70 13 0	
				70 13 0
DONCASTER AND TEMPLESTOWE SHIRE—				
Doncaster Road	..		808 18 11	
Heidelberg–Warrandyte Road	..		2,159 3 5	
Warrandyte–Ringwood Road..	..		515 19 4	
				3,484 1 8
DUNDAS SHIRE—				
Hamilton–Dunkeld Road	..		476 6 10	
Hamilton–Horsham Road	..		1,413 1 4	
Hamilton–Mt. Gambier Road	..		826 7 3	
Hamilton–Port Fairy Road	..		1,179 19 8	
Hamilton–Portland Road	..		845 3 4	
Hamilton–Warrnambool Road	..		881 14 6	
				5,622 12 11
DUNMUNKLE SHIRE—				
Horsham–Murtoa Road	..		535 16 0	
Minyip–Donald Road	..		149 15 7	
Marnoo–Rupanyup Road	..		2,586 10 3	
Rupanyup–Murtoa Road	..		290 12 6	
Stawell–Warracknabeal Road	..		3,261 6 1	
				6,824 0 5
EAGLEHAWK BOROUGH—				
Mount Korong Road	..		175 17 11	
				175 17 11
EAST LODDON SHIRE—				
Borung–Prairie Road	..		17 3 4	
Dingee Road	..		576 5 7	
Mitiamo Road	..		240 2 7	
Prairie Road	..		455 13 3	
				1,289 4 9
ELTHAM SHIRE—				
Eltham–Yarra Glen Road	..		2,581 9 8	
Hurstbridge–Kinglake Road	..		1,600 8 2	
Yarra Glen–Glenburn Road	..		341 5 11	
				4,523 3 9
ESSENDON CITY—				
Bendigo Road (O.M.)	..		0 5 0	
Sunbury Road (O.M.)	..		189 0 0	
				189 5 0
EUROA SHIRE—				
Arcadia Road	..		989 9 7	
Avenel–Longwood Road	..		18 13 6	
Euroa–Arcadia Road	..		1,866 11 0	
Euroa–Mansfield Road	..		302 14 0	
Euroa–Strathbogie Road	..		2,440 3 6	
Murchison–Violet Town Road	..		85 3 4	
				5,702 14 11
FERNTREE GULLY SHIRE—				
Beaconsfield–Emerald Road	..		8 8 7	
Belgrave–Emerald Road	..		1,218 1 5	
Burwood Road	..		2,296 13 9	
Emerald Road	..		979 0 7	
Main Ferntree Gully Road	..		5,927 15 4	
Monbulk Road	..		1,852 4 11	
Olinda Road	..		1,310 0 8	
				13,592 5 3
FLINDERS SHIRE—				
Hastings–Flinders Road	..		3,762 18 8	
Mornington–Dromana Road	..		432 9 4	
Mornington–Flinders Road	..		505 12 2	
Point Nepean Road	..		4,568 1 11	
Red Hill Road	..		1,121 16 8	
Rosebud–Flinders Road	..		855 11 9	
Stony Point Road	..		88 5 6	
				11,334 16 0
FOOTSCRAY CITY—				
Ballarat Road (O.M.)	363 17 8		..	
Prince's Highway (O.M.)	..		453 7 0	
		363 17 8		453 7 0
Carried forward	..	2,922 0 3	..	212,159 7 10

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,922 0 3	..	212,159 7 10
FRANKSTON AND HASTINGS SHIRE—				
Cranbourne–Frankston Road	..		403 8 11	
Frankston–Dandenong Road	..		2,424 18 8	
Frankston–Flinders Road	..		6,202 14 9	
Mooroodue Road	..		290 10 11	
Point Nepean Road	..		3,723 11 7	
				13,045 4 10
FRANKSTON AND HASTINGS, AND CRANBOURNE SHIRES (Joint Works)—				
Dandenong Road	..		3,190 8 8	
				3,190 8 8
FRANKSTON AND HASTINGS, AND MORNINGTON SHIRES (Joint Works)—				
Mooroodue Road	..		314 9 6	
				314 9 6
GISBORNE SHIRE—				
Bacchus Marsh	..		871 12 1	
Gisborne Station Road	..		35 1 1	
Mount Macedon Road	..		540 5 3	
				1,446 18 5
GLENELG SHIRE—				
Coleraine–Casterton Road	..		5,072 9 0	
Dergholm Road	..		2,650 4 9	
Mount Gambier Road	..		2,316 3 0	
Portland–Casterton Road	..		3,033 12 1	
Wando Vale Road	..		768 2 7	
				13,840 11 5
GLENLYON SHIRE—				
Ballan Road	..		217 16 0	
Ballarat Road	..		222 19 8	
Castlemaine–Daylesford Road	..		443 10 11	
Daylesford–Trentham Road	..		869 6 2	
Daylesford–Hepburn Road	..		1 18 5	
Malmsbury–Daylesford Road	..		2,457 4 6	
				4,212 15 8
GOULBURN SHIRE—				
Avenel–Longwood Road	..		17 17 11	
Vickers Road	..		73 8 0	
				91 5 11
GRENVILLE SHIRE—				
Ballarat–Hamilton Road	..		1,904 19 2	
Cressy Road	..		362 4 10	
Lismore Road	..		235 19 10	
Pitfield Road	..		1,372 18 0	
				3,876 1 10
HAMILTON TOWN—				
Ararat Road	..		0 9 11	
Hamilton–Warrnambool Road	..		9 5 6	
Port Fairy Road	..		6 5 8	
Portland Road	..		1 4 4	
				17 5 5
HAMPDEN SHIRE—				
Camperdown–Ballarat Road (Section between Grenville Shire boundary and Skipton)	..		28 5 9	
Camperdown–Ballarat Road	..		3,297 5 3	
Caramut–Lismore Road	..		926 0 2	
Camperdown–Cobden Road	..		220 14 2	
Cobden–Terang Road	..		628 0 6	
Lismore–Pittong	..		313 7 9	
Lismore–Cressy Road	..		1,051 17 10	
McKinnon's Bridge–Noorat Road	..		25 17 4	
Prince's Highway	..		221 14 11	
Terang–Framlingham Road	..		8 6 6	
Terang–Mortlake Road	..		350 8 0	
				7,071 18 2
HEALESVILLE SHIRE—				
Healesville–Alexandra Road	..		904 6 2	
Healesville–Kinglake Road	..		143 15 0	
Healesville–Woori Yallock Road	..		403 0 3	
				1,451 1 5
HEIDELBERG CITY—				
Greensborough–Hurstbridge Road	..		1,986 8 5	
Main Heidelberg–Eltham Road	..		1,519 12 1	
Main Whittlesea Road	..		20 10 8	
				3,526 11 2
HEYTESBURY SHIRE—				
Camperdown–Cobden Road	..		540 13 2	
Cobden–Port Campbell–Princetown Road	..		1,617 10 9	
Cobden–Terang Road	..		1,655 7 5	
Cobden–Scott's Creek Road	..		642 10 4	
Timboon–Nirranda Road	..		1,781 4 11	
Timboon–Port Campbell Road	..		151 4 1	
				6,388 10 8
Carried forward	..	2,922 0 3	..	270,632 10 11

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,922 0 3	..	270,632 10 11
HORSHAM TOWN—				
Dimboola–Horsham Road	..		560 1 10	
Dooen Road	..		522 0 1	
Hamilton Road	..		151 1 3	
Natimuk Road	..		1,200 16 9	
Western Highway	..		1 7 9	
				2,435 7 8
HUNTLY SHIRE—				
Heathcote–Elmore Road	..		257 4 0	
				257 4 0
INGLEWOOD BOROUGH—				
Bendigo–Charlton Road	..		91 2 10	
				91 2 10
KARA KARA SHIRE—				
Avoca–St. Arnaud Road	..		663 16 0	
Charlton Road	..		1,864 8 5	
Marnoo Road	..		69 9 2	
Navarre Road	..		1,325 18 8	
St. Arnaud–Donald Road	..		1,877 1 4	
				5,800 13 7
KARA KARA AND CHARLTON SHIRES (Joint Works)—				
Charlton Road	..		16 0 1	
				16 0 1
KARKAROOC SHIRE—				
Hopetoun–Rainbow Road	..		1,040 4 6	
Hopetoun–Warracknabeal Road	..		4,420 6 4	
Hopetoun–Woomelang–Sealake Road	..		867 10 6	
Rainbow–Beulah–Birchip Road	..		519 1 10	
				6,847 3 2
KEILOR AND BROADMEADOWS SHIRES (Joint Works)—				
Lancefield Road	..		90 19 6	
				90 19 6
KILMORE SHIRE—				
Heathcote Road	..		613 9 10	
Kilmore–Kilmore East Road	..		360 15 0	
Lancefield–Kilmore Road	..		638 13 7	
				1,612 18 5
KILMORE AND PYALONG SHIRES (Joint Works)—				
Heathcote Road	..		99 1 3	
				99 1 3
KILMORE AND ROMSEY SHIRES (Joint Works)—				
Lancefield–Kilmore Road	..		29 15 2	
				29 15 2
KOROIT BOROUGH—				
Koroit–Warrnambool Road	..		945 0 2	
				945 0 2
KORONG SHIRE—				
Borung–Hurstwood Road	..		264 14 2	
Charlton–Bendigo Road	..		393 9 11	
Serpentine Road	..		1,480 0 7	
				2,138 4 8
KORUMBURRA SHIRE—				
Bena–Kongwak Road	..		539 15 6	..
Bena–Korumburra Road	..		1,728 3 6	
Bena–Poowong Road	..		1,184 14 8	
Fairbank Road	..		1,305 16 11	
Kongwak–Inverloch Road	..		543 9 5	
Korumburra–Leongatha Road	..		281 13 3	
Korumburra–Warragul Road	..		3,908 0 7	
Korumburra–Drouin Road	..		561 14 4	
Korumburra–Wonthaggi Road	..		2,107 2 8	
Lang Lang–Nyora Road	..		15 2 1	
Loch–Nyora Road	..		325 14 3	
Loch–Wonthaggi Road	..		1,521 13 5	
Nyora–Poowong Road	..		431 2 4	
Poowong–Ranceby Road	..		220 1 3	
				14,674 4 2
KORUMBURRA AND BASS SHIRES (Joint Works)—				
Loch–Nyora Road	..		164 11 11	
				164 11 11
KOWREE SHIRE—				
Booroopki Road	..		2,079 16 9	
Booroopki–Frances Road	..		417 9 5	
Edenhope–Goroke Road	..		397 0 0	
Hamilton–Edenhope–Apsley Road	..		4,558 11 5	
Kaniva–Edenhope Road	..		53 13 8	
Wombelano Road	..		516 11 11	
				8,023 3 2
Carried forward	..	2,922 0 3	..	313,858 0 8

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,922 0 3	..	313,858 0 8
KYNETON SHIRE—				
Daylesford Road	..		1 1 1	
Daylesford–Trentham Road	..		105 2 7	
Melbourne–Bendigo Road	..		197 10 6	
Redesdale Road	..		174 11 2	
Trentham Road	..		2,576 3 11	
Tylden–Woodend Road	..		213 7 4	
				3,267 16 7
KYNETON AND GLENLYON SHIRES (Joint Works)—				
Daylesford–Trentham Road	..		100 7 6	
				100 7 6
LAWLOIT SHIRE—				
Broughton Road	..		590 1 4	
Kaniva–Edenhope Road	..		366 13 7	
Nhill–Kaniva–Border Road	..		319 3 10	
South Lillimur Road	..		562 18 0	
Yearinga Road	..		528 7 6	
				2,367 4 3
LEIGH SHIRE—				
Ballarat–Rokewood Road	..		756 3 6	
Shelford–Bannockburn Road	..		722 12 4	
Cressy–Inverleigh Road	..		798 19 5	
Inverleigh–Shelford Road	..		33 13 3	
Rokewood–Shelford Road	..		707 8 3	
Cressy–Rokewood Road	..		700 9 10	
Werneth Road	..		3 17 6	
				3,723 4 1
LEIGH AND COLAC SHIRES (Joint Shires)—				
Cressy–Inverleigh Road	..		514 18 10	
				514 18 10
LEXTON SHIRE—				
Avoca–Ararat Road	..		300 18 5	
Avoca–Ballarat Road	..		1,356 3 4	
				1,657 1 9
LILLYDALE SHIRE—				
Evelyn–Lilydale Road	..		55 3 9	
Main Healesville Road	..		1,466 6 5	
Monbulk Road	..		212 0 9	
Mount Dandenong Road	..		3,067 6 0	
Yarra Glen Road	..		1,106 7 8	
				5,907 4 7
LOWAN SHIRE—				
Dimboola–Kaniva Road	..		573 7 2	
Goroke Road	..		377 3 5	
Lorquon Road	..		341 9 0	
Lorquon West Road	..		720 11 9	
Yanac Road	..		845 10 3	
				2,858 1 7
MAFFRA SHIRE—				
Boisdale–Briagolong Road	..		1,161 2 6	
Briagolong–Dargo Road	..		468 9 1	
Briagolong–Stratford Road	..		85 0 0	
Bushy Park–Valencia Creek Road	..		1,079 4 0	
Licola Road	..		1,459 15 1	
Maffra–Sale Road	..		271 13 4	
Maffra–Stratford Road	..		561 12 9	
Maffra–Newry Road	..		1,278 9 2	
Tinamba–Boisdale Road	..		2,223 5 3	
Traralgon–Maffra Road	..		1,019 1 6	
Tinamba–Newry Road	..		844 7 0	
				10,451 19 8
MALDON SHIRE—				
Baringhup Road	..		275 6 6	
Castlemaine–Maldon Road	..		854 6 10	
Maldon–Eddington Road	..		668 19 11	
Newstead Road	..		47 12 1	
				1,846 5 4
MALDON AND MARONG SHIRES—				
Maldon–Eddington Road	..		208 1 5	
				208 1 5
MANSFIELD SHIRE—				
Benalla–Mansfield Road	..		879 15 5	
Euroa–Merton Road	..		361 4 0	
Mansfield Road	..		4,773 18 8	
Mansfield–Wood's Point Road	..		2,334 8 8	..
Mansfield–Tolmie Road	..		481 9 11	
Maindample–Benalla Road	..		199 13 9	
Merton–Strathbogie Road	..		125 14 10	
				9,156 5 3
MARONG SHIRE—				
Bendigo–Bridgewater Road	..		28 14 3	
Bendigo–Eddington Road	..		1,336 13 3	
				1,365 7 6
Carried forward	..	2,922 0 3	..	357,281 19 0

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,922 0 3	..	357,281 19 0
MARYBOROUGH BOROUGH—				
Avoca Road	..		376 3 2	
Ballarat Road	..		33 19 3	
Castlemaine Road	..		353 2 9	
Eddington Road	..		316 13 10	
				1,079 19 0
MELTON SHIRE—				
The Gap	..		17 3 3	
				17 3 3
METCALFE SHIRE—				
Elphinstone–Harcourt Road	..		76 9 3	
Kyneton–Redesdale Road	..		504 1 7	
				580 10 10
MILDURA SHIRE—				
Deakin Avenue	..		105 2 10	
Irymple Road	..		1,801 8 2	
Melbourne Road	..		204 16 0	
Murray Valley Road	..		174 12 3	
Wentworth Road	..		1,730 2 1	
				4,016 1 4
MILDURA CITY—				
Bridge Road	..		111 18 8	
Deakin Avenue	..		3,480 1 2	
Tenth Street	..		24 19 8	
Langtree Avenue	..		63 4 8	
				3,680 4 2
MINHAMITE SHIRE—				
Hamilton–Macarthur–Port Fairy Road	..		1,477 7 2	
Warrnambool–Hawkesdale–Penshurst Road	..		2,094 1 9	
Woolsthorpe–Bessiebelle Road	..		1,268 19 9	
				4,840 8 8
MIRBOO SHIRE—				
Grand Ridge Road	..		833 19 7	
Mardan Road	..		474 0 2	
Mirboo–Leongatha Road	..		265 3 10	
Mirboo North–Thorpdale Road	..		221 8 5	
Mirboo South Road..	..		1,513 3 9	
Mirboo–Yarragon Road	..		412 1 10	
Morwell–Mirboo Road	..		712 2 8	
				4,432 0 3
MOORABBIN CITY—				
Centre Dandenong Road	..		432 12 11	
Point Nepean Road..	..		236 12 2	
Warrigal Road (O.M.)	..		161 4 4	
				830 9 5
MORDIALLOC CITY—				
Beach Road (O.M.)	..		40 6 2	
Point Nepean Road..	..		259 17 4	
				300 3 6
MORNINGTON SHIRE—				
Mornington–Dromana Road	..		497 6 3	
Point Nepean Road..	..		4,031 4 4	
				4,528 10 7
MORTLAKE SHIRE—				
Caramut–Lismore Road	..		1,892 16 2	
Mortlake–Warrnambool Road	..		11 10 1	
Mortlake–Ararat Road	..		1,214 16 6	
Terang–Mortlake Road	..		557 7 10	
Terang–Framlingham Road	..		696 9 6	
				4,373 0 1
MORWELL SHIRE—				
Jeeralang West Road	..		2,547 7 2	
Jumbuk Road	..		1,936 10 6	
Morwell–Mirboo Road	..		1,323 17 9	
Prince's Highway	..		423 2 7	
				6,230 18 0
MOUNT ROUSE SHIRE—				
Ballarat–Hamilton Road	..		2,298 1 1	
Hamilton–Dunkeld Road	..		501 0 0	
Hamilton–Penshurst Road	..		1,169 18 11	
Maroona–Glenthompson Road	..		168 3 5	
Penshurst–Caramut Road	..		1,924 11 5	
				6,061 14 10
MULGRAVE SHIRE—				
Ferntree Gully Road	..		992 9 11	
Springvale Road	..		798 9 1	
				1,790 19 0
McIVOR SHIRE—				
Heathcote–Elmore Road	..		846 10 3	
Heathcote–Redesdale Road	..		728 1 8	
Kilmore–Heathcote–Bendigo Road	..		2,259 6 9	
Lancefield–Tooborac Road	..		73 10 7	
Mount Camel Estate Road	..		547 8 5	
				4,454 17 8
Carried forward	..	2,922 0 3	..	404,498 19 7

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	2,922 0 3	..	404,498 19 7
NARRACAN SHIRE—				
Allambee–Childers Road	..		649 2 9	
Childers–Thorpdale Road	..		416 5 6	
Mirboo–Yarragon Road	..		471 4 7	
Moe–Yallourn Road..	..		47 14 1	
Prince's Highway	..		197 17 3	
Trafalgar–Thorpdale Road	..		2,406 12 10	
Walhalla Road	..		2,608 11 5	
Willow Grove Road..	..		2,824 9 6	
Yarragon–Leongatha Road	..		2,676 11 9	
Yarragon–Shady Creek Road	..		1,093 1 5	
				13,391 11 1
NEWHAM AND WOODEND SHIRE—				
Lancefield Road	..		803 18 10	
Mount Macedon Road	..		625 5 7	
Tylden Road	..		262 17 6	
				1,692 1 11
NEWHAM AND WOODEND, AND KYNETON SHIRES (Joint Works)—				
Tylden Road	..		121 12 0	
				121 12 0
NEWSTEAD AND MOUNT ALEXANDER SHIRE—				
Castlemaine–Daylesford Road	..		525 11 0	
Creswick Road	..		423 2 8	
Maldon Road	..		530 13 2	
				1,479 6 10
NEWSTEAD AND MOUNT ALEXANDER, AND GLENLYON SHIRES (Joint Works)—				
Castlemaine–Daylesford Road	..		44 13 0	
				44 13 0
NUMURKAH SHIRE—				
Echuca–Picola Road	..		339 18 3	
Nathalia–Picola Road	..		215 8 11	
Numurkah–Nathalia Road	..		403 13 9	
Numurkah–Tungamah Road	..		90 14 7	
Shepparton–Numurkah–Cobram Road..	..		1,953 7 10	
				3,003 3 4
NUMURKAH AND DEAKIN SHIRES (Joint Works)—				
Echuca–Picola Road	..		212 16 9	
				212 16 9
OAKLEIGH CITY—				
Ferntree Gully Road	..		2 0 1	
Prince's Highway	..		721 15 11	
				723 16 0
OAKLEIGH AND MOORABBIN CITIES (Joint Works)—				
Warrigal Road (O.M.)	2,246 5 2		24 1 10	
		2,246 5 2		24 1 10
OAKLEIGH AND MALVERN CITIES (Joint Works)—				
Warrigal Road (O.M.)	518 0 0		..	
		518 0 0		
OMEO SHIRE—				
Benambra Road	..		829 16 11	
Day Avenue	..		495 9 0	
Swift's Creek–Omeo Road	..		1,165 3 1	
				2,490 9 0
ORBOST SHIRE—				
Combienbar Road	..		402 9 0	
Marlo Road	..		998 15 5	
Prince's Highway	..		252 0 2	
Orbost–Delegate Road	..		660 10 11	
				2,313 15 6
OTWAY SHIRE—				
Beech Forest–Apollo Bay Road	..		412 10 6	
Carlisle–Gellibrand Road	..		403 12 11	
Colac–Beech Forest Road	..		1,019 9 4	
Colac–Forrest Road	..		77 4 6	
Beeeh Forest–Laver's Hill Road	..		196 0 3	
Beech Forest–Mount Sabine Road	..		291 16 2	
Forrest–Apollo Bay Road	..		2,053 16 4	
				4,454 10 0
OXLEY SHIRE—				
Bright Road	..		2,509 15 9	
Greta–Glenrowan Road	..		348 8 1	
Kilfeera–Boggy Creek Road	..		180 13 10	
Wangaratta–Whitfield Road	..		3,549 11 7	
				6.588 9 3
OXLEY AND WANGARATTA SHIRES (Joint Works)—				
Wangaratta–Whitfield Road	..		36 14 9	
				36 14 9
PHILLIP ISLAND SHIRE—				
Newhaven Road	..		237 9 3	
Phillip Island Road..	..		157 9 8	
Ventnor Road	..		403 18 1	
				798 17 0
Carried forward	..	5,686 5 5	..	441,874 17 10

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	5,686 5 5	..	441,874 17 10
PORT FAIRY BOROUGH—				
Hamilton Road	..		448 5 9	
				448 5 9
PORTLAND SHIRE—				
Bridgewater Road	..		2,171 17 4	
Heath Road	..		1,889 16 11	
Portland–Casterton Road	..		1,535 6 2	
Portland–Hamilton Road	..		3,115 11 7	
				8,712 12 0
PRESTON CITY—				
Epping Road	..		13 16 9	
Epping Road (O.M.)	7,326 13 5		2,015 4 4	
Whittlesea Road	..		401 0 11	
		7,326 13 5		2,430 2 0
PYALONG SHIRE—				
Kilmore–Heathcote–Bendigo Road	..		1,054 0 1	
Lancefield–Tooborac Road	..		246 10 7	
				1,300 10 8
PYALONG AND McIVOR SHIRES (Joint Works)—				
Lancefield–Tooborac Road	..		49 2 8	
				49 2 8
QUEENSCLIFFE BOROUGH—				
Geelong Road	..		156 17 11	
Point Lonsdale Road	..		31 1 8	
				187 19 7
RINGWOOD BOROUGH—				
Main Healesville Road	..		1,243 13 8	
Mount Dandenong Road	..		1,118 19 8	
Ringwood–Warrandyte Road	..		498 18 7	
				2,861 11 11
RINGWOOD BOROUGH AND DONCASTER AND TEMPLESTOWE SHIRE (Joint Works)—				
Ringwood–Warrandyte Road	..		122 18 9	
				122 18 9
RIPON SHIRE—				
Ballarat–Ararat Road	..		186 6 7	
Ballarat–Hamilton Road	..		1,945 3 8	
Skipton Road	..		1,425 2 5	
				3,556 12 8
RIPON AND HAMPDEN SHIRES—				
Ballarat–Hamilton Road	..		0 14 6	
				0 14 6
ROCHESTER SHIRE—				
Bendigo–Echuca Road	..		35 2 2	
Corop Road	..		493 2 2	
Rochester–Bamawm–Prairie Road	..		3,116 16 0	
Timmering Road	..		146 8 11	
				3,791 9 3
RODNEY SHIRE—				
Kyabram–Nathalia Road	..		318 18 10	
Kyabram–Tongala Road	..		679 11 2	
Mooroopna–Undera Road	..		3,173 6 9	
Shepparton–Tatura Road	..		1,800 18 6	
Tatura–Murchison Road	..		355 14 4	
Tatura–Byrneside–Kyabram Road	..		3,709 11 7	
				10,038 1 2
RODNEY SHIRE AND SHEPPARTON BOROUGH (Joint Works)—				
Shepparton–Tatura Road	..		518 12 1	
				518 12 1
ROMSEY SHIRE—				
Lancefield–Kilmore Road	..		254 8 5	
Lancefield–Tooborac Road	..		401 5 10	
Melbourne–Lancefield Road	..		766 13 9	
Woodend–Lancefield Road	..		443 2 8	
				1,865 10 8
ROSEDALE SHIRE—				
Prince's Highway	..		117 13 7	
Seaspray Road	..		683 1 9	
Traralgon–Gormandale Road	..		132 6 6	
Traralgon–Maffra Road	..		922 18 2	
Willung Road	..		100 6 9	
				1,956 6 9
ROSEDALE AND ALBERTON SHIRES (Joint Works)—				
Carrajung–Gormandale Road	..		59 5 0	
				59 5 0
RUTHERGLEN SHIRE—				
Barnawartha–Howlong Road	..		32 12 6	
Chiltern–Howlong Road	..		634 5 2	
Murray Valley Road	..		286 3 9	
Rutherglen–Wahgunyah Road	..		350 19 0	
Springhurst–Rutherglen Road	..		177 15 9	
				1,481 16 2
Carried forward	..	13,012 18 10	..	481,256 9 5

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward		13,012 18 10	..	481,256 9 5
SALE TOWN—				
Prince's Highway	..		483 18 1	
				483 18 1
SANDRINGHAM CITY—				
Beach Road (O.M.)	3,950 1 10		434 1 6	
		3,950 1 10		434 1 6
SEBASTOPOL BOROUGH—				
Ballarat–Hamilton Road	..		47 16 11	
Ballarat–Rokewood Road	..		361 0 2	
				408 17 1
SEYMOUR SHIRE—				
Avenel–Longwood Road	..		59 15 9	
Highlands Road	..		436 9 9	
Seymour–Yea Road	..		165 10 8	
Upper Goulburn Road	..		642 16 9	
				1,304 12 11
SEYMOUR AND BROADFORD SHIRES—				
Upper Goulburn Road	..		79 7 0	
				79 7 0
SHEPPARTON SHIRE—				
Dookie–Nalinga Road	..		783 15 7	
Katandra Road	..		402 17 0	
Pine Lodge Road	..		102 10 7	
Shepparton–Nagambie Road	..		895 13 1	
Shepparton–Numurkah Road	..		2,279 8 0	
				4,464 4 3
SHEPPARTON SHIRE AND SHEPPARTON BOROUGH (Joint Works)—				
Shepparton–Nalinga Road	..		30 0 0	
				30 0 0
SHEPPARTON BOROUGH—				
Shepparton–Nagambie Road	..		0 2 7	
Shepparton–Nalinga Road	..		30 2 7	
Shepparton–Numurkah Road	..		0 6 6	
				30 11 8
SHEPPARTON BOROUGH AND RODNEY SHIRE (Joint Works)—				
Shepparton–Mooroopna Road	..		0 2 6	
Shepparton–Tatura Road	..		0 5 3	
				0 7 9
SOUTH BARWON SHIRE—				
Barwon Heads Road	..		2,378 4 10	
Prince's Highway	..		394 17 9	
Torquay Road	..		309 6 1	
				3,082 8 8
SOUTH BARWON AND BELLARINE SHIRES (Joint Works)—				
Barwon Heads Road	..		20 18 6	
				20 18 6
SOUTH BARWON AND BARRABOOL SHIRES (Joint Works)—				
Torquay Road	..		764 7 5	
				764 7 5
SOUTH GIPPSLAND SHIRE—				
Albert River–Welshpool Road	..		54 11 9	
Boolarra–Foster Road	..		1,099 17 7	
Boolarra–Welshpool Road	..		1,281 4 11	
Falls Road	..		560 0 5	
Foster–Yarram Road	..		1,786 18 11	
Hazel Park Road	..		112 9 0	
Main South Gippsland Road	..		1,885 5 10	
Stony Creek–Dollar Road	..		248 13 11	
Toora–Gunyah Road	..		499 0 3	
Toora–Wonyip Road	..		368 15 7	
Turton's Creek Road	..		463 12 6	
				8,360 10 8
SOUTH GIPPSLAND AND WOORAYL SHIRES (Joint Works)—				
Dollar–Stony Creek Road	..		39 4 7	
Main South Gippsland Road	..		259 16 3	
				299 0 10
ST. ARNAUD BOROUGH—				
Avoca–St. Arnaud Road	..		362 1 7	
Charlton Road	..		385 7 10	
Navarre Road	..		386 3 6	
St. Arnaud–Donald Road	..		119 16 8	
				1,253 9 7
STAWELL BOROUGH—				
Ararat–Stawell Road	..		339 3 11	
Glenorchy Road	..		53 4 0	
				392 7 11
STAWELL SHIRE—				
Landsborough Road	..		56 14 2	
Marnoo Road	..		3,023 10 2	
Marnoo–Rupanyup Road	..		52 12 3	
Navarre Road	..		257 7 2	
Stawell–Glenorchy–Horsham Road	..		1,942 9 9	
Stawell–Warracknabeal Road	..		1,658 0 1	
				6,990 13 7
Carried forward	..	16,963 0 8	..	509,656 6 10

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	16,963 0 8	..	509,656 6 10
STRATHFIELDSAYE SHIRE—				
Heathcote–Bendigo Road	..		1,101 15 8	
Mandurang Road	..		1,059 12 4	
Strathfieldsaye Road	..		630 10 5	
				2,791 18 5
SWAN HILL SHIRE—				
Annuello–Weimen Road	..		236 9 6	
Euston Road	..		132 4 8	
Nyah–Ouyen Road	..		339 16 0	
Piangil Station Road	..		626 11 5	
Swan Hill Road	..		25 7 9	
Tooloybuc Road	..		56 3 9	
Ultima Road	..		294 1 2	
Ultima–Sealake Road	..		439 8 4	
				2,150 2 7
TALBOT SHIRE—				
Maryborough–Avoca Road	..		1 2 0	
Maryborough–Ballarat Road	..		1,980 13 7	
				1,981 15 7
TAMBO SHIRE—				
Bairnsdale–Bruthen Road	..		80 11 7	
Basin Road	..		252 14 5	
Bruthen–Omeo Road	..		92 11 1	
Mossiface Road	..		164 6 2	
Nowa Nowa–Buchan–Gelantipy Road	..		1,281 9 8	
				1,871 12 11
TOWONG SHIRE—				
Murray Valley Road	..		844 2 3	
Omeo Road	..		190 2 5	
				1,034 4 8
TRARALGON SHIRE—				
Prince's Highway	..		378 6 10	
Traralgon–Balook Road	..		462 11 4	
Traralgon–Gormandale Road	..		1,984 5 5	
Traralgon–Maffra Road	..		165 2 10	
Traralgon Creek Road	..		1,050 4 1	
Tyers Road	..		1,071 5 10	
				5,111 16 4
TULLAROOP SHIRE—				
Avoca Road	..		663 3 1	
Ballarat Road	..		57 11 11	
Dunolly Road	..		6 6 7	
Eddington Road	..		1,583 10 4	
Maryborough–Dunolly Road	..		71 13 5	
Natte Yallock Road	..		514 17 5	
				2,897 2 9
TUNGAMAH SHIRE—				
Cobram–Katamatite Road	..		41 15 9	
Cobram South Road	..		13 18 6	
Cobram–Yarrawonga Road	..		46 3 0	
Katandra Road	..		476 13 5	
Numurkah–Tungamah–Wilby Road	..		1,891 1 6	
St. James Road	..		148 7 11	
				2,618 0 1
UPPER MURRAY SHIRE—				
Corryong Road	..		462 6 6	
Tintaldra Road	..		590 7 4	
				1,052 13 10
UPPER YARRA SHIRE—				
Don Road	..		180 18 8	
Launching Place–Gembrook Road	..		79 18 1	
Little Yarra Road	..		565 18 3	
Main Warburton Road	..		1,702 4 1	
				2,528 19 1
VIOLET TOWN SHIRE				
Murchison–Violet Town Road	..		288 15 7	
Violet Town–Dookie Road	..		514 0 0	
				802 15 7
VIOLET TOWN AND EUROA SHIRES (Joint Works)—				
Murchison–Violet Town Road	..		18 1 0	
				18 1 0
VIOLET TOWN AND SHEPPARTON SHIRES (Joint Works)—				
Violet Town–Dookie Road	..		21 6 6	
				21 6 6
WALPEUP SHIRE—				
Hopetoun–Ouyen Road	..		18 3 8	
Mildura Road	..		53 18 6	
Ouyen–Pinnaroo Road	..		1,135 13 6	
				1,207 15 8
WANGARATTA SHIRE—				
Beechworth Road	..		441 2 10	
Peechelba Road	..		6 17 2	
Wangaratta–Myrtleford Road	..		312 13 6	760 13 6
Carried forward	..	16,963 0 8	..	536,505 5 4

