



Harmony Road, Warren County, Showing New Line of Road Around the Hill.

# FIFTEENTH ANNUAL REPORT

OF THE

## Commissioner of Public Roads

For the Year ending October 31

1908



TRENTON, N. J.:

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OFFICE OF COMMISSIONER OF PUBLIC ROADS,

TRENTON, NEW JERSEY, December 22, 1908.

*To His Excellency, John Franklin Fort, Governor, and the Legislature of New Jersey:*

I have the honor to submit the fifteenth annual report of the Commissioner of Public Roads, for the fiscal year ending October 31, 1908, with such comments and suggestions as existing circumstances seem to require.

FREDERICK GILKYSON,

*Commissioner of Public Roads.*

# REPORT.

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The question of road construction and maintenance, raised by the changes in modern traffic conditions, is one which is giving our State Department of Public Roads much concern.

We have within the boundaries of our State 1,381.379 miles of roads, improved under the State Aid Law, the greater mileage of which was constructed before the use of self-propelled vehicles became extensive. In other words, most of our highways were improved for wagon and carriage traffic. The method of construction used successfully met the requirements of this traffic, but the advent of the motor vehicle has demonstrated that change in the present method of road building is essential.

We are extremely fortunate in that our natural resources for road building materials are, perhaps, greater than those of any other state in the Union. In part of the central section, and in all of the southern section of the State, high-grade gravel, especially adapted for road building purposes, is found in large deposits, usually contiguous to the roads under course of construction. Roads built with this material invariably present a smooth, hard surface about ten months of the year. They are apt to be disturbed by the frosts leaving the ground in the early spring, but are soon ironed out and become smooth and even under traffic. These roads do not disintegrate so freely under motor vehicle travel and are freer from dust than the stone road.

In the northern and northeastern sections of the State we have numerous and extensive quarries producing diabase, diorite, gabbro, dolomite and other minerals adapted to road building purposes. In many instances portable crushers are built along the line of the road undergoing construction, and the rock is procured from adjacent hills. In most instances, however, we depend upon our transportation lines for the delivery of rock, and, with their vast systems touching almost every community in our State, it

is possible to secure the commodities within short hauling distance from the road under course of construction.

Assuming, therefore, that our gravel roads, for a time at least, will meet the requirements of their localities, the question which immediately confronts us is the maintenance and future construction of our macadam roads.

With the almost inexhaustible supply of trap rock so accessible, and, consequently, procurable at a reasonable cost, it would seem that the practical and economic solution of this problem would be by the incorporation of some substance with this mineral to form a homogeneous mass. This will give the road a smooth, plastic, waterproof surface, making it almost entirely dustless.

During the past year a number of experiments have been conducted along the lines suggested, all of which have been attended by more or less satisfactory results.

In the borough of Princeton, Mercer county, a road known as the Elm street, Princeton and Rosedale road, was constructed by the incorporation of heavy Kentucky oil having an 82 per cent. asphaltic base. The method of construction of this road was similar to that for which provision was made in our standard specifications, with the exception that, after the binder had been spread over the second course of stone and properly rolled, oil, in quantities of one and one-half gallons to the square yard, was sprinkled over the road by use of a patented sprinkling tank wagon. A mixture of three-quarter inch stone and screenings was then spread over the oiled surface and the road thoroughly rolled. It developed that the oil would not penetrate the binder to any degree, necessitating the application of considerable additional top dressing to hold the oil on the road. This crude method of construction, however, has given great satisfaction. Notwithstanding the fact that the road has been subjected to heavy teaming traffic, it has not shown the slightest disintegration, but, on the other hand, presents a smooth, resilient surface, is free from ruts and almost entirely dustless.

Another experiment was made in the borough of Hopewell, Mercer county, on what is known as the Hopewell road. On this road oil having a 70 per cent. asphaltic base was used, being sprinkled over the finished surface as a dust preventive. The results obtained have proven quite unsatisfactory. The oil has not



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penetrated the surface of the road to any extent. As a result, during dry weather, the surface is flaky and more or less uneven, while in wet weather it becomes oily and slippery, being ruinous to wearing apparel and a menace to both wagon and motor vehicle traffic. This evil can in some measure be corrected by the application of additional top dressing of fine stone over the present surface.

In Union county a road extending from North Broad street, Elizabeth, to the county line of Essex county, was built by the application of Tarvia over the second course of stone. This road, when completed, presented a pleasing, dustless surface, but, under extremely heavy traffic, has become uneven and wavy. We are inclined to the belief that this defect is due to lack of experience in this class of construction rather than to the inferiority of the materials used.

In the building of the Evesham road in Camden county, a section of twelve hundred lineal feet was laid by the Amies Asphalt Company. This method of construction consists of coating the second course of stone with a patented asphaltic substance. The treatment of the stone in this instance was done at the quarries. The material was placed on the road dry and thoroughly rolled until it presented a smooth and even surface. Apparently it has no tendency to be slippery and is absolutely dustless. This method of construction is extremely desirable for suburban streets and roads.

In Camden county, between Chew's Landing and Blackwood, we have recently completed the building of a road which is considered by a number of road building experts to be a most excellent highway. In the construction of this road we profited by our experience on the Princeton road. After the second course of stone had been placed on the road, heavy Kentucky oil, having an 82 per cent. asphaltic base, was applied in quantities of about three quarts to the square yard of surface. The oil was allowed to remain on the road uncovered until sufficient time had elapsed to allow it to work into the interstices between the stones. After this three-quarter inch stone and screenings were distributed over the surface and the road thoroughly rolled with a twelve-ton steam roller. In this construction the compression of the roller caused the oil to ooze up, affixing itself to each particle of the fine stone, leaving a



smooth, uniform surface, sufficiently resistant to make it exceptionally desirable for travel either by wagon or motor vehicle. We believe that still better results would be secured by heating the one and one-half inch stone and coating it with oil before spreading it upon the road. This process would, no doubt, prove too costly for extensive road construction.

The last and most striking departure from the old practice is what is known as the Imperial pavement, three pieces of which have been laid. In Harrison, Hudson county, one block was treated as follows: The earth composing the road was ploughed, thoroughly harrowed and formed up to grade, after which a binder, composed of asphaltum, fluxed with a lighter oil, was applied hot by means of a steel-bodied sprinkling wagon. This wagon was drawn over the prepared surface and the hot asphaltum thoroughly sprinkled on it. Then the harrows were again used until the binder was thoroughly mixed through the mass. A mould board plow was next used to turn this impregnated mass under, at the same time bringing fresh earth to the surface. This, in turn, was treated in the same manner as the first surface, and the asphaltum thoroughly mixed as before. The result was a mass of earth thoroughly impregnated with asphaltum to a depth of about five or six inches. The really new feature of the work was then introduced—that is, the rolling tamper. This is a machine composed of a series of cast-iron sprocket wheels loosely revolving upon an axle. This machine weighs about five thousand pounds, and each tooth has a surface area of about eight inches. The machine is hauled over the surface of the road and the teeth sink to the full depth of the mixture, compacting the bottom first. Its continued passage compresses more and more of the mass until the machine with its toothed wheels rides upon the surface, which, by this time, resembles a piece of tough leather. This is then ironed and smoothed by a ten-ton steam roller and lastly polished with a five-ton roller. Just before the final finish, a coating of sharp sand or screenings is spread upon the surface and rolled in, thus preventing any tendency to slipperiness, which is one of the greatest objections to other asphalt pavements. This method of construction was also employed at Westville, Gloucester county, and Landing, Morris county, and, in each instance, has given satisfaction. That at Landing in particular, which was the last laid, has met with praise from those who have seen it.

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In a number of the counties, and in several municipalities of our State, oils, tar products and patented substances for surface treatment and dust preventives have been extensively used. The results have been varied, and, at the best, but temporary. The State Department has given but little encouragement to this form of treatment.

In reviewing the experimental work accomplished during the past year, the results would indicate that the use of heavy asphaltum oil as a binding substance will prove the most desirable, economical and practical in future construction work. Furthermore, it is probable that in the advancement of road building during the coming year our standard specifications will be modified so as to provide for the use of this or some kindred material.

In considering the question of maintenance and repairs, it is quite apparent that the old method of scraping the material from the sides of the road and dumping it in the center, as well as placing new stone and screenings on the worn-out surface, must be abolished, since the results obtained are unsatisfactory and do not warrant the cost involved.

We have in course of preparation a set of specifications which we propose distributing among the various county commissioners, boards of chosen freeholders, road supervisors and road overseers. In these specifications we will recommend that in repairing roads they should first be scarified to a depth of at least two inches, and, after the removal of all foreign matter, be treated with some binding substance similar to that to be specified for use in new construction. In fact, in the expenditure of the moneys over which this department has jurisdiction, we will insist upon the adoption of this plan of treatment. While the first cost is greater, the results are much more permanent, and, in a great measure, will relieve the objectionable features of our present stone roads.