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	16,963 0 8	..	536,505 5 4
WANGARATTA BOROUGH—				
Beechworth Road	..		46 2 0	
Sydney Road	..		99 10 8	
				145 12 8
WANNON SHIRE—				
Coleraine–Harrow–Apsley Road	..		2,699 6 3	
Hamilton–Coleraine–Casterton Road	..		2,917 2 6	
Wannon Bridge Road	..		1,205 12 8	
				6,822 1 5
WANNON AND GLENELG SHIRES (Joint Works)—				
Hamilton–Coleraine–Casterton Road	..		11 3 10	
				11 3 10
WARANGA SHIRE—				
Colbinabbin–Elmore Road	..		1,412 13 5	
Colbinabbin–Moora Road	..		1,598 10 0	
Heathcote–Elmore Road	..		955 2 0	
Murchison–Rushworth Road	..		2,989 14 2	
Rushworth–Stanhope Road	..		3,826 18 8	
Tatura Road	..		376 7 11	
				11,159 6 2
WARANGA AND HUNTLY SHIRES (Joint Works)—				
Heathcote–Elmore Road	..		50 10 1	
				50 10 1
WARRACKNABEAL SHIRE—				
Birchip Road	..		2,483 8 5	
Dimboola Road	..		1,213 4 0	
Hopetoun Road	..		2,955 5 10	
Minyip Road	..		1,473 16 3	
Rainbow Road	..		3,140 5 7	
				11,266 0 1
WARRAGUL SHIRE—				
Bloomfield Road	..		357 13 11	
Brandy Creek Road..	..		952 15 11	
Darnum–Allambee Road	..		302 17 9	
Prince's Highway	..		87 14 3	
Warragul–Korumburra Road..	..		2,159 5 8	
Warragul–Leongatha Road	..		323 7 6	
				4,183 15 0
WARRNAMBOOL SHIRE—				
Allansford–Nirranda Road	..		432 0 1	
Caramut–Lismore Road	..		181 18 9	
Framlingham Road	..		162 8 11	
Garvo–Laang Road	..		23 10 6	
Mortlake Road	..		1,122 7 9	
Peterborough Road	..		179 8 4	
Timboon–Nirranda Road	..		125 3 6	
				2,226 17 10
WARRNAMBOOL CITY—				
Prince's Highway	..		938 14 0	
				938 14 0
WERRIBEE SHIRE—	—			
Geelong–Bacchus Marsh Road	..		297 7 9	
Prince's Highway	..		147 8 5	
				444 16 2
WHITTLESEA SHIRE—				
Epping Road	..		548 13 9	
Main Whittlesea Road	..		1,669 10 1	
Wallan Road	..		1,533 0 8	
Whittlesea–Kinglake	..		108 5 10	
				3,859 10 4
WIMMERA SHIRE—				
Dooen Road	..		732 5 3	
Horsham Wal Wal Road	..		1,081 18 2	
Horsham–Murtoa Road	..		700 13 1	
Natimuk Road	..		3,215 13 3	
				5,730 9 9
WIMMERA AND ARAPILES SHIRES (Joint Work)—				
Horsham–Hamilton Road	..		51 0 5	
				51 0 5
WIMMERA AND ARAPILES SHIRES, AND HORSHAM TOWN (Joint Works)—				
Horsham–Hamilton Road	..		3 8 4	
				3 8 4
WINCHELSEA SHIRE—				
Birregurra Road	..		277 7 11	
Birregurra–Dean's Marsh Road	..		581 3 11	
Birregurra–Forrest Road	..		349 4 0	
Lorne Road	..		18 6 0	
				1,226 1 10
WINCHELSEA AND COLAC SHIRES (Joint Works)—				
Birregurra Road	..		14 6 2	
				14 6 2
Carried forward	..	16,963 0 8	..	584,638 19 5

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	16,963 0 8	..	584,638 19 5
WODONGA SHIRE—				
Kiewa–Wodonga Road	..		1,059 15 10	
Sydney Road	..		127 8 6	
Tallangatta Road	..		41 11 4	
Wodonga–Yackandandah Road	..		1,509 3 7	
				2,737 19 3
WONTHAGGI BOROUGH—				
Wonthaggi–Inverloch Road	..		109 5 7	
Wonthaggi–Korumburra Road	..		73 5 2	
Wonthaggi–Loch Road	..		73 8 6	
				255 19 3
WOORAYL SHIRE—				
Fairbank Road	..		116 9 4	
Farmer's Road	..		3,159 8 8	
Inverloch–Leongatha Road	..		1,532 9 9	
Inverloch–Wonthaggi Road	..		131 1 3	
Kongwak–Inverloch Road	..		141 15 8	
Leongatha–Mirboo Road	..		806 11 4	
Leongatha–Yarragon Road	..		952 13 10	
Lower Tarwin Road	..		1,884 15 0	
Main South Gippsland Road..	..		1,126 19 9	
Mardan Road	..		2,681 18 4	
Mirboo South–Foster North Road	..		3 3 9	
Turton's Creek Road	..		49 17 4	
Wild Dog Valley Road	..		374 16 6	
				12,962 0 6
WOORAYL AND SOUTH GIPPSLAND SHIRES (Joint Works)—				
Mirboo South–Foster North Road	..		62 6 3	
				62 6 3
WYCHEPROOF SHIRE—				
Birchip–Sealake Road	..		446 4 7	
Birchip–Wycheproof Road	..		262 10 6	
Corack Road	..		7 17 10	
Sealake–Ultima Road	..		197 4 10	
Woomelang–Sealake Road	..		170 5 3	
Wycheproof–Sealake Road	..		27 12 1	
				1,111 15 1
YACKANDANDAH SHIRE—				
Dederang Road	..		794 15 6	
Gundowring Road	..		604 17 4	
Kiewa–Wodonga Road	..		721 17 8	
Kiewa East Road	..		137 6 11	
Kergunyah South	..		275 1 10	
Myrtleford–Yackandandah Road	..		100 8 6	
Yackandandah–Wodonga Road	..		1,757 10 4	
				4,391 18 1
YARRAWONGA SHIRE—				
Peechelba Station Road	..		46 13 9	
Tungamah–Wilby Road	..		4 7 3	
Yarrawonga–Wangaratta Road	..		545 18 10	
				596 19 10
YARRAWONGA AND WANGARATTA SHIRES (Joint Works)—				
Peechelba Road	..		5 15 10	
				5 15 10
YEA SHIRE—				
Highlands Road	..		79 19 5	
Molesworth–Dropmore Road	..		98 12 9	
Upper Goulburn Road	..		2,730 9 2	
Whittlesea–Yea Road	..		785 17 10	
Yarra Glen–Glenburn Road	..		240 5 4	
Yea–Glenburn Road	..		1,652 19 11	
				5,588 4 5
YEA AND BROADFORD SHIRES (Joint Works)—				
Upper Goulburn Road	..		39 19 7	
				39 19 7
	..			
		16,963 0 8		612,391 17 6

UNDER DIRECT SUPERVISION OF BOARD.

ALBERTON SHIRE—				
Boolarra–Welshpool Road	..		528 13 0	
				528 13 0
BALLAN SHIRE—				
Ballarat Road	..		530 3 5	
				530 3 5
BALLARAT AND BUNGAREE SHIRES (Joint Works)—				
Ballarat–Creswick Road	..		679 12 9	
				679 12 9
BALLARAT SHIRE AND BALLAARAT CITY (Joint Works)—				
Ballarat–Creswick Road	..		22 5 0	
				22 5 0
Carried forward	..	..	..	1,760 14 2

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	..	..	1,760 14 2
BARRABOOL SHIRE—				
Anglesea Road	..		2,574 7 9	
				2,574 7 9
BELLARINE SHIRE—				
Geelong–Portarlington Road	..		400 17 4	
Geelong–Queenscliffe Road	..		606 19 11	
Portarlington–St. Leonards Road	..		437 8 10	
				1,445 6 1
BERWICK SHIRE—				
Prince's Highway	..		35 6 10	
				35 6 10
BRAYBROOK SHIRE—				
Prince's Highway	..		464 2 2	
				464 2 2
BROADFORD SHIRE—				
Sydney Road	..		104 0 1	
				104 0 1
CAMBERWELL CITY, MULGRAVE SHIRE AND MALVERN CITY (Joint Works)—				
Warrigal Road (O.M.)	519 3 8			
		519 3 8		
CHELSEA CITY—				
Point Nepean Road	..		912 15 3	
				912 15 3
COBURG CITY—				
Sydney Road (O.M.)	7 16 10		..	
		7 16 10		..
COHUNA SHIRE—				
Murray River Valley Road	..		418 2 11	
				418 2 11
COLLINGWOOD CITY—				
Heidelberg Road (O.M.)	..		1,568 10 7	
				1,568 10 7
COLLINGWOOD AND HEIDELBERG CITIES (Joint Works)—				
Heidelberg Road (Merri Creek Bridge) (O.M.)	389 3 10		..	
		389 3 10		
CORIO AND NEWTOWN AND CHILWELL SHIRES (Joint Works)—				
Fyansford Road	..		60 14 5	
				60 14 5
DANDENONG SHIRE—				
Prince's Highway	..		1,508 3 7	
Springvale Road	..		152 4 5	
				1,660 8 0
ECHUCA BOROUGH—				
Echuca–Cohuna Road	..		671 1 11	
				671 1 11
EUROA SHIRE—				
Murchison–Shepparton Road	..		1,242 6 0	
Sydney Road	..		85 1 9	
				1,327 7 9
FLINDERS SHIRE—				
Mornington–Dromana Road	..		1,151 18 11	
				1,151 18 11
FOOTSCRAY CITY—				
Prince's Highway	..		675 3 10	
Napier Street (O.M.)	..		277 15 10	
				952 19 8
FOOTSCRAY AND MELBOURNE CITIES (Joint Works)—				
Ballarat Road (Lynch's Bridge) (O.M.)	11,798 15 9		..	
		11,798 15 9		..
GISBORNE SHIRE—				
Melbourne–Bendigo Road	..		175 16 9	
				175 16 9
GLENLYON SHIRE—				
Ballan Road	..		22 12 8	
				22 12 8
GOULBURN SHIRE—				
Goulburn Valley Road	..		2,688 4 8	
Murchison–Shepparton Road	..		458 6 4	
				3,146 11 0
HEALESVILLE SHIRE—				
Healesville–Alexandra Road	..		1,449 6 1	
Marysville Road	..		1,364 18 7	
Healesville–Woori Yallock Road	..		412 9 2	
				3,226 13 10
HEIDELBERG CITY—				
Main Heidelberg–Eltham Road	..		1,888 19 11	
Main Heidelberg–Eltham Road	..		498 7 3	
				2,387 7 2
HUNTLY SHIRE—				
Bendigo–Echuca Road	..		71 2 7	
				71 2 7
Carried forward	..	12,715 0 1	..	24,138 0 6

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	12,715 0 1	..	24,138 0 6
KEILOR SHIRE—				
Melbourne–Bendigo Road	..		36 18 9	36 18 9
KILMORE SHIRE—				
Sydney Road	..		59 9 1	59 9 1
LILLYDALE SHIRE—				
Main Healesville Road	..		1,985 1 1	
Main Warburton Road	..		919 0 2	
Mount Dandenong Road	..		3,761 1 7	6,665 2 10
MALDON SHIRE—				
Castlemaine–Maldon Road	..		118 17 2	118 17 2
MALDON AND TULLAROOP SHIRES (Joint Works)—				
Eddington Road	..		150 4 11	150 4 11
MANSFIELD SHIRE—				
Mansfield–Wood's Point Road	..		2,554 0 7	2,554 0 7
MELBOURNE CITY—				
Punt Road Bridge (O.M.)	28,608 0 3	28,608 0 3	..	..
MOORABBIN CITY—				
Warrigal Road (O.M.)	..		101 2 1	101 2 1
MORNINGTON SHIRE—				
Mornington–Dromana Road	..		638 9 9	638 9 9
MORWELL SHIRE—				
Morwell–Mirboo Road	..		335 9 11	
Boolarra–Welshpool Road	..		399 2 8	734 12 7
MORWELL AND WOORAYL SHIRES (Joint Works)—				
Boolarra–Foster Road	..		240 9 8	240 9 8
McIVOR SHIRE—				
Kilmore–Heathcote–Bendigo Road	..		2,435 6 6	2,435 6 6
NARRACAN SHIRE—				
Walhalla Road	..		2,445 12 9	2,445 12 9
NEWHAM AND WOODEND SHIRE—				
Melbourne–Bendigo Road	..		53 11 3	53 11 3
NEWSTEAD AND MOUNT ALEXANDER SHIRE—				
Castlemaine–Maryborough Road	..		1,059 0 10	1,059 0 10
ORBOST SHIRE—				
Cann Valley Road	..		1,393 15 6	
Wangrabelle Road	..		149 9 3	1,543 4 9
PORTLAND SHIRE—				
Portland–Hamilton Road	..		37 16 2	37 16 2
RUTHERGLEN SHIRE—				
Springhurst–Rutherglen Road	..		43 16 7	43 16 7
SANDRINGHAM CITY—				
Beach Road (O.M.)	..		547 6 10	547 6 10
SEYMOUR SHIRE—				
Goulburn Valley Road	..		254 15 6	
Sydney Road	..		689 17 10	944 13 4
SOUTH GIPPSLAND AND WOORAYL SHIRES (Joint Works)—				
Boolarra–Foster Road	..		210 14 1	210 14 1
TAMBO SHIRE—				
Prince's Highway	..		303 10 3	303 10 3
TULLAROOP SHIRE—				
Castlemaine–Maryborough Road	..		1,470 10 11	1,470 10 11
UPPER YARRA SHIRE—				
Wood's Point Road	..		2,867 0 11	2,867 0 11
VIOLET TOWN SHIRE—				
Sydney Road	..		11 4 10	11 4 10
WALPEUP SHIRE—				
Mildura Road	..		690 12 5	690 12 5
Carried forward	..	41,323 0 4	..	50,101 10 4

STATEMENT OF EXPENDITURE IN CONNEXION WITH CONSTRUCTION AND MAINTENANCE, ETC.—*continued.*

Municipality and Road.	Permanent Works.		Maintenance Works.	
	Amount.	Total.	Amount.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	41,323 0 4	..	50,101 10 4
WANGARATTA SHIRE—				
Beechworth Road	..		7 11 11	
Springhurst–Rutherglen Road	..		18 18 10	
Yarrawonga Road	..		2,004 11 9	
				2,031 2 6
WANGARATTA SHIRE AND WANGARATTA BOROUGH (Joint Works)—				
Yarrawonga Road	..		1 10 4	
				1 10 4
WANGARATTA BOROUGH—				
Sydney Road	..		48 0 7	
				48 0 7
WERRIBEE SHIRE—				
Prince's Highway	..		56 0 7	
				56 0 7
WHITTLESEA SHIRE—				
Whittlesea–Kinglake Road	..		267 7 2	
				267 7 2
WINCHELSEA SHIRE—				
Lorne Road	..		1,577 16 7	
Prince's Highway	..		91 8 1	
				1,669 4 8
WODONGA SHIRE—				
Bonegilla Road	..		47 15 1	
				47 15 1
TOTAL	..	41,323 0 4	..	54,222 11 3
GRAND TOTAL	..	58,286 1 0	..	666,614 8 9
STATE HIGHWAYS.				
Prince's Highway West	..		50,659 9 3	
Prince's Highway East	..		88,376 9 7	
Western Highway	..		47,585 5 10	
Calder Highway	..		43,738 5 4	
Northern Highway	..		2,443 3 1	
Hume Highway	..		17,215 7 6	
Omeo Highway	..		34,383 9 9	
Murray Valley Highway	..		87,270 13 10	
South Gippsland Highway	..		27,014 17 4	
Midland Highway	..		12,736 19 2	
Bonang Highway	..		7,480 17 8	
				418,904 18 4
TOURISTS' ROADS.				
Acheron Way	..		3,378 7 11	
Alpine Road	..		2,750 1 11	
Donna Buang Road	..		3,247 19 5	
Gipsy Point Road	..		96 8 8	
Grampians Road	..		6,828 12 8	
Mallacoota Road	..		800 7 8	
Mount Buffalo Road	..		4,763 14 5	
Mount Victory Road	..		445 5 3	
Ocean Road	..		20,432 8 1	
Otway Lighthouse Road	..		822 8 11	
Silverband Track	..		174 0 8	
Sydenham Inlet Road	..		361 18 10	
Wartook Road	..		30 9 2	
				44,132 3 7
TOTAL	..			
TOTAL	..	58,286 1 0	..	1,129,651 10 8

APPENDIX D.

COUNTRY ROADS BOARD.

MAIN ROADS.

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, RECONSTRUCTED, AND MAINTAINED UNDER THE PROVISIONS OF THE COUNTRY ROADS ACT 1928 DURING THE YEAR ENDED 30TH JUNE, 1938.

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
UNDER MUNICIPALITIES.			
ALBERTON SHIRE—			
Albert River–Welshpool Road	Patrol maintenance throughout, from MacAulay's to South Gippsland Shire boundary		8
Balook–Yarram Road	Patrol maintenance throughout, from Calrossie to Balook		9
Carrajung–Gormandale Road	Construction of 50-ft. span timber bridge over Tarra River at Calrossie, with approaches		·1
" " "	Construction of 75-ft. span timber bridge over Spring Creek at Won Wron, with approaches		·18
" " "	Patrol maintenance throughout, from Yarram to Gormandale		30
Foster–Yarram Road	Repairs to decking of bridge over Albert River, and painting bridge		—
" " "	Construction of approach curve to Yarram–Port Albert Road at Alberton		·15
" " "	Patrol maintenance throughout, from shire boundary to Alberton		8
Yarram–Boolarra Road	Construction of 100-ft. span timber bridge over Jack River, and approaches		·1
" " "	Patrol maintenance throughout, from Mason's Corner, near Yarram, to Madalya		15
Yarram–Port Albert Road	Tree planting and erection of guard fencing between Pound Road and railway crossing at Le Grand's, ·8 miles		—
" " "	Road mix seal, ⅜ inch, from Sullivan's Gully, Alberton to Port Albert		4·5
" " "	Reconditioning of 80-ft. span timber bridge over Sullivan's Gully		·15
" " "	Patrol maintenance throughout, from Yarram to Port Albert		9
Yarram–WonWron Road	Construction of 90-ft. span timber bridge over Bodman's Creek at Won Wron		·02
" " "	Reconditioning and double coat sealing from Won Wron School to Bodman's Creek bridge		·57
" " "	Reconditioning and double coat sealing on approach to May's Bridge		·13
" " "	Patrol maintenance throughout, from South Gippsland Highway to Won Wron		5
ALEXANDRA SHIRE—			
Cathkin–Mansfield Road	Realignment and widening road, lengthening culverts from 4·25 to 5·25 miles		·72
" " "	Double coat sealing from 4·25 to 5·25 miles		1
" " "	Patrol maintenance throughout		12
Healesville–Alexandra Road	Construction of reinforced concrete bridges over Little River and Connelly's Creek, each 70 feet long		·03
" " "	Forming approaches to Little River Bridge, Taggerty		·27
" " "	Clearing, forming, and surfacing		3
" " "	Double coat bitumen sealing from 3·33 to 5 miles		1·67
" " "	Patrol maintenance throughout		18
Terip Terip Road	Patrol maintenance throughout, repairs to bridges at ·3 and 1·2 miles		9·8
Upper Goulburn Road	Construction of triple pipe culvert and realignment 1·7 miles north-west of Alexandra		·2
" " "	Cutting and filling to improve visibility 1·9 miles north-west of Alexandra		·17
" " "	Realignment on curve, 2 miles north-west of Alexandra		·12
" " "	Realignment, forming, and gravelling between ·7 and 1·7 miles		·38
" " "	Construction of quadruple 54-in. culvert and approaches 8·25 miles east of Alexandra		·04
" " "	Double coat bitumen sealing		3·5
" " "	Patrol maintenance throughout		27
Yarck Road	Patrol maintenance throughout		3·8
ARAPILES SHIRE—			
Horsham–Hamilton Road	Reshaping and double coat surface treatment of floodways		·22
" " "	Reshaping and double coat bituminous surfacing		1·89
" " "	Gravelling and straightening bend at channel, Parish of Mockinya		·09
" " "	Construction of double 12-in. culvert at 5 miles		—
" " "	General maintenance throughout		25·4
Horsham–Natimuk–Edenhope Road	Construction of three-cell reinforced concrete culvert in Natimuk Township		—
" " "	Reshaping and double coat bituminous surfacing		1·02
" " "	General maintenance throughout, erection of township signs at Natimuk		23·5
ARARAT SHIRE—			
Ararat–Elmhurst Road	Reconstruction and sealing from 3·3 to 5·3 miles		2
" " "	Construction of five concrete culverts		2
" " "	Patrol maintenance		23
Ararat–Warrnambool Road	Road mix seal from 6 to 7 miles		1
" " "	Sealing from 19·5 to 21 miles and 22 to 23·5 miles		3
" " "	Reconstruction and gravelling from 16·3 to 19·5 miles		3·2
" " "	Patrol maintenance		34
Ballarat–Hamilton Road	Construction of new timber decking to stone bridge at Wickliffe		—
" " "	Widening to 18 feet from 5·3 to 6·3 miles		1
" " "	Patrol maintenance, including provision of plantations from 18 to 20 miles		23
Maroona–Glenthompson Road	Reconstruction and sealing from 8·9 to 9·2 miles		·3
" " "	Road mix seal from 4·2 to 5·5 miles		1·3
" " "	Patrol maintenance		22·5
ARARAT TOWN—			
Ballarat–Stawell Road	Patrol maintenance throughout		3·25
AVOCA SHIRE—			
Ararat Road	Patrol maintenance throughout		7·2
" " "	Reconstruction and double coat sealing		·75
Ballarat–St. Arnaud Road	Reconstruction, including transitioning of curves, and construction of culverts		4·5
" " "	Double coat sealing		6·5
" " "	Patrol maintenance throughout		23·25
Bealiba Road	Patrol maintenance throughout		9
Landsborough Road	Patrol maintenance throughout		1·8
Maryborough Road	Reconstruction, including transitioning of curves, and construction of culverts		2·85
" " "	Double coat sealing		3
" " "	Patrol maintenance throughout		5
	Carried forward	—	407·12

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	407·12
AVON SHIRE—			
Dargo Road	General maintenance		45
Maffra–Sale Road	General maintenance		2·96
Maffra–Stratford Road	General maintenance		2
Prince's Highway	General maintenance		·75
BACCHUS MARSH SHIRE—			
Bacchus Marsh–Balliang Road	Widening from 14 feet to 18 feet		1·5
" " " "	Double coat sealing 14 feet wide		2
" " " "	Patrol maintenance		15·21
Ballarat Road	Patrol maintenance		1·2
Geelong–Bacchus Marsh Road	Double coat sealing 14 feet wide		2·81
" " " "	Patrol maintenance		7·81
Gisborne Road	Widening from 14 feet to 18 feet		1·5
" "	Double coat sealing 14 feet wide		1·8
" "	Patrol maintenance		10·22
BACCHUS MARSH AND CORIO SHIRES (Joint Works)—			
Bacchus Marsh–Balliang Road	Patrol maintenance		1·6
BAIRNSDALE SHIRE—			
Bairnsdale–Lindenow Road	Patrol maintenance		4
Bairnsdale–Paynesville Road	Reconstruction and double coat sealing		·95
" " "	Patrol maintenance		10
Bulumwaal–Tabberabbera Road	Reconstruction and double coat sealing		1·25
" " "	Patrol maintenance		16
Prince's Highway	Patrol maintenance		2
BALLAN SHIRE—			
Ballarat Road	Road mix resealing through Ballan township		·93
" "	Patrol maintenance, Ballan township		1
Daylesford Road	Realignment, reconstruction and double coat sealing three curves between 2 and 4 miles		·15
" "	Patrol maintenance throughout		12·7
Gordon–Meredith Road	Reconstruction, gravelling and double coat bitumen sealing southerly from Morrison's		·78
" " "	Road mix sealing between Gordon and Egerton southerly from railway station		1·02
" " "	General maintenance throughout		5·1
Mt. Wallace Road	Road mix resealing two sections between 2 and 6 miles		2·51
" "	Replacing two open inverts near 3·5 and 4 miles with reinforced concrete pipe culverts		—
" "	Patrol maintenance throughout		10·7
Spargo Creek Road	Reconditioning fine crushed rock and double coat sealing throughout		1·2
" " "	General maintenance throughout		1·2
BALLAN AND BUNINYONG SHIRES (Joint Works)—			
Gordon–Meredith Road	General maintenance throughout		·4
BALLARAT SHIRE—			
Ballarat–Lexton Road	General maintenance		18·2
Maryborough–Ballarat Road	Reconstruction, realignment, gravelling, priming and sealing		·85
" " "	General maintenance		12·65
BANNOCKBURN SHIRE—			
Gordon–Meredith Road	Gravel sheeting 12 feet wide		1
" "	General maintenance throughout		3
Inverleigh Road	Widening from 12 feet to 18 feet and ¾-in road mix seal at Fyansford		·76
" "	Road mix seal, ½ inch, at Murgheboluc		2·49
" "	Patrol maintenance throughout		16·5
Shelford–Bannockburn Road	Reconstruction and double coat sealing between Bannockburn and boundary		2·5
" " "	General maintenance throughout		6·5
BARRABOOL SHIRE—			
Anglesea Road	Double coat sealing southwards from Prince's Highway West at Waurn Ponds		·55
" "	Reconstruction and double coat sealing southwards from Prince's Highway West at Waurn Ponds		·92
" "	Patrol maintenance throughout		9·6
Hendy Main Road	Double coat sealing north of Prince's Highway at Mt. Moriac		1·88
" " "	Reconstruction at Barrabool		·87
" " "	Reconstruction at Paraparap		·75
" " "	Patrol maintenance 4 miles; general maintenance balance of road		14
BASS SHIRE—			
Almurta Road	Raising super-elevation of curves		·2
" "	Patrol maintenance throughout		4·95
Almurta–Grantville Road	Improving super-elevation on curves		·15
" " "	Patrol maintenance throughout		3·81
Anderson–Dalyston Road	Road mix seal 12 feet wide between 76·61 and 77·31 miles		·71
" " "	Patrol maintenance		6·55
Dalyston–Glen Forbes Road	Super-elevation of curves between 2·15 and 3·76 miles		·3
" " "	Patrol maintenance throughout		10·34
Dalyston–Wonthaggi Road	Patrol maintenance throughout		1·93
Inverloch–Wonthaggi Road	Widening surfacing from 12 feet to 16 feet easterly from Borough of Wonthaggi boundary and constructing spiral transition curve near 84 miles		·95
" " "	Double coat bitumen surfacing easterly from Borough of Wonthaggi boundary		·76
" " "	Patrol maintenance throughout		3·57
Korumburra–Wonthaggi Road	Double coat bitumen surfacing from 14·01 to 15·62 miles from Korumburra		1·61
" " "	Double bitumen surfacing on approaches to Powlett River bridge		·13
" " "	Resurfacing of road from 12·21 to 15·62 miles from Korumburra		3·41
" " "	Patrol maintenance throughout		7·72
Main Coast Road	Patrol maintenance throughout		18·66
Wonthaggi–Loch Road	Patrol maintenance throughout		16·2
BASS SHIRE AND WONTHAGGI BOROUGH (Joint Works)—			
Loch–Wonthaggi Road	Patrol maintenance throughout		·7
BEECHWORTH SHIRE—			
Beechworth Road	Gravelling		1·5
" "	Double coat sealing		1·5
" "	Patrol maintenance		20·7
Bright Road	Gravelling		1
" "	Double coat sealing		1
" "	Patrol maintenance		4·3
Everton–Myrtleford Road	Gravelling		2
" " "	Double coat sealing		2·2
" " "	Patrol maintenance		11
	Carried forward	—	781·24

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	781·24
BEECHWORTH SHIRE—*continued.*			
Myrtleford–Yackandandah Road ..	Patrol maintenance	..	2·25
Stanley Road	Widening and gravelling	..	2
" "	Double coat sealing	..	1·25
" "	Patrol maintenance	..	9
BELFAST SHIRE—			
Hamilton Road	Road mix seal ¾ inch, 12 feet wide, commencing at Port Fairy Borough boundary, from 0 to 3 miles	..	3
" "	General maintenance throughout	..	13·5
Penshurst Road	Road mix seal ¾ inch, 15 feet wide, from 2 to 2·25 miles and 8·5 to 9·5 miles to Koroit Borough boundary	..	1·25
" "	Patrol maintenance 7·5 miles and general maintenance 2 miles	..	9·5
BELLARINE SHIRE—			
Geelong–Portarlington Road ..	Patrol maintenance throughout	..	17·45
Geelong–Queenscliffe Road ..	Patrol maintenance throughout	..	14·7
Portarlington–St. Leonards Road ..	Patrol maintenance throughout	..	6·7
Barwon Heads–Ocean Grove Road ..	Patrol maintenance throughout	..	1·25
BENALLA SHIRE—			
Benalla–Shepparton Road ..	General maintenance throughout	..	·9
Goorambat Road	Double coat sealibg	..	·38
" "	General maintenance	..	5·22
Goorambat–Thoona Road ..	General maintenance throughout	..	11·8
Greta Road	General maintenance throughout	..	·8
Kelfeera Road	General maintenance throughout	..	15·7
Lima Road	Redecking bridge and general maintenance throughout	..	2·9
Sydney Road	Resealing	..	·77
" "	General maintenance	..	1·23
Tatong–Tolmie Road	General maintenance	..	10
BERWICK SHIRE—			
Beaconsfield–Emerald Road ..	General maintenance from 0 to 6·7 miles	..	6·7
Cockatoo–Gembrook Road ..	General maintenance from 0 to 4·3 miles	..	4·3
Gembrook Road	Reconditioning and sealing	..	1·25
" "	General maintenance from 0 to 5·5 miles	..	5·5
Hallam–Emerald Road	General maintenance from 0 to 4·5 miles	..	4·5
Koo-wee-rup–Longwarry Road ..	General maintenance from 0 to 1·6 miles	..	1·6
Launching Place–Gembrook Road ..	General maintenance from 0 to 6 miles	..	6
Nar-Nar-Goon–Longwarry Road ..	Reconstruction	..	2
" " ..	General maintenance from 0 to 11·6 miles	..	11·6
Woori Yallock–Pakenham–Koo-wee-rup Road	General maintenance from 0 to 23·82 miles	..	23·82
BET BET SHIRE—			
Avoca Bealiba Road	Double coat sealing 16 feet wide from Bealiba towards Dunolly	..	·94
" " "	General maintenance throughout	..	13·7
Betley Road	General maintenance throughout	..	4·5
Dunolly Road	General maintenance throughout	..	12
Dunolly–Eddington Road	General maintenance throughout	..	5
Maryborough–Dunolly Road ..	Double coat sealing 16 feet wide from Bet Bet Creek	..	3
" " " ..	General maintenance throughout	..	4·5
BIRCHIP SHIRE—			
Beulah–Birchip–Wycheproof Road ..	Resheeting pavement and reforming shoulders, 1 mile west of Birchip	..	1·87
" " "	Patrol maintenance throughout	..	22
Donald–Birchip–Sea Lake Road ..	Resheeting pavement and reforming shoulders, ·5 mile south of Birchip	..	1·17
" " " " ..	Patrol maintenance throughout	..	26·75
BLACKBURN AND MITCHAM SHIRE—			
Burwood Road	Reconstruction with crushed rock and sealing with bitumen from 3·61 to 3·8 miles ..	..	1·19
" "	Patrol maintenance throughout	..	3·8
Main Healesville Road	Road mix seal ¾ inch x 30 feet wide from 2·1 to 3·3 miles	..	1·2
" " "	Road mix seal ¾ inch x 20 feet wide from 3·3 to 3·49 miles	..	·19
" " "	Patrol maintenance throughout	..	4·2
BRAYBROOK SHIRE—			
Ballarat Road	Patrol maintenance throughout	..	3·36
BRIGHT SHIRE—			
Bright Road	Reforming, priming, and sealing with bitumen from ·52 to 1·52 miles and 16·1 to 18·95 miles	..	3·85
" "	Patrol maintenance from 1·52 to 16·1 miles	..	14·58
Harrietville Road	Reforming, priming, and sealing with bitumen from 1 to 2 miles	..	1
" "	Patrol maintenance from 2 to 14 miles	..	14
Kiewa Valley Road	Patrol maintenance from 0 to 8 miles	..	8
Myrtleford–Yackandandah Road ..	Patrol maintenance from 1 to 10·6 miles	..	9·6
BROADMEADOWS SHIRE—			
Sydney Road	Drag spread seal from Cemetery gates to Camp Road	..	1·5
BROADMEADOWS AND KEILOR SHIRES (Joint Works)—			
Lancefield Road	Shoulder improving from Woodland Street to English Street	..	1·18
" "	Widening to 20 feet with crushed rock from English Street to Broadmeadows–Albion railway line	..	1·11
BULLA SHIRE—			
Melbourne–Lancefield Road ..	Widening, resheeting with crushed rock, and double coat sealing northerly from 1·25 miles north of Frances Lane	..	2·32
" "	General maintenance	..	14
Sunbury Road	General maintenance	..	2
BULN BULN SHIRE—			
Bloomfield Road	Patrol maintenance	..	·9
Fumina Road	Patrol maintenance	..	9·7
Koo-wee-rup–Longwarry Road ..	Bitumen sealing 12 feet wide	..	1
" " "	Patrol maintenance, sand sheeting where necessary	..	6·5
Loch Valley Road	Patrol maintenance	..	6·4
Longwarry–Drouin Road	Patrol maintenance	..	5·7
Main Neerim Road	Patrol maintenance	..	22
Main South Road	Realignment, resheeting, fencing, and construction of deviation	..	·97
" " "	Patrol maintenance	..	14·75
Neerim East Road	Resheeting and realigning in preparation for bitumen sealing 12 feet wide	..	1
" " "	Patrol maintenance	..	4
Neerim North–Noojee Road ..	Patrol maintenance	..	3·5
Prince's Highway	Widening of formation and crushed rock surfacing, guttering, and bitumen sealing	..	·4
" "	Patrol maintenance	..	1·06
Westernport Road	Bitumen sealing on sand 13 feet wide	..	3·67
" "	Patrol maintenance	..	8·25
	Carried forward	—	1272·37