To maintain the roads thus repaired will require diligent and intelligent attention on the part of the county road supervisors. These supervisors should be furnished with facilities to enable them to inspect every section of road under their care at least once each week. Stations should be established at convenient points along the line of each road where materials could be stored and repairs made as soon as the road shows the least sign of deterioration. Certainly, this system of maintenance would give greater



satisfaction to the traveling public, and, we believe, that in a few years it would reduce the cost at least fifty per cent.

To secure the desired results and to insure a greater degree of uniformity in road maintenance and repairs, it is recommended that chapter 113, Laws of 1906, as amended by chapter 304, Laws of 1908 (the Motor Vehicle Law), be amended so as to provide that six thousand dollars shall be set aside each year for the employment and traveling expenses of two district supervisors, to be appointed by the Commissioner of Public Roads and to serve under him. These district supervisors should act under instructions from the Commissioner of Public Roads, have jurisdiction over all maintenance and repair work, advise with the county road supervisors and aid them in the prosecution of their work. The reason for this recommendation is obvious, since, with the rapidly increasing mileage of improved roads, it is impossible for the State Commissioner or the State Supervisor to keep constantly in touch with this branch of the work of their department.

It is also recommended that chapter 113, Laws of 1906, as amended by chapter 304, Laws of 1908, section 37 (the Motor Vehicle Law), be amended so as to make the distribution of moneys collected for registration fees, licenses, fines and the like, applicable only to county roads, whether built under state aid or not. The distribution of this money, as provided for under the present act, seems to defeat the purpose for which it is assessed. Under this act all counties, cities, boroughs, towns and other classes of municipal corporations having improved roads, meaning roads which are at all seasons of the year firm, smooth and convenient for travel, and excepting streets paved with cobble stones, Belgian block or asphalt, are entitled to an apportionment of these moneys according to the mileage of their streets or roads. As a result, the various cities of our State, having a vast mileage of vitrified brick, wooden block, bitulithic and other patented pavements, would receive a large portion of this fund, and, after deducting the amount apportioned to the several hundred boroughs and other municipal corporations, there will be but little left for use in repairing and maintaining our highways. It is our understanding that motor vehicle registration fees and license fees are assessed for the purpose of creating a

fund for the repair and improvement of roads which are more or less damaged by this class of traffic. Consequently, the law should be amended so as to confine the use of this money to such purpose.

It is also recommended that the State Road Law be amended to provide that after the first county road shall have been constructed under state aid, it shall be the duty of the board of chosen freeholders to appoint some suitable person as county engineer. In a number of the counties no provision has been made for such office, it being the practice of the board of chosen freeholders to secure the services of local engineers in making surveys, plans, profiles and cross sections necessary to be used in the construction of roads. As a result, there is a noticeable lack of uniformity in road building in such counties. In the counties having regularly appointed county engineers better results are obtained and the work is performed more economically.

By reference to the detailed report of roads built during the past year, it will be found that particular attention has been given to the extension of what we may term our "trunk line system," also to connecting several principal highways. Distances between important points have been thereby reduced and travel has been greatly facilitated.

In the progress of this work careful consideration has been given to the future requirements and uses of our roads. Dangerous turns have been eliminated and replaced by graceful curves, easy grades have been established, narrow wooden bridges have been removed and supplanted by concrete culverts extending the width of the road, and better systems of drainage have been inaugurated. In general, the character of the work done demonstrates that we are advancing in the art of road construction.

While it is admitted that the advent of the self-propelled vehicle has had a destructive influence on our highways, and, consequently, greater expenditures for maintenance and repairs have been necessitated, we must not lose sight of the fact that the increasing popularity of these vehicles has had the effect of greatly advancing the work of road building. The best efforts of our leading engineers and scientists have been stimulated, and if, as hoped, success attends the experimental work now being done, the automobile will have proven a benefit rather than a detriment to our highways.



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In compliance with the act of March 27, 1905, we make a statement of cost of roads, as follows:

## COST OF ROADS.

## Atlantic County.

	Miles.		
May's Landing and Downtown road....	13.94		
Cost .....		\$34,874 25	
State's share.....			\$11,624 75

## Bergen County.

	Miles.		
Rivervale, Demarest, Cedar and Piermont avenues .....	4.97		
Cost .....		\$31,151 15	
State's share.....			\$10,383 72
Westwood and Leslie avenues.....	1.185		
Cost .....		7,625 55	
State's share.....			2,541 85
	6.155	\$38,776 70	\$12,925 57

## Burlington County.

Red Lion and Tabernacle road, amount to complete payment on 1906 contract..	\$538 87
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## Camden County.

	Miles.		
Camden, Ellisburg and Marlton turnpike.	9.00		
Cost .....		\$27,888 83	
State's share.....			\$9,296 28
Blue Anchor road.....	2.33		
Cost .....		3,722 00	
State's share.....			1,240 67
	11.33	\$31,610 83	\$10,536 95

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## Essex County.

	Miles.		
West Fairfield and Clinton road.....	2.114		
Cost .....		\$17,218 24	
State's share.....			\$5,739 41

## Gloucester County.

	Miles.		
Malaga and Downtown road.....	5.74		
Cost .....		\$12,910 60	
State's share.....			\$4,303 53

## Hunterdon County.

	Miles.		
White House and Flemington road, first section .....	6.478		
Cost .....		\$50,476 05	
State's share.....			\$16,825 35

## Mercer County.

	Miles.		
Elm street, Rosedale and Pennington road .....	2.96		
Cost .....		\$26,859 51	
State's share.....			\$8,953 17
Etra and Perrineville road.....	1.19		
Cost .....		8,430 15	
State's share.....			2,810 05
Brunswick pike.....	3.70		
Cost .....		32,807 76	
State's share.....			10,935 92
	7.85	\$68,097 42	\$22,699 14

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## Middlesex County.

	Miles.		
Half Acre road.....	3.37		
Cost .....		\$9,289 45	
State's share.....			\$3,096 48
Colonia and Avenel road.....	1.59		
Cost .....		13,395 26	
State's share.....			4,465 09
Cranbury and Plainsboro road.....	1.004		
Cost .....		6,624 00	
State's share.....			2,208 00
Livingston avenue.....	1.12		
Cost .....		10,287 72	
State's share.....			3,429 24
Main street, Woodbridge.....	1.75		
Cost .....		17,164 68	
State's share.....			5,721 56
State street, Perth Amboy.....	1.35		
Cost .....		10,095 70	
State's share.....			3,365 23
River road.....	1.66		
Cost .....		14,605 19	
State's share.....			4,868 40
	11.844	\$81,462 00	\$27,154 00

## Monmouth County.

	Miles.		
Farmingdale and Hamilton road, first section .....	3.00		
Cost .....		\$8,424 75	
State's share.....			\$2,808 25
Manalapan connecting road.....	.265		
Cost .....		3,183 88	
State's share.....			1,061 29
Rumson road, east portion.....	.76		
Cost .....		8,613 00	
State's share.....			2,871 00
Eatontown and Colt's Neck road, second section .....	3.31		
Cost .....		24,922 60	
State's share.....			8,307 53
	7.335	\$45,144 23	\$15,048 07

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## Ocean County.

	Miles.		
Bayhead and Seaside Park road, northern section .....	4.671		
Cost .....		\$25,586 50	
State's share.....			\$8,528 83

## Passaic County.

	Miles.		
Midvale (Greenwood Lake) road extension .....	.313		
Cost .....		\$38,946 55	
State's share.....			\$12,982 18

## Salem County.

	Miles.		
Mannington road.....	1.58		
Cost .....		\$11,298 30	
State's share.....			\$3,766 10

## Somerset County.

	Miles.		
South Bound Brook road.....	2.25		
Cost .....		\$19,699 58	
State's share.....			\$6,566 53
Dead river road.....	2.12		
Cost .....		17,755 51	
State's share.....			5,918 50
	4.37	\$37,455 09	\$12,485 03

## Union County.

	Miles.		
West Grand street, First avenue and Locust street.....	2.23		
Cost .....		\$16,390 80	
State's share.....			\$5,463 60
North Broad street and Elizabeth avenue .....	.956		
Cost .....		15,513 63	
State's share.....			5,171 21
Terrill road.....	1.04		
Cost .....		7,516 27	
State's share.....			2,505 42



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## Warren County.