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	1272·37
BUNGAREE SHIRE—			
Daylesford–Ballarat Road ..	Resurfaceing and sealing	..	2·5
BUNINYONG SHIRE—			
Ballarat–Rokewood Road	General maintenance throughout	..	14
Elaine–Mt. Mercer Road	Reconditioning	..	1·5
,, ,, ,, ...	Patrol maintenance	..	5
CASTLEMAINE BOROUGH—			
Castlemaine–Maryborough Road ..	General maintenance	..	1·5
Melbourne–Bendigo Road	Reconstruction of granitic sand	..	·23
,, ,, ,, ...	Road mix seal	..	·29
,, ,, ,, ...	General maintenance	..	3·07
CHARLTON SHIRE—			
Bendigo Road	Construction of box culvert to replace invert crossing	..	—
Bendigo Road	General maintenance	..	1·75
Donald Road	Shouldering, resheeting and bituminous sealing	..	1·8
,, ,, ...	General maintenance	..	13
St. Arnaud Road	Bituminous sealing	..	3·1
,, ,, ...	General maintenance	..	15·4
CHARLTON AND DONALD SHIRES (Joint Works)—			
Donald Road	Bituminous sealing	..	1·25
CHELSEA CITY—			
Point Nepean Road	Patrol maintenance	..	5·66
Springvale Road	Patrol maintenance	..	·83
CHILTERN SHIRE—			
Barnawartha–Howlong Road ..	Patrol maintenance throughout, and preparation for sealing from ·75 to 1·75 miles ..	..	5·9
Chiltern–Howlong Road	Reconstruction from 5·5 to 6·3 miles	..	·8
,, ,, ,, ...	Patrol maintenance from 0 to 5 miles	..	5
Sydney Road	Patrol maintenance	..	1·15
CLUNES BOROUGH—			
Maryborough–Ballarat Road ..	Patrol maintenance	..	3·2
COHUNA SHIRE—			
Cohuna–Leitchville Road	Flanking, sheeting with crushed rock and double coat sealing from Murray Valley Highway to Leitchville	..	1
,, ,, ,, ...	Flanking, sheeting with crushed rock and double coat sealing from end of existing sealed section, 1·3 miles from Cohuna, to 2·49 miles from Cohuna	..	1·19
,, ,, ,, ...	Patrol maintenance throughout	..	10·75
Cohuna–Koondrook Road ..	Reshaping and surfacing with coarse sand from 3·25 to 3·5 miles from junction with Murray Valley Highway	..	·25
,, ,, ,, ..	General maintenance throughout	..	8·5
COLAC BOROUGH			
Prince's Highway	Road mix seal	..	·66
,, ,, ...	Patrol maintenance	..	2·44
COLAC SHIRE—			
Colac–Ballarat Road	General maintenance throughout	..	21·4
Colac–Beech Forest Road	Double coat sealing from 2·38 to 2·88 miles	..	·5
,, ,, ,, ...	General maintenance throughout	..	11·25
Colac–Forrest Road	Reconstruction and double coat sealing from ·3 to ·67 mile and 4·6 to 5·23 miles ..	..	1
,, ,, ,, ...	General maintenance throughout	..	16·9
Cororooke Road	Road mix seal from 0 to 1 mile	..	1
,, ,, ...	General maintenance throughout	..	7·25
Cressy–Inverleigh Road	General maintenance throughout	..	8·7
Prince's Highway	Road mix seal	..	·66
,, ,, ...	General maintenance throughout	..	3·44
Swan Marsh Road	Reconstruction and double coat sealing from 1·59 to 2·55 miles	..	·96
,, ,, ...	General maintenance throughout	..	5·66
CORIO SHIRE—			
Geelong–Bacchus Marsh Road ..	Widening from 10 feet to 16 feet with crushed rock from 0 to 3 miles	..	3
,, ,, ,, ,, ..	General maintenance throughout	..	20·2
CRANBOURNE SHIRE—			
Cranbourne–Frankston Road ..	General maintenance throughout	..	7·5
Koo-wee-rup–Longwarry Road ..	General maintenance throughout	..	6
Koo-wee-rup–Pakenham Road ..	Surfacing with crushed rock and sealing between South Gippsland Highway and Koo-wee-rup	..	·64
,, ,, ,, ..	General maintenance throughout	..	5·5
Main Coast Road	General maintenance throughout	..	8
Westernport Road	General maintenance throughout	..	9
CRESWICK SHIRE—			
Castlemaine–Ballarat Road ..	Scarifying and reshaping old macadam, resheeting with gravel 20 feet wide and sealing 16 feet wide for 2·54 miles only from 6·85 to 10·1 miles	..	3·29
,, ,, ,, ..	Experimental applications of calcium chloride and sodium chloride to gravel roadway from 15·5 to 16·15 miles, 16·7 to 17 miles, and for ·3 miles between 19·1 and 19·6 miles	..	1·25
,, ,, ,, ..	Widening old macadam and pitched roadway to 20 feet and sheeting with gravel from 19·1 to 19·6 miles and 19·8 to 20·3 miles	..	1
,, ,, ,, ..	Gravelling re-aligned curves and double coat sealing 16 feet wide from 1·35 to 1·73 miles	..	·38
,, ,, ,, ..	Planting avenue of trees from 7 to 7·6 miles and 11·25 to 12·1 miles, 1·45 miles ..	..	—
,, ,, ,, ..	Erection of guide posts from 0 to 9·35 miles, excepting 2·35 miles at Creswick, 7 miles ..	..	—
,, ,, ,, ..	Construction of reinforced concrete box culvert and approaches at 18 miles	..	·1
,, ,, ,, ..	Patrol maintenance throughout	..	23·7
Daylesford–Ballarat Road ..	Scarifying, reshaping, widening to 20 feet, sheeting with crushed rock and gravel; and double coat seal 16 feet wide from 1·74 to 6 miles excepting from 3·6 to 3·75 miles	..	4·11
,, ,, ,, ..	Erection of guide posts from 0 to 6 miles, 6 miles	..	—
,, ,, ,, ..	Patrol maintenance throughout	..	12·4
	Carried forward	—	1568·88

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	1568·88
DANDENONG SHIRE—			
Cheltenham Road	Patrol maintenance throughout		6·4
Prince's Highway	Patrol maintenance throughout		1·8
Springvale Road	Construction of 24-in. x 12-in box culvert and crossing 52 feet long at junction with Centre Road		—
,, ,,	Patrol maintenance throughout		8
DANDENONG AND CRANBOURNE SHIRES (Joint Works)—			
Dandenong–Frankston Road	Patrol maintenance throughout		6·1
DAYLESFORD BOROUGH—			
Ballan Road	General maintenance throughout		1·6
Ballarat Road	Double coat sealing throughout		1·05
,, ,,	General maintenance throughout		1·05
Castlemaine Road	Double coat sealing throughout		·65
,, ,,	General maintenance throughout		·65
Daylesford–Trentham Road	General maintenance throughout		·9
Hepburn–Daylesford Road	General maintenance throughout		1·14
Malmsbury–Daylesford Road	General maintenance throughout		1·42
DEAKIN SHIRE—			
Echuca–Cornella Road	Forming and sanding		1·07
,, ,, ,,	Patrol maintenance		7·5
Echuca–Picola Road	Forming and sanding		3·2
,, ,, ,,	Patrol maintenance		5
Kyabram–Nathalia Road	Reconstruction and sealing		1
,, ,, ,,	Patrol maintenance		7
Kyabram–Tongala Road	Patrol maintenance		8
Rochester–Tongala Road	Scarifying, resheeting and sealing		2
,, ,, ,,	Patrol maintenance		13
DEAKIN AND NUMURKAH SHIRES (Joint Works)—			
Echuca–Picola Road	General maintenance of Stewart's Bridge		—
DEAKIN AND RODNEY SHIRES (Joint Works)—			
Kyabram–Tongala Road	Patrol maintenance		1
Rochester Kyabram Road	Scarifying, widening, and sealing		·64
,, ,, ,,	Patrol maintenance		3
DIMBOOLA SHIRE—			
Hopetoun–Rainbow Road	General maintenance throughout		5
Rainbow Road	Double coat bitumen sealing on limestone rubble from 0 to 1·5 miles from Dimboola		1·6
,, ,,	Scarifying, reshaping, and resheeting existing rubble with limestone rubble between Dimboola and Tarranyurk, in four sections		2·22
,, ,,	Rubbling existing loam formations between Dimboola and Tarranyurk, in four sections		1·97
,, ,,	Loam forming and limestone rubble surfacing 2 miles south from Rainbow		·58
,, ,,	Patrol maintenance throughout		42
Rainbow–Beulah–Birchip Road	Loam forming and limestone rubble surfacing various sections from Rainbow to the shire boundary		2·54
,, ,, ,, ,,	Scarifying and resheeting existing limestone rubble with limestone rubble from 13·2 to 13·6 miles from Rainbow		·4
,, ,, ,, ,,	General maintenance throughout		14
Rainbow Rises Road	Loam forming and limestone rubble surfacing from 0 to ·23 miles from Rainbow		·23
,, ,,	General maintenance throughout		6
Warracknabeal Road	Scarifying, and resheeting existing blue metal between 0 and ·85 miles		·49
,, ,,	Loam forming and limestone rubble surfacing 1·6 miles from Dimboola		·27
,, ,,	Double coat bitumen sealing on limestone rubble between 7·7 and 9·4 miles from Dimboola		2
,, ,,	Patrol maintenance throughout		9·5
DIMBOOLA AND KARKAROOC SHIRES (Joint Works)—			
Hopetoun–Rainbow Road	General maintenance throughout		5
DONALD SHIRE—			
Donald–Charlton Road	Resheeting with granite sand north from the Donald Racecourse		1·12
,, ,, ,,	Erecting tree guards in continuation of existing avenues, ·62 miles		—
,, ,, ,,	Patrol maintenance throughout		13
Marnoo–Donald Road	Scarifying, resheeting and double coat sealing south from the Donald-Minyip Road		1·02
,, ,,	Patrol maintenance throughout		12·7
St. Arnaud–Birchip Road	Scarifying, resheeting, and double coat sealing south from Buloke		1·97
,, ,, ,,	Double coat sealing in the town of Donald		·12
,, ,, ,,	Erecting tree guards in continuation of existing avenues, ·62 miles		—
,, ,, ,,	Patrol maintenance throughout		28·2
DONALD AND CHARLTON SHIRES (Joint Works)—			
Donald–Charlton Road	Replacing invert with box culvert and regrading approaches		—
DONCASTER AND TEMPLESTOWE SHIRE—			
Doncaster Road	Rescaling, shouldering, &c.		1
,, ,,	General maintenance		6·2
Heidelberg–Warrandyte Road	Rescaling		2
,, ,, ,,	Reconstruction and widening to 20 feet		·31
,, ,, ,,	Sealing		·62
,, ,, ,,	General maintenance		9·8
Warrandyte–Ringwood Road	Deviation at Pig Tail Hill		·3
,, ,, ,,	General maintenance		4·2
DUNDAS SHIRE—			
Hamilton–Dunkeld Road	Road mix seal between 11·2 and 12·2 miles, and 13·37 and 14·5 miles		2·02
,, ,, ,,	Patrol maintenance throughout		14·5
Hamilton–Horsham Road	Patrol maintenance throughout		49
Hamilton–Mount Gambier Road	Patrol maintenance throughout		12·85
Hamilton–Port Fairy Road	Patrol maintenance throughout		18·75
Hamilton–Portland Road	Patrol maintenance throughout		9·5
Hamilton–Warrnambool Road	Forming and gravelling between ·85 and 1·15 miles at Break-neck Corner		·3
,, ,, ,,	Patrol maintenance throughout		7·5
	Carried forward	—	1942·83

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	1942·83
DUNMUNKLE SHIRE—			
Horsham–Murtoa Road	Road mix seal 4 miles from Murtoa	..	·85
,, ,, ,, ...	Patrol maintenance throughout	..	5·33
Marnoo–Rupanyup Road	Road mix seal at eastern end of road	..	4·61
,, ,, ,, ...	Patrol maintenance throughout	..	10·2
Minyip–Donald Road	Scarifying, widening, and resheeting with fine crushed rock	..	1·12
,, ,, ,, ...	Patrol maintenance throughout	..	3·2
Rupaynup–Murtoa Road	Sealing with bituminous emulsion	..	2·5
,, ,, ,, ...	Patrol maintenance throughout	..	9·25
Stawell–Warracknabeal Road ..	Double coat sealing between Rupanyup and Minyip	..	6·41
,, ,, ,, ..	Patrol maintenance throughout	..	28·5
EAGLEHAWK BOROUGH—			
Mount Korong Road	Road mix seal, ¾ inch, easterly from Marong Shire boundary	..	1·05
EAST LODDON SHIRE—			
Borung–Prairie Road	Patrol maintenance throughout	..	1·5
Dingee Road	Patrol maintenance throughout	..	7·16
Mitiamo Road	Patrol maintenance throughout	..	5·05
Prairie Road	Patrol maintenance throughout	..	8
ELTHAM SHIRE—			
Eltham–Yarra Glen Road ..	Road mix seal from 4·7 to 6·2 miles	..	1·5
,, ,, ,, ..	Sealing from 10·7 to 11·4 miles	..	·7
,, ,, ,, ..	Patrol maintenance throughout	..	21
Hurstbridge–Kinglake Road ..	Widening and regrading from 4·2 to 5 miles	..	·8
,, ,, ,, ..	Patrol maintenance throughout	..	16
Yarra Glen–Glenburn Road ..	Patrol maintenance throughout	..	8
EUROA SHIRE—			
Arcadia Road	Double coat sealing easterly from Arcadia Township	..	2
,, ,, ...	Patrol maintenance throughout	..	5·7
Avenel–Longwood Road	General maintenance throughout	..	2·1
Euroa–Arcadia Road	Construction of shoulders and double coat sealing from 2 to 5 miles	..	3
,, ,, ,, ...	Patrol maintenance throughout	..	17
Euroa–Mansfield Road	Patrol maintenance throughout	..	16·1
Euroa–Strathbogie Road	Construction of shoulders, surfacing, and double coat sealing from 2 to 6 miles ..	..	4
,, ,, ,, ...	Patrol maintenance throughout	..	19·2
Murchison–Violet Town Road ..	Patrol maintenance	.	13·2
FERNTREE GULLY SHIRE—			
Beaconsfield–Emerald Road ..	Patrol maintenance between Emerald Township and Nottingham House	..	·5
Belgrave–Emerald Road	Resurfacing near Selby	..	·95
,, ,, ,, ...	Patrol maintenance	..	6·73
Burwood Road	Widening and resurfacing at Lower Ferntree Gully	..	·72
,, ,, ...	Patrol maintenance	..	4·5
Emerald Road	Resurfacing at Avonsleigh and Emerald	..	1
,, ,, ...	Patrol maintenance	..	3·25
Main Ferntree Gully Road ..	Widening and resurfacing near Scoresby and Upper Ferntree Gully	..	1·17
,, ,, ,, ..	Patrol maintenance	..	10·8
Monbulk Road	Widening and resurfacing	..	·54
,, ,, ...	Patrol maintenance	..	5
Olinda Road	Resurfacing	..	·3
,, ,, ...	Patrol maintenance	..	6
FLINDERS SHIRE—			
Hastings–Flinders Road	Reconstruction and sealing westerly from Bittern	..	·59
,, ,, ,, ...	Sheeting and sealing at Merricks	..	·92
,, ,, ,, ...	Construction and sealing at Shoreham	..	·12
,, ,, ,, ...	Sheeting and sealing at Manton's Creek	..	1·48
,, ,, ,, ...	Patrol maintenance throughout	..	17
Mornington–Dromana Road ..	Construction and sealing at Tassell's Creek	..	·15
,, ,, ,, ..	Patrol maintenance throughout	..	2·5
Mornington–Flinders Road ..	Reconstruction and sealing at "The Avenue"	..	·4
,, ,, ,, ..	Patrol maintenance throughout	..	12
Point Nepean Road	Widening, sheeting, and sealing at Dromana	..	·44
,, ,, ,, ...	Widening, sheeting, and sealing westerly from Rosebud	..	2·2
,, ,, ,, ...	Widening, sheeting, and sealing at Rye	..	·29
,, ,, ,, ...	Patrol maintenance throughout	..	21·5
Red Hill Road	Widening, sheeting, and sealing east of Red Hill Station	..	1·32
,, ,, ,, ...	Patrol maintenance throughout	..	3·75
Rosebud Flinders Road	Reconstruction at Bonco	..	·35
,, ,, ,, ...	Patrol maintenance throughout	..	13·5
Stony Point Road	Patrol maintenance throughout	..	4
FRANKSTON AND HASTINGS SHIRE—			
Cranbourne–Frankston Road ..	General maintenance throughout	..	2·8
Frankston–Dandenong Road ..	Reconstruction with crushed rock, priming, and sealing southerly from south-eastern angle of Allotment 56, Parish of Lyndhurst	..	·73
,, ,, ,, ..	General maintenance throughout	..	5·5
Frankston–Flinders Road ..	Crushed rock surfacing, priming, and sealing deviation through Allotment 27, Parish of Frankston	..	·52
,, ,, ,, ..	Crushed rock surfacing deviation at Kings Bridge, Hastings	..	·43
,, ,, ,, ..	Reconstruction with crushed rock, priming, and sealing opposite Allotment 7A, Parish of Frankston	..	·21
,, ,, ,, ..	Reconstruction with crushed rock opposite Allotments 40A and 41, Parish of Tyabb ..	..	·75
,, ,, ,, ..	General maintenance throughout	..	14
Mooroodue Road ..	General maintenance throughout	..	3
Point Nepean Road ..	Light pre-mix sealing Humphries Road to Post Office, Wells Street to Mile Bridge, Seaford Road north to boundary	..	4·7
,, ,, ,, ..	Double traffic line marking 3·25 miles southerly from shire boundary to Mile Bridge ..	..	—
,, ,, ,, ..	Single traffic line marking southerly from Mile Bridge to Humphries Road	..	—
,, ,, ,, ..	General maintenance throughout	..	7·5
FRANKSTON AND HASTINGS AND CRANBOURNE SHIRES (Joint Works)—			
Frankston–Dandenong Road ..	Priming and sealing northerly from south-eastern angle of Allotment 56, Parish of Lyndhurst to shire boundary	..	1·7
FRANKSTON AND HASTINGS AND MORNINGTON SHIRES (Joint Works)—			
Mooroodue Road	Reconstruction with crushed rock, priming, and sealing opposite Allotment 14, Parish of Frankston	..	·25
	Carried forward..	—	2333·92

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	2333·92
GISBORNE SHIRE—			
Bacchus Marsh Road	Sealing		1·03
" " "	General maintenance throughout		9·72
Gisborne Station Road	Patrol maintenance throughout		1·2
Mount Macedon Road	Patrol maintenance throughout		6·75
GLENELG SHIRE—			
Coleraine–Casterton Road	Concrete bridge and approaches at Casterton		·32
" " "	Patrol maintenance throughout		7
Dergholm Road	Double coat sealing between 2 and 5 miles		2·02
" "	Construction of two reinforced concrete culverts, each with two openings 9 feet x 8 feet and 8 feet x 8 feet respectively, near Roseneath		—
" "	Sheeting with crushed rock at Dunrobin		·5
" "	Patrol maintenance throughout		22
Mount Gambier Road	Double coat sealing between 3 and 8 miles		4·32
" "	Double coat sealing between 12 and 16 miles		4·82
" "	Patrol maintenance throughout		30
Portland–Casterton Road	Double coat sealing between Sandford and Merino		8·74
" " "	Patrol maintenance throughout		20
Wando Vale Road	Double coat sealing from Bartagunyah Road to Satimer Road		1·49
" "	Road mix seal on modified macadam between 5 and 6 miles		·55
" "	Gravel sheeting between Satimer and Torah Roads		2·18
" "	Patrol maintenance throughout		6·55
GOULBURN SHIRE—			
Avenel–Longwood Road	General maintenance, gravelling, &c.		6
Station Road	General maintenance, gravelling, &c.		·8
Vickers Road	General maintenance, gravelling, &c.		1
GLENLYON SHIRE—			
Ballan Road	Patrol maintenance throughout		4·45
Ballarat Road	Patrol maintenance throughout		3·5
Castlemaine–Daylesford Road	Patrol maintenance throughout		13
Daylesford–Hepburn Road	Patrol maintenance throughout		1
Daylesford–Trentham Road	Double coat sealing at Daylesford end		·28
" " "	Patrol maintenance throughout		10
Malmsbury–Daylesford Road	Reconstruction in fine crushed rock and double coat sealing		2·08
" " "	Patrol maintenance throughout		15
GRENVILLE SHIRE—			
Ballarat–Hamilton Road	Road mix seal westerly from Sebastopol Borough boundary		1·44
" " "	Road mix seal through Scarsdale Township, from 10·7 to 12·49 miles		1·79
" " "	Patrol maintenance throughout		24·1
Cressy Road	Widening from 4 to 6 miles		2
" "	Patrol maintenance throughout		9·5
Lismore Road	Construction of a three-cell culvert, each cell 4 feet x 4 feet, at 3 miles		—
" "	Construction of 21-in. diameter pipe culvert and floodway at 3·7 miles		—
" "	Construction of 15-in. diameter pipe culvert and floodway at ·6 miles		—
" "	Construction of two 21-in. diameter pipe culverts and floodways at 2 miles		—
" "	Patrol maintenance throughout		10
Pitfield Road	Double coat sealing from 4·3 to 5·3 miles		1
" "	Double coat sealing from 8·3 to 9·8 miles		1·51
" "	Patrol maintenance throughout		12·6
HAMPDEN SHIRE—			
Camperdown–Ballarat Road	Widening pavement from 10 feet to 16 feet, including realignment and reconstruction of transitioned curves with basaltic gravel, and double coat sealing from 1·5 to 3·96 miles north of junction with Prince's Highway		2·46
" " "	Road mix seal 10 feet wide with scoria aggregate ¾ inch loose from 9·05 to 12·35 miles south of Skipton Township		3·3
" " "	Road mix seal 10 feet wide with quartz gravel aggregate ¾ inch loose from 2·35 to 4·35 miles south of Skipton Township		2
" " "	Patrol maintenance throughout		48·4
Camperdown–Cobden Road	Forming and gravelling 16 feet wide with basaltic gravel at deviation required by construction of water storage basin, from 1·75 to 2·25 miles south of junction with Prince's Highway		·5
" " "	Double coat sealing 16 feet wide from 1·9 to 2·25 miles south of junction with Prince's Highway		·35
" " "	Patrol maintenance throughout		3·34
Caramut–Lismore Road	Widening pavement from 10 to 16 feet, including realignment and reconstruction of transitioned curves with basaltic gravel, westerly from junction with Camperdown–Ballarat Road		1·25
" " "	Patrol maintenance throughout		16
Cobden–Terang Road	Widening pavement from 10 to 16 feet, scarifying, reshaping and sheeting with basaltic gravel, including deviation at sharp corner, from ·12 to ·82 mile south of junction with Prince's Highway		·7
" " "	Patrol maintenance throughout		2·95
Lismore–Cressy Road	Widening pavement from 10 to 16 feet, scarifying, reshaping and sheeting with basaltic gravel and double coat sealing, easterly from junction with Camperdown–Ballarat Road		·5
" " "	Construction of 4 feet x 1 foot 6 in. box culvert 30 feet long at 17 miles east of junction with Camperdown–Ballarat Road		—
" " "	Construction of double 4 feet x 2 feet box culvert, 30 feet long at 17·23 miles east of junction with Camperdown–Ballarat Road		—
" " "	Patrol maintenance throughout		18·79
Lismore–Pittong Road	Sheeting various sections with crushed rock 12 feet wide		3·32
" " "	Patrol maintenance throughout		12·4
McKinnon's Bridge–Noorat Road	Patrol maintenance throughout		3·85
Prince's Highway	Widening foundations from 16 to 20 feet, scarifying, reshaping and sheeting with basaltic gravel and double coat sealing in Township of Camperdown		·1
" "	Patrol maintenance throughout in Townships of Terang and Camperdown		2·63
Terang–Mortlake Road	Deviation at sharp corner and reconstruction of curve, including removal of house to new site, from ·55 to ·72 miles north of junction with Prince's Highway		·17
" " "	Patrol maintenance throughout		7
HEALESVILLE SHIRE—			
Healesville–Alexandra Road	Road mix seal from Shire Hall to timber bridge		·11
" " "	Road mix seal from timber bridge at Recreation Road to concrete bridge at Graceburn		·06
" " "	Road mix seal from concrete bridge at Graceburn to eastern township boundary		·2
" " "	Road mix seal from Church Street to south-western township boundary		·71
Healesville Kinglake Road	Road mix seal from Healesville–Alexandra Road to Healesville railway crossing		·4
HEIDELBERG CITY—			
Greensborough–Hurstbridge Road	Construction of 36-in. diameter reinforced concrete pipe culvert between Greensborough and Diamond Creek		—
" " "	Widening of roadway between Greensborough and Diamond Creek		·13
" " "	Spreading and rolling crushed rock along edges of metal		2
" " "	Replacement of wooden culverts with reinforced concrete pipes at various places		—
" " "	Carpeting with pre-mixed bituminous screenings between Greensborough and Diamond Creek		·37
	Carried forward	—	2716·12

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	2716·12
HEIDELBERG CITY—*continued.*			
Greensborough–Hurstbridge Road ..	Painting white traffic lines on curves and hills	..	—
,, ,, ,, ..	General maintenance throughout	..	9·15
Main Heidelberg–Eltham Road ..	Widening road at intersection of Lower Plenty Road	..	—
,, ,, ,, ,, ..	Surfacing with plant-mixed bituminous screenings Lower Road, Ivanhoe	..	·6
,, ,, ,, ,, ..	Construction of approaches to Darebin Creek Bridge, Alphington	..	—
,, ,, ,, ,, ..	General maintenance throughout	..	7·13
Main Whittlesea Road	General maintenance	..	1·19
Heidelberg–Warrandyte Road ..	General maintenance	..	·17
HEYTESBURY SHIRE—			
Camperdown–Cobden Road ..	Widening embankment at Cobden	..	·04
,, ,, ,, ..	Patrol maintenance throughout	..	5
Cobden–Port Campbell–Princetown Road	Double coat sealing at Scott's Creek	..	1·1
,, ,, ,,	Realignment and construction of three-span bridge at Scott's Creek	..	·35
,, ,, ,,	Patrol maintenance throughout	..	19
Cobden–Scott's Creek Road ..	Resheeting with crushed rock at Cobden	..	·83
,, ,, ,, ..	Patrol maintenance throughout	..	7·25
Cobden–Terang Road	Double coat sealing between Cobden and Colrico	..	2·62
,, ,, ,, ..	Reconstruction and sheeting with crushed rock at Colrico	..	1·06
,, ,, ,, ..	Patrol maintenance throughout	..	12
Timboon–Nirranda Road	Double coat sealing westerly from Timboon	..	1·68
,, ,, ,, ..	Resheeting limestone with gravel westerly from above section	..	1·5
,, ,, ,, ..	Patrol maintenance throughout	..	8
Timboon–Port Campbell Road ..	Patrol maintenance throughout	..	5
HORSHAM TOWN—			
Dimboola–Horsham Road ..	Road mix seal	..	·5
Dooen Road	Widening with gravel from 15 to 20 feet	..	·62
Natimuk Road	Widening with gravel from 15 to 20 feet	..	·39
HUNTLY SHIRE—			
Heathcote–Elmore Road	Pre-mix seal from Northern Highway to Hervey Street, Elmore	..	·14
INGLEWOOD BOROUGH—			
Bendigo–Charlton Road	General maintenance throughout	..	1·57
KARA KARA SHIRE—			
Avoca–St. Arnaud Road	Patrol maintenance throughout	..	23
Charlton Road	Sealing various sections between Slaty Creek and Coongoer Bridge	..	4·07
,, ,, ...	Patrol maintenance throughout	..	10
Marnoo Road	Patrol maintenance	..	2·18
Navarre Road	Sealing southerly from Borough of St. Arnaud boundary	..	1·25
,, ,, ...	Patrol maintenance throughout	..	22
St. Arnaud–Donald Road	Road mix seal various sections between St. Arnaud North and Swanwater	..	2·48
,, ,, ,, ...	Patrol maintenance throughout	..	17
KARKAROOC SHIRE—			
Hopetoun–Rainbow Road ..	Forming and metalling 16 feet wide at 7 miles and construction of deviation for 700 feet transition curve at south-eastern corner of Allotment 71, Parish of Goyura	..	·45
,, ,, ,, ..	Patrol maintenance throughout	..	24
Hopetoun–Warracknabeal Road ..	Double coat bitumen sealing from 8·4 to 10 miles, 14·7 to 15·4 miles and 19·2 to 19·85 miles	..	2·93
,, ,, ,, ..	Patrol maintenance throughout	..	20
Hopetoun–Woomelang–Sea Lake Road	Patrol maintenance throughout	..	24
Rainbow–Beulah–Birchip Road ..	Patrol maintenance throughout	..	25
KERANG SHIRE—			
Koondrook Road	General maintenance	..	1
KILMORE SHIRE—			
Heathcote Road	Double coat bitumen sealing from 2·44 to 3·7 miles	..	1·26
,, ,, ...	Patrol maintenance	..	3·56
Kilmore–Kilmore East Road ..	Resheeting with gravel and double coat bitumen sealing easterly from Racecourse	..	—
,, ,, ,, ..	General maintenance	..	2·26
Lancefield–Kilmore Road	Resheeting with gravel and double coat bitumen sealing westerly from Hume Highway	..	·75
,, ,, ,, ..	Patrol maintenance	..	1·29
KILMORE AND PYALONG SHIRES (Joint Works)—			
Heathcote Road	Patrol maintenance	..	2·99
KILMORE AND ROMSEY SHIRES (Joint Works)—			
Lancefield–Kilmore Road	Patrol maintenance	..	2·28
KOROIT BOROUGH—			
Koroit–Warrnambool Road ..	Scarifying bitumen surfaced roadway, reshaping, widening to 16 feet, and single coat sealing from Southern Cross to Koroit, 2·25 to 4·25 miles	..	2
,, ,, ,, ..	Patrol maintenance throughout	..	6·25
KORONG SHIRE—			
Charlton–Bendigo Road	Widening existing seal coat by 9 feet from south end of road	..	·66
,, ,, ,, ...	General maintenance throughout	..	1
Serpentine Road	Double coat sealing, 16 feet wide, from Calder Highway	..	2·83
,, ,, ...	General maintenance throughout	..	10·5
Boring–Hurstwood Road	General maintenance throughout	..	7
KORUMBURRA SHIRE—			
Bena–Kongwak Road	Scarifying and reshaping sections of existing macadam and sheeting with fine crushed rock from 4·36 to 11·5 miles	..	7·14
,, ,, ,, ...	General maintenance throughout	..	11·5
,, ,, ,, ...	Reconstruction in fine crushed rock from 1·1 to 3 miles	..	1·9
,, ,, ,, ...	General maintenance throughout	..	3·2
Bena–Poowong Road	Road mix seal from 1 to 1·75 miles and 2·91 to 3·39 miles	..	1·23
,, ,, ,, ...	Scarifying existing macadam and sheeting with fine crushed rock from 3·39 to 5·07 miles	..	1·68
,, ,, ,, ...	General maintenance throughout	..	6·01
Fairbank Road	Reconstruction in sand from 0 to 2 miles	..	2
,, ,, ...	General maintenance throughout	..	5·4
Kongwak–Inverloch Road ..	Reshaping and sheeting existing gravel with gravel from 3·44 to 4·44 miles ..	..	1
,, ,, ,, ..	General maintenance throughout	..	6·3
Korumburra–Drouin Road ..	Road mix seal from 2·26 to 3·75 miles	..	1·49
,, ,, ,, ..	General maintenance throughout	..	4·7
Korumburra–Leongatha Road ..	General maintenance throughout	..	4·54
	Carried forward	—	3083·89