	Miles.		
Lopatcong road.....	2.59		
Cost .....		\$16,778 67	
State's share.....			\$5,592 89
Total number of miles.....	93.353		
Total cost allowed.....		\$550,056 13	
Total paid on contracts January 1, 1908, to December 3, 1908 .....			\$183,890 90
Total paid supervisors.....			21,093 28
Total paid out.....			\$204,984 18
Appropriation .....			300,000 00
Balance, against which contracts have been filed.....			95,015 82

The following roads were paid for out of the appropriation for the year 1907, but were not completed in time to be listed in the 1907 report:

## Bergen County.

	Miles.		
Franklin turnpike.....	1.59		
Cost .....		\$14,585 65	
State's share.....			\$4,861 88
Summit and Woodcliff avenues.....	1.85		
Cost .....		15,649 46	
State's share.....			5,216 49
	3.44	\$30,235 11	\$10,078 37

## Burlington County.

	Miles.		
Lumberton and Medford road.....	3.90		
Cost .....		\$29,950 00	
State's share.....			\$9,983 33
Westfield and Camden turnpike.....	3.12		
Cost .....		29,799 99	
State's share.....			9,933 33
	7.02	\$59,749 99	\$19,916 66

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## Cape May County.

	Miles.		
Tuckahoe road, first section.....	3.399		
Cost .....		\$23,055 00	
State's share.....			\$7,685 00

## Essex County.

	Miles.		
Westville avenue.....	1.467		
Cost .....		\$10,639 20	
State's share.....			\$3,546 40
Harrison street.....	1.30		
Cost .....		10,441 60	
State's share.....			3,480 53
Watchung avenue.....	.88		
Cost .....		16,735 76	
State's share.....			5,578 59
High street.....	.992		
Cost .....		10,580 30	
State's share.....			3,526 77
	<hr/> 4.639	<hr/> \$48,396 86	<hr/> \$16,132 29

## Middlesex County.

	Miles.		
River road.....	2.97		
Cost .....		\$30,830 50	
State's share.....			\$10,276 83

## Monmouth County.

	Miles.		
Allentown road.....	.955		
Cost .....		\$9,984 90	
State's share.....			\$3,328 30
Eatontown and Colt's Neck road, first section .....	3.25		
Cost .....		\$30,875 99	
State's share.....			\$10,291 99
	<hr/> 4.205	<hr/> \$40,860 89	<hr/> \$13,620 29

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## Ocean County.

	Miles.		
Lakehurst and Lakewood road.....	6.335		
Cost .....		\$22,359 83	
State's share.....			\$7,453 28

## Passaic County.

	Miles.		
Macopin road.....	1.86		
Cost .....		\$18,804 25	
State's share.....			\$6,268 08

## Salem County.

	Miles.		
Aldine road.....	1.326		
Cost .....		\$10,318 90	
State's share.....			\$3,439 63

## Warren County.

	Miles.		
Harmony road.....	5.36		
Cost .....		\$43,490 97	
State's share.....			\$14,496 99
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Total number of miles.....	40.554		
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Total cost.....		\$328,102 30	
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Total paid by State.....			\$109,367 42

The following roads were paid for out of the appropriation for the year 1906, but their completion has been delayed until this year:

## Burlington County.

	Miles.		
Red Lion and Tabernacle road.....	3.65		
Cost .....		\$8,366 10	
Paid by State.....			\$2,249 83

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## Middlesex County.

	Miles.		
Jamesburg and Dayton road.....	2.86		
Cost .....		\$23,112 78	
State's share.....			\$7,704 26
Total number of miles.....	6.51		
Total cost.....		\$31,478 88	
Total paid by State.....			\$9,954 09

The following improved roads were taken over by the counties, under the provisions of the supplements to the road act:

## Essex County.

	Miles.
Northfield road extension.....	2.75
Eagle Rock avenue.....	3.12
Total number of miles.....	5.87

The total length of improved roads added to our mileage during the year 1908 is as follows:

Paid for from 1908 appropriation.....	93.353 miles.
Paid for from 1907 appropriation.....	40.554 "
Paid for from 1906 appropriation.....	6.51 "
Taken over by the counties without cost.....	5.87 "
Total .....	146.287 "

The following roads are approaching completion, but were not finished in time to be reported in the preceding lists:

## Camden County.

	Miles.	Cost.
Camden and Blackwood turnpike extension .....	2.404	\$27,849 97
Evesham road.....	2.43	21,232 18
		\$49,082 15



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## Cape May County.

	Miles.	Cost.	
Rio Grande road.....	2.907	\$15,668 58	\$15,668 58

## Essex County.

Central and Green Brook avenues.....	2.828	\$28,696 00	
Fairview avenue .....	2.344	17,748 45	
		<hr/>	\$46,444 45

## Mercer County.

Hopewell and Stoutsburg road.....	2.03	\$14,360 64	\$14,360 64
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## Middlesex County.

Cheesequakes creek road.....	1.97	\$26,920 34	\$26,920 34
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## Monmouth County.

Lakewood and Adelpia road, first section .....	2.16	\$7,500 00	
Keyport and South Amboy road.....	1.20	13,303 59	
		<hr/>	\$20,803 59

## Ocean County.

New Egypt section of Lakewood and New Egypt road.....	3.00	\$16,787 20	
Lakewood and Alligator road.....	2.867	13,823 89	
		<hr/>	\$30,611 09

## Salem County.

Penn's Grove and Dancer's Mill road..	3.02	\$25,272 82	
Alloway and Aldine road, second section,	4.76	19,200 00	
		<hr/>	\$44,472 82

## Somerset County.

Washington Valley road.....	2.033	\$24,928 95	\$24,928.95
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## Sussex County.

Frankford and Sandyston road.....	3.455	\$32,079 17	\$32,079 17
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## Warren County.

Morris turnpike.....	1.17	\$9,795 70	
New Brunswick turnpike.....	.75	8,934 89	
			\$18,730 59
<hr/>			
Total number of miles.....	41.328		
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Total cost.....			\$324,102 37
State's share.....			108,034 12

The total amount expended by the State and the number of miles paid for in each county since the passage of the State Aid Law are as follows:

County.	Miles.	Amount.
Atlantic .....	95.86	\$98,281 38
Bergen .....	23.77	48,373 80
Burlington .....	189.011	297,490 13
Camden .....	106.55	195,793 24
Cape May.....	32.458	55,954 95
Cumberland .....	1.22	14,773 23
Essex .....	106.672	267,230 98
Gloucester .....	80.635	89,431 80
Hudson .....	4.76	40,135 27
Hunterdon .....	17.398	46,701 32
Mercer .....	130.244	334,035 80
Middlesex .....	142.454	271,487 13
Monmouth .....	101.30	188,303 54
Morris .....	67.825	138,675 97
Ocean .....	50.776	60,475 28
Passaic .....	62.239	122,756 89
Salem .....	25.133	38,186 20
Somerset .....	77.419	143,439 28
Sussex .....	7.598	15,416 58
Union .....	16.775	35,628 51
Warren .....	41.282	83,648 13
	<hr/>	<hr/>
	1,381.379	\$2,586,219 41

The following table shows the number of miles of road built in each county, in each year, since the passage of the State Aid Law. Also the number of miles built each year, and the total number of miles built in each county.

COUNTY.	1892. No. Miles.	1893. No. Miles.	1894. No. Miles.	1895. No. Miles.	1896. No. Miles.	1897. No. Miles.	1898. No. Miles.	1899. No. Miles.	1900. No. Miles.	1901. No. Miles.	1902. No. Miles.	1903. No. Miles.	1904. No. Miles.	1905. No. Miles.	1906. No. Miles.	1907. No. Miles.	1908. No. Miles.	Total No. Miles Built.
Atlantic .....					12	10	6.84	4.03		7.03	20.10	13	1	1.51		6.41	13.94	95.86
Bergen .....											1.02		9.375	2.22	.42	1.14	9.595	23.77
Burlington .....		10.54	20.46	9.75	11.02	10.48	15.03	18.36	8.93	17.36	19.131	27.98	2.48		3.71	3.11	10.67	189.011
Camden .....		13.62		8.25		4.125	12.79	2.23	1	4.48	8.80	9.50	5.985	1.40		23.04	11.33	106.55
Cape May .....										6	5.394	6.20	2.23	2.63		6.605	3.399	32.458
Cumberland .....												1.22						1.22
Essex .....				6.50	6	4.91	9.276	12.07	9.60	9.36	8.723	5.79	8.545	8.24		5.085	12.623	106.672
Gloucester .....				7.75	6	5.50	7.59	11.40	4.61	17.44	6.875	7.73					5.74	80.635
Hudson .....									2.44						2.32			4.76
Hunterdon .....															5.55	5.37	6.478	17.398
Mercer .....			9.46	6.40	10.95	4.75	2.704	10.83	9.16	10.37	15.89	12.30	7.55	16.18		5.85	7.85	130.244
Middlesex .....	10.55	3.18	2.36	7.68	8.43	4.75	6.164	13.10	9.01	6.12	14.95	9.52	12.42	8.335	4.981	3.23	17.674	142.454
Monmouth .....				3.75	5	5.10	14.46	5.64	6.67	13.25	17.67	5.21	7.47	3.36	2.18	11.54	101.30	
Morris .....						6.13	6.30	10.46	6.53	4.306	10.079	7.13	5.98	3.59	6.63	.69		67.825
Ocean .....											3.90	9.97	11.83	7.16		6.91	11.006	50.776
Passaic .....						4.79	5.48	8.67	6.73	3.987	6.57	6.09	1.54	5.38	3.88	4.132	4.99	62.239
Salem .....				2.67				2.17	2.05		3.25	4.61	7.477				2.906	25.133
Somerset .....						6.23	7.27	6.60	6.65	7.93	5.88	6.24	10.68	2.685	5.60	7.284	4.37	77.419
Sussex .....										.893		4.03	1.695	.98				7.598
Union .....									3.432		2.141		.63		4.01	2.336	4.226	16.775
Warren .....								.08		7.43	8.792	3.94	13.09				7.95	41.282
Total built each year .....	10.55	27.34	32.28	46.33	60.82	66.665	84.544	114.46	75.782	109.376	154.745	152.92	107.717	67.780	40.461	83.322	146.287	1,381.379