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	3083·89
KORUMBURRA SHIRE—*continued.*			
Korumburra-Warragul Road ..	Road mix seal of bitumen from 2·7 to 6·57 miles	..	3·87
" " " ..	Reconstruction in sand and double coat sealing from 10·42 to 12·21 miles ..	..	1·79
" " " ..	General maintenance throughout	..	12·21
Korumburra-Wonthaggi Road ..	Road mix seal on bitumen from 1·87 to 2·3 miles, 3·44 to 3·85 miles, 6·71 to 7·84 miles, and 8·85 to 10·18 miles ..	..	3·3
" " " ..	Reconstruction in fine crushed rock and double coat sealing from 6 to 6·2 miles ..	..	·2
" " "	Construction of timber and steel bridge, and approaches at 11·7 miles	..	·01
" " " ..	General maintenance throughout	..	12·21
Lang Lang-Nyora Road	General maintenance throughout	..	1·55
Loch-Nyora Road	Scarifying, reshaping, and surfacing with gravel where necessary from 1·6 to 5·2 miles	..	3·6
" " " ..	General maintenance throughout	..	5·2
Loch-Wonthaggi Road	Reconstruction in gravel and double coat sealing from 3·08 to 4·64 miles ..	..	1·56
" " " ..	General maintenance throughout	..	4·64
Nyora-Poowong Road	Road mix seal from 1·75 to 2·84 miles	..	1·09
" " " ..	General maintenance throughout	..	6·08
Poowong-Ranceby Road	General maintenance throughout	..	4·3
KOWREE SHIRE—			
Booroopki Road	Double coat bitumen sealing at Goroke	..	1
" " " ..	General maintenance throughout	..	13·5
Booroopki-Frances Road	General maintenance throughout	..	18
Edenhope-Goroke Road	General maintenance throughout	..	28·5
Hamilton-Edenhope-Apsley Road ..	Double coat bitumen sealing at and near Edenhope and Apsley	..	6
" " " " ..	General maintenance throughout	..	41
Kaniva-Edenhope Road	General maintenance throughout	..	14·5
Wombelano Road	Forming and travelling at south-western corner of Allotment 108, Parish of Toolongrook	..	·18
" "	General maintenance throughout	..	21
KYNETON SHIRE—			
Daylesford Road	General maintenance at Malmsbury	..	·7
Daylesford-Trentham Road ..	General maintenance between Trentham Township and turn-off to Lyonville	..	2·45
Melbourne-Bendigo Road	Resealing at Kyneton	..	·45
" " " " ..	General maintenance at Kyneton	..	1·3
Redesdale Road	General maintenance from Kyneton to Langley	..	6·25
Trentham Road	Reconstruction at Tylden	..	·98
" " ..	General maintenance balance of road	..	16·52
Tylden-Woodend Road	General maintenance at Tylden	..	3·25
LAWLOIT SHIRE—			
Broughton Road	Resheeting with limestone between 2·5 and 3·06 miles	..	·56
" " "	Patrol maintenance throughout	..	9·9
Kaniva-Edenhope Road	Patrol maintenance throughout	..	12·1
Nhill-Kaniva-Border Road ..	Road mix seal, $\frac{3}{4}$ inch, through township of Kaniva	..	·38
" " " ..	Patrol maintenance throughout	..	·7
South Lillimur Road	Resheeting with limestone from 0 to ·38 mile	..	·38
" " " ..	Road mix seal, $\frac{3}{4}$ inch, from ·38 to ·76 mile	..	·38
" " " ..	Patrol maintenance throughout	..	6·5
Yearinga Road	Resheeting with limestone from 6·3 to 6·73 miles and 2·17 to 2·65 miles	..	·61
" " " ..	Patrol maintenance throughout	..	9·7
LEIGH SHIRE—			
Ballarat-Rokewood Road	Reconditioning northerly from end of bitumen through Corindhap Township ..	..	2·25
" " " ..	Patrol maintenance	..	8
Cressy-Inverleigh Road	Road mix sealing in Parish of Dereq	..	3·25
" " " ..	Patrol maintenance	..	11·25
Cressy-Rokewood Road	Realignment and reconditioning from junction with Cressy-Inverleigh Road northerly to Kurucurnc Creek	..	2·25
" " " ..	Patrol maintenance	..	11
Inverleigh Shelford Road	Patrol maintenance	..	6
Rokewood Shelford Road	Double coat sealing from junction with Ballarat Colac Road through Rokewood Township	..	·5
" " " ..	Patrol maintenance	..	17
Shelford-Bannockburn Road ..	Double coat sealing westerly from shire boundary to end of existing bitumen ..	..	3·25
" " " ..	Patrol maintenance	..	6·75
Werneth Road	Patrol maintenance	..	3
LEIGH AND COLAC SHIRES (Joint Works)—			
Cressy-Inverleigh Road	Road mix seal from junction with Rokewood Cressy Road westerly to shire boundary	..	1·25
" " "	Patrol maintenance	..	2·25
LEXTON SHIRE—			
Avoca-Ararat Road	General maintenance throughout	..	9·2
Avoca-Ballarat Road	Gravel reconstruction, repairing, and renewing culverts from 10·4 to 15·4 miles ..	..	5
" " "	Double coat sealing from 1·25 to 3·96 miles and 10·4 to 10·7 miles	..	3·01
" " "	General maintenance throughout	..	17·25
LILYDALE SHIRE—			
Evelyn-Lilydale Road	Realignment and reconstruction	..	1·65
" " "	Patrol maintenance	..	3
Main Healesville Road	Construction of steel and timber bridge, 40-ft. span, over Olinda Creek ..	..	·01
" " "	Regrading in Lilydale Township	..	·08
Monbulk Road	Patrol maintenance	..	8·2
Mount Dandenong Road	Reconstruction at Kilsyth	..	1·14
" " "	Pre-mix seal at Croydon	..	1
" " "	Patrol maintenance	..	11·8
Yarra Glen Road	Construction of concrete bridge, 80 feet in length	..	·02
" " "	Patrol maintenance	..	4·6
LOWAN SHIRE—			
Dimboola-Kaniva Road	Patrol maintenance throughout	..	2·2
Goroke Road	Patrol maintenance throughout	..	6·7
Lorquon Road	Patrol maintenance throughout	..	5
Lorquon West Road	Patrol maintenance throughout	..	14
Yanac Road	Patrol maintenance throughout	..	18
MAFFRA SHIRE—			
Boisdale-Briagolong Road ..	Gravelling and bitumen sealing near 3 miles	..	1·5
" " " ..	Patrol maintenance throughout	..	6
Briagolong Dargo Road	Gravelling and bitumen sealing near 2 miles	..	·5
" " "	Patrol maintenance throughout	..	3
Briagolong-Stratford Road ..	Construction of a timber bridge near 3 miles	..	—
" " " ..	Patrol maintenance throughout	..	3
Bushy Park-Valencia Creek Road ..	Gravelling and bitumen sealing near 4 miles	..	1
" " " " " ..	Patrol maintenance throughout	..	7
	Carried forward	—	3574·15

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	3574·15
MAFFRA SHIRE—*continued.*			
Licola Road	Gravelling and bitumen sealing near 4 miles	..	1·5
" "	Patrol maintenance balance of road	..	38·5
Maffra–Newry Road	Gravelling and bitumen sealing near 5 miles	..	1
" " "	Patrol maintenance balance of road	..	5
Maffra–Sale Road	Patrol maintenance throughout	..	7
Maffra–Stratford Road	Drag seal near 3 miles	..	1
" " "	Patrol maintenance throughout	..	3
Tinamba–Boisdale Road	Drag seal near 2 miles	..	1
" " "	Drag seal near 4 miles	..	1
" " "	Patrol maintenance balance of road	..	12
Tinamba–Newry Road	Construction of concrete bridge near 2 miles	..	—
" " "	Patrol maintenance balance of road	..	3
Traralgon–Maffra Road	Gravelling and bitumen sealing near 4 miles	..	2
" " "	Patrol maintenance balance of road	..	5
MALDON SHIRE—			
Baringhup Road	General maintenance throughout	..	8
Castlemaine–Maldon Road ..	General maintenance throughout	..	8
Maldon–Eddington Road	General maintenance throughout	..	11
Newstead–Maldon Road	General maintenance throughout	..	4·25
MALDON AND MARONG SHIRES (Joint Works)—			
Maldon–Eddington Road	General maintenance throughout	..	4
MANSFIELD SHIRE—			
Benalla–Mansfield Road	Preparation for bituminous surfacing	..	·5
" " "	Patrol maintenance	..	9·5
Euroa–Merton Road	Patrol maintenance throughout	..	4·4
Maindample–Benalla Road ..	Patrol maintenance throughout	..	9·5
Mansfield Road	Forming and gravelling east of Mansfield	..	·9
" "	Preparation for bituminous surfacing	..	2
" "	Patrol maintenance throughout	..	42
Mansfield–Tolmie Road	Preparation for bituminous surfacing	..	·5
" " "	Patrol maintenance throughout	..	5
Mansfield–Woods Point Road ..	Preparation for bituminous surfacing	..	1
" " "	Patrol maintenance	..	18·5
Merton–Strathbogie Road	Patrol maintenance throughout	..	6·6
MARONG SHIRE—			
Bendigo–Bridgewater Road ..	Patrol maintenance	..	1·24
Bendigo–Eddington Road	Replacing wooden deck of two brick abutment culverts with concrete slabs	..	—
" " "	Replacing decayed wooden culverts with large concrete pipe culverts	..	—
" " "	Sheeting and widening gravelled and metalled formations	..	1·1
" " "	Forming and sanding and reconstruction of four floodways	..	·85
" " "	Patrol maintenance, erection of ten sets of direction boards	..	25
MARYBOROUGH BOROUGH—			
Avoca Road	Realignment and widening existing bitumen 12 feet wide to 16 feet	..	·95
" "	Reconstruction of two curves	..	·2
" "	Construction of two 30-in. diameter reinforced concrete pipe culverts, 36 feet and 32 feet long, to replace existing wooden structures	..	—
" "	Patrol maintenance	..	1·15
Ballarat Road	Patrol maintenance	..	1·4
Castlemaine Road	Reshaping and resheeting, including construction of two curves	..	·43
" "	Patrol maintenance	..	1·6
Eddington Road	Realignment and widening existing bitumen 12 feet wide to 18 feet	..	1·24
" "	Construction of 48-in. x 36-in. reinforced concrete box culvert, 68 feet long ..	..	—
" "	Redecking with reinforced concrete of existing wooden culvert	..	—
" "	Patrol maintenance	..	1·24
MCIVOR SHIRE—			
Heathcote–Elmore Road	Reconstruction and sealing at Lady's Pass, and from thence towards Toolleen ..	..	1·37
Heathcote–Redesdale Road ..	Patrol maintenance from Heathcote to Redesdale Bridge	..	12
Kilmore–Heathcote–Bendigo Road ..	Reconstruction and sealing north and south of Heathcote and at Axedale ..	..	5·2
" " " " ..	Patrol maintenance from Tooborac to Axedale	..	25·45
Lancefield–Tooborac Road ..	Patrol maintenance from Tooborac to shire boundary	..	1·25
Mount Camel Estate Road ..	Reconstruction and sealing northerly from Lady's Pass	..	·52
" " " " ..	Patrol maintenance from Lady's Pass to shire boundary	..	5
MELTON SHIRE—			
The Gap Road	Patrol maintenance	..	·75
Toolern Road	Patrol maintenance	..	6
METCALFE SHIRE—			
Elphinstone–Harcourt Road ..	General maintenance throughout	..	8·56
Kyneton–Redesdale Road	General maintenance throughout	..	12·25
MILDURA CITY—			
Bridge Road	General maintenance	..	·7
Deakin Avenue	Construction of concrete kerbs and channels, respreading metal and bitumen surfacing ..	..	1
Langtree Avenue	General maintenance	..	·42
Tenth Street	General maintenance	..	·08
MILDURA SHIRE—			
Deakin Avenue Road	Construction of limestone rubble base course and road mix seal	..	·81
" " "	General maintenance	..	·81
Irymple Road	Bituminous sealing between Ginquam and Benetook Avenue	..	·75
" "	General maintenance from Deakin Avenue to Ginquam Avenue	..	4·87
Melbourne Road	General maintenance from main channel south of Red Cliffs to north railway crossing	..	1
Wentworth Road	Road mix seal from Sturt Highway northerly to Fifth Street, Merbein	..	1·05
" "	General maintenance between Fifth Street and the Abbotsford bridge over the River Murray	..	15·5
MINHAMITE SHIRE—			
Hamilton – Macarthur – Port Fairy Road	Double coat sealing on crushed rock surface 15 feet wide, south of Macarthur Township ..	..	1
" " " "	Scarifying existing road, widening to 15 feet and resheeting with crushed rock	..	1·5
" " " "	Patrol maintenance throughout	..	22
Warrnambool–Hawkesdale–Penshurst Road	Double coat sealing on crushed rock surface 15 feet wide at "Laugulac," south from the Mount Rouse Shire boundary	..	1
" " " "	Scarifying existing road, widening to 15 feet and resheeting with crushed rock	..	2·67
" " " "	Patrol maintenance throughout	..	17
Woolsthorpe–Bessiebelle Road ..	Supply of spalls, crushing and stacking 1,100 cubic yards of crushed rock for resheeting and widening east from the Warrnambool–Hawkesdale–Penshurst Road	..	1
" " " ..	Gravelling 16 feet wide by 4 inches depth between Bessiebelle and Portland Shire boundary	..	·6
" " " ..	Patrol maintenance throughout	..	29
	Carried forward	—	4008·31

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	4008·31
MIRBOO SHIRE—			
Grand Ridge Road	Road mix seal through Allotment 80, Parish of Allambee East		1·12
,, ,, ,,	Reconstruction of roadway through Allotments 111 and 87A, Parish of Allambee East		·5
,, ,, ,,	Patrol maintenance throughout		6
Mardan Road	Road mix seal through Allotment 30, Parish of Mardan		·95
,, ,,	Widening of pavement through Allotment 30, Parish of Mardan		·5
,, ,,	Patrol maintenance throughout, including bridge treatment and painting		4·6
Mirboo–Leongatha Road	Widening formation near shire boundary		1·1
,, ,,	Patrol maintenance throughout, including bridge treatment and painting		4·4
Mirboo–North Thorpdale Road	Widening of pavement and formation near Township of Mirboo North		·5
,, ,, ,,	Patrol maintenance throughout, including bridge treatment and painting		6·5
Mirboo South Road	Reshaping and double coat sealing from Township of Mirboo North		1·5
,, ,, ,,	Road mix seal on Cains Hill and near shire boundary		2·9
,, ,, ,,	Patrol maintenance throughout		9·5
Mirboo–Yarragon Road	Patrol maintenance throughout, including bridge treatment and painting		5·7
Morwell–Mirboo Road	Road mix seal from west boundary of Allotment 34, Parish of Mirboo		1·25
,, ,, ,,	Patrol maintenance throughout, including benching of curves through Allotments 35 and 33A, Parish of Mirboo		5·5
MOORABBIN CITY—			
Centre Dandenong Road	Reconstruction and widening easterly from Warrigal Road		·3
,, ,, ,,	General maintenance balance of road		2·59
Point Nepean Road	General maintenance throughout		3·13
MORDIALLOC CITY—			
Point Nepean Road	Surfacing with pre-mixed drag seal from 75 yards north of railway bridge, Mordialloc, southwards to concrete roadway		·4
,, ,, ,,	Painting white centre line from Moorabbin Road to railway bridge at Mordialloc, 2·11 miles		—
,, ,, ,,	Patrol maintenance		2·9
MORNINGTON SHIRE—			
Point Nepean Road	General maintenance throughout		9·28
Mornington–Dromana Road	General maintenance throughout		6·38
MORTLAKE SHIRE—			
Caramut–Lismore Road	Road mix seal on Mortlake–Darlington section from Mortlake to 2·39 miles		2·62
,, ,, ,,	Road mix seal on Mortlake–Darlington section from 5·87 to 9·3 miles		3·42
,, ,, ,,	Patrol maintenance throughout		29
Mortlake–Ararat Road	Road mix seal on Mortlake–Woorndoo section from ·18 to 1·44 miles		1·26
,, ,, ,,	Road mix seal on Woorndoo–Bolac section from 3·31 to 6·31 miles		3
,, ,, ,,	Patrol maintenance throughout		24
Mortlake–Warrnambool Road	Patrol maintenance throughout		14
Terang–Framlingham Road	Double coat bitumen sealing from 12·52 to 13·87 miles		1·35
,, ,, ,,	Patrol maintenance throughout		11
Terang–Mortlake Road	Construction of two curves between Mortlake and 1 mile		·27
,, ,, ,,	Patrol maintenance throughout		7
MORTLAKE AND HAMPDEN SHIRES (Joint Works)—			
Caramut–Lismore Road	Repairs to bridge over Mount Emu Creek		—
MORWELL SHIRE—			
Jeeralang West Road	Sealing from 3·35 to 6·35 miles		3
,, ,, ,,	General maintenance		23·5
Jumbuk Road	Sealing from 1·2 to 3·2 miles		2
,, ,, ,,	General maintenance		12·5
Morwell–Mirboo Road	Construction of bridge and approaches, including sealing at Eel Hole Creek		·44
,, ,, ,,	Construction of concrete culverts at 1 and 8 miles		—
,, ,, ,,	General maintenance, including flood damage repairs to bridge at 6·2 miles		9·14
Prince's Highway	Widening bitumen and sealing		·5
,, ,,	General maintenance		1·5
MOUNT ROUSE SHIRE—			
Ballarat–Hamilton Road	Double coat sealing on gravel between Glenthompson and Wickliffe		4·6
,, ,, ,,	Road mix seal between Dunkeld and Glenthompson		3·55
,, ,, ,,	Patrol maintenance throughout		21
Hamilton–Dunkeld Road	Road mix seal between Dunkeld and 2·47 miles to Hamilton		1·33
,, ,, ,,	Patrol maintenance throughout		4
Hamilton–Penshurst Road	Road mix seal between Penshurst and 1·75 miles to Port Fairy		1·12
,, ,, ,,	Scarifying, reforming and double coat sealing from 5·87 to 7·35 miles to Hamilton		·73
,, ,, ,,	Patrol maintenance throughout		14
Maroona–Glenthompson Road	Double coat sealing on gravel between Glenthompson and 1·08 miles to Willaura		1·08
,, ,, ,,	Patrol maintenance throughout		1
Penshurst–Caramut Road	Road mix seal from 7·23 miles to 10·23 miles to Caramut		1·29
,, ,, ,,	Scarifying, reforming and double coat sealing from 1·07 to 1·57 miles to Caramut		·5
,, ,, ,,	Patrol maintenance throughout		15
MULGRAVE SHIRE—			
Ferntree Gully Road	Double coat sealing on crushed rock pavement between Box Hill Road and Clayton Road		1
,, ,, ,,	Double coat sealing on crushed rock pavement easterly from May Road		·5
,, ,, ,,	Patrol maintenance throughout		5·75
Springvale Road	Regrading, reforming, widening to 20-ft. width and resheeting with crushed rock between High Street Road and Waverley Road, and 40 chains south of Waverley Road		1·5
,, ,,	General maintenance throughout		4·85
NARRACAN SHIRE—			
Allambee–Childers Road	Patrol maintenance		8·5
Childers–Thorpdale Road	Patrol maintenance		1·5
Mirboo–Yarragon Road	Patrol maintenance		6·5
Moe–Yallourn Road	Patrol maintenance		2
Prince's Highway	Patrol maintenance		1·5
Trafalgar–Thorpdale Road	Realignment and sand surfacing		·54
,, ,, ,,	Patrol maintenance		9
Walhalla Road	Sand surfacing and realignment		·87
,, ,, ,,	Patrol maintenance		32
Willowgrove Road	Sand surfacing and realignment		1·3
,, ,, ,,	Patrol maintenance		22
Yarragon–Leongatha Road	Sand sheeting and realignment		·43
,, ,, ,,	Patrol maintenance		9
Yarragon–Shady Creek Road	Construction of timber bridge		—
,, ,, ,, ,,	Patrol maintenance		6
	Carried forward	—	4419·25

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	4419·25
NEWHAM AND WOODEND SHIRE—			
Lancefield Road	Patrol maintenance from Woodend	..	4·8
" "	General maintenance to shire boundary	..	4·45
Mount Macedon Road	Double coat sealing easterly from 1 mile	..	·78
" " "	Patrol maintenance throughout	..	5·25
Tylden Road	Patrol maintenance throughout	..	3·2
NEWHAM AND WOODEND AND KYNETON SHIRES (Joint Works)—			
Tylden Road	Patrol maintenance throughout	..	1·2
NEWSTEAD AND MOUNT ALEXANDER SHIRE—			
Castlemaine Daylesford Road ..	Patrol maintenance	..	6·7
Creswick Road	Patrol maintenance	..	11
Maldon Road	Reconstruction	..	2
" "	Patrol maintenance	..	4
NEWSTEAD AND MOUNT ALEXANDER AND GLENLYON SHIRES (Joint Works)—			
Castlemaine–Daylesford Road ..	Patrol maintenance	..	·6
NUMURKAH SHIRE—			
Echuca–Picola Road	General maintenance	..	16
" "	Patrol maintenance from 0 to 6 miles	..	6
Nathalia–Picola Road	Patrol maintenance throughout	..	7·8
Numurkah–Nathalia Road ..	Patrol maintenance throughout	..	15·9
Numurkah Tungamah Road ..	Patrol maintenance throughout	..	5
Shepparton Numurkah–Cobram Road	Reforming and gravelling at each end of Melville Street, Numurkah	..	·82
" " " "	Patrol maintenance throughout	..	20·6
OAKLEIGH CITY—			
Ferntree Gully Road	Patrol maintenance	..	·48
Prince's Highway	Patrol maintenance	..	1·12
OMEO SHIRE—			
Benambra Road	Benching and elevating on dangerous curves between 0 and 5·5 miles	..	—
" "	Patrol maintenance, including gravel sheeting from 0 to 14·45 miles	..	14·45
Day Avenue Road	Resealing with bitumen from 0 to ·45 mile	..	·45
" " "	Patrol maintenance from 0 to 1·75 miles	..	1·75
Swift's Creek Omeo Road ..	Construction of three-span timber and steel bridge over the Livingstone Creek, together with forming and gravelling of approaches from 4·41 to 4·6 miles	..	·19
" " " " ..	Patrol maintenance from 0 to 18·15 miles	..	18·15
ORBOST SHIRE—			
Combienbar Road	Patrol maintenance throughout	..	8·5
Marlo Road	General maintenance, and road mix seal	..	10·2
Orbost–Delegate Road	Resheeting with gravel and sealing throughout	..	·31
Prince's Highway	General maintenance, and construction of concrete culvert to replace timber bridge, at Orbost Township	..	1·32
OTWAY SHIRE—			
Beech Forest–Apollo Bay Road ..	Reconstruction of single 30-ft. span timber bridge over Costin's Creek	..	·01
" " " " ..	Patrol maintenance from Apollo Bay towards Beech Forest	..	11
Beech Forest–Lavers Hill Road ..	Patrol maintenance throughout	..	12·5
Beech Forest–Mount Sabine Road ..	Patrol maintenance throughout	..	12·5
Carlisle–Gellibrand Road	Patrol maintenance throughout	..	11
Colac–Beech Forest Road	Widening, super-elevating, and resheeting with fine crushed rock from 2·92 miles to 3·67 miles at Gellibrand River Bridge	..	·75
" " " "	Erection of new decking and gravel beams on four-span timber bridge over Gellibrand River, total span 120 feet	..	·02
" " " "	Patrol maintenance from shire boundary to Gellibrand	..	4
Colac–Forrest Road	Patrol maintenance from shire boundary to Forrest	..	3·8
Forrest–Apollo Bay Road	Double coat sealing from 5·49 to 6·63 miles	..	1·14
" " " "	Double coat sealing of widening strips, total width 24 feet, through Apollo Bay ..	..	·32
" " " "	Road mix seal from Wild Dog Creek Bridge to Apollo Bay	..	1·9
" " " "	Widening curves between 6·63 and 9·47 miles	..	2·84
" " " "	Patrol maintenance throughout	..	25
OXLEY SHIRE—			
Bright Road	Realignment and reconstruction from Shea's to Tarrawingee turn-off	..	3·17
" "	Patrol maintenance	..	24·3
Greta Glenrowan Road	Patrol maintenance	..	5
Kilfeera–Boggy Creek Road ..	Patrol maintenance	..	1·1
Wangaratta Whitfield Road ..	Reconstruction and sealing south of Targoora	..	2·22
" " " ..	Forming and gravelling on new deviation at Edi	..	·97
" " " ..	Patrol maintenance	..	31·8
PHILLIP ISLAND SHIRE—			
Newhaven Road	General maintenance throughout	..	7·75
Phillip Island Road	General maintenance throughout	..	1·25
Ventnor Road	General maintenance throughout	..	5·75
PORT FAIRY BOROUGH—			
Hamilton Road	Road mix seal, ¾ inch, 15 feet wide, from Prince's Highway to ·4 mile	..	·4
" "	Road mix seal, ¾ inch, 12 feet wide, from ·4 to 1·4 miles at Belfast Shire boundary	..	1
" "	General maintenance throughout, prior to road mix seal	..	1·4
PORTLAND SHIRE—			
Bridgewater Road	Reforming and sheeting 5 miles west of Portland	..	2·01
" "	Patrol maintenance throughout	..	10·5
Heath Road	Reforming and gravel sheeting near freezing works	..	·95
" "	Patrol maintenance throughout	..	10·8
Portland–Casterton Road	Patrol maintenance throughout	..	20·85
Portland–Hamilton Road	Reforming and gravel sheeting northerly from Branxholme Cemetery	..	1·89
" " "	Patrol maintenance throughout	..	28·8
PRESTON CITY—			
Epping Road	General maintenance throughout	..	1·4
Whittlesea Road	Reconstruction of junction between Frier Avenue and Tyler Street, and resheeting with pre-mix	..	·06
" "	General maintenance throughout	..	2·5
PYALONG SHIRE—			
Kilmore–Heathcote Bendigo Road ..	Double coat sealing 16 feet wide from 9·85 to 11·36 miles	..	1·51
" " " " ..	Patrol maintenance	..	11·34
Lancefield–Tooborac Road ..	Patrol maintenance	..	10·8
PYALONG AND MCIVOR SHIRES (Joint Works)—			
Lancefield–Tooborac Road ..	Patrol maintenance	..	2·04
	Carried forward	—	4870·61

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	4870·61
QUEENSCLIFFE BOROUGH			
Geelong Road	General maintenance throughout		3·5
Point Lonsdale Road	General maintenance throughout		·72
RINGWOOD BOROUGH—			
Main Healesville Road	Reconstruction and widening from 20 to 30 feet		3·24
Mount Dandenong Road	Surfacing		·5
" " "	Realignment and widening from 16 to 20 feet		·62
" " "	General maintenance		1·75
Ringwood Warrandyte Road	General maintenance		1
RIPON SHIRE—			
Ballarat–Ararat Road	Construction of three-cell reinforced concrete culvert at 99·4 miles		—
" " "	General maintenance		1·4
Ballarat–Hamilton Road	Widening from 12 to 16 feet and road mix reseal, ¾ inch, from 0 to ·79 mile and 4·32 to 6·29 miles		2·76
" " "	Scarifying, gravelling, and double coat sealing 16 feet wide from 6·29 to 8·06 miles		1·77
" " "	Patrol maintenance throughout		16·26
Skipton Road	Widening from 12 feet to 16 feet and road mix reseal, ¾ inch, from 0 to ·05 mile, 10·2 to 11·56 miles, and 17·51 to 18·68 miles		3·08
" "	Double coat sealing 16 feet wide from ·69 to 1·02 miles		·33
" "	Patrol maintenance throughout		18·68
RIPON AND HAMPDEN SHIRES (Joint Works)—			
Ballarat–Hamilton Road	Road mix reseal, ¾ inch, on bridge over Emu Creek		·04
ROCHESTER SHIRE—			
Bendigo–Echuca Road	Patrol maintenance throughout		·88
Corop Road	Double coat bituminous sealing on gravel southerly from Rochester		·95
" " "	Patrol maintenance throughout		5·5
Rochester–Barnawn Prairie Road	Double coat bituminous sealing on gravel between Lockington and Tennyson		7·72
" " "	Patrol maintenance throughout		27·5
Timmering Road	Patrol maintenance throughout		4·5
RODNEY SHIRE—			
Kyabram–Nathalia Road	Reconstruction at Deakin Shire boundary		·19
" " "	Reshouldering near Kyabram Saleyard		·25
" " "	General maintenance throughout		1
Kyabram–Tongala Road	Road mix seal throughout		1
" " "	General maintenance throughout		1
Mooroopna–Undera Road	Reconstruction in sand clay at North Mooroopna		4·22
" " "	Reshouldering at North Mooroopna		1·12
" " "	General maintenance throughout		11·6
Shepparton–Tatura Road	Reconstruction and sealing at Mooroopna		·19
" " "	Reshouldering between Tatura and Ardmona		5
" " "	Pavement widening near Tatura and Ardmona		4·2
" " "	General maintenance throughout		10·15
Tatura–Byrneside–Kyabram Road	Reshouldering west of Lancaster		3
" " "	Reshouldering and pavement widening west of Byrneside		3·55
" " "	Reconstruction and sealing near Byrneside–Merrigum, and Lancaster		·61
" " "	General maintenance throughout		17
Tatura–Murchison Road	Reshouldering north of Murchison		1·5
" " "	General maintenance throughout		12
RODNEY SHIRE AND SHEPPARTON BOROUGH (Joint Works)—			
Shepparton Tatura Road	General maintenance throughout, including repairs to Grey's Bridge		1·8
ROMSEY SHIRE			
Lancefield–Kilmore Road	Patrol maintenance throughout		9·71
Lancefield–Tooborac Road	Double coat sealing northerly from Lancefield		·89
" " "	Patrol maintenance throughout		4·31
Melbourne–Lancefield Road	General maintenance throughout		15·85
Woodend–Lancefield Road	Reconditioning southerly from Seven Roads		·52
" " "	Patrol maintenance throughout		5·62
ROSEDALE SHIRE—			
Prince's Highway	General maintenance throughout, through Rosedale Township		·9
Seaspray Road	Patrol maintenance throughout, from Longford to Seaspray		15·75
Traralgon Gormandale Road	Patrol maintenance throughout, from Flynn's Creek to Gormandale		4·53
Traralgon–Maffra Road	Patrol maintenance throughout, from Latrobe River to Thomson River		21
Willung Road	Patrol maintenance throughout, from Rosedale to Willung		8
ROSEDALE AND ALBERTON SHIRES (Joint Works)—			
Carrajung Gormandale Road	Patrol maintenance throughout, through Gormandale Township		·75
RUTHERGLEN SHIRE—			
Barnawartha–Howlong Road	Boxing out and resheeting with gravel		·95
" " "	Patrol maintenance		1·6
Chiltern–Howlong Road	Double coat seal		1·43
" " "	Patrol maintenance		4·6
Murray Valley Road	Double coat seal		·06
" " "	Patrol maintenance		·79
Rutherglen–Wahgunyah Road	Patrol maintenance		5·89
SALE TOWN—			
Prince's Highway	Patrol maintenance		·5
Sale–Longford Road	Patrol maintenance		·13
SEBASTOPOL BOROUGH—			
Ballarat–Hamilton Road	Patrol maintenance throughout		·84
Ballarat–Rokewood Road	Road mix seal southerly from Victoria Street		·68
" " "	Tree-planting southerly from Ophir Street, ·4 miles		—
" " "	Patrol maintenance throughout		2·34
SEYMOUR SHIRE—			
Avenel–Longwood Road	General maintenance		5·5
Highlands Road	General maintenance		16
Upper Goulburn Road	General maintenance, including building of rock and timber wall at Reedy Creek Bridge near Taliarook		11·4
Seymour–Yea Road	Scarifying and grading near Military Camp, Seymour		2
" " "	Replacing six open crossings with pipe culverts		—
" " "	General maintenance		7
SHEPPARTON BOROUGH—			
Shepparton–Nagambie Road	Patrol maintenance throughout		2·05
Shepparton–Nalinga Road	Patrol maintenance throughout		·95
Shepparton Numurkah Road	Patrol maintenance throughout		·95
SHEPPARTON BOROUGH AND RODNEY SHIRE (Joint Works)—			
Shepparton–Mooroopna Road	Patrol maintenance throughout		·04
Shepparton–Tatura Road	Patrol maintenance throughout		·14
	Carried forward	—	5206·36