# Description of Roads Improved in 1908.

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## ATLANTIC COUNTY.

### *May's Landing and Downstown Road, 13.94 Miles Long.*

This road begins at Mill street, May's Landing, and extends westerly through Richland, Buena Vista and Landisville to the Gloucester county line at Downstown. It is built of gravel, sixteen feet wide, and from six to eight inches deep. It passes through much wild and unimproved land, which, however, is being rapidly taken up and improved by the Italian and other foreign residents. At present it possesses a greater value as a through line or cross state road, because, in connection with the Malaga road, it completes another improved highway from Atlantic City to Camden.

The maximum grade was reduced from 7 per cent. to 3.20 per cent.

## BERGEN COUNTY.

### *Rivervale, Demarest, Cedar and Piermont Avenues, 4.97 Miles Long.*

This system of improved roads extends from north to south through the entire length of Rivervale township, and connects on the east with the improved roads of Hillsdale township. The roads are built of macadam, fourteen feet wide and six inches deep.

The maximum grade was reduced from 8.50 per cent. to 5 per cent.



*Westwood and Leslie Avenues, 1.185 Miles Long.*

These roads are also in Rivervale township. They connect the old Tappan road with Rivervale avenue, thus giving this new township an almost complete system of roads north and south, east and west. They also form two very important extensions of road improvements in the adjoining municipalities. The width of the macadam is fourteen feet and its depth six inches.

The amount of grading was much less than the average in Bergen county, the maximum grade only being reduced from 5.20 per cent. to 4.50 per cent.

*Franklin Turnpike, 1.59 Miles Long.*

This improvement commences in the borough of Hohokus and extends northerly toward Mahwah. It is a portion of the old turnpike from Hackensack to the New York state line. The alignment of this road was very good, but the gradients were unnecessarily heavy. Owing to the fact that the road, throughout a greater portion of its length, followed the lower side of the mountain, it was very wet and muddy during many months of the year and in winter and spring was almost impassable. It was because this was the worst piece of road between Hackensack and the state line that the necessity for its improvement became so evident. The work was accordingly commenced in 1907 and completed this year. The result is that what was the worst piece of this old turnpike is now the best. The macadam is fourteen feet wide and six inches deep, and the roadbed is graded to a width of thirty feet.

Some idea of the amount of grading necessary may be learned from the fact that the maximum grade was reduced from 8 per cent. to 2.82 per cent.

*Summit and Woodcliff Avenues, 1.85 Miles Long.*

These two roads are both located in the borough of Woodcliff. The first is a continuation of the macadam road from Hackensack northward along the valley to the Park Ridge improved roads,



Woodcliff Avenue, Woodcliff, Bergen County, Before Improvement.



Woodcliff Avenue, Woodcliff, Bergen County, After Improvement.



Lumberton and Medford Road, Burlington County, Before Improvement.



Lumberton and Medford Road, Burlington County, After Improvement.



## COMMISSIONER OF PUBLIC ROADS.

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thus practically completing another through line to the State of New York. The other runs westward from the Hackensack reservoir through Woodcliff Heights. Both roads are built of macadam, fourteen feet wide and eight inches deep.

The maximum grade was reduced from 13 per cent. to 6.50 per cent.

## BURLINGTON COUNTY.

*Red Lion and Tabernacle Road, 3.65 Miles Long.*

This road was commenced in 1906, but was not finally finished until this year. It begins at the stone road in front of the old Red Lion tavern and extends through a fertile farming section to Tabernacle. The soil is a loose, sandy loam, and, though it produces good crops, it is almost the worst road material that can be found, an empty wagon in itself being a load for a team. The improvement of this road with gravel, twelve feet wide and eight inches thick, gives the farmers along its line a smooth, hard highway over which they can haul three times as great a load as the same team was able to move over the old road. Thus it will prove one of the greatest blessings this region has received in many a year.

The grade was and is practically level.

*Lumberton and Medford Road, 3.90 Miles Long.*

This is a portion of the old Lumberton turnpike which was purchased by the township, and, in consideration of their public-spiritedness, the road was improved from the railroad crossing through Lumberton to Cross Roads, at which point it connects with the stone road leading to Medford. The road forms one of the most important remaining links in the through line from the Upper Delaware section of our State to Atlantic City. When the four miles between Indian Mills and Atsion are built, we will have an improved highway fifteen miles shorter than the old route by the way of Merchantville and Collingswood. The road

is built of macadam, fourteen feet wide and six inches deep, with a short stretch of telford of the same width, but eight inches in depth.

As the road was very well and thoroughly graded by the turnpike company, the grade remains unchanged.

*Westfield and Camden Turnpike, 3.12 Miles Long.*

This road begins at the bridge over Pompesse creek, on the other side of which the improvement was completed the previous year, and extends to the Riverside stone road in Bridgeboro. It is built of macadam, fourteen feet wide and eight inches thick.

The completion of this work is of more than ordinary value, because it connects the northern and southern systems of improved roads in Burlington county. It also forms a more direct and better road from Burlington to Camden than that which follows the eastern bank of the Delaware river.

Several very radical changes in grade were made during the progress of the work, whereby the maximum gradient was reduced from 4.49 per cent. to 2.94 per cent.

CAMDEN COUNTY.

*Camden, Ellisburgh and Marlton Turnpike, 9 Miles Long.*

This turnpike was bought by the State and county last year at the price fixed by the commissioners who were appointed by the Governor to appraise it. The top of the road was entirely worn off and had to be replaced. This was done this year and the city of Camden has now a fine, smooth highway from its suburbs to the Burlington county line.

As this was merely resurfacing work there was no change whatever in the grade.

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*Blue Anchor Road, 2.33 Miles Long.*

This fine gravel road begins at the macadam in Berlin and extends southeasterly to the railroad crossing in Tansboro. The width of the gravel bed is fourteen feet and its depth six inches. It passes through a fine farming country, and it was for the purpose of better enabling the farmers to cart their produce to market that this road was improved.

There was a slight change made in the grade, eliminating a few hills and filling in some small hollows, whereby the maximum grade was changed from 2.50 per cent. to 2.033 per cent.

## CAPE MAY COUNTY.

*Tuckahoe Road, First Section, 3.399 Miles Long.*

This gravel road begins at the northeast line of the Ocean City road in Marmora and extends easterly to the bridge over Cedar Swamp creek. The gravel bed is fourteen feet wide, eight and twelve inches thick.

This is the first section of the connecting line between the Main Shore road and Tuckahoe, and forms one of the most marked improvements that have been made in the Cape May county roads. The original road was very heavy and sandy, and, in many portions, was nothing more than a winding wagon track through the pines. It is now a firm, smooth, hard and straight highway, over which a loaded team can travel with ease, and already the country along the line seems to be waking up to the advantages to be derived from this improved road. Fields are being cleared and cultivated, and preparations are being made to raise a large quantity of truck to supply the demands of the thousands of summer visitors who throng to Ocean City. The road, in fact, serves the double purpose of developing local property, while, at the same time, furnishing an improved highway by which the through travel from the northern and western portions of the State may reach the shore.

The maximum grade was reduced from 2.80 per cent. to 1.20 per cent.