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	5206·36
SHEPPARTON SHIRE—			
Dookie–Nalinga Road	Reconstruction of old macadam surface	..	1
,, ,, ,, ...	General maintenance	..	8
Dookie–Violet Town Road ..	General maintenance	..	·05
Katandra Road	Reconstruction of old macadam surface and sealing	..	5
,, ,, ...	General maintenance	..	9
Pine Lodge Road	General maintenance	..	4
Shepparton–Nagambie Road ..	Road mix seal	..	1
,, ,, ,, ..	General maintenance	..	8
Shepparton–Numurkah Road ..	Reconstruction of old macadam surface and sealing	..	3
,, ...	General maintenance	..	12
SHEPPARTON SHIRE AND SHEPPARTON BOROUGH (Joint Works)—			
Shepparton–Nalinga Road ..	Road mix seal	..	·25
,, ,, ,, ..	General maintenance	..	·25
SOUTH BARWON SHIRE—			
Barwon Heads Road	Road mix seal, ½ inch, from Bayley Street to Sparrow Vale Road	..	2·63
,, ,, ,, ...	Modified macadam reconstruction near 5 miles	..	·25
,, ,, ,, ...	General maintenance, including reconditioning three curves between 8 and 10 miles and curve at 3 miles	..	13
Prince's Highway	Road mix seal, ¾ inch, from tram terminus to Settlement Road	..	·52
,, ,, ...	General maintenance	..	1
Torquay Road	General maintenance, drainage and surfacing edges of road	..	3·48
SOUTH BARWON AND BARRABOOL SHIRES (Joint Works)—			
Torquay Road	Road mix seal, ½ inch, from 6 miles towards Geelong	..	1·6
,, ,, ...	General maintenance and scoria surfacing edges of road	..	8·5
SOUTH BARWON AND BELLARINE SHIRES (Joint Works)—			
Barwon Heads Road	General maintenance of bridge	..	·28
SOUTH GIPPSLAND SHIRE—			
Albert River–Welshpool Road ..	Patrol maintenance throughout	..	1·7
Boolarra–Foster Road	Patrol maintenance throughout and bitumen sealing	..	8
Boolarra–Welshpool Road ..	Patrol maintenance throughout	..	11·8
Falls Road	Patrol maintenance throughout	..	5
Foster–Yarram Road	Patrol maintenance throughout	..	17·98
Hazel Park Road	Patrol maintenance throughout	..	4·89
Main South Gippsland Road ..	Patrol maintenance throughout	..	13·25
Stony Creek–Dollar Road	Patrol maintenance throughout	..	6·84
Toora–Gunyah Road	Patrol maintenance throughout	..	12
Toora–Wonyip Road	Patrol maintenance throughout	..	5
Turton's Creek Road	Patrol maintenance throughout	..	5
SOUTH GIPPSLAND AND WOORAYL SHIRES (Joint Works)—			
Dollar–Stony Creek Road	Patrol maintenance throughout	..	2
Main South Gippsland Road ..	Patrol maintenance throughout	..	·75
ST. ARNAUD BOROUGH—			
Avoca–St. Arnaud Road	Road mix seal northerly from borough boundary	..	·96
,, ,, ,, ...	Patrol maintenance throughout	..	1·6
Charlton Road	Sealing southerly from borough boundary	..	1·02
,, ,, ...	Patrol maintenance throughout	..	1·5
Navarre Road	Road mix seal throughout	..	·95
,, ,, ...	Patrol maintenance throughout	..	·95
St. Arnaud–Donald Road	Patrol maintenance throughout	..	2·5
STAWELL BOROUGH—			
Ararat–Stawell Road	Road mix seal	..	·67
,, ,, ,, ...	General maintenance	..	2
Glenorchy Road	General maintenance	..	·75
STAWELL SHIRE—			
Marnoo Road	Patrol maintenance throughout	..	35
Navarre Road	Patrol maintenance throughout	..	20
Marnoo–Rupanyup Road	Patrol maintenance throughout	..	5
Stawell–Glenorchy–Horsham Road ..	Patrol maintenance throughout	..	21
Horsham–Wal Wal Road	Patrol maintenance throughout	..	2·5
Stawell–Warracknabeal Road ..	Patrol maintenance throughout	..	7
Landshorough Road	Patrol maintenance throughout	..	5
STRATHFIELDSAYE SHIRE—			
Heathcote–Bendigo Road	Reconstruction in gravel 5 inches loose depth, 16 feet wide, and double coat sealing westerly from Bendigo–Heathcote railway	..	1
Mandurang Road	Reconstruction in gravel 5 inches loose depth, 16 feet wide, and double coat sealing from Beudigo City boundary	..	1·33
Strathfieldsaye Road	Reconstruction in gravel 5 inches loose depth, 16 feet wide, easterly from 4 miles east of Bendigo	..	1
SWAN HILL SHIRE—			
Annuello–Wemen Road	Patrol maintenance	..	16
Euston Road	Patrol maintenance	..	3
Nyah–Ouyen Road	Patrol maintenance	..	49
Piangil Station Road	Road mix seal	..	·46
,, ,, ,, ...	Patrol maintenance	..	2
Swan Hill Road	Patrol maintenance	..	1·25
Tooleybuc Road	Patrol maintenance	..	2
Ultima Road	Patrol maintenance	..	20
Ultima–Sealake Road	Patrol maintenance	..	16
TALBOT SHIRE—			
Maryborough–Avoca Road ..	General maintenance throughout	..	·8
Maryborough–Ballarat Road ..	Road mix seal, ½ inch, from 3·6 to 5·1 miles through Township of Talbot	..	1·5
,, ,, ,, ..	Reshaping, sheeting with gravel, and double coat sealing from 9·65 to 12·05 miles ..	..	2·4
,, ,, ,, ..	General maintenance throughout	..	15
TAMBO SHIRE—			
Bairnsdale–Bruthen Road ..	Patrol maintenance	..	·6
Basin Road	Patrol maintenance	..	10·2
Bruthen–Omeo Road	Patrol maintenance	..	·8
Mossiface Road	Patrol maintenance	..	3
Nowa Nowa–Buchan–Gelantipy Road	Patrol maintenance	..	33
	Carried forward	—	5672·12

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	5672·12
TOWONG SHIRE—			
Murray Valley Road	Patrol maintenance from Bethanga Bridge to Murray Valley Highway at Granya ..	..	20·3
Omeo Road	General maintenance at Township of Tallangatta	..	1·35
TRARALGON SHIRE—			
Prince's Highway	Road mix seal, ¾ inch	..	·6
,, ...	Patrol maintenance throughout	..	1·1
Traralgon Balook Road	Patrol maintenance throughout and building up at two slips	..	12·25
Traralgon Creek Road	Widening pavement to 16 feet and double coat sealing	..	2·53
,, ,, ,, ...	Patrol maintenance throughout	..	16
Traralgon–Gormandale Road ..	Double coat sealing on fine crushed rock, 16 feet wide	..	1·61
,, ,, ,, ..	Patrol maintenance throughout	..	6·9
Traralgon–Maffra Road	Double coat sealing, 16 feet wide	..	·08
,, ,, ,, ...	Patrol maintenance throughout	..	3
Tyers Road	Widening pavement 5 feet and double coat sealing	..	2
,, ,, ...	Patrol maintenance throughout	..	7·75
TULLAROOP SHIRE—			
Avoca Road	Widening pavement from 10 feet to 16 feet, and shouldering	..	1·21
,, ,, ...	Realignment, transitioning curves, construction of two box culverts and sealing ..	..	·29
,, ,, ...	Patrol maintenance throughout	..	9·2
Ballarat Road	Patrol maintenance throughout, construction of two pipe culverts	..	3·1
Eddington Road	Construction of reinforced concrete box culvert, 8 feet x 9 feet	..	—
,, ,, ...	Double coat sealing, 16 feet wide	..	2
,, ,, ...	Construction of steel and timber bridge over Four Mile Creek	..	—
,, ,, ...	Patrol maintenance throughout	..	13·9
Maryborough–Dunolly Road ..	Patrol maintenance throughout	..	3·4
Natte Yallock Road	Construction of floodway	..	·23
,, ,, ...	Reconstruction of blue metal section with gravel pavement	..	·25
,, ,, ,, ...	Patrol maintenance throughout	..	7·25
TUNGAMAH SHIRE—			
Yarrawonga–Cobram Road ..	Priming and sealing at Cobram Township	..	1·68
,, ,, ,, ..	Patrol maintenance	..	1·68
Cobram South Road	Patrol maintenance	..	4·36
Numurkah–Tungamah–Wilby Road	Reforming and gravelling	..	1·34
,, ,, ,, ,,	Patrol maintenance	..	30·34
St. James Road	Patrol maintenance	..	8·98
Cobram–Katamatite Road ..	Patrol maintenance	..	1·02
UPPER MURRAY SHIRE—			
Corryong Road	Surfacing metal road over Towong Gap with gritty material	..	·5
,, ,, ...	Patrol maintenance throughout	..	13·5
Tintaldra Road	Construction of 30-in. diameter reinforced concrete pipe culvert, near Recreation Reserve, Cudgewa	..	—
,, ,, ...	Patrol maintenance throughout	..	14·25
UPPER YARRA SHIRE—			
Don Road	Widening of pavement to 16 feet by two 18-in. strips in crushed rock, between north end of floodway at Yarra River and corner of Old Don Road	..	·52
,, ,, ...	General maintenance throughout	..	1·15
Launching Place–Gembrook Road ..	General maintenance throughout	..	10·2
Little Yarra Road	Sand sheeting between Barrier Swamp Bridge and Black Sands Road	..	2·5
,, ,, ,, ...	Sand sheeting between Hackett's Creek at Three Bridges and Blake Street, Powelltown	..	3·6
,, ,, ,, ...	General maintenance throughout	..	10·2
Warburton Road	Bitumen resealing from western railway crossing at Launching Place to Church of England at Wesburn	..	4·26
,, ,, ...	Crushed rock reconstruction of section in La La, Warburton, at corner of Park Road ..	..	·09
,, ,, ...	General maintenance from shire boundary at Woori Yallock Creek to Pocknee's Corner at Warburton	..	13·75
VIOLET TOWN SHIRE—			
Murchison–Violet Town Road ..	Patrol maintenance throughout	..	13
Violet Town–Dookie Road ..	Patrol maintenance throughout	..	17
WALPEUP SHIRE—			
Mildura Road	Double coat sealing through Ouyen Township	..	·76
Ouyen–Pinnaroo Road	Resealing through Murrayville and Walpeup Townships	..	·7
,, ,, ,, ...	Patrol maintenance, approximately 30 miles, general maintenance balance of road ..	..	81·9
WANGARATTA BOROUGH—			
Beechworth Road	General maintenance	..	1
Sydney Road	General maintenance	..	2·73
WANGARATTA SHIRE—			
Beechworth Road	Patrol maintenance throughout	..	11
Peechelba Road	Patrol maintenance throughout	..	1·5
Wangaratta–Myrtleford Road ..	Patrol maintenance throughout	..	6·5
WANNON SHIRE—			
Coleraine–Harrow–Apsley Road ..	Double coat bitumen sealing 12 feet wide from Peterson's deviation to 8 miles ..	..	3·6
,, ,, ,, ,, ..	Double coat bitumen sealing 10 feet wide from Martin's to McDougall's Lane ..	..	4·47
,, ,, ,, ,, ..	General maintenance throughout	..	35
Hamilton–Coleraine–Casterton Road	Bitumen sealing 16 feet wide, Muntham Hill	..	·8
,, ,, ,, ,,	Road mix seal 12 feet wide between 1 and 4 miles	..	·28
,, ,, ,, ,,	Road mix seal on eastern section to shire boundary from 2 to 6·12 miles	..	4·12
,, ,, ,, ,,	General maintenance	..	16
Wannon Bridge Road	Double coat sealing from H. Williams to McLean's Bridge	..	2·6
,, ,, ,, ...	General maintenance throughout	..	6
WANNON AND GLENELG SHIRES (Joint Works)—			
Hamilton–Coleraine–Casterton Road	General maintenance	..	2·12
WARANGA SHIRE—			
Colbinabbin–Moora Road	Reconstruction and double coat sealing	..	3·45
,, ,, ,, ...	Patrol maintenance throughout	..	8
Colbinabbin–Elmore Road ..	Road mix seal, ¾ inch, through Colbinabbin Township	..	2·18
,, ,, ,, ..	Reconstruction and double coat sealing east of six cross roads	..	2·35
,, ,, ,, ..	Patrol maintenance throughout	..	11
Heathcote–Elmore Road	Reconstruction and double coat sealing two sections near Toolleen	..	4·16
,, ,, ,, ...	Patrol maintenance throughout	..	20
Murchison–Rushworth Road ..	Reconstruction and double coat sealing east of Rushworth	..	3
,, ,, ,, ..	Reconstruction and double coat sealing west of Murchison	..	1·3
,, ,, ,, ..	Patrol maintenance throughout	..	16
Rushworth–Stanhope Road ..	Reconstruction and double coat sealing at Stanhope	..	3·48
,, ,, ,, ..	Patrol maintenance throughout	..	12
Tatura Road	Patrol maintenance throughout	..	1
	Carried forward	—	6211·34

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	—	6211·34
WARRACKNABEAL SHIRE—			
Birchip Road	General maintenance		14
Dimboola Road	General maintenance		7·5
Hopetoun Road	General maintenance		18
Minyip Road	General maintenance		13
Rainbow Road	Limestone construction		2·16
" "	General maintenance		18
WARRAGUL SHIRE—			
Bloomfield Road	Patrol maintenance and tree planting, painting bridges and culverts		8
Brandy Creek Road	Patrol maintenance and painting bridges and culverts		8·2
" "	Road mix seal 1 inch, 20 feet wide, through Warragul Town		1
Darnum-Allambee Road	Patrol maintenance		8
Prince's Highway	Patrol maintenance		1·05
Warragul-Korumburra Road	Patrol maintenance and tree-planting		14·5
" "	Road mix seal ¼ inch, 16 feet wide		·5
" "	Reshaping, resheeting and widening from 9·5 to 12·5 miles		3
Warragul Leongatha Road	Patrol maintenance and tree-planting		4
" "	Widening formation from 0 to ·5 mile		·5
WARRNAMBOOL CITY—			
Prince's Highway	Sheeting with scoria, double coat sealing and realignment from eastern boundary, from 161·44 to 161·76 miles		·32
" "	Patrol maintenance		2·69
WARRNAMBOOL SHIRE—			
Allansford-Nirranda Road	Patrol maintenance throughout		17
Caramut-Lismore Road	Patrol maintenance throughout		6
Framlingham Road	Patrol maintenance throughout		4·5
Garvoc-Laang Road	Patrol maintenance throughout		7
Mortlake Road	Patrol maintenance throughout		16
Peterborough Road	Patrol maintenance throughout		9
Timboon-Nirranda Road	Patrol maintenance throughout		5·5
WERRIBEE SHIRE—			
Geelong-Bacchus Marsh Road	Reforming, gravelling, and patrol maintenance		2·37
WHITTLESEA SHIRE—			
Epping Road	Sealing		1
" "	General maintenance and shouldering between shire boundary and Woodstock		10
Main Whittlesea Road	Reconstruction		2
" "	Sealing		1
" "	General maintenance and shouldering between shire boundary and Whittlesea		14·5
Wallan Road	Reconstruction		1
" "	Sealing		1
" "	General maintenance between Whittlesea and shire boundary		6
Whittlesea-Kinglake Road	Patrol maintenance between Whittlesea and Hume Vale		4·5
WIMMERA SHIRE—			
Dooen Road	Construction of 3 feet gravel strip on each side of bitumen surface		3
" "	Patrol maintenance		3
Horsham Murtoa Road	Reconstruction and construction of box culvert from 1·42 to 1·65 miles		·23
" " "	Double coat sealing from ·4 to 1·65 miles		1·25
" " "	Patrol maintenance		8·29
Horsham-Wal Wal Road	Loaming and gravelling from 6·98 to 7·94 miles		·96
" "	Patrol maintenance		8·2
Natimuk Road	Draining and culverts from 8·4 to 9·4 miles		1
" "	Reshaping and double coat sealing from 1·12 to 8·12 miles		7
" "	Patrol maintenance		9·4
WIMMERA AND ARAPILES SHIRES (Joint Works)—			
Horsham-Hamilton Road	Patrol maintenance		2·98
WIMMERA AND ARAPILES SHIRES, AND HORSHAM TOWN (Joint Works)—			
Horsham-Hamilton Road	Patrol maintenance		·18
WINCHELSEA SHIRE—			
Birregurra Road	Double coat sealing on curve at Prince's Highway		·21
" "	Patrol maintenance throughout		2·5
Birregurra-Dean's Marsh Road	Double coat sealing on sections near Whoorel and Dean's Marsh		1·08
" "	Patrol maintenance throughout		7·5
Birregurra Forrest Road	Double coat sealing near "Studbrook" and near Gerangamete Road		·87
" "	Widening and resheeting existing macadam southerly from railway crossing, Parish of Murroon		·51
" "	Patrol maintenance throughout		10
WINCHELSEA AND COLAC SHIRES (Joint Works)—			
Birregurra Road	Patrol maintenance throughout		1·5
WODONGA SHIRE—			
Kiewa Wodonga Road	Reforming and gravelling		1·25
Sydney Road	Patrol maintenance throughout		1·25
Tallangatta Road	Gravelling		·4
" "	Patrol maintenance throughout		1·4
Wodonga-Yackandandah Road	Gravelling and double coat sealing		1·6
" "	Patrol maintenance throughout		3·4
WONTHAGGI BOROUGH—			
Wonthaggi-Inverloch Road	Patrol maintenance throughout		2·32
Wonthaggi-Korumburra Road	Patrol maintenance throughout		·75
Wonthaggi Loch Road	Patrol maintenance throughout		·81
WOORAYL SHIRE—			
Fairbank Road	General maintenance throughout		2·08
Farmer's Road	General maintenance throughout		13·5
Foster North Mirboo South	General maintenance throughout		2·75
Inverloch-Leongatha Road	General maintenance throughout		16
Inverloch-Wonthaggi Road	General maintenance throughout		2·5
Kongwak-Inverloch Road	General maintenance throughout		2·16
Leongatha-Mirboo Road	General maintenance throughout		6·8
Leongatha-Yarragon Road	General maintenance throughout		13
Lower Tarwin Road	General maintenance throughout		11·75
Main South Gippsland Road	General maintenance throughout		17
Mardan Road	General maintenance throughout		10
Turton's Creek	General maintenance throughout		6·75
Wild Dog Valley Road	General maintenance throughout		9
	Carried Forward	—	6640·86

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Reconstruction and Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	..	6640·86
WYCHEPROOF SHIRE—			
Birchip Sealake Road	Clearing, forming, and limestoning in sections southerly from Sealake	..	·68
,, ,, ,, ...	Patrol maintenance southerly from Sealake to shire boundary	..	17·5
Birchip Wycheproof Road ..	Reshouldering and resheeting easterly from Tchum Lake	..	2·25
,, ,, ,, ..	Patrol maintenance westerly from Wycheproof to Tchum Lake	..	16·5
Sealake–Ultima Road	Patrol maintenance easterly from Sealake to shire boundary	..	10
Woomelang–Sealake Road ..	Patrol maintenance from Birchip turnoff to shire boundary	..	10
Wycheproof–Sealake Road ..	Patrol maintenance through Townships of Wycheproof and Sealake	..	1·1
YACKANDANDAH SHIRE—			
Dederang Road	Patrol maintenance throughout, and preparation for sealing from 0 to ·75 mile ..	..	28
Gundowring Road	Patrol maintenance throughout, and preparation for sealing from 6 to 10 miles ..	..	20·1
Kergunyah South Road	Patrol maintenance throughout	..	11·2
Kiewa East Road	Patrol maintenance throughout	..	3·2
Kiewa–Wodonga Road	Double coat sealing from 3·4 to 4·4 miles	..	1
,, ,, ,, ...	Reconditioning with roller and grader	..	3·4
,, ,, ,, ...	Patrol maintenance throughout	..	6·4
Myrtleford Yackandandah Road ..	Patrol maintenance throughout	..	5·4
Yackandandah Wodonga Road ..	Double coat sealing from 4·5 to 5·3 miles	..	·8
,, ,, ,, ..	Reconditioning with roller and grader	..	9·6
,, ,, ,, ..	Patrol maintenance throughout, and preparation for sealing from 8·5 to 9·5 miles ..	..	15·7
YARRAWONGA SHIRE—			
Peechelba Road	General maintenance between Wangaratta Yarrawonga Road and Ovens River ..	..	1
Tungamah–Wilby Road	General maintenance between shire boundary and Wilby	..	1·25
Wangaratta–Yarrawonga Road ..	General maintenance between Murray River and Murray Valley Highway at Township of Yarrawonga and Murray Valley Highway and shire boundary. Parishes of Bundalong and Peechelba	..	10·5
YEA SHIRE—			
Highlands Road	General maintenance	..	2·5
Molesworth–Dropmore Road ..	General maintenance	..	10
Upper Goulburn Road	Strip sealing 12 feet wide from Yellow Creek Bridge to Cotton's Pinch	..	6
,, ,, ,, ...	Realignment, regrading, and gravelling at Box Hill	..	·38
,, ,, ,, ...	Realignment, regrading, and gravelling at Morrissey's	..	·15
,, ,, ,, ...	General maintenance	..	21
Whittlesea–Yea Road	General maintenance	..	31
Yarra Glen–Glenburn Road ..	General maintenance	..	10
Yea–Glenburn Road	Strip sealing 12 feet wide from Yea to O'Connor's Flat	..	5·5
,, ,, ,, ...	General maintenance	..	18
YEA AND BROADFORD SHIRES (Joint Works)—			
Upper Goulburn Road	General maintenance	..	1·75
	Total, Ordinary Main Roads	—	6899·79
	METROPOLITAN MAIN ROADS.		
BOX HILL CITY—			
Burwood Road	Construction in crushed rock and priming with cold tar	..	1·12
,, ,, ,, ...	Patrol maintenance	..	·91
Healesville Road	Plant mix drag coat	..	·5
,, ,, ,, ...	Patrol maintenance	..	1·52
BOX HILL AND CAMBERWELL CITIES (Joint Works)—			
Warrigal Road	Construction in crushed rock, including pitched channels	1·07	..
CAMBERWELL CITY—			
Doncaster Road	Widening with crushed rock primed with tar from Marwal Avenue to Balwyn Road ..	..	·44
,, ,, ,, ...	Sealing 10 feet wide from Marwal Avenue to Houghton Street	..	·26
,, ,, ,, ...	Patrol maintenance	..	1·95
Healesville Road	Patrol maintenance	..	·11
CAMBERWELL CITY AND MULGRAVE SHIRE (Joint Works)—			
Warrigal Road	Patrol maintenance	..	1·25
COBURG CITY—			
Sydney Road	General maintenance	..	·6
COLLINGWOOD CITY—			
Heidelberg Road	General maintenance throughout	..	·5
ESSENDON CITY—			
Sunbury Road	Constructing channelling on western side of the eastern roadway and widening road, approximately 5 feet to the channel	..	·2
FOOTSCRAY CITY—			
Ballarat Road	Patrol maintenance from west end of approach to Lynch's Bridge to Nicholson Street ..	..	·88
Prince's Highway	Single coat sealing from Nicholson Street to Barkly Street	..	·5
Napier Street	Patrol maintenance throughout	..	·08
MOORABBIN CITY—			
Warrigal Road	General maintenance, Centre Road to Oak Grove	..	3·54
MORDIALLOC CITY—			
Beach Road	Painting white centre line, 3·2 miles	..	—
,, ,, ,, ...	Patrol maintenance	..	3·2
OAKLEIGH AND MALVERN CITIES (Joint Works)—			
Warrigal Road	Widening bank near Scotchman's Creek	·2	..
OAKLEIGH AND MOORABBIN CITIES (Joint Works)—			
Warrigal Road	Widening with fine crushed rock to 20 feet and surfacing with plant mix seal ..	1	..
,, ,, ,, ...	Patrol maintenance throughout	..	1
PRESTON CITY—			
Epping Road	Construction of rolled concrete base kerb channel and underground drainage from Junction Street to Dundas Street	·3	..
,, ,, ,, ...	Construction of shoulders and concrete kerb channel from Bell Street to Junction Street	..	·19
,, ,, ,, ...	Resheeting with premix from Murray Road to Edgar Street	..	·6
SANDRINGHAM CITY—			
Beach Road	Widening in fine crushed rock, concrete kerbs and channels, drainage work, and adjustment to footpaths from Royal Avenue to Balcombe Road	1·27	..
,, ,, ,, ...	Patrol maintenance	..	5·68
	Total, Metropolitan Main Roads	3·84	22·93
	GRAND TOTAL (Under Municipalities)	3·84	6922·72

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Fature and Locality of Works.	Permanent Works constructed.	Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER DIRECT SUPERVISION OF BOARD.		
ALBERTON SHIRE—			
Boolarra Welshpool Road ..	General maintenance—Grand Ridge Road to South Gippsland Shire boundary—direct labour	..	8·5
BALLAN SHIRE—			
Melbourne-Ballarat Road	General maintenance at Ballan—direct labour	..	1·02
,, ,, ,, ...	Road mix sealing at Ballan—direct labour	..	·93
BALLARAT SHIRE—			
Ballarat-Creswick Road	General maintenance throughout—direct labour	..	5·64
,, ,, ,, ...	Double coat sealing at Mount Rowan—direct labour	..	·76
BARRABOOL SHIRE—			
Anglesea Road	Construction of timber bridge over Thompson's Creek, together with approaches, gravelling, and double coat sealing—direct labour	..	·4
,, ,, ...	Construction of steel and timber bridge over Spring Creek—direct labour	..	·01
BELLARINE SHIRE—			
Geelong-Portarlington Road ..	Double coat sealing of fine crushed rock pavement from Geelong City boundary towards Portarlington—direct labour	..	1·04
Geelong-Queenscliffe Road ..	Filling scours, trimming batters, and laying pitched channel on Leopold Hill—direct labour	..	·25
,, ,, ,, ..	Road mix sealing between rail crossing and Leopold Store—direct labour	..	1·7
BERWICK SHIRE—			
Prince's Highway	General maintenance at Berwick—direct labour	..	·3
BROADFORD SHIRE—			
Sydney Road	General maintenance at Broadford—direct labour	..	1·45
CHELSEA CITY—			
Point Nepean Road	Widening existing reinforced concrete bridge over Patterson River at Chelsea—direct labour	..	·02
COHUNA SHIRE—			
Murray River Valley Road ..	General maintenance at Cohuna—direct labour	..	·5
,, ,, ,, ,, ..	Widening pavement at Cohuna—direct labour	..	·12
DANDENONG SHIRE—			
Prince's Highway	Widening reinforced concrete bridge over Dandenong Creek near Dandenong—direct labour	..	·01
ECHUCA BOROUGH—			
Echuca-Cohuna Road	General maintenance near Echuca—direct labour	..	1·18
,, ,, ,, ...	Construction of bridge near Echuca—direct labour	..	·01
EUROA SHIRE—			
Murchison Shepparton Road ..	General maintenance in Euroa Shire—direct labour	..	7·3
,, ,, ,, ..	Reforming gravelling, and sealing near Arcadia—direct labour	..	2·2
,, ,, ,, ..	Construction of a reinforced concrete flat slab bridge near Arcadia	..	·02
Sydney Road	General maintenance in Euroa Shire—direct labour	..	1·8
FLINDERS SHIRE—			
Mornington-Dromana Road ..	Construction of steel and timber bridge over Dunn's Creek—direct labour	..	·01
GISBORNE SHIRE—			
Melbourne-Bendigo Road	General maintenance at Gisborne—direct labour	..	1·33
,, ,, ,, ...	Improvement to curve at Gisborne—direct labour	..	·05
GOULBURN SHIRE—			
Goulburn Valley Road	General maintenance in Goulburn Shire—direct labour	..	21·2
,, ,, ,, ...	Priming and sealing south of Murchison East—direct labour	..	3·86
,, ,, ,, ...	Priming and sealing between Murchison and Murchison East—direct labour	..	1·09
,, ,, ,, ...	Forming and gravelling between Hughes Creek and Nagambie—direct labour ..	..	2
Murchison-Shepparton Road ..	General maintenance in Goulburn Shire—direct labour	..	3·5
HEALESVILLE SHIRE—			
Healesville-Alexandra Road ..	General maintenance—Yarra River to Gracedale and Dom Dom Saddle to Healesville Shire boundary—direct labour	..	28
,, ,, ,, ..	Road mix sealing from Buxton to Healesville Shire boundary—direct labour ..	..	1·04
,, ,, ,, ..	Removing footpath and widening bridge over Graceburn Creek—direct labour ..	..	·01
,, ,, ,, ..	Construction of timber bridge over Badger Creek—direct labour	..	·01
Marysville Road	General maintenance—St. Fillan to Marysville—direct labour	..	6·5
,, ,, ...	Reconstruction and sealing at Marysville—direct labour	..	·3
HEIDELBERG CITY—			
Heidelberg Road	Widening arch of bridge over Darebin Creek—direct labour	..	·02
HUNTLY SHIRE—			
Bendigo-Echuca Road	General maintenance at Epsom and Elmore—direct labour	..	2·15
KEILOR SHIRE—			
Melbourne-Bendigo Road	General maintenance—Essendon City boundary to Spring Gully—direct labour ..	..	1·08
KILMORE SHIRE—			
Sydney Road	General maintenance at Kilmore—direct labour	..	1·64
LILYDALE SHIRE—			
Main Healesville Road	General maintenance between Lilydale and Yarra River Bridge—direct labour ..	..	11·05
,, ,, ,, ...	General maintenance between Ringwood Borough boundary and Lilydale—direct labour	..	6
,, ,, ,, ...	Spreading crushed rock on earth shoulders between Ringwood Borough boundary and Stringybark Creek—direct labour	..	11·2
,, ,, ,, ...	Shouldering, resheeting with fine crushed rock, priming, and covering with toppings at Black Springs—direct labour	..	·27
Main Warburton Road	General maintenance between junction with Main Healesville Road and bridge over Woori Yallock Creek—direct labour	..	9·9
,, ,, ,, ...	Reconstruction, surfacing with fine crushed rock, and double coat sealing at Little Stringybark Creek near Wandin North State School—direct labour	..	·4
,, ,, ,, ...	Spreading crushed rock over earth shoulders between Main Healesville Road and Killara Hill—direct labour	..	7·5
,, ,, ,, ...	Widening existing reinforced concrete bridge over Wandin Yallock Creek—direct labour	..	·01
Mount Dandenong Road	General maintenance between Montrose Store and Olinda—direct labour	..	5·68
,, ,, ,, ...	Removing slips, filling washouts, and repairing pavement between Montrose Store and Olinda—direct labour	..	5·68
	Carried forward		166·64

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS CONSTRUCTED, ETC.—*continued.*

Name of Municipality and Road.	Nature and Locality of Works.	Permanent Works Constructed.	Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER DIRECT SUPERVISION OF BOARD—*continued.*		
	Brought forward		166·64
LILYDALE SHIRE—*continued*—			
Mount Dandenong Road	Double coat sealing of crushed rock pavement between Montrose Store and Kalorama—direct labour	..	2·48
" " "	Reshaping, spreading top course, and sealing in two sections between Kalorama and Wombat Gully, and between the Log Cabin and Olinda—direct labour	..	1·6
" " "	Spreading crushed rock on earth shoulders between Wombat Gully and the Log Cabin—direct labour	..	1·57
" " "	Construction of pitched channel approximately 1 mile north of Kalorama—direct labour	..	·08
MALDON SHIRE—			
Castlemaine-Maldon Road	Realigning and resheeting near Maldon—direct labour	..	3·37
Maldon-Eddington Road	Repairing Eddington Bridge—direct labour	..	·01
MANSFIELD SHIRE—			
Mansfield Wood's Point Road	General maintenance—Jamieson to Wood's Point—direct labour	..	38
MORWELL SHIRE—			
Boolarra-Foster Road	General maintenance—Boolarra to Boolarra South—direct labour	..	6
Boolarra-Welshpool Road	General maintenance—Morwell-Mirboo Road to English's Corner—direct labour	..	9
Morwell-Mirboo Road	General maintenance—Morwell-Mirboo Shire boundary to Whitelaw's Track—direct labour	..	7
McIVOR SHIRE—			
Kilmore-Heathcote-Bendigo Road	Realigning, resheeting, and sealing between Tooborac and Axedale—direct labour	..	5·16
NEWHAM AND WOODEND SHIRE—			
Melbourne-Bendigo Road	General maintenance at Woodend—direct labour	..	1·1
NEWSTEAD AND MOUNT ALEXANDER SHIRE—			
Castlemaine-Maryborough Road	General maintenance near Castlemaine—direct labour	..	1·37
" " "	General maintenance—Castlemaine to Joyce's Creek—direct labour	..	11·03
" " "	Sealing road junction at Newstead—direct labour	..	·01
" " "	Sealing approaches to bridges at Newstead and Muckleford—direct labour	..	·2
" " "	Construction of deviation at Joyce's Creek—direct labour	..	·31
" " "	Construction of culvert at Newstead—direct labour	..	·01
ORBOST SHIRE—			
Cann Valley Road	General maintenance from Prince's Highway to New South Wales border—direct labour	..	28
Wangrabelle Road	General maintenance—Prince's Highway to Wangrabelle—direct labour	..	16
SEYMOUR SHIRE—			
Goulburn Valley Road	General maintenance in Seymour Shire—direct labour	..	8·85
Sydney Road	General maintenance at Seymour—direct labour	..	1·56
" "	Road mix sealing at Seymour—direct labour	..	1·35
" "	Double coat sealing on shoulders at Seymour—direct labour	..	·39
TAMBO SHIRE—			
Prince's Highway	General maintenance at Lakes Entrance—direct labour	..	1·36
TULLAROOP SHIRE—			
Castlemaine-Maryborough Road	General maintenance—Joyce's Creek to Maryborough—direct labour	..	13·13
" " "	Realigning and resheeting at Joyce's Creek—direct labour	..	·64
" " "	Sealing at Joyce's Creek—direct labour	..	·64
" " "	Realigning and construction of culvert at Carisbrook—direct labour	..	·12
UPPER YARRA SHIRE—			
Wood's Point Road	General maintenance, McVeighs to Matlock—direct labour	..	34
VIOLET TOWN SHIRE—			
Sydney Road	General Maintenance at Violet Town—direct labour	..	·8
WALPEUP SHIRE—			
Mildura Road	Sealing at Ouyen—direct labour	..	·76
WANGARATTA SHIRE—			
Beechworth Road	General maintenance—Avenue section near Wangaratta—direct labour	..	·9
Springhurst-Rutherglen Road	General maintenance in Wangaratta Shire—direct labour	..	2·65
Yarrawonga Road	General maintenance in Wangaratta Shire—direct labour	..	11·3
" "	General maintenance at boundary of Wangaratta Shire and Borough—direct labour	..	·3
" "	Reforming and sanding between Wangaratta and Killawarra—direct labour	..	1·89
WANGARATTA BOROUGH—			
Sydney Road	General maintenance at Wangaratta—direct labour	..	2·4
WERRIBEE SHIRE—			
Melbourne-Geelong Road	General maintenance at Werribee—direct labour	..	·86
WHITTLESEA SHIRE—			
Whittlesea-Kinglake Road	Road mix sealing at Tommy's Hut—direct labour	..	1
WINCHELSEA SHIRE—			
Lorne Road	General maintenance—Lorne to Deans Marsh—direct labour	..	16
" "	Widening surfacing, and channelling near Lorne Township—direct labour	..	·36
" "	Double coat sealing near Lorne Township—direct labour	..	·46
Prince's Highway	General maintenance at Winchelsea Township—direct labour	..	1·4
WODONGA SHIRE—			
Bonegilla Road	General maintenance in Wodonga Shire—direct labour	..	1·52
	Total, Ordinary Main Roads	..	403·6
	METROPOLITAN MAIN ROADS.		
COLLINGWOOD AND HEIDELBERG CITIES (Joint Works)—			
Heidelberg Road	Plant mix surfacing between Clifton Hill railway gates and Golf Links Avenue—direct labour	..	·75
FOOTSCRAY CITY—			
Napier Street	Surfacing portion of existing concrete base	..	·06
FOOTSCRAY AND MELBOURNE CITIES (Joint Works)—			
Ballarat Road	Completion of construction in steel and concrete of Lynch's Bridge over Maribyrnong River—direct labour	·06	..
	Total, Metropolitan Main Roads	·06	·81
	GRAND TOTAL (Under direct supervision of Board)	·06	404·41

APPENDIX E.

COUNTRY ROADS BOARD

STATE HIGHWAYS.

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF HIGHWAYS RECONSTRUCTED AND MAINTAINED UNDER THE PROVISIONS OF THE COUNTRY ROADS ACT 1928 DURING THE YEAR ENDED 30TH JUNE, 1938.

Name of Highway and Section.	Nature and Locality of Works.	Works Reconstructed.	Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER DIRECT SUPERVISION OF THE BOARD.		
PRINCE'S HIGHWAY (WEST)—			
Section 1	Gravelling shoulders at Skeleton Creek—direct labour	1·75	..
,,	Road mix sealing at Little River—direct labour	1	..
,,	Construction of stock crossing at Skeleton Creek—direct labour	·03	..
,,	Light emulsion sealing at Laverton—direct labour	1·7	..
,,	Plant mix sealing between Bacchus Marsh turn-off and Separation-street—direct labour	·55	..
,,	Construction of a reinforced concrete pipe culvert at Laverton—direct labour	·01	..
,,	Road mix sealing between Waurn Ponds and Mount Moriac—direct labour	·4	..
,,	Major repairs and premix regulation between Waurn Ponds and Mount Moriac—direct labour	·4	..
,,	Road mix sealing between Waurn Ponds and Mount Moriac—direct labour	·7	..
,,	Double coat sealing at Mount Moriac—direct labour	1·5	..
,,	Regrading hill, gravelling and double coat sealing west of Mount Moriac—direct labour	·2	..
,,	Pre-mix regulation prior to road mix sealing east from Barrabool-Winchelsea Shire boundary—direct labour	1·2	..
,,	Road mix sealing east from Barrabool-Winchelsea Shire boundary—direct labour	1·2	..
,,	General maintenance	..	52
Section 2	Resheeting in crushed rock near Warncoort—direct labour	1	..
,,	Pre-mix patching and increasing super-elevation of curves prior to road mix sealing, from Winchelsea-Colac Shire boundary to Colac—direct labour	10·67	..
,,	Road mix sealing between Weerite and Camperdown—direct labour	3·4	..
,,	Pre-mix regulation and road mix sealing west of Winchelsea—direct labour	2·95	..
,,	General maintenance	..	48·81
Section 3	Road mix sealing, Gnotuk to Port Fairy—direct labour	13·34	..
,,	General maintenance	..	52·38
Section 4	Reconstruction in crushed rock between Port Fairy and Yambuk—direct labour	·37	..
,,	Road mix sealing at Finn's Corner two miles west of Port Fairy—direct labour	·22	..
,,	Reconstruction in buckshot gravel between Tyrendarra and Narrawong—direct labour	3·74	..
,,	Road mix sealing near Tyrendarra—direct labour	1·9	..
,,	Road mix sealing near Narrawong—direct labour	2·19	..
,,	Sealing between Aliestree and Bolwarra—direct labour	2·39	..
,,	Road mix sealing between Heathmere and Heywood—direct labour	5	..
,,	Replacement of timber bridge by flat slab type concrete structure over Darlot's Creek at Tyrendarra—direct labour	·01	..
,,	General maintenance	..	49·8
Section 5	Reconstruction in buckshot gravel westerly from bridge over the Fitzroy River in Heywood Township—direct labour	·4	..
,,	Road mix sealing between Winnap and Dartmoor—direct labour	2·87	..
,,	General maintenance	..	44·62
PRINCE'S HIGHWAY (EAST)—			
Section 1	Reconstruction in sand and double coat sealing between Deep Creek and Hancock's Gully—direct labour	1	..
,,	Realignment in sand and double coat sealing at Whiskey Creek—direct labour	·2	..
,,	Construction in sand of deviation at Robin Hood Hotel—direct labour	·8	..
,,	Reconstruction and double coat sealing between Drouin and Warragul—direct labour	3·7	..
,,	Light plant mix sealing between Springvale and Hallam—direct labour	7·28	..
,,	Light emulsion sealing between Beaconsfield and Officer—direct labour	·8	..
,,	Grubbing stumps under pavement, resheeting and double coat sealing near Longwarry North—direct labour	3	..
,,	Widening existing timber bridge over Ti Tree Creek—direct labour	·01	..
,,	Construction of a two-cell reinforced concrete culvert near 43 mile post in the Shire of Berwick—direct labour	·01	..
,,	General maintenance	..	49·93
Section 2	Widening and resheeting with granitic sand easterly from Traralgon Creek bridge—direct labour	·5	..
,,	Widening concrete bridge over Moe River—direct labour	·02	..
,,	Widening timber bridge over Blind Joe's Creek near Rosedale—direct labour	·02	..
,,	Construction of approaches to highway from Upper Flynn-road and Flynn railway station—direct labour	·08	..
,,	Construction of a reinforced concrete bridge over Latrobe River at Rosedale—direct labour	·35	..
,,	Replacement of culvert at 93·2 miles—direct labour	·01	..
,,	Sealing at 117 mile post—direct labour	·1	..
,,	Realigning curves at western approach to Thompson River bridge—direct labour	·24	..
,,	General maintenance	..	66·76
Section 3	Road mix sealing existing pavement between Montgomery and Stratford—direct labour	3·45	..
,,	General maintenance	..	38·1
Section 4	Double coat sealing at Filmer's Corner—direct labour	·2	..
,,	Double coat sealing approaches to Bosses' Swamp bridge—direct labour	·19	..
,,	Repairs to Nicholson River bridge—direct labour	·01	..
,,	Pre-mix regulation between 189 and 191 mile post—direct labour	2·2	..
,,	Improvement to curve and double coat sealing at Bark's Corner—direct labour	·17	..
,,	Improvement to curve and double coat sealing at Kalimna Golf Links Corner—direct labour	·13	..
,,	Forming, grading, gravelling and construction of culverts near Toorloo Arm	·54	..
,,	General maintenance	..	58·83
Section 5	Reconditioning, realigning, gravelling and double coat sealing between Orbost and Fat Cow Creek—direct labour	4·14	..
,,	Repairs to approaches at Newton's Creek bridge—direct labour	·62	..
,,	Reconditioning, realigning and gravelling between Bellbird and Cadwalladers—direct labour	·48	..
,,	Clearing, grading, forming, boxing, trimming, gravelling and construction of a culvert between Cabbage Tree and Bellbird	4·33	..
,,	General maintenance	..	54·18
Section 6	Reconditioning, realigning and gravelling between Tracey's and Wingan River—direct labour	1·84	..
,,	Improving three curves near New South Wales border—direct labour	·24	..
,,	General maintenance	..	41·49
	Carried forward	97·75	556·9

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS RECONSTRUCTED, ETC.—*continued.*

Name of Highway and Section.	Name and Locality of Works.	Works Reconstructed.	Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER DIRECT SUPERVISION OF THE BOARD—*continued.*		
	Brought forward	97·75	556·9
WESTERN HIGHWAY—			
Section 1	Plant mix sealing at Deer Park—direct labour	3·9	..
,,	Road mix sealing between Rockbank and Melton—direct labour	14·3	..
,,	Major repairs prior to road mix sealing at Djerriwarrah Creek—direct labour	·25	..
,,	Gravelling shoulders at Rockbank—direct labour	1	..
,,	Road mix sealing at Bacchus Marsh—direct labour	1·7	..
,,	Realigning, resheeting and double coat sealing at Korkuperrimal Creek—direct labour	·4	..
,,	Road mix sealing at Myrniong—direct labour	2·2	..
,,	Pre-mix regulating and plant mix sealing east of Myrniong—direct labour	·35	..
,,	Plant mix sealing at Pyke's Creek—direct labour	·31	..
,,	Road mix sealing west of Gordon—direct labour	2·4	..
,,	General maintenance	..	55·21
Section 2	Pre-mix regulating from Ballarat to west of Burrumbeet—direct labour	13	..
,,	Road mix sealing west of Burrumbeet—direct labour	3·2	..
,,	Light emulsion resealing between Burrumbeet and Trawalla—direct labour	4·5	..
,,	Super-elevating curves between Ballarat and Burrumbeet—direct labour	·28	..
,,	Widening shoulders at Box's Cutting west of Beaufort—direct labour	1	..
,,	Road mix sealing from Middle Creek through Buangor—direct labour	4·7	..
,,	Widening and double coat sealing edges and pre-mix regulating east and west of Buangor—direct labour	2	..
,,	Double coat sealing approaches to Hopkin's River bridge at Dobie—direct labour	·42	..
,,	Widening and double coat sealing edges between Dobie and Greenhill's Creek—direct labour	1·6	..
,,	Realigning and double coat sealing curve at 123 mile post east of Greenhill's Creek—direct labour	·2	..
,,	General maintenance	..	53·08
Section 3	General maintenance	..	50·36
Section 4	Pre-mix regulating west of Gerang—direct labour	1·5	..
,,	Road mix sealing between Horsham and Pimpinio—direct labour	2	..
,,	General maintenance	..	38·7
CALDER HIGHWAY—			
Section 1	Road mix sealing west of Kyneton—direct labour	1·15	..
,,	Road mix sealing and pre-mix patching west of Gisborne—direct labour	·45	..
,,	Grubbing, clearing and forming south of Woodend—direct labour	1	..
,,	Road mix sealing, pre-mix patching and shouldering between Woodend and Carlsruhe—direct labour	3·85	..
,,	Road mix sealing, pre-mix patching and shouldering east of Kyneton—direct labour	2·88	..
,,	Repairing road mix seal between 20 and 27 mile posts—direct labour	6·45	..
,,	Repairing road mix seal between Woodend and Kyneton—direct labour	1·5	..
,,	Sealing approaches to bridge at Chewton—direct labour	·2	..
,,	Reconstruction of culverts at Chewton—direct labour	·01	..
,,	General maintenance	..	58
Section 2	Construction of road junction at Bridgewater—direct labour	·05	..
,,	Reshaping, resheeting and sealing near Castlemaine and Harcourt—direct labour	1·3	..
,,	Road mix sealing north of Bendigo—direct labour	1·91	..
,,	Redecking and widening three culverts north of Castlemaine—direct labour	·01	..
,,	General maintenance	..	43·07
Section 3	Pre-mix patching and road mix sealing south of Wedderburn—direct labour	·87	..
,,	Sealing approaches to bridge at Wedderburn—direct labour	·2	..
,,	Renewing deck of bridge south of Admey's Hill—direct labour	·01	..
,,	General maintenance	..	52·23
Section 5	Reforming and sheeting between Mittyack and Nunga—direct labour	3·97	..
,,	Reconstruction and regrading of sandhills near Pier Millan—direct labour	2·64	..
,,	General maintenance	..	44·81
Section 6	Reforming and sheeting between Trinita and Nowingi—direct labour	3·1	..
,,	Reforming, grading and sheeting south of Trinita—direct labour	1·64	..
,,	Reforming, grading and sheeting between Ouyen and Trinita—direct labour	3·91	..
,,	General maintenance	..	40·14
NORTHERN HIGHWAY—			
Section 1	Road mix sealing southerly from Murray Valley Highway—direct labour	·31	..
,,	Light emulsion sealing southerly from Echuca—direct labour	8·25	..
,,	General maintenance	..	48·5
HUME HIGHWAY—			
Section 1	Super-elevating curve and road mix sealing at Craigieburn—direct labour	1·6	..
,,	Road mix sealing at Wallan—direct labour	4·1	..
,,	Super-elevating curve and double coat sealing between Pretty Sally's Hill and Wallan—direct labour	·16	..
,,	Road mix sealing south of Tallarook—direct labour	2·1	..
,,	Laying non-skid seal coat on Beveridge Hill—direct labour	·23	..
,,	Light sealing north of Craigieburn—direct labour	·8	..
,,	Widening existing reinforced concrete bridge near 39 mile post in Kilmore Shire—direct labour	·01	..
,,	General maintenance	..	48·32
Section 2	Construction of new curve north of Seymour—direct labour	·15	..
,,	Construction of new curve north of Avenel—direct labour	·19	..
,,	General maintenance	..	55·66
Section 3	Construction of approaches to Benalla storeyard—direct labour	·12	..
,,	Construction of new reinforced concrete culvert over Felltimber Creek near Wodonga—direct labour	·05	..
,,	Construction of footbridge on existing bridge over Indigo Creek—direct labour	·01	..
,,	General maintenance	..	60·18
OMEO HIGHWAY—			
Section 1	Widening and reconditioning from Bark Shed to Shady Creek—direct labour	·74	..
,,	Widening and reconditioning from Shady Creek to Tambo Crossing—direct labour	·76	..
,,	General maintenance	..	16·39
Section 2	Reconditioning and double coat sealing in Swift's Creek Township—direct labour	1·39	..
,,	Construction of deviation at Tucker Box Hill—direct labour	·36	..
Section 3	Realigning, regrading, surfacing and construction of new bridge over Cemetery Creek—direct labour	·54	..
,,	Reconditioning, widening and surfacing between Sunnyside and Lightning Creek—direct labour	1·32	..
MURRAY VALLEY HIGHWAY—			
Section 1	Road mix sealing near Huon—direct labour	4·4	..
,,	Priming and sealing at Walwa—direct labour	·5	..
,,	Construction of reinforced concrete bridge over Kiewa River—direct labour	·02	..
,,	Reshaping and surfacing at Granya—direct labour	·2	..
,,	General maintenance	..	88·58
Section 2	Reshaping and sanding westerly from Wyuna—direct labour	7·76	..
,,	Resheeting and sealing east of Echuca—direct labour	5·34	..
,,	Pre-mix patching and road mix sealing easterly and westerly from Echuca—direct labour	2·93	..
,,	Realigning three curves east of Echuca—direct labour	·85	..
,,	Construction of new curves between Hume Highway and Rutherglen—direct labour	·12	..
,,	Forming and sanding between Rutherglen and Yarrawonga—direct labour	·8	..
,,	Reforming and gravelling west of Rutherglen—direct labour	1·08	..
,,	Priming and sealing west of Rutherglen—direct labour	·97	..
,,	Construction of new curve between Rutherglen and Wodonga—direct labour	·59	..
	Carried forward	247·5	1310·26

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS RECONSTRUCTED, ETC.—*continued.*

Name of Highway and Section.	Nature and Locality of Work.	Works Reconstructed.	Maintenance Works Carried Out.
		Miles.	Miles
	UNDER DIRECT SUPERVISION OF THE BOARD—*continued.*		
	Brought forward	247·5	1310·26
MURRAY VALLEY HIGHWAY—*continued.*			
Section 2	Road mix sealing west of Yarrawonga—direct labour	·36	..
,,	Priming and sealing in Cobram township—direct labour	·3	..
,,	General maintenance	..	140·5
Section 3	Light emulsion sealing westerly from Echuca—direct labour	1·83	..
,,	Pre-mix patching between Echuca and Turrumbery—direct labour	13·03	..
,,	Sealing approaches to State Rivers and Water Supply Commission's culverts between Leitchville turnoff and Kerang—direct labour	·38	..
,,	Construction of approaches to Lazarus'-road east of Cohuna—direct labour	·02	..
,,	Pre-mix patching and road mix sealing between Leitchville and Kerang—direct labour	23·67	..
,,	Pre-mix patching near Cohuna—direct labour	4·9	..
,,	Realigning curves at Kerang—direct labour	·1	..
,,	Pre-mix patching between Kerang and Lake Charm—direct labour	17·13	..
,,	Road mix sealing north of Kerang—direct labour	1	..
,,	Sealing between Tresco and Lake Boga—direct labour	2·82	..
,,	Road mix sealing between Tresco and Lake Boga—direct labour	3·84	..
,,	Resheeting and sealing at Lake Boga—direct labour	·9	..
,,	Construction of decking on State Rivers and Water Supply Commission's bridges near Cohuna—direct labour	·02	..
,,	Sealing west of Cohuna—direct labour	·98	..
,,	General maintenance	..	98·19
Section 4	Reforming and sheeting between Boundary Bend and Lake Powell—direct labour	9·54	..
,,	General maintenance	..	54·7
SOUTH GIPPSLAND HIGHWAY—			
Section 1	Resheeting with fine crushed rock and double coat sealing east of Cranbourne—direct labour	·5	..
,,	Double coat sealing east of Five Ways—direct labour	2	..
,,	Resheeting with fine crushed rock and double coat sealing east of contour drain—direct labour	1·1	..
,,	Shouldering and road mix sealing west of Tooradin—direct labour	1	..
,,	Surfacing with fine crushed rock at Dalmore—direct labour	·36	..
,,	Correction in sand and double coat sealing from Lang Lang River to Main Coast-road turnoff—direct labour	2·75	..
,,	Reconstruction in sand from Main Coast-road turnoff to 54 mile post—direct labour	2·25	..
,,	Construction of a reinforced concrete bridge over Eumemmering Creek	·02	..
,,	General maintenance	..	38·8
Section 3	Construction of new bridge and approaches over Merriman's Creek—direct labour	·13	..
,,	Replacement of culvert at 30·6 miles—direct labour	·01	..
,,	Replacement of culvert at 38 mile post—direct labour	·01	..
,,	Reconditioning, gravelling and realigning at Seaspray turnoff—direct labour	·26	..
,,	Replacement of culvert at 41·4 miles—direct labour	·01	..
,,	Reconditioning, gravelling and double coat sealing at Longford causeway—direct labour	·68	..
,,	Construction of new bridge over Longford causeway—direct labour	·02	..
,,	General maintenance	..	16·45
MIDLAND HIGHWAY—			
Section 1	Resheeting and light double coat sealing prior to road mix sealing between Lethbridge and Meredith—direct labour	1·35	..
,,	Road mix sealing between Lethbridge and Meredith—direct labour	5·6	..
,,	General maintenance	..	49·59
Section 4	Surface treatment between Shepparton and Pine Lodge—direct labour	2	..
,,	General maintenance	..	36·32
Section 5	Construction of approaches to new bridge near Swanpool—direct labour	·49	..
,,	Reforming and resheeting between Benalla and Swanpool—direct labour	·99	..
,,	Road mix sealing near Benalla—direct labour	3·06	..
,,	Construction of reinforced concrete bridge near Benalla—direct labour	·02	..
,,	Reshaping, widening and sealing south of Swanpool—direct labour	·3	..
,,	General maintenance	..	28·6
BONANG HIGHWAY—			
Section 1	Reconditioning and gravelling north of Orbost Showgrounds—direct labour	1·53	..
,,	Reconditioning, gravelling and widening in sections throughout—direct labour	4·5	..
,,	Widening and top dressing from Blue Gum to Toney's—direct labour	2·5	..
,,	General maintenance	..	72·04
STURT HIGHWAY—			
Section 1	Reforming and sheeting easterly from South Australian border—direct labour	20·66	..
,,	General maintenance	..	61·62
	Total (Under direct supervision of Board)	382·42	1907·07
	UNDER MUNICIPALITIES.		
ALBERTON SHIRE—			
South Gippsland Highway—			
Section 3	Regrading, shouldering, and gravelling from near Giffard Road junction to Morris's Creek, 27 to 28 miles	1	..
,,	Regrading, shouldering, and gravelling from Nightingale's to Four Mile Creek, 24 to 25·2 miles	1·2	..
,,	Double coat sealing from Shield's to near Giffard Road junction, 21·3 to 27 miles	5·7	..
,,	Construction of concrete end walls and posts on culverts between 35·5 miles and 37·5 miles	—	..
,,	Patrol maintenance throughout from Monkey Creek to Yarram, 16·8 to 44·3 miles	..	27·5
LAWLOIT SHIRE—			
Western Highway—			
Section 5	Tree planting from 255 to 257·1 miles and 259 to 260 miles, 3·1 miles	—	..
,,	Resheeting with gravel from 244·6 to 245·17 miles	·57	..
,,	Reshaping and regrading limestone from 268·62 to 268·92 miles and 269·55 to 270·1 miles	·85	..
,,	Resheeting with limestone from 267·1 to 268·62 miles, 268·92 to 269·55 miles, and 270·1 to 271·5 miles	3·6	..
,,	Resheeting with gravel from 272·9 to 273·77 miles	·87	..
,,	Double coat sealing from 244·6 to 247·1 miles	2·5	..
,,	Double coat sealing from 268·62 to 268·92 miles and 269·55 to 270·1 miles	·85	..
,,	Patrol maintenance throughout and grading side tracks	..	29·2
LOWAN SHIRE—			
Western Highway—			
Section 4	Patrol maintenance throughout	..	3·4
Section 5	Double coat sealing from 242·04 to 244·6 miles in Parish of Kinimakatka	..	2·56
,,	Patrol maintenance throughout	..	9·98
OMEO SHIRE—			
Omeo Highway—			
Section 1	Patrol maintenance, including erection of guard posts, from 45·9 to 62·88 miles	..	16·98
Section 2	Widening and realignment from 10·39 to 10·43 miles, 32·96 to 33·05 miles, and 38·88 to 38·92 miles	·17	..
	Carried forward	17·31	89·62

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF ROADS RECONSTRUCTED, ETC.—*continued.*

Name of Highway and Section.	Nature and Locality of Work.	Works Reconstructed.	Maintenance Works Carried Out.
		Miles.	Miles.
	UNDER MUNICIPALITIES—*continued.*		
	Brought forward	17·31	89·62
OMEO SHIRE—*continued.*			
Section 2	Construction of two-span timber bridge over Sheep Station Creek with forming and gravelling of approaches from 23·5 to 23·84 miles	·34	..
.. ..	Reconditioning, gravelling, and sealing with bitumen from 19·16 to 20·57 miles ..	1·41	..
.. ..	Reconstruction of bridge over Bald Hills Creek, with forming and gravelling of approaches from 17·37 to 17·48 miles	·11	..
.. ..	Forming and gravelling from 14·19 to 14·33 miles	·14	..
.. ..	Patrol maintenance, including erection of guard Posts, from 0 to 45·9 miles	..	45·9
Section 3	Widening box cutting from 3·06 to 3·1 miles	·04	..
.. ..	Forming and gravelling from 4·02 to 4·22 miles, and construction of a double 30-in. diameter reinforced concrete pipe culvert at 4·13 miles	·2	..
.. ..	Forming and gravelling from 4·37 to 4·59 miles, and construction of a 54 in. diameter reinforced concrete pipe culvert at 4·48 miles	·22	..
.. ..	Widening and benching from 6·33 to 6·42 miles	·03	..
.. ..	Widening and realignment from 9·06 to 9·39 miles, 9·67 to 9·84 miles, 10 to 10·07 miles, 10·3 to 10·37 miles, 10·68 to 10·8 miles, 40·98 to 41·02 miles, and 42·59 to 42·7 miles	·91	..
.. ..	Widening to form car park from 41·17 to 41·21 miles	·04	..
.. ..	Patrol maintenance, including erection of guard posts, from 0 to 55 miles	..	55
SWAN HILL SHIRE—			
Murray Valley Highway—			
Section 3	Road mix seal at Lake Boga, 85·76 to 87·35 miles	1·59	..
.. ..	Realignment of curves at 87·4, 89·1, and 90 miles	1·06	..
.. ..	Double coat sealing from Lake Boga to Pental Siding, 87·55 to 90·1 miles	2·55	..
.. ..	Patrol maintenance from Lake Boga to Swan Hill, 85·76 to 94·35 miles	..	8·59
Section 4	Road mix seal at Swan Hill, from 1·81 to 4·26 miles	2·45	..
.. ..	Sheeting 3-in. depth, realignment of curves and double coat sealing at Nyah North, from 17·19 to 20·22 miles	3·03	..
.. ..	Sheeting 3-in. depth at Wood Wood, from 20·22 to 23·25 miles	3·03	..
.. ..	Patrol maintenance from Swan Hill to Boundary Bend, 1·81 to 56·17 miles	..	54·36
TOWONG SHIRE—			
Murray Valley Highway—			
Section 1	Construction of large concrete box culvert at 52·85 miles	—	..
.. ..	Forming culverts and sanding, including deviation between 51·31 and 52·97 miles approximately 8 miles north-east of Granya	1·15	..
.. ..	Improvement to curve near Jingellic Bridge, from 80·3 to 80·37 miles	·07	..
Omeo Highway—			
Section 3	Construction of two curves between Granite Flat and Mitta Mitta, from 63·4 to 63·57 miles and 65·37 to 65·45 miles	·25	..
.. ..	Widening Lord's side cutting from 72·92 to 73·69 miles	·77	..
.. ..	Patrol maintenance from Lightning Creek to Eskdale, 54·89 to 80·24 miles	..	25·35
Section 4	Construction of two-case in place of concrete pipe culverts at 98·25 and 98·35 miles ..	—	..
.. ..	Reconstruction of side cuttings from 97·8 to 98·1 near Fernvale	1·29	..
.. ..	Patrol maintenance from Eskdale to Tallangatta, 80·24 to 104·36 miles	..	24·12
UPPER MURRAY SHIRE—			
Murray Valley Highway—			
Section 1	Forming, grading, and gravelling deviation between 104·36 and 104·91 miles	·55	..
.. ..	Construction of 36-in. x 18-in. reinforced concrete box culvert at 103 miles—direct labour	—	..
.. ..	Construction of 36-in. x 18-in. reinforced concrete box culvert at 105 miles—direct labour	—	..
.. ..	Double coat sealing Miller's Hill between 103·69 and 102·24 miles	·55	..
.. ..	Patrol maintenance throughout	..	20·2
WYCHEPROOF SHIRE—			
Calder Highway—			
Section 4	Reconditioning and sealing north of Nullawil from 198·89 to 201·2 miles	2·31	..
.. ..	Reconditioning and sealing from Culgoa to Berriwillock, 209·1 to 219 miles	9·9	..
.. ..	Patrol maintenance from Wycheproof to Sea Lake, 182·28 to 229·44 miles	..	47·16
Section 5	Realignment at Sea Lake from 230 to 230·5 miles	·5	..
.. ..	Realignment north of Sea Lake from 231·71 to 232·25 miles	·54	..
.. .. ..	Patrol maintenance from Sea Lake to Nyarrin turnoff, 230·02 to 241·52 miles ..	..	11·5
	Total	52·34	381·8

APPENDIX F.