## ESSEX COUNTY.

*West Fairfield and Clinton Road, 2.114 Miles Long.*

This improvement begins at the Fairfield road, in the township of Caldwell, and sweeps around westward in a curve until it meets the Horse Neck road. It is built principally for the accommodation of the farmers who cultivate this rich land on the edge of the Great Piece Meadows. Like all good farming land, in wet weather it is very heavy; consequently, it was almost impossible for the farmers to move their produce to market in wet weather. The problem, therefore, that confronted them was either to have the road improved or cease raising such large crops. As the latter could not be thought of, the road was improved with a telford pavement sixteen feet wide and eight inches deep, and, at the same time, the maximum grade was reduced from 2.30 per cent. to 1.10 per cent.

*Westville Avenue, 1.467 Miles Long.*

This street begins at the Presbyterian church in Caldwell and extends westerly, through Caldwell and West Caldwell, to the Swamp road in Westville. It is built of telford, sixteen feet wide and eight inches thick. It connects the farming and pasture land of the Passaic river bottoms with the town of Caldwell, thus affording the truck raisers and dairymen a more direct route to market.

The maximum grade was reduced from 5.86 per cent. to 4.08 per cent.

*Harrison Street, 1.30 Miles Long.*

This road branches off from Eagle Rock avenue at Roseland, and extends westerly to the Swamp road. Its chief local value lies in the fact that many dairymen are compelled to use it daily in conveying milk from their farms to the Oranges, and a good, hard road, smooth and convenient for travel at all seasons of the year,



West Fairfield and Clinton Road, Essex County, Before Improvement.



West Fairfield and Clinton Road, Essex County, After Improvement.

## COMMISSIONER OF PUBLIC ROADS.

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is to them almost a necessity. It is built of telford, sixteen feet wide and eight inches thick.

To promote the ease and convenience of travel, the maximum grade was reduced from 8.37 per cent. to 4.35 per cent.

*Watchung Avenue, .88 Miles Long.*

This road begins at East Passaic avenue in the town of Bloomfield, extends westerly across the Morris canal and thence curves around to the bridge over the Yantecaw river, from which point it extends westerly to Broad street. The chief value of the road lies in the fact that it forms the last remaining link in an east and west system of improved roads across the northern section of Essex county, from Nutley on the east to Upper Montclair on the west.

The construction of part of this road was quite expensive, owing to the fact that a very long and deep fill was required to carry the road across the low land bordering the Yantecaw river. The pavement is of telford, sixteen feet wide and eight inches deep.

On the western end it was necessary to make a very deep cut in order to strike Broad street at grade. As a consequence, the maximum grade was reduced from 11.62 per cent. to 5.27 per cent.

*High Street, .992 Miles Long.*

This improvement begins at East Passaic avenue, as a country road, and ends as a borough street at Franklin avenue in the borough of Nutley. In our through east and west road this, with Watchung avenue, forms one of the only two links that were missing in the cross country road from the Passaic river to the First Watchung mountain.

As the improvement was carried over a very hilly stretch of country, it was found necessary to reduce the maximum grade from 11.27 per cent. to 6.65 per cent.

The four roads just described, Westville avenue, Harrison street, Watchung avenue and High street were all commenced in 1907, but the work of improvement was not completed until this year.



## GLOUCESTER COUNTY.

*Malaga and Downstown Road, 5.74 Miles Long.*

The improvement of this road marks the first construction, under state aid, in Gloucester county since 1903. Its importance from the State's standpoint lies in the fact that it completes a through line across the State to Atlantic City, while from a local standpoint it is of great value to the farmers and truck raisers whose places border it, inasmuch as it permits them to haul three times as much with the same team as they could before this improvement was completed. The road also marks another new departure in this county, inasmuch as the width of the road is increased from the old standard of fourteen feet to twenty-four feet, and the improvement is so marked that it is a cause for constant congratulation among the people along the line of the road. The depth of the gravel bed varies from nine inches in the centre to six inches at seven feet on each side of the centre, from which depth it is gradually reduced to one inch at the extreme outer edge.

This road was improved still further by reducing the maximum grade from 4.25 per cent. to 2 per cent.

## HUNTERDON COUNTY.

*White House and Flemington Road, First Section, 6.478 Miles Long.*

This macadam construction begins at the Somerset county line on the New Brunswick and Easton turnpike, and extends thence westerly through Mechanicsville to Old White House tavern, at which point it swerves to the south, through White House station, and ends at a point near Pleasant Run. The width of the pavement is fourteen feet and its depth six inches, while the width of the graded roadway varies from forty feet in the open country to thirty-four and twenty-eight feet in the towns. The remainder of the road to the county seat in Flemington has been surveyed, and it is the intention of the authorities to continue the improvement to



Malaga and Downtown Road, Gloucester County, Before Improvement.



Malaga and Downtown Road, Gloucester County, After Improvement.





Whitehouse and Flemington Road, First Section, Hunterdon County,  
Before Improvement.



Whitehouse and Flemington Road, First Section, Hunterdon County,  
After Improvement.



the county seat next year. The benefits which this road will confer upon Hunterdon county are already becoming quite marked in the increase and character of the vehicular travel, and already many persons of means are visiting and looking into the natural advantages of the county with a view to future investment.

The change in the road is most marked. Many short, abrupt turns have been removed, steep hills cut down, new bridges built, and deep hollows filled, and the maximum grade reduced from 12.50 per cent. to 5 per cent.

#### MERCER COUNTY.

*Elm Street, Rosedale and Pennington Road, 2.96 Miles Long.*

Elm street, the first portion of this improved road, begins at the Lawrenceville and Princeton stone road, and runs northerly a little less than one-half of a mile, where it strikes the Rosedale road, which latter extends westerly to Captain VanKirk's corner in Rosedale, where the improvement ends. The last portion of the title refers to the ultimate intention of the county to extend this stone road to Pennington. The width of the macadam is fourteen feet and its depth six inches.

On this road asphaltum oil was used as a cementing binder for the first time in the history of New Jersey road construction, and many valuable and important facts about its application were learned. It was first applied upon the one and one-half-inch stone, after the same had been thoroughly bonded and rolled, but it was found that the heavy asphaltum oil would not penetrate the consolidated roadbed. It was therefore necessary to loosen up the stone before the application of the oil, and on the remainder of the work the asphaltum oil was applied to the one and one-half-inch stone without the use of any other binder. After sprinkling the oil, which had been previously heated, a layer of stone screenings was spread upon the road and rolled until the oil was forced through to the surface, when more screenings were applied, and this process continued until the oil ceased to show upon the surface. The results have more than equaled our expectations, as the road is not only dustless, but practically noiseless and very resilient. If this pavement stands the freezing and thawing effects

of the winter and spring, we feel that the dust problem will have been practically solved in the State of New Jersey.

The road was further improved by reducing the maximum grade from 10.20 per cent. to 6 per cent.

*Etra and Perrineville Road, 1.19 Miles Long.*

This road begins at the upper Hightstown and Perrineville road and follows a winding course to the Monmouth county line, at which point it connects with the improved road to Perrineville. It is purely a local road, built of macadam, fourteen feet wide and six inches thick.

There was little change made in the grade, the maximum being reduced from 2.10 per cent. to 1.80 per cent.

*Brunswick Pike, 3.70 Miles Long.*

The new construction begins at the end of the old macadam and extends in a straight line northeasterly through Penn's Neck to the bridge over the Millstone river at the Middlesex county line. The macadam is sixteen feet wide and eight inches deep. The total width of the graded roadway is thirty-six feet.

The finishing of this contract marks the completion of the macadamizing and grading of all of that portion of this old turnpike lying in Mercer county, between the city of Trenton and the Middlesex county line. When Middlesex county shall have completed its portion, the distance between Trenton and New Brunswick will be reduced five miles.

While the alignment of this road was all that could be desired, the gradients were in many cases much steeper than they should be. The maximum grade was therefore reduced from 5.38 per cent. to 1.95 per cent.

## MIDDLESEX COUNTY.

*Half Acre Road, 3.37 Miles Long.*

This gravel road begins at the Jamesburg and Englishtown county road and extends through Hoffman to Half Acre. Owing to the proximity of good gravel, the gravel bed was made twenty feet in width, and the depth from nine inches in the centre to three inches at the outer edges. Quite a noticeable change was made in this road by straightening it on each side of Manalapan brook. As it is built through a rich farming country, it will, consequently, prove of great value to the people along its line, giving them a good outlet to the railroad station at all seasons of the year.

The maximum grade was reduced from 6.50 per cent. to 5.40 per cent.

*Colonia and Avenel Road, 1.59 Miles Long.*

This cross road begins at the right of way of the Pennsylvania railroad in Colonia, and extends in a general easterly direction, crossing the Woodbridge and Rahway stone road, passing through Demarest on the Heights, and ending at the Perth Amboy and Woodbridge railroad in Avenel. The width of the macadam is fourteen feet and its depth six inches.

The most noticeable change in this road was caused by cutting down the hills and filling the intervening hollows, thus reducing the maximum grade from 5.60 per cent. to 2.043 per cent.

*Cranbury and Plainsboro Road, 1.004 Miles Long.*

This improvement is a continuation of that commenced in 1904, and carries it on from the tracks of the Trenton and New Brunswick railroad toward Cranbury, stopping at Scott's Corner. The width of the macadam is fourteen feet and its depth six inches. The road traverses a rich, fertile and flat farming country; therefore, at certain seasons of the year it was almost impassable for a loaded team, but the farmers along its line can



now haul their produce to the railroad at Plainsboro or on to Princeton, which is their best market, at all seasons of the year.

A peculiarity of this road lies in the fact that for the purpose of proper drainage it was found necessary to increase the maximum grade from .24 per cent. to .95 per cent.

*Livingston Avenue, 1.12 Miles Long.*

This is a continuation of Livingston avenue, New Brunswick, commencing at Mile Run brook, the city line, and extending southwesterly along the Trenton and New Brunswick turnpike to Howell's lane. This macadam road connects Livingston Park with New Brunswick. The pavement is sixteen feet wide and eight inches thick, and the total width of the graded roadway is twenty-eight feet.

The improvement is a most marked one, especially at the New Brunswick end, where, by means of a heavy fill, and a longer though not so heavy cut, the maximum grade is reduced from 7 per cent. to 2.50 per cent.

*Main Street, 1.75 Miles Long.*

The road takes its present name from Main street, Woodbridge, while it is in reality a portion of the old Woodbridge and New Brunswick turnpike. This improvement is an extension of the macadam already laid on Main street, beginning where that ends and extending thence to Bloomfield's Corner on the Perth Amboy and Metuchen stone road. It forms a continuous improved road, with those already built, from Woodbridge to Metuchen, thence through to the county seat at New Brunswick; hence it is not only of great local but also of general benefit to the whole county. The width of the stone bed is fourteen feet and its depth eight inches.

If nothing else had been done upon this road, the grading alone would have been a vast benefit to every user of it, as the maximum grade was reduced from 14 per cent. to 4.166 per cent.



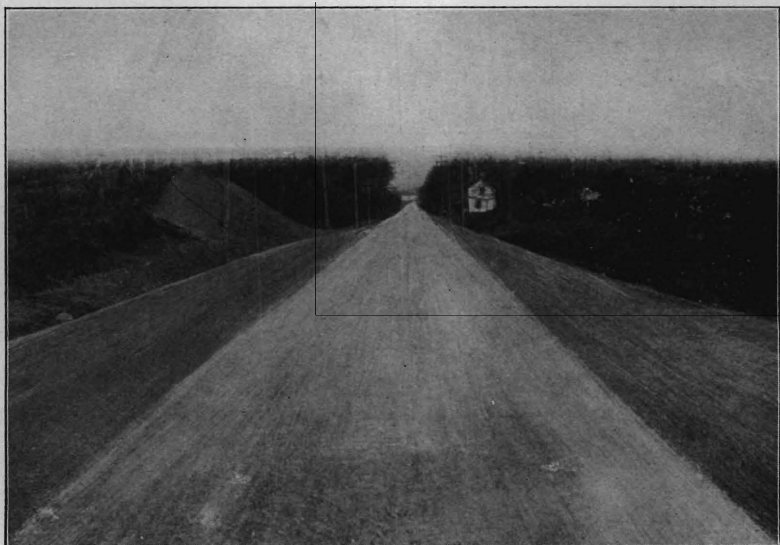
Livingston Avenue, Middlesex County, Before Improvement.



Livingston Avenue, Middlesex County, After Improvement.



Main Street, Woodbridge, Middlesex County, Before Improvement.



Main Street, Woodbridge, Middlesex County, After Improvement.



*State Street, 1.35 Miles Long.*

Beginning at Meredith's line in the city of Perth Amboy, this improvement follows the line of State street through the extreme northern portion of the city to Woodbridge creek, thence to the macadam road at Sewaren. It furnishes an inlet from Woodbridge by way of Sewaren and Boynton Beach into the heart of the city of Perth Amboy. Built, as it is, across the salt meadows, it forms the only hard road into Perth Amboy on the eastern side of the Central Railroad of New Jersey. It is constructed of macadam, fourteen feet wide and eight inches thick.

The only noticeable change in grade on the road is the approach to the drawbridge over Woodbridge creek from the northern side, at which point the maximum grade was reduced from 3.40 per cent. to 2.10 per cent.

*River Road, 1.66 Miles Long.*

This work marks the completion of the improvement of the road on the north side of the Raritan river, in the county of Middlesex, between the Albany street bridge and Bound Brook. It begins at what is now called Raritan avenue in Highland Park, and extends to the macadam already laid on the Landing bridge and Stelton road. It was built first to accommodate the manufacturing interests, which have just been located in Highland Park, and second, for the residents who are fast filling this growing suburb of New Brunswick. The road also forms the most beautiful drive in the vicinity of New Brunswick.

The pavement is fourteen feet wide and eight inches thick, and the width of the graded roadway is twenty-eight feet. It was necessary to do a great deal of cutting to bring the road out to this width and also to reduce the maximum grade from 5 per cent. to 2.50 per cent.

*River Road, 2.97 Miles Long.*

This is another section of the road along the north bank of the Raritan river, the improvement of which was begun in 1902. This section, which begins at the end of the old macadam, west of the Landing bridge, was commenced in 1907, but was not completed until this year. It ends at the macadam laid by the township, and, with it, completes the line of the improved road from Landing bridge to Bound Brook. The width of the macadam is fourteen feet and its depth eight inches, while the graded width of the roadway is twenty-eight feet. One of the most marked changes in the improvement of this road was the elimination of many unnecessary, and, in some cases, quite abrupt turns. In the entire length of the improved section there is not now one single sharp turn.

The road was further greatly improved by reducing the maximum grade from 5 per cent. to 2.20 per cent.

*Jamesburg and Dayton Road, 2.86 Miles Long.*

The improvement of this road was commenced in 1906, but the work was delayed to such an extent that it was not completed until 1908. The pavement begins at the engine house in Jamesburg and follows a general westerly direction to the Dayton improved road. The width of the stone bed is fourteen feet and its depth eight inches. This road, in connection with the improvements already made, gives Jamesburg a direct connection with Dayton and Monmouth Junction.

The greatest and most marked improvement on the entire work was the reduction of the maximum grade from 15 per cent. to 4.10 per cent.



Farmingdale and Hamilton Road, Monmouth County, Before Improvement.





## COMMISSIONER OF PUBLIC ROADS.

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## MONMOUTH COUNTY.

*Farmingdale and Hamilton Road, First Section, 3 Miles Long.*

This road begins at the improved road in Farmingdale, on the corner of which stands Lutz's store, and extends northeasterly and easterly toward Asbury Park. The idea in building this road is to give the interior of the State an outlet to the shore at Asbury Park. The completion of the remaining link, about one and one-half miles, will connect the road just built with Corliss avenue, which has been already improved. It will also prove of great value to the many truck raisers who live along and near it, as it will enable them to haul much greater loads, in a shorter time, to Asbury Park and Ocean Grove than they have been able to do heretofore.

The width of the gravel bed constructed is twenty feet and its depth varies from nine inches in the centre to three inches at the shoulders.

The maximum grade was reduced from 1.40 per cent. to .40 per cent.

*Manalapan Connecting Road, .265 Miles Long.*

This short connecting link, lying in the village of Manalapan, begins at the end of the stone road leading to Freehold, and ends where the Baird road intersects the stone road leading from Manalapan church toward Hightstown. Its construction fills in a gap which has been most noticeable because of the many miles of improved roads on each end of it.

The width of the stone bed is sixteen feet and its thickness six inches. The grade remains unchanged.

*Rumson Road, East Portion, .76 Miles Long.*

The improvement of this street from the west end of the Seabright drawbridge to the stone road laid on The Road of Two Rivers replaces with macadam, sixteen feet wide and six inches thick, the most heavily traveled portion of that famous old gravel

road. To eliminate the dust nuisance, the surface was treated with a coating of heavy asphalt oil. This has been effectual in laying the dust, but the surface of the road is not all that we could wish. It is hoped, however, that the little defects which have shown themselves may be removed in the spring.

There was but little change made in the grade, the maximum being reduced from 1.90 per cent. to 1.30 per cent.

*Eatontown and Colt's Neck Road, Second Section, 3.31 Miles Long.*

This is the last link in the chain of improved highways across the State from Trenton to Long Branch. The roads in the neighborhood of Trenton and those along the shore have been improved for a number of years. The work was completed from Trenton to Freehold in 1904, and since that time the improvement has been pushed steadily eastward until it has at last reached the stone road at Eatontown, from which point access may be had to all of the principal shore resorts over improved roads.