COUNTRY ROADS BOARD.

TOURISTS' ROADS.

STATEMENT SHOWING MILEAGE, LOCALITY, ETC., OF TOURISTS' ROADS RECONSTRUCTED AND MAINTAINED UNDER THE PROVISIONS OF THE COUNTRY ROADS ACT 1928 DURING THE YEAR ENDED 30TH JUNE, 1938.

Name of Municipality and Road.	Nature and Locality of Work.	Works Reconstructed.	Maintenance Works Carried Out.
		Miles.	Miles.
UNDER DIRECT SUPERVISION OF THE BOARD.			
Acheron Way	Resheeting and double coat sealing at Somers Park—direct labour	·19	..
" "	Widening and resheeting with crushed rock from Marysville-road at St. Fillans to Somers Park—direct labour	1·31	..
" "	Priming existing crushed rock with cold tar adjacent to Somers Park—direct labour	1	..
" "	Widening road and extending parking space at Cement Creek—direct labour	·98	..
" "	General maintenance	..	23
Donna Buang Roads	Reforming, grading and surfacing with crushed rock near Panton's Gap—direct labour	·76	..
" " "	Reshaping, repairing and surfacing with decomposed rock between Panton's Gap and Wade's Lookout—direct labour	·95	..
" " "	General maintenance	..	22·5
Gipsy Point-road	General maintenance	..	1·5
Mallacoota-road	General maintenance	..	15
Sydenham Inlet-road	General maintenance	..	14
	Total (Under direct supervision of Board)	4·29	76·
UNDER MUNICIPALITIES.			
OMEO AND BRIGHT SHIRES (Joint Works)—			
Alpine-road	Forming and gravelling at Emu Plain from 19 to 19·72 miles	·72	..
" "	Reforming, widening and gravelling from 26·6 to 26·73 miles and 27·63 to 27·95 miles	·45	..
" "	Patrol maintenance	..	33
OTWAY SHIRE—			
Ocean-road (Apollo Bay to Lavers Hill)	Double coat sealing 12 feet wide from Lavers Hill, from 0 to 1·1 miles	1·1	..
" " " " "	Replacing old timber culvert with double 12-in. diameter reinforced concrete pipes, 48 feet long	·01	..
" " " " "	Widening, super-elevating and resheeting with crushed rock from 1·1 to 2·19 miles	·79	..
" " " " "	Patrol maintenance from Apollo Bay to Lavers Hill	..	34
	Total (Under Municipalities)	3·37	67·

APPENDIX G.

COUNTRY ROADS BOARD.

UNEMPLOYMENT RELIEF ACT, No. 4097.

STATEMENT SHOWING DETAILS OF UNEMPLOYMENT RELIEF WORKS PUT IN HAND DURING THE YEAR ENDING 30TH JUNE, 1938.

Municipality and Road.	Particulars of Work.	Grant.	Expenditure.
		£	£ s. d.
ALBERTON SHIRE			
Carrajung-Merrimans Creek Road	Forming and side cutting	3,000	1,939 14 2
Jack River Valley Road	Forming and grading	1,000	1,000 0 0
MANSFIELD AND ALEXANDRA SHIRE—			
Maintongoon Road	Forming	1,000	1,000 0 0
ARAPILES SHIRE—			
Goroke-Natimuk Road	Forming and gravelling	1,000	470 18 11
Mount Arapiles Road	Clearing and forming	750	750 0 0
BAIRNSDALE AND AVON SHIRES—			
Lindenow-Dargo Road	Forming	2,000	2,000 0 0
BANNOCKBURN AND CORIO SHIRES—			
Ballan-Anakie Road	Reforming and surfacing	1,000	746 5 3
BENALLA SHIRE—			
Benalla-Yarrawonga Road	Clearing, forming and gravelling	3,000	25 11 6
BET BET SHIRE—			
Bealiba-Tarnagulla Road	Forming and gravelling	500	493 19 1
BIRCHIP—			
Berriwillock Road	Surfacing with limestone	1,500	..
BUNINYONG SHIRE—			
Yendon-Egerton Road	Forming and gravelling	1,500	1,500 0 0
CHARLTON SHIRE—			
Stone Crossings	Crossings over flood sections	2,000	1,916 2 10
Boort-Charlton Road	Forming and gravelling	1,000	999 10 8
CRANBOURNE SHIRE—			
Mount Lyall Road	Clearing and forming	1,000	980 4 3
GORDON SHIRE—			
Boort-Wycheproof Road	Forming and gravelling	1,000	1,000 0 0
KARKAROOC SHIRE—			
Hopetoun-Yarto Road	Forming and metalling	500	410 13 4
Speed-Nyarrin Road	Forming and surfacing	500	455 17 11
KERANG SHIRE—			
Koroop Road	Forming, reforming and gravelling	1,000	120 14 11
MAFFRA SHIRE—			
Licola Road	Widening side cuttings	2,500	2,500 0 0
MANSFIELD SHIRE—			
Mansfield-Wood's Point Road	Widening side cuttings	1,500	1,500 0 0
MARONG SHIRE			
Ravenswood Marong Road	Reforming	1,000	943 8 8
METCALFE SHIRE—			
Elphinstone-Harcourt Road	Reforming and surfacing	2,000	1,326 7 9
MIRBOO SHIRE—			
Clear Creek Valley West Road	Grading, forming and culverts	1,500	1,492 15 2
OMEO SHIRE—			
Tambo Valley (Omeo Highway)	Forming, grading and gravelling	1,500	1,500 0 0
ORBOST SHIRE—			
Betka River	Construction of bridge	500	500 0 0
OXLEY SHIRE—			
Upper Rose River Road	Clearing and forming	1,000	965 19 9
SOUTH GIPPSLAND SHIRE—			
Darby River Road	Clearing, forming and surfacing	3,500	3,500 0 0
Fish Creek-Waratah Bay Road	Clearing and forming	1,000	1,000 0 0
	Carried forward	39,250	31,038 4 2

STATEMENT SHOWING DETAILS OF UNEMPLOYMENT RELIEF WORKS, ETC.—*continued.*

Municipality and Road.	Particulars of Work.	Grant.	Expenditure.
		£	£ s. d.
	Brought forward ..	39,250	31,038 4 2
SWAN HILL SHIRE—			
Nyah–Ouyen Road	Clearing, forming and surfacing	1,500	1,500 0 0
TAMBO SHIRE—			
Bonang–Gelantipy Road	Clearing and forming	1,000	830 13 2
Orbost–Buchan Road	Forming	4,500	3,280 16 10
Suggan–Buggan Road	Clearing and forming	6,500	4,000 0 0
TOWONG SHIRE—			
Tallangatta–Corryong Road	Reforming and surfacing	1,000	1,000 0 0
WARANGA SHIRE—			
Stanhope Estate Road	Forming and surfacing	1,000	997 3 0
WARRACKNABEAL SHIRE—			
Donald–Warracknabeal Road	Forming and surfacing	1,000	1,000 0 0
WARRNAMBOOL SHIRE—			
Naringal Road	Clearing and forming	1,000	39 11 2
WINCHELSEA SHIRE—			
Lorne–Erskine Falls Road	Widening and reforming	1,000	1,000 0 0
WOORAYL SHIRE AND WONTHAGGI BOROUGH—			
Cape Patterson–Eagle's Nest Road	Forming	1,500	1,396 18 10
WOORAYL SHIRE—			
Cape Patterson–Eagle's Nest Road	Forming	1,000	1,000 0 0
Buffalo–Waratah Road	Forming and reforming and gravelling ..	2,000	1,006 4 7
WYCHEPROOF SHIRE—			
Wycheproof–Boort Road	Forming and surfacing	1,000	996 17 4
ORBOST SHIRE—			
Princes Highway East	Widening	454	418 3 5
CRANBOURNE SHIRE—			
South Gippsland Highway	Clearing scrub for stock route	901	901 0 0
BULN BULN SHIRE—			
Princes Highway East	Clearing scrub for stock route	645	645 0 0
		65,250	51,050 12 6

APPENDIX H.

Amendment to portion of Page 3 of Instructions to Municipal Engineers (1938)

CURVATURE, CROSS SECTION AND SUPERELEVATION.

For the purpose of curve design roads are divided into two classes, Class "A" roads being those in open country and where speeds are generally 35 miles per hour or over, and Class "B" roads being those in hilly country, and where speeds are generally less than 35 miles per hour.

CURVATURE.

CLASS A ROADS.

Principles of Design.—In open country and where speeds are generally 35 miles and over, transitioned curves shall be used whenever possible. Transition curves shall be spirals designed for a particular uniform speed in accordance with the following principles:

At the junction of tangent and spiral (TS) there is no acceleration of the vehicle towards the centre of the curve, but at a point on a curve where the radius is R (feet) and the speed v (feet per sec.) the acceleration is $\frac{v^2}{R}$ towards the centre. At constant speed v, in making the change of path over the transition length L (feet) between the tangent (TS) and the point of minimum radius ($S.C.$ or $S.S.$) there is thus a change of acceleration from zero to $\frac{v^2}{R}$, which change is made in time $\frac{L}{v}$. The rate of change of acceleration is thus:

$$A = \frac{v^2}{R} \div \frac{L}{v} = \frac{v^3}{RL} \text{ (feet per sec. per sec. per sec.).}$$

The rate of change is determined by the rate at which the steering wheel is turned. This rate of change shall be taken as $A = 2{\cdot}00$ feet per sec. per sec. per sec. for speeds of less than 50 m.p.h., and $A = 1{\cdot}536$ feet per sec. per sec. per sec. for speeds of 50–70 m.p.h. inclusive.

The length of transition is then fixed by the formula:—

$$L = \frac{v^3}{AR} \text{ or, expressing the speed in terms of miles per hour } (V),$$

$$L = \frac{1{\cdot}581V^3}{R} \text{ for speeds less than 50 miles per hour,}$$

$$L = \frac{2{\cdot}051V^3}{R} \text{ for speeds of 50–70 miles per hour inclusive.}$$

The centrifugal force at any point should be balanced by friction and superelevation.

The maximum coefficient of friction shall be taken as 0·15. The maximum superelevation shall be 1 in 10, i.e., 0·10 feet per foot. Plan 3·10 shows the standard notation for transitioned curves. Plans 3·11 and 3·12 are alignment charts for testing the critical relationships in designing or setting out. In the general case a curve is to be designed for a particular speed V, as follows, using these figures and the appended tables.

For each speed there is a special form of transition curve. As shown above, the length l of this special curve at any point is inversely proportional to the radius at that point. In a given case the suitable value of L for use in the tables may be found approximately by the alignment chart. The intersection angle I being known, the values of I and V should be joined on the chart and a value of L read off. A second value of L should also be obtained by joining the value of V and the maximum value of $E + F$, i.e., 0·25 for $E = 0{\cdot}10$. The smaller of the values of L should be selected. Adopting the nearest multiple of 25 feet less than that value of L, the table for the given speed V should be used to find the minimum radius and other data required to plot or set out the curve.

It should be noted that the maximum value of $E + F = 0{\cdot}25$ is not utilized in every curve. At the point of minimum radius the superelevation should, however, be not less than the normal cross-fall of the road cross-section on a straight, i.e., 1 in 30 to 1 in 36 (approximately 0·03). If at the point of minimum radius the necessary and sufficient value of $E + F$ lies between 0·18 and 0·25 then the superelevation adopted should be $E + F$ minus 0·15. If at the point of minimum radius the necessary and sufficient value of $E + F$ lies between 0·03 and 0·18 the superelevation adopted should be 0·03. This method of design always requires only moderate friction, whilst it minimizes unsightly superelevation and attendant earthworks costs.

The suitable uniform speed for a curve depends not only on introducing horizontal curvature and superelevation so as to provide comfortable steering within the traffic lane, but also on adequate sight distance horizontally and vertically, and on comfortable rate of change of grade. For average coefficient of friction in braking of $F = 0{\cdot}50$ and allowing 0·5 second reaction time, the minimum sight distances required for various speeds are approximately :—

Speed (Miles per Hour).	Minimum Sight Distance in Feet on Centre Line at 4 Feet Above Road Level.
30	175
35	225
40	275
45	335
50	400
60	550
70	750

For comfort, the rate of change of grade should not exceed the following values :—

	Speed (Miles per Hour.)						
	30.	35.	40.	45.	50.	60.	70.
Maximum rate of change of grade (per cent.) in 100 feet	16	12	9	7.5	6	4	3

The minimum length of vertical curves to meet requirements of sight distance and comfort may be obtained from plan 3·14 attached. Vertical curves shall be parabolas.

Section Speed.—In designing a section of road in an area with generally uniform topographical character, the engineer should endeavour to provide for all curves one and the same speed (known as the "section speed") thus affording uniform driving conditions and safety over the section. At the end of a section of road where there is a change in topography, and it is necessary to change from one section speed to another, it is desirable to change the speed on successive curves in steps of 5 or 10 miles per hour, so as to accustom the driver gradually to changing conditions. Where, on an exceptional curve, the speed has to be reduced below the section speed, a warning sign should be provided, especially for large abrupt changes in driving conditions, e.g., a reduction of 20 miles per hour or more below the section speed. Other cases are dealt with further hereunder.

To select suitable section speeds for a Class "A" road the engineer should estimate for each section of road (in sections as long as possible) the maximum section speed which can be obtained without extravagant expenditure. On each section the curves should be classified as suitable for 70, 60, 50, 45, 40, 35, or 30 miles per hour, and examined together to ascertain the expenditure on the section required to convert all curves to two or three alternative section speeds, and the most suitable section speed may thus be selected.

On an existing untransitioned circular curve, the introduction of a transitioned curve having the same secant distance reduces the minimum radius to approximately three-quarters of the original value. This rule can be applied when using the chart to assess the approximate suitable speed for a curve so re-aligned, V being found, firstly for the given values of I and approximately equivalent R, and secondly for the maximum value of $E + F$ and the approximately equivalent R, the lower value of V being adopted.

Design Details. Isolated curves below the section speed should be avoided wherever they can be eliminated at reasonable cost. Where resheeting or reforming is done on an existing road, every opportunity should be taken to improve both curvature and visibility.

Wherever they can be fitted within the road reserve without increase in cost, curves with radii larger than the minimum required by the section speed may be adopted. In general, two means of doing this are available:—

(1) Without departing from the selected section speed, the minimum radius of the curve is increased, and the superelevation decreased accordingly.

(2) If the possibility occurs of introducing a curve with a design speed much higher (say 20 miles per hour or more) than the section speed, this may be done, provided that the conditions on adjacent lengths are suitable.

Compound curves (i.e., unidirectional circular arcs of different radii with a common tangent point) are very undesirable, as a sudden decrease in radius after the curve has been entered is most disconcerting to the driver. These curves should be avoided unless a transition length is employed to join the two circular arcs. Unidirectional curves with only a short straight between the curves are unsightly, and should also be avoided wherever possible. Where such a design is required, the length of straight between the ends of the two transitions shall be generally not less than the distances given in Table 1 below:—

TABLE 1.

Speed, miles per hour	30	35	40	45	50	60	70
Length—feet	50	75	100	125	150	200	250

The above distances are to be regarded as minima only, and wherever possible they should be increased to $4V$, where V is the numerical value of the section speed in miles per hour, to conform with the superelevation requirements specified later.

At adjacent reverse curves there is no necessity to provide any straight between the two transition curves, and the tangent points of the two transitions may be permitted to coincide, although an intermediate straight of the length stated above is desirable if it can be reasonably obtained.

Where the intersection angle is small, care should be taken to ensure that a curve of sufficiently large radius is adopted to avoid sudden and unsightly changes in cross-section and alignment. A curve should be selected from the chart and tables in the normal way, but the transition length should not be permitted to fall below a minimum value of approximately 150 feet (using the nearest suitable tabular curve for one of the standard design speeds).

If the advisability or extent of the improvement of any curve is in doubt, and if any deviation from the existing road reserve is involved, a report should be submitted and a direction obtained from the Board. Particulars of deviations should be submitted as set out on Forms "D 1" and "D 3." Particulars of ownership are not required where negotiations are to be made by the Council.

Widening should be used on transition curves where on a two-lane pavement the traffic density exceeds 400 vehicles per 12-hour day.

Where widening of the pavement is adopted, the amount for two-lane pavements should be as shown in the tables under Column "W." It should be applied wholly on the inside of the curve and should commence at the *T.S.* and reach the value given in the tables at the *S.C.* or *S.S.*, and at intermediate points should be proportional to the distance from the *T.S.* The formation should be widened by the same amount.

CLASS B ROADS.

In hill country and where speeds are generally less than 35 miles per hour, plain circular curves may be used, but their radii should be as large as is reasonably practicable. Care should also be taken, as for Class "A" roads, to ensure that at small intersection angles, curves of sufficiently large radii are adopted for the reasons previously stated. The visibility, and the lengths of vertical curves should be appropriate to the speed at which the section of road can be negotiated, but shall generally be as required on Class "A" roads for a speed of 35 miles per hour.

CROSS-SECTION AND SUPERELEVATION.

CLASS A ROADS.

Cross-sections should be supplied, on transitioned curves at not less than 50 feet intervals, and the finished surface levels at the centre line, and at each edge of pavement and formation should be shown thereon to facilitate and ensure correct setting out. Maximum superelevation shall be determined in accordance with the attached tables, charts, and instructions.

Superelevation shall be applied in the following manner:—

(*a*) *Isolated Transitioned Curves, Unidirectional Curves, and Reversed Curves with Finite Tangents.*

At the junction of straight line and spiral (*T.S.*), the outer half of the pavement and formation shall be level in cross-section, and the inner half shall remain at normal cross fall. At the other end of the spiral (*S.C.* or *S.S.*) the pavement and formation shall have the full superelevation (*E*) required. The outer half of the pavement shall be changed from crown to level section in a length on the tangent in feet (*a*) equal to twice the speed value (*V*) in miles per hour as shown on plan 3·13, except that between unidirectional curves with limited tangents the length (*a*) shall be as given in Table 1 for the appropriate speed value (see page 3).

The inside half of the pavement shall attain a plane inclined section in a length along the spiral, in feet (*b*), equal to twice the design speed (*V*) in miles per hour, except that when the pavement is revolved about the inside edge, the length in feet (*b*) shall be equal to the speed value (*V*) in miles per hour. Between this latter section and the end of the spiral (*S.C.* or *S.S.*) the increase up to maximum superelevation (*E*) shall be made in the ratio $E \times \left(\frac{l - b}{L - b}\right)$. (See plan 3·13.)

(*b*) *Small Intersection Angles.*

In the case of small intersection angles, if the section speed of the road is less than that obtained with $L = 150$ feet, the correct value of $E + F$ (to determine superelevation) shall be obtained from the tables, or from the chart by joining with a straight edge the values of R (for $L = 150$ feet), V (section speed), and reading off the value of $E + F$, subject to E (maximum superelevation) being not less than 0·03.

(*c*) *Reversed Curves with Common Tangent Points.*

At the common tangent points of reversed curves, the full cross-section shall be level. Full superelevation (E) shall be attained at the end of the spiral ($S.C.$) between which point and the tangent ($T.S.$) the superelevation shall be in the ratio $E \times \left(\frac{l - b}{L - b}\right)$. (See plan 3·13.)

CLASS B ROADS.

Sheet 3·7.—The method of application of widening and superelevation is fully described in the specification itself. In the last paragraph of sp. 3·7 concerning widening where tapered surfacing is adopted, the distance to be inserted should generally be 1 foot. For tapered surfacing in hill country and on isolated settlers' roads, the pavement and formation widths should generally differ by not more than 4 feet. Where it is considered necessary, for special reasons, to make the formation considerably wider than the pavement, the latter should be placed approximately in the centre of the formation on curves, and the outer portion (not to exceed 3 feet) of the higher shoulder sloped towards the outer table drain at 1 in 15.

LONGITUDINAL GRADING ON CURVES GENERALLY.

Where the longitudinal grades exceed 2 per cent. superelevation may be applied by lowering the inside edge and raising the outside edge of the pavement (i.e., the pavement shall be revolved about the centre line). Where the longitudinal grades are 2 per cent. or less, care shall be taken to grade both the inside edge and the centre line so that there is no unnecessary lowering of the inside edges of pavement and formation, resulting in unsightliness, poor drainage in cuttings, or bringing the pavement into a region of bad subgrade. Such curves will in general not be graded by revolving the section strictly above the inside edge, but will approximate thereto. In the preliminary grading of such curves on rough sheets, grades should be plotted along the inside edges of pavement and formation, and along the centre line, for the purpose of checking that none of the above-mentioned undesirable features exist. These check grades on the inside edges should not appear in the finished plans, the reduced levels on the longitudinal and cross-sections giving all the required information.

In all cases the finished surface levels shown on the longitudinal section shall refer to the centre line.

Where necessary, short vertical curves may be inserted at points marked C (on the attached profiles) by eye adjustments of pegs or side boards on the job. (See Plan 3·13).

LONGITUDINAL GRADE COMPENSATION ON CURVES.

As far as possible, in both survey and drafting work, an endeavour should be made to provide some allowance for grade compensation on curves, provided this can be done without undue complication of the longitudinal grade line. The amount of compensation should be approximately as follows:—

The secant point of the curve shall be one-half of the total amount of superelevation (on the width of pavement) below grade.

The upper tangent point shall be the total amount of superelevation on the curve, below grade.

In survey work, where subsequent improvement in alignment may be anticipated on sharp curves at some future date, sufficient compensation should be provided to permit of future shortening of the line due to such curve improvement.

(Typical Specification Sheet.)

CROSS-SECTION AND SUPERELEVATION

PLAIN CIRCULAR CURVES.

CLASS B ROADS.

The formation and pavement shall be superelevated and widened in accordance with the following table and specification, and in accordance with the drawings attached.

Radius (Feet).	Cross Slope at Full Superelevation.	Widening (Feet).
00– 100	1 in 10	4
101– 200	1 in 10	3
201– 300	1 in 10	2
301– 400	1 in 10	..
401– 600	1 in 12	..
601– 800	1 in 16	..
801–1,000	1 in 20	..
1,001 upwards	Superelevation equal to normal crossfall	..

The change from normal cross-section to widened and superelevated cross-section shall be effected uniformly in distances, commencing on the tangent line, 50 feet before the tangent point, and ending on the curve not more than 50 feet from the tangent point.

At the common tangent points of reversed curves, the full cross-section shall be level.

All widening of formation, and pavement (when the latter is of uniform depth) shall be made on the inside of curves, and unless otherwise shown on plans, shall commence on the tangent line 50 feet before the tangent point, and reach the specified amount on the curve, not more than 50 feet after the tangent point.

TAPERED SURFACING.

For tapered surfacing, the pavement shall remain at constant width on straights and curves, and shall extend to within.....feet of the edge of formation on the inside of curves. The outer portion of the higher shoulder (not to exceed 3 feet) shall be sloped towards the outer table drains at 1 in 15.

(Typical Specification Sheet.)

CROSS-SECTION AND SUPERELEVATION.

TRANSITIONED CURVES.

On transitioned curves, the formation and pavement shall be superelevated as shown on plans, the lower edge of the pavement being nearer the centre of the curve. The finished shape of the road on curves shall be determined by the reduced levels on the centre line and at the edges of pavement and/or formation, as shown on the cross-sections at not more than 50 feet intervals.

The reduced levels shown shall be accurately obtained after full consolidation has taken place.

FORMULÆ FOR THE DESIGN OF TRANSITION CURVES.

1. Formulæ for use with tables when *L* & *R* have been fixed.

$$\textit{Tangent Length } (T) = (R + \text{shift}) \tan \frac{I}{2} + \frac{L}{2} - \frac{L^3}{240R^2} \tag{1}$$

$$\textit{Secant Distance } (S) = (R + \text{shift}) \sec \frac{I}{2} - R \tag{2}$$

Note.—If the tangent or secant lengths so calculated do not suit field conditions, different values of L and R, and in some cases V, may have to be selected, due consideration being given to the remaining formulæ set out below.

2. Additional General Formulæ.

In special cases, e.g. if conditions require adoption of values of T or S not directly calculated from the tables, the further formulæ for the design and setting out of these curves are as follows:—

Radius.

The minimum radius considering v, i, A, i.e. the radius at the centre of double spiral is given by,

$$R = \sqrt{\frac{v^3}{iA}} \tag{3A}$$

For V less than 50 m.p.h. ($A = 2{\cdot}00$) $R = 9{\cdot}507 \sqrt{\frac{V^3}{I}}$ (3B)

For V 50 m.p.h. and over ($A = 1{\cdot}536$) $R = 10{\cdot}848 \sqrt{\frac{V^3}{I}}$ (3C)

The minimum value of R with a given value of V and the maximum value of $(E + F)$ is given by

$$R = \frac{0{\cdot}0668V^2}{(E + F)_{max.}} \tag{4}$$

$(E + F)_{max.}$ shall not exceed 0·25 or a lower limit imposed by special conditions.

The value of R to be adopted shall be the larger value obtained by the use of equations (3) and (4).

Maximum Superelevation, may be obtained sufficiently accurately by interpolation for $E + F$ on the charts (Plans 3·11 and 3·12) and in accordance with instructions on page 3.

$$\textit{Length of Transition } L = \frac{v^3}{AR} \tag{5A}$$

using the value of R as obtained from equations (3A) or (4)

For V less than 50 m.p.h. ($A = 2{\cdot}00$) $L = \frac{1{\cdot}58V^3}{R}$ (5B)

For V 50 m.p.h. and over ($A = 1{\cdot}536$) $L = \frac{2{\cdot}05V^3}{R}$ (5C)

$$\textit{Shift } (p) = \frac{L^2}{24R} - \frac{L^4}{2688R^3} \tag{6}$$

$$\textit{Abscissa } (x) = l - \frac{l^5}{40(RL)^2} \tag{7A}$$

$$\textit{Ordinate } (y) = \frac{l^3}{6(RL)} - \frac{l^7}{336(RL)^3} \tag{7B}$$

$$\textit{Spiral Angle } (\phi) = \frac{l^2}{2L.R} \text{ radians}; \qquad \phi_s = \frac{L}{2R} \text{ radians} \tag{8}$$

$$\textit{Polar Angle } (\theta) = \tan^{-1} \frac{y}{x} \tag{9}$$

$$\textit{Circular arc} = R(i - 2\phi) \text{ where } i \text{ and } \phi \text{ are both expressed in radians.} \tag{10}$$

$$\textit{Widening } (W) = n \left[R - \sqrt{R^2 - 400}\right] + \frac{V}{\sqrt{R}} \tag{11}$$

in which n represents the number of lanes.

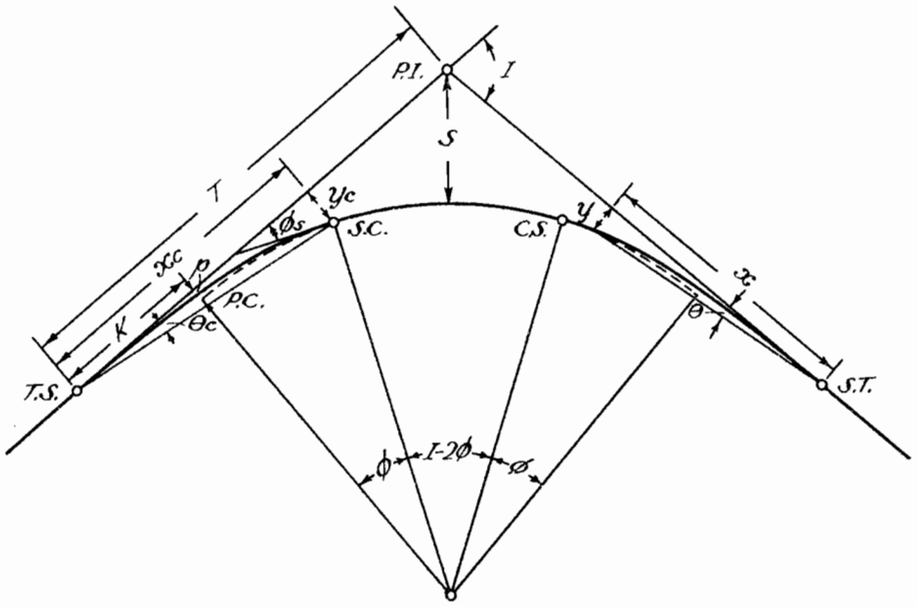
NOTE.—These formulæ were not included in the report presented to Parliament, but were inserted on the authority of the Speaker of the Legislative Assembly at the desire of the Country Roads Board.

By Authority: H. J. GREEN, Government Printer, Melbourne.

— C. R. B. —

Plan 3.10 Aug. '38

— Standard Notation for Transitioned Curves —



T.S. = Point of change from tangent to spiral.
S.C. = Point of change from spiral to circle.
L = Total length of transition spiral from T.S. to S.C. (feet).
ℓ = Length in feet from the T.S. along the curve to any point on the spiral.
v = Design speed in feet per second.
V = Design speed in miles per hour.
i = Intersection angle in radians.
I = Intersection angle in degrees.
R = Radius in feet of sharpest permissible circular arc, or minimum radius at centre of double spiral.
x, y = Abscissa & ordinate respectively of any point on the spiral with reference to the T.S. and the initial tangent.
x_c, y_c = Coordinates of the S.C.
ϕ, ϕ_s = Spiral angle at any point, and at S.C. respectively.
θ, θ_c = Polar angle = spiral deflection angle at the T.S. from the initial tangent to any point on the spiral, and to the S.C. respectively.
p = Shift = ordinate from the tangent to the P.C. of the circular curve portion produced. (osculating circle).
K = Abscissa of the offset at P.C. measured from the T.S.
T = Total tangent distance = distance from P.I. to T.S.
S = Total external secant distance.
F = Allowable value of coefficient of friction at design speed.
E = Superelevation in feet per foot.
A = Allowable rate of change of acceleration (feet/sec^3) on transition curve at design speed.

Plan 3.11 Sept. '38.