The road is built through a very fertile farming district, which is under a high state of cultivation, and, as a consequence, is used almost continually by the farmers in transporting their produce. For their benefit, as well as for that of the general traveling public, much grading was done, thereby reducing the grade from a maximum of 7.40 per cent. to 3.80 per cent. The width of the macadam is fourteen feet and its depth six inches, while the road is graded to a width of thirty feet.

*Allentown Road, .955 Miles Long.*

The line of this improvement begins at the bridge over Indian run, which marks the division line between Monmouth and Mercer counties. It then follows Church street to Main street, thence northerly on Main street two hundred feet, thence returning to the junction of Church and Main streets, follows the latter to High street, thence along High street to the Davis station stone road. The macadamizing of these streets connects the stone road from Trenton to Allentown with that leading from Allentown to Davis



Bayhead and Seaside Park Road, Northern Section, Ocean County,  
Before Improvement.



Bayhead and Seaside Park Road, Northern Section, Ocean County,  
After Improvement.



station on the Pemberton and Hightstown railroad, thus increasing the utility of both of these roads, thereby making this improvement of greater value than its length would at first seem to indicate. The stone work is eighteen feet wide and eight inches thick.

The maximum grade was reduced from 2.50 per cent. to 1.90 per cent.

*Eatontown and Colt's Neck Road, First Section, 3.25 Miles Long.*

This is a continuation of the Freehold and Colt's Neck road, and carries that improvement forward from Yellow brook, in Colt's Neck, through Scobeyville, to a point three hundred feet east of the first angle west of the road leading from Tinton Falls to Leedsville. It forms still another section of the improved road which we are building across the State from Trenton to the seashore. As it passes through a rich farming country, it also affords a good, hard road, over which the farmers may haul the products of the soil at all seasons of the year, thus saving them many valuable hours. The macadam pavement is fourteen feet wide and six inches thick, while the graded width of the roadway varies from thirty-two to forty-two feet, thus giving it the appearance of being what it really is, a state highway.

There were many short hills and hollows along the line, which have been cut down and filled up until the maximum grade has been reduced from 4.30 per cent. to 2.30 per cent.

OCEAN COUNTY.

*Bayhead and Seaside Park Road, Northern Section, 4.671 Miles Long.*

Of all the roads built in New Jersey the past year this may be called the only entirely new one. Commencing at Bayhead, the road traverses what was an almost trackless sand bar between the Atlantic ocean on one side and Barnegat bay on the other. Wheeling had become in fact so very difficult that many of those who had been attracted to this fine stretch of beach on one side and splendid still water on the other, were considering seriously the

advisability of abandoning their summer homes by the sea, and seeking rest and refreshment in more accessible resorts. The situation in brief was this: Shall Ocean county and the State of New Jersey see the development of this portion of the beach not only come to a standstill, but begin to retrograde, or shall they do something to foster and encourage the enterprise of the people who had done so much to make it what it already was? In line of the policy of the State of New Jersey there was but one answer to this query. Everything in reason shall be done to promote the growth of this section. Therefore the road was built from Bayhead as far south as Normandy Beach, the construction being of gravel, twenty-four feet wide and varying in depth from nine inches in the centre to three inches at the shoulders.

In building the road it was necessary, in order to preserve a straight course, to cut through the property of the United States at the Bayhead Life Saving Station. Permission to do this was obtained by the residents of the beach. Other obstructions, such as ice houses, were also removed, in order that it might not be necessary to change the direct course of the road.

The grading consisted in simply leveling the sand hills and filling up the hollows, leaving the completed road practically level.

*Lakehurst and Lakewood Road, 6.335 Miles Long.*

This may in great part be called a new road, as so many crooks and turns were eliminated in improving it. For example, one very crooked section, 1.65 miles in length, was abandoned, and a straight line built through the woods. The change is so great that what is left of the old road is hardly recognizable. The improvement is more particularly described as beginning at Centre street in Lakehurst and extending northeasterly to the Mount's Crossing road near the Alligator on the western boundary of Lakewood.

When the improvement was first undertaken it was said that the roads in Lakewood were already improved and it would not be necessary to carry the work beyond the present ending point to make a good, hard road between these two important towns, but the contrast between the so-called improved road in Lakewood and the state and county road that had been built from Lakehurst to the borders of Lakewood was so great that a demand imme-



Macopin Road, Passaic County, Before Improvement.



Macopin Road, Passaic County, After Improvement.



diately arose for a continuation of the improvement into Lakewood, and, in accordance with that demand, the road is now being constructed for the remainder of the distance. The entire work, when completed, will give the winter residents of Lakewood one of the most pleasant drives out of that resort. The width of the gravel is twenty-four feet and its depth gradually decreases from nine inches in the centre to three inches at the shoulders.

The changes made in this road by grading are no less striking than those made in its course, the maximum grade being reduced from 6 per cent. to 1.90 per cent.

#### PASSAIC COUNTY.

##### *Midvale (Greenwood Lake) Road Extension, 3.13 Miles Long.*

This is a still further extension of the improvement of the main highway along the valley of the Wanaque river toward Greenwood Lake, the present work ending at the township line of West Milford, thus bringing the macadamizing to within three miles of the lower end of Greenwood Lake, that Mecca of so many sportsmen and pleasure seekers. The width of the macadam is sixteen feet and its depth four inches.

As the country becomes much more rolling and mountainous as we travel northward along the Wanaque valley, the maximum grade had to be reduced from 18 per cent. to 7.50 per cent.

##### *Macopin Road, 1.86 Miles Long.*

The improvement completed on this road during the past year finishes the macadamizing throughout its entire length from the Paterson and Hamburg turnpike to the Echo Lake road, thereby giving the residents of Paterson a much shorter and more direct road to Echo Lake and the Upper Macopin region. It is constructed of macadam, fourteen feet wide and four inches thick.

As the road is built through a mountainous country, a great deal of grading, through both dirt and rock, was necessary, in order to reduce the maximum grade from 13.60 per cent to 6.20 per cent.

## SALEM COUNTY.

*Mannington Road, 1.58 Miles Long.*

This was an old shell road which had been improved by the township, and was taken over by the county as a part of a through system. As the road had previously been improved with oyster shells, it was deemed best to use them in this work. They were, therefore, spread upon the road for a width of sixteen feet and to a depth of twelve inches, except from the bridge over Fenwick creek to station ten, and from station seventeen to station thirty-two, where an extra width of four feet was added on each side, decreasing in depth from twelve inches to one inch at the extreme outer edge.

There was no change whatever in the grade.

*Aldine Road, 1.326 Miles Long.*

This road begins at the intersection of the Mannington and Quinton roads in the village of Alloway, and extends easterly toward Aldine, the present work stopping at the bridge over Hitchner's mill race in the village of Remsterville. It is the first section of the extension of the east and west road across the county, which, owing to limited railroad facilities, is almost a necessity. The width of the gravel bed is twenty feet and its depth varies from nine inches in the centre to three inches on the side.

Owing to the hilly nature of the eastern end of the road it was necessary to reduce the maximum grade of 8 per cent. to 3.80 per cent.

## SOMERSET COUNTY.

*South Bound Brook Road, 2.25 Miles Long.*

The improvement of this road was commenced at the culvert near the south borough line of South Bound Brook, and was carried southeasterly along the Delaware and Raritan canal to the road leading to Middlebush. It is a portion of the old New Bruns-

wick and Easton turnpike, and, as such, is of more than local value. The present section of road gives the people along its line an outlet to Bound Brook, and it is hoped to carry the improvement on next year to New Brunswick, when we will have a fine river drive along the south bank of the Raritan river from New Brunswick to Bound Brook. The width of the stone work on the present improvement is fourteen feet and its depth eight inches, while the width of the graded roadway is forty feet.

The maximum grade was reduced from 6.13 per cent. to 4 per cent.

*Dead River Road, 2.12 Miles Long.*

This road begins at the southerly end of the bridge over the Passaic river, near the village of Millington, and extends thence southerly past the West Millington Baptist cemetery to the road to Liberty Corner, thence westerly through Stone House settlement to a point. The road stops thus abruptly because it was the intention of the board of freeholders to continue the work next year. The width of the macadam is fourteen feet and its depth eight inches, while the roadway is graded to a width of thirty-three and a half feet.

This road is really a continuation of the Valley road in Morris county, and furnishes the people who live along it an outlet to improved roads extending all the way to Newark.

The maximum grade was reduced from 5.08 per cent. to 3.95 per cent.

UNION COUNTY.