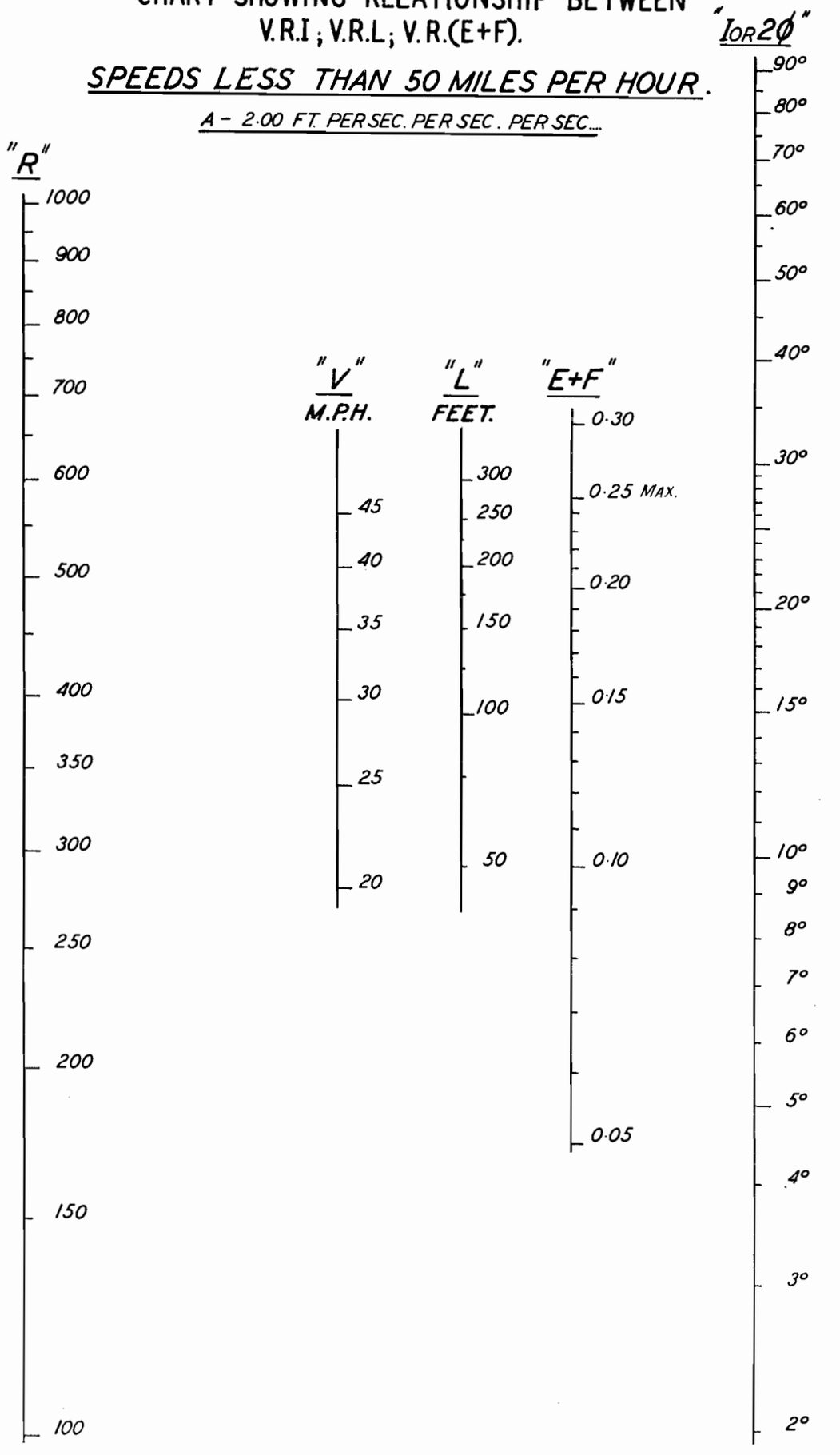
C.R.B.

SPIRAL TRANSITION CURVES

CHART SHOWING RELATIONSHIP BETWEEN V.R.I ; V.R.L ; V.R.(E+F).

SPEEDS LESS THAN 50 MILES PER HOUR.

A - 2·00 FT. PER SEC. PER SEC. PER SEC....



Plan 312 Sept '38.

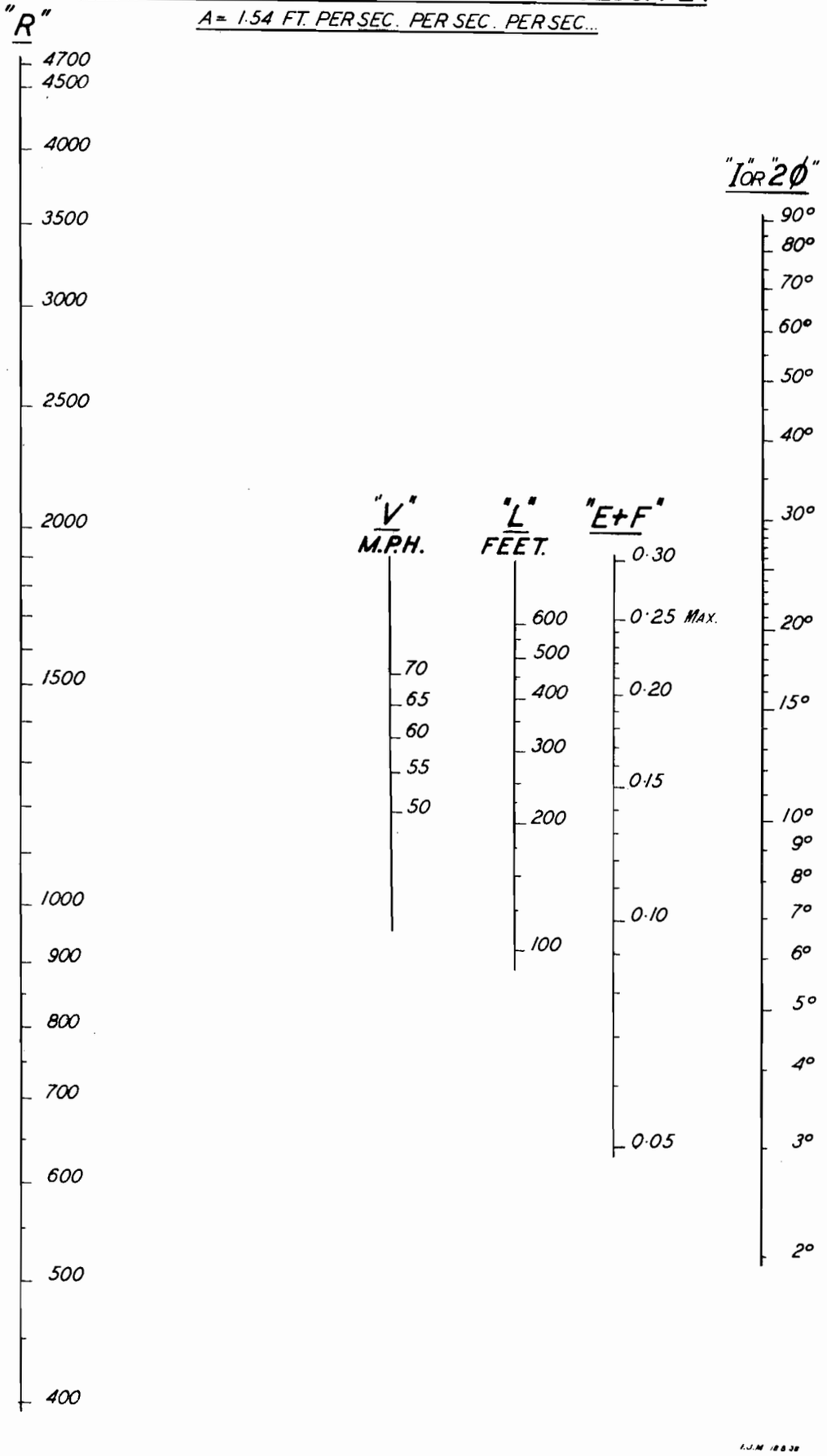
C.R.B.

SPIRAL TRANSITION CURVES

CHART SHOWING RELATIONSHIP BETWEEN V.R.I.; V.R.L.; V.R.(E+F).

SPEEDS 50-70 MILES PER HOUR INCLUSIVE.

A = 1.54 FT. PER SEC. PER SEC. PER SEC...



I.S.M. 18838

C. R. B.

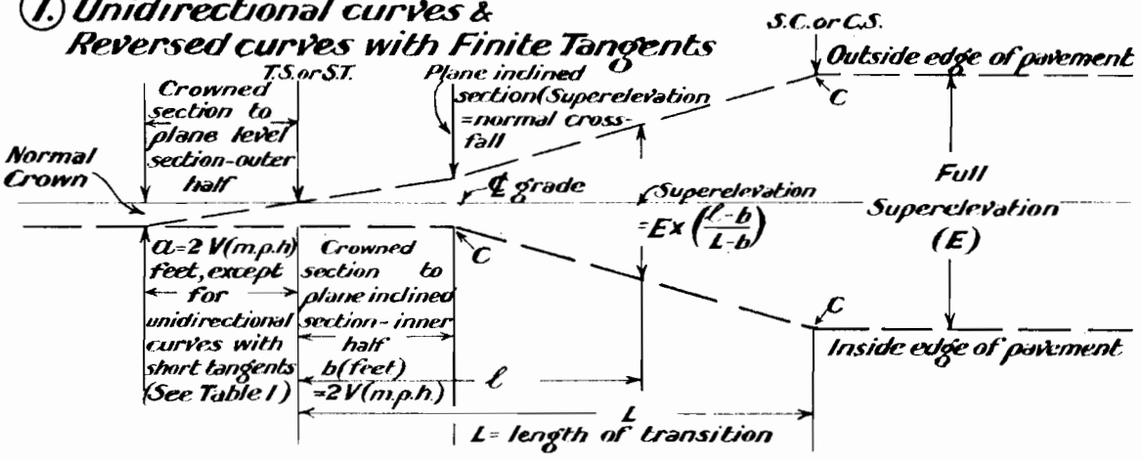
Plan 3·13

Superelevation on Transitioned Curves

Sketch Profiles

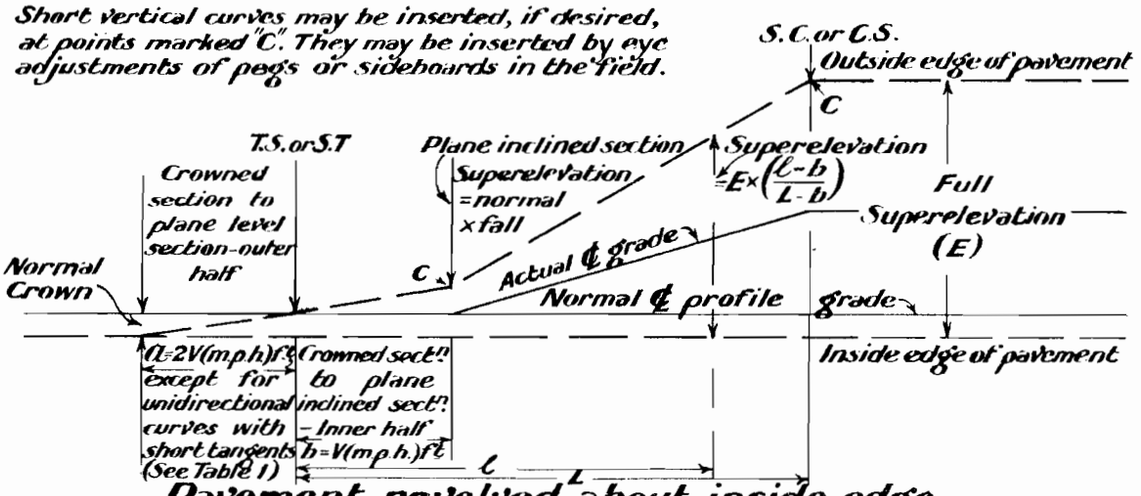
Pavements not exceeding 22 feet width

(1.) Unidirectional curves & Reversed curves with Finite Tangents



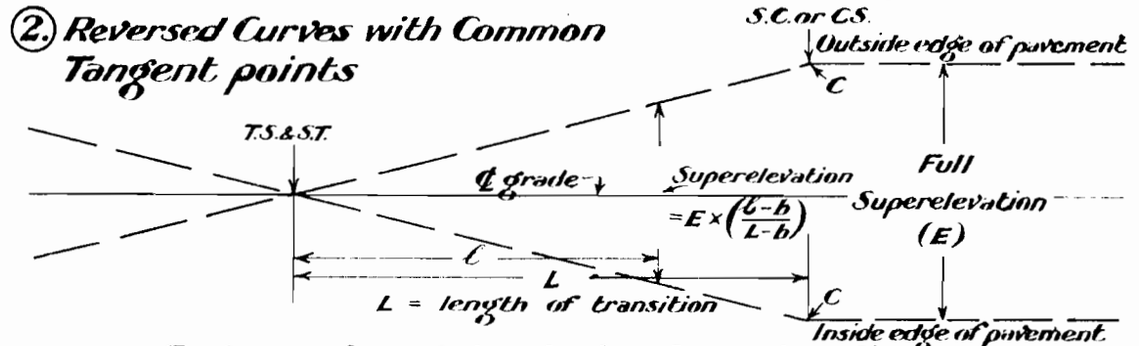
Pavement revolved about centre line

Short vertical curves may be inserted, if desired, at points marked "C". They may be inserted by eye adjustments of pegs or sideboards in the field.

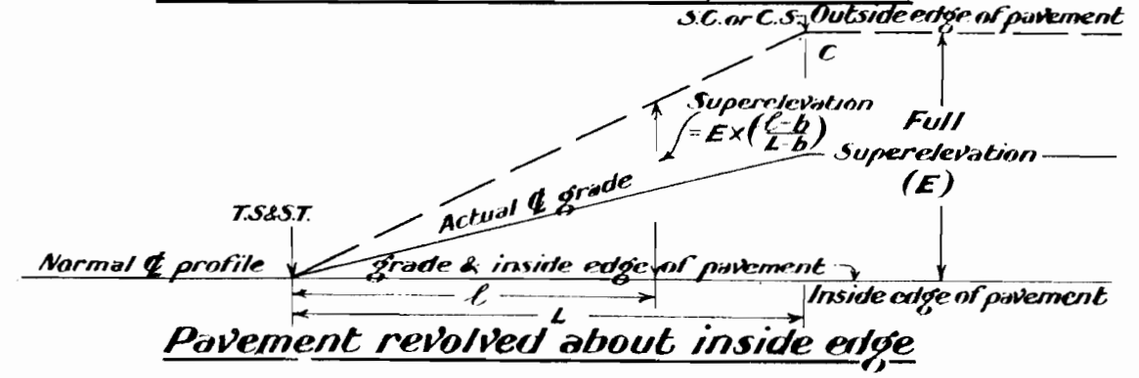


Pavement revolved about inside edge

(2.) Reversed Curves with Common Tangent points



Pavement revolved about centre line



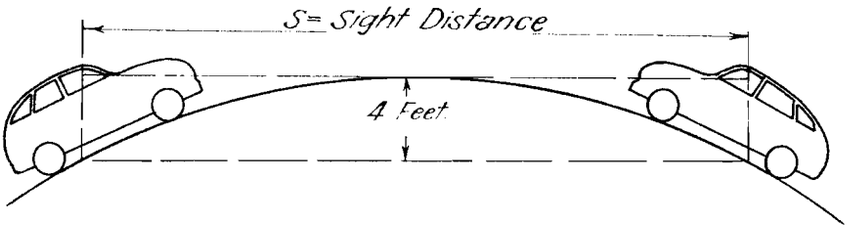
Pavement revolved about inside edge

Plan 3.14 Sept '38

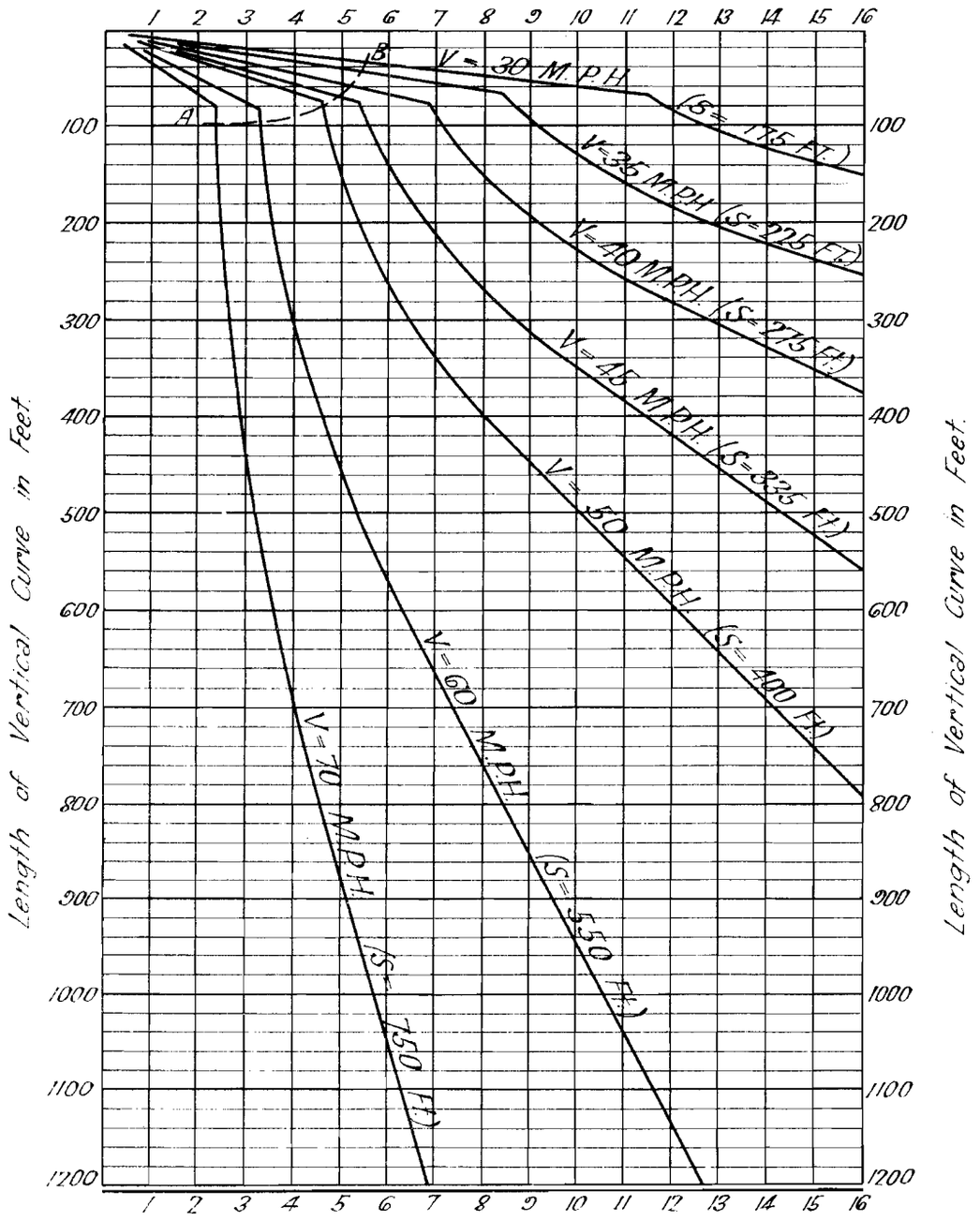
C. R. B.

CHART TO FIND LENGTH OF VERTICAL CURVES

Line AB Indicates Minimum Values to be Adopted



Algebraic Difference in Grade Rates Per Cent.



Algebraic Difference in Grade Rates Per Cent.

TABLES FOR DESIGN OF TRANSITION CURVES

DESIGN SPEED 30 M.P.H. (A = 2·00)

ℓ	R	SHIFT	LOG R	LOG (R+SHIFT)	x	y	θ (POLAR ANGLE)	φ (SPIRAL ANGLE)	$\frac{L^3}{240\ R^2}$	E + F	E	W	ℓ
25	1703·68	—	3·2313879	—	25·00	0·06	0° 08′ 25″	0° 25′ 10″	—				25
50	851·84	—	2·9303580	—	50·00	0·49	0 33 40	1° 41 00	—				50
75	567·89	0·41	2·7542642	2·7545777	74·97	1·65	1 15 40	3 47 00	—	0·1059	0·030	2 FEET	75
100	425·92	0·98	2·6293280	2·6303262	99·86	3·91	2 14 33	6 43 30	0·02	0·1412	0·030	2 FEET	100
125	340·74	1·91	2·5324231	2·5348507	124·58	7·62	3 30 10	10 30 30	0·07	0·1764	0·030	3 FEET	125
150	283·94	3·29	2·4532266	2·4582298	148·95	13·14	5 02 30	15 08 00	0·17	0·2117	0·0617	3 FEET	150
175	243·38	5·22	2·3862849	2·3955011	172·74	20·78	6 51 32	20 36 00	0·39	0·2470	0·097	4 FEET	175

DESIGN SPEED 35 M.P.H (A = 2·00)

ℓ	R	SHIFT	LOG R	LOG (R+SHIFT)	x	y	θ (POLAR ANGLE)	φ (SPIRAL ANGLE)	$\frac{L^3}{240\ R^2}$	E + F	E	W	ℓ
25	2705·38	—	3·4322282	—	25·00	0·040	0° 05′ 19″	0° 15′ 53″		—			25
50	1352·69	—	3·1311982	—	50·00	0·308	0 21 11	1 03 32		—		.	50
75	901·79	—	2·9551069	—	74·987	1·040	0 47 39	2 22 57		0·0907	0·030		75
100	676·34	0·616	2·8301682	2·8305637	99·945	2·464	1 24 43	4 14 09	0·01	0·1210	0·030	2 FEET	100
125	541·08	1·203	2·7332582	2·7342226	124·833	4·808	2 12 21	6 37 06	0·03	0·1512	0·030	2 FEET	125
150	450·90	2·077	2·6540769	2·6560733	149·585	8·300	3 10 34	9 31 49	0·07	0·1815	0·0315	3 FEET	150
175	386·48	3·296	2·5871302	2·5908182	174·103	13·158	4 19 20	12 58 18	0·15	0·2117	0·0617	3 FEET	175
200	338·17	4·913	2·5291382	2·5354019	198·251	19·591	5 38 37	16 56 34	0·29	0·2420	0·0920	3 FEET	200

TABLE FOR DESIGN OF TRANSITION CURVES

DESIGN SPEED 40 M.P.H. (A = 2·00)

ℓ	R	SHIFT	LOG R	LOG(R+SHIFT)	x	y	θ(POLAR ANGLE)	φ(SPIRAL ANGLE)	$\frac{L^3}{240\,R^2}$	E + F	E	W	ℓ
25	4038·35	—	3·6062042	—	25·00	0·026	0° 03′ 33″	0° 10′ 38″	—	0·0265	0·030	—	25
50	2019·18	—	3·3051742	—	50·00	0·206	0 14 11	0 42 34	—	0·0529	0·030	—	50
75	1346·12	0·17	3·1290829	3·1291387	75·00	0·696	0 31 55	1 35 46	—	0·0794	0·030	—	75
100	1009·59	0·41	3·0041442	3·0043214	99·976	1·651	0 56 45	2 50 15	—	0·1059	0·030	—	100
125	807·67	0·81	2·9072342	2·9076693	124·925	3·223	1 28 42	4 26 01		0·1323	0·030	2 FEET	125
150	673·06	1·39	2·8280529	2·8289498	149·814	5·567	2 07 41	6 23 05	0·03	0·1588	0·030	2 FEET	150
175	576·91	2·21	2·7611062	2·7627686	174·597	8·833	2 53 46	8 41 24	0·07	0·1853	0·035	2·5 FEET	175
200	504·80	3·30	2·7031142	2·7059466	199·215	13·170	3 46 56	11 21 01	0·13	0·2117	0·062	2·5 FEET	200
225	448·71	4·69	2·6519618	2·6564815	223·586	18·720	4 47 09	14 21 55	0·24	0·2382	0·088	3 FEET	225
250	403·84	6·43	2·6062043	2·6130698	247·605	25·618	5 54 25	17 44 05	0·40	0·2647	0·115	3 FEET	250

TABLE FOR DESIGN OF TRANSITION CURVES

DESIGN SPEED 45 M.P.H. (A = 2·00)

l	R	SHIFT	LOG R	LOG(R+SHIFT)	x	y	θ (POLAR ANGLE)	ϕ (SPIRAL ANGLE)	$\frac{L^3}{240\ R^2}$	E + F	E	W	l
25	5749·92		3·7596617		25	0·018	0° 02′ 32″	0 07 28					25
50	2874·96		3·4586317		50	0·145	0 09 58	0 29 54					50
75	1916·64		3·2825404		74·997	0·489	0 22 25	1 07 16					75
100	1437·48		3·1576017		99·988	1·159	0 39 51	1 59 35					100
125	1149·98	0·566	3·0606917	3·0609041	124·963	2·264	1 02 17	3 06 50	0·01	0·1176	0·030	2 FEET	125
150	958·32	0·978	2·9815104	2·9819535	149·908	3·911	1 29 40	4 29 03	0·02	0·1412	0·030	2 FEET	150
175	821·42	1·553	2·9145637	2·9153856	174·801	6·209	2 02 04	6 06 12	0·03	0·1647	0·030	2 FEET	175
200	718·74	2·317	2·8565717	2·8579696	199·613	9·263	2 39 25	7 58 18	0·06	0·1882	0·0382	2 FEET	200
225	638·88	3·298	2·8054192	2·8076554	224·302	13·178	3 21 44	10 05 21	0·12	0·2117	0·0617	2 FEET	225
250	574·99	4·521	2·7596617	2·7630617	248·818	18·055	4 09 01	12 27 21	0·20	0·2353	0·0853	3 FEET	250
275	522·72	6·013	2·7182690	2·7232365	273·097	23·994	5 01 15	15 04 17	0·32	0·2588	0·1088	3 FEET	275

TABLE FOR DESIGN OF TRANSITION CURVES

DESIGN SPEED 50 M.P.H. (A = 1·536)

l	R	SHIFT	LOG R	LOG(R+SHIFT)	x	y	θ(POLAR ANGLE)	ϕ(SPIRAL ANGLE)	$\frac{L^3}{240\ R^2}$	E + F	E	W	l
25	10270·06				25	0·01	0 01 24	0° 04 11					25
50	5135·03				50	0·08	0 05 35	0 16 44					50
75	3423·35				75	0·27	0 12 33	0 37 39					75
100	2567·52				100	0·65	0 22 19	1 06 57					100
125	2054·01				125	1·27	0 34 52	1 44 36					125
150	1711·68	0·55	3·2334226	3·2335621	149·97	2·19	0 50 13	2 30 37		0·0979	0·030		150
175	1467·15	0·87	3·1664745	3·1667320	174·94	3·48	1 08 20	3 25 00		0·1142	0·030	2 FEET	175
200	1283 76	1·30	3·1084839	3·1089233	199·88	5·19	1 29 16	4 27 45		0·1305	0·030	2 FEET	200
225	1141 12	1·85	3·0573313	3·0580347	224·78	7·39	1 52 58	5 38 52	0·04	0·1468	0·030	2 FEET	225
250	1027·00	2·54	3·0115704	3·0126432	249·63	10·13	2 19 22	6 58 22	0·06	0·1631	0·030	2 FEET	250
275	933·64	3·37	2·9701794	2·9717442	274·40	13·48	2 48 44	8 26 17	0·10	0·1794	0·030	2 FEET	275
300	855·84	4·38	2·9323926	2·9346095	299·08	17·49	3 20 48	10 02 27	0·15	0·1957	0·0457	2 FEET	300
325	790·00	5 56	2·8976271	2·9006729	323·63	22·21	3 55 38	11 47 02	0·23	0·2120	0·0620	2 FEET	325
350	733·58	6·94	2·8654475	2·8695368	348·01	27·71	4 33 14	13 40 06	0·33	0·2283	0·0783	2 FEET	350
375	684·67	8·54	2·8354813	2·8408648	372·19	34·04	5 13 37	15 41 26	0·47	0·2446	0·0946	3 FEET	375

TABLE FOR DESIGN OF TRANSITION CURVES

DESIGN SPEED 60 M.P.H. (A = 1·536)

ℓ	R	SHIFT	LOG R	LOG(R+SHIFT)	x	y	θ (POLAR ANGLE)	φ (SPIRAL ANGLE)	$\frac{L^3}{240\,R^2}$	E + F.	E	W	ℓ
25	17746·66				25	0·01	0° 00′ 49	0° 02′ 24″					25
50	8873·33				50	0·05	0 03 13	0 09 41					50
75	5915·55				75	0·16	0 07 16	0 21 48					75
100	4436·67				100	0·38	0 12 55	0 38 45					100
125	3549·33				125	0·73	0 20 11	1 00 32					125
150	2957·78		3·4709659		150	1·27	0 29 03	1 27 11		0·0815	0·030		150
175	2535·24		3·4040191		175	2·01	0 39 33	1 58 39		0·0951	0·030		175
200	2218·34	0·75	3·3460281	3·3461749	199·96	3·01	0 51 40	2 34 59		0·1087	0·030		200
225	1971·85	1·07	3·2948739	3·2951095	224·93	4·28	1 05 32	3 16 08		0·1223	0·030		225
250	1774·67	1·47	3·2491177	3·2494772	249·88	5·87	1 20 43	4 02 10		0·1359	0·030	2 FEET	250
275	1613·33	1·95	3·2077232	3·2082478	274·80	7·81	1 37 40	4 53 01	0·03	0·1495	0·030	2 FEET	275
300	1478·80	2·54	3·1699094	3·1706548	299·69	10·14	1 56 13	5 48 43	0·05	0·1631	0·030	2 FEET	300
325	1365·13	3·22	3·1351740	3·1361972	324·54	12·88	2 16 23	6 49 16	0·08	0·1767	0·030	2 FEET	325
350	1267·62	4·02	3·1029891	3·1043642	349·33	16·08	2 38 10	7 54 39	0·11	0·1903	0·0403	2 FEET	350
375	1183·11	4·95	3·0730252	3·0748384	374·06	19·78	3 01 34	9 04 51	0·16	0·2039	0·0539	2 FEET	375
400	1109·17	6·00	3·0449981	3·0473412	398·70	23·99	3 26 34	10 19 53	0·22	0·2175	0·0675	2 FEET	400
425	1043·92	7·20	3·0186672	3·0216523	423·24	28·75	3 53 11	11 39 50	0·29	0·2311	0·0811	2 FEET	425
450	985·93	8·54	2·9938461	2·9975917	447·66	34·11	4 21 24	13 04 37	0·39	0·2446	0·0946	2 FEET	450
475	934·03	10·04	2·9703608	2·9750042	471·93	40·08	4 51 12	14 34 13	0·51	0·2582	0·1082	2 FEET	475

TABLE FOR DESIGN OF TRANSITION CURVES

DESIGN SPEED 70 M.P.H. (A = 1·536)

ℓ	R	SHIFT	LOG R	LOG(R+SHIFT)	x	y	θ (POLAR ANGLE)	φ (SPIRAL ANGLE)	$\frac{L^3}{240\ R^2}$	E + F	E	W	ℓ
25	28181·04				25	0·004	0° 00′ 30	0 01 31					25
50	14090·52				50	0·03	0 02 02	0 06 06					50
75	9393·68				75	0·10	0 04 34	0 13 43					75
100	7045·26				100	0·24	0 08 08	0 24 24					100
125	5636·21				125	0·46	0 12 42	0 38 07					125
150	4696·84		3·6718058		150	0·80	0 18 18	0 54 53		0·0699	0·030		150
175	4025·86		3·6048587		175	1·27	0 24 54	1 14 43		0·0815	0·030		175
200	3522·63		3·5468670		199·98	1·89	0 32 32	1 37 35		0·0932	0·030		200
225	3131·23	0·67	3·4957150	3·4958079	224·97	2·69	0 41 10	2 03 30		0·1048	0·030		225
250	2818·10	0·92	3·4499564	3·4500982	249·95	3·70	0 50 50	2 32 29		0·1165	0·030		250
275	2561·91	1·23	3·4085639	3·4087724	274·92	4·92	1 01 31	3 04 30		0·1281	0·030	2 FEET	275
300	2348·42	1·60	3·3707758	3·3710716	299·88	6·38	1 13 11	3 39 35		0·1398	0·030	2 FEET	300
325	2167·77	2·03	3·3360132	3·3364197	324·82	8·12	1 25 54	4 17 42		0·1514	0·030	2 FEET	325
350	2012·93	2·54	3·3038287	3·3043764	349·73	10·14	1 39 37	4 58 52	0·04	0·1631	0·030	2 FEET	350
375	1878·74	3·12	3·2738667	3·2745873	374·63	12·47	1 54 20	5 43 06	0·06	0·1747	0·030	2 FEET	375
400	1761·32	3·78	3·2458382	3·2467693	399·48	15·13	2 10 06	6 30 22	0·09	0·1864	0·0364	2 FEET	400
425	1657·71	4·57	3·2195085	3·2207042	424·30	18·13	2 26 50	7 20 41	0·12	0·1980	0·0480	2 FEET	425
450	1565·56	5·38	3·1946697	3·1961596	449·07	21·52	2 44 40	8 14 04	0·16	0·2097	0·0597	2 FEET	450
475	1483·21	6·33	3·1712026	3·1730522	473·78	25·31	3 03 27	9 10 29	0·20	0·2213	0·0713	2 FEET	475
500	1409·05	7·38	3·1489264	3·1511951	498·43	29·50	3 23 15	10 09 57	0·26	0·2330	0·0830	2 FEET	500
525	1341·95	8·54	3·1277364	3·1304914	522·99	34·14	3 44 05	11 12 28	0·34	0·2446	0·0946	2 FEET	525
550	1280·96	9·82	3·1075355	3·1108523	547·46	39·23	4 05 54	12 18 01	0·42	0·2563	0·1063	2 FEET	550