*West Grand Street, First Avenue and Locust Street, 2.23 Miles Long.*

This road begins at DeHart place, in the city of Elizabeth, and extends along West Grand street and First avenue to Roselle, thence along Locust street, under the Central railroad of New Jersey, to Westfield avenue, in the borough of Roselle Park. It forms a connecting link between the city of Elizabeth and the borough of Roselle, on the south side of the railroad, and is of great benefit to both places, as it gives them a direct improved road. The



width of the macadam is sixteen feet, its depth on new work eight inches, and on old work four inches.

The maximum grade was reduced from 6 per cent. to 2.75 per cent.

*North Broad Street and Elizabeth Avenue, .956 Miles Long.*

This improvement is of much greater value than its length would indicate, as it connects the improved roads and streets of Union county with those of Essex county. The width of the macadam is sixteen feet, where there are no trolley tracks, and twenty-three feet, or all that was left of the street outside of the portion taken care of by the trolley company, where tracks were laid. The depth was eight and twelve inches, while the graded width of the roadway varies from thirty-six to forty feet. The work of improvement begins at King street, in the city of Elizabeth, and extends through Lyons Farms to the present stone road on Elizabeth avenue near the Essex county line.

The maximum grade on the hill leading up from Lyons Farms station toward the Essex county line was reduced from 6 per cent. to 4 per cent.

*Terrill Road, 1.04 Miles Long.*

The work of improvement on this road begins at Green brook, the dividing line between the counties of Union and Somerset, and extends southeasterly along the line between the city of Plainfield and the township and borough of Fanwood to South avenue. The width of the pavement is sixteen feet and its depth eight inches, while that of the graded roadway is forty feet. The importance of this road lies in the fact that it connects so many other improved roads and renders them more available.

The maximum grade, where the road is carried over the Central railroad of New Jersey by means of an overhead bridge, was reduced from 9 per cent. to 7 per cent.



Harmony Road, The New Road Around Allshouse Hill, Harmony Township,  
Warren County.



Harmony Road, The New Road Around Allshouse Hill, Harmony Township,  
Warren County.

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## WARREN COUNTY.

*Lopatcong Road, 2.59 Miles Long.*

This is an extension of the road just described, and carries the improvement forward to the borough line of Phillipsburg. The construction is telford, fourteen feet wide and eight inches thick. The width of the graded roadway is twenty-seven feet.

It was found necessary to do considerable grading on this road, whereby the maximum grade was reduced from 9.66 per cent. to 4.87 per cent.

*Harmony Road, 5.36 Miles Long.*

The work of improvement on this road was commenced at the end of the old macadam in the year 1907, but was not completed until this year. It is a very important portion of the main road from Belvidere, the county seat, to Phillipsburg, the largest city in the county. It is built of telford, fourteen feet wide, and eight inches deep, and the width of the roadway as graded is twenty-seven feet.

Though following in its general trend the valley of the Delaware river, the road was nevertheless quite hilly. We were, therefore, compelled to do a great deal of heavy cutting, whereby the maximum grade was reduced from 15.25 per cent. to 6.60 per cent.



## DONT'S.

# Suggestions to Road Supervisors.

BY

ROBERT A. MEEKER, STATE SUPERVISOR OF ROADS.

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Don't leave grass and weeds on the shoulders and in the gutters.

Don't dig the mud out of the gutters and throw it upon the road.

Don't leave dirt in piles on the road.

Don't throw grass and weeds upon the road surface.

Don't dump stone or gravel on an old road without first preparing the surface to receive it, because you thereby cause willful waste and woeful want.

Don't place new material on the road without leveling and shaping it so that the grade and cross section of the road will be unchanged.

Don't expect travel to spread and roll the new material; one-half of the money spent is wasted by this method.

Don't put new material on an old, hard road surface before first picking or loosening the old covering. It is good for the quarryman and gravel owner but bad for the taxpayer and road user.

Don't try to do work without proper tools.

Don't leave your scarifier in the shed.

Don't forget to use your sprinkling wagon.

Don't let your steam roller be idle.

Don't think any old tools are good enough for road work.

Don't use dull picks, broken shovels, dull scraper-blades or broken and leaky steam rollers.

Don't waste your rainy days.

Don't let water stand on your road.

Don't try to repair a road in dry weather without a liberal use of water.

Don't allow culverts or pipes to become choked up.

Don't allow the outlets of underdrains to become stopped up.

Don't let water get under a road.

Don't let ruts form.

Don't let the shoulders get higher than the center of the road.

Don't let the road lose its original cross section.

Don't fail to widen your fills at every opportunity. No better place for the mud, grass and weeds taken off the road than on the sides of high embankments.

Don't use guard rails if you can get dirt to widen your road.

Don't bury a stone road under mud.

Don't crown your road so high that no one will travel on the sides.

Don't forget that the entire width of the road is intended for use.

Don't expect a road to take care of itself.

Don't fail to locate all good repair material lying on or near the road.

Don't wait until you are ready to go to work before you procure the necessary materials for repair.

Don't be constantly changing your road gang.

Don't let experienced men go simply to give someone a job.

Don't lose sight of the fact that road repairing is a trade and must be learned.

Don't guess at the amount of material required,—measure and know.

Don't depend on someone else to tell you what the condition of your road is.

Don't fail to visit every road under your care at least once a week.

Don't refuse to try any new material that may be offered, unless the same has been proven bad.

Don't be satisfied with anything but the best.

# Requirements of Road Construction for Modern Travel.

---

BY JOSHUA DOUGHTY, JR., COUNTY ENGINEER OF SOMERSET.

The highways, built under state aid within the last twenty years, begin to show their unsuitableness for present methods of travel. What was, a decade or more ago, considered a first-class road, is now regarded as becoming unfit for the demands of the present day. It has been supposed, until recently, that a smooth, hard surface of fine stone, resting upon a substantially built cracked-stone foundation, was the desideratum in the way of improved roads, and, in so far as travel by horse-drawn vehicles is concerned, such is still the case. A macadam road, of best construction, cannot be excelled, for such purposes, in this part of the world. Such highways have, however, been found deficient, not because of defects in design and construction, but because of the change in the character of the vehicles passing over them. Twenty years ago automobiles and motor cycles were unheard of; ten years ago only occasionally, but they are now of frequent or continual occurrence.

The experience of road builders and road users goes to show that a change in character of at least the surface of roads is most desirable, if not necessary, and the attention of engineers is being directed to supply what is needed. The impact of rolling tires under horse-drawn conveyances tends to make roads harder and harder as time passes. The particles of stone in the top dressing are forced, from time to time, into voids and crevices in the layer beneath till one uniformly solid mass results, and this mass is hard. Now, under travel by vehicles propelled by other than horse power, as automobiles and the like, of greater weight and at higher speed, the finer particles that should, under all circumstances, remain on the road, are, on the other hand, lifted by the rapid motion of rub-



ber tires and carried by currents of air to points off the highway, and thus their cementing value is lost. The bottom courses of stone are then reached, soon exposed, quickly affected by rains, snows and frosts that penetrate below the surface, and then the destruction of a costly highway is only a question of time.

Hard roads, meaning thereby such as are unyielding in the slightest degree to travel thereon, are not elastic to the extent required. The difficulty seems to be right here: Any decrease of hardness and inflexibility is apt to be accompanied by less durability and a tendency to ruts, conditions to be avoided if possible.

To overcome the dust nuisance, preventives and remedies of various kinds have been suggested and many of them tested. The results of these trials are not by any means uniform even when conditions are similar. Sprinkling crude petroleum has, in some instances, been attempted with fair results, so far as laying the dust is concerned, but the road is apt to ravel, as the stones become loose in consequence of the loss of binding power. If oil is used it should be of an asphaltum base, as paraffine base oils, when dried out, are too brittle. Natural asphaltum would be most proper to use, but its cost and the expense attending its application would make it too high in price for our county roads. Tar, such as is produced in coke ovens, may be used to good advantage. Heat must be applied to render the tar less viscous after the road has once been made free from dust and well dried. Ammonia, sulphur and water must be removed from the tar preparation before it is used. It is very important that the tar used is that produced by distilling at a low heat, as too high a degree of heat renders the residue unfit for use. This pavement is nearly noiseless under use, is readily cleaned, attractive to the eye, produces neither dust nor mud, is quickly laid, easily repaired, and wears well. There are a few defects attending its use. It will not stand continued moisture and is not so well adapted to steep grades.

I would suggest the following method: Scarify the surface of the road to a depth of about two inches, lay on about one-half inch of some tar preparation and roll same carefully. Then apply coating of one-half-inch stone, add more tar preparation, cover with one-half-inch stone and roll thoroughly.

# My Observations of Modern Road Construction.

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BY J. J. ALBERTSON, COUNTY ENGINEER OF CAMDEN.

At present, public attention is attracted more toward road maintenance than road building. We already have large investments in roads, and it is with the deepest regret that we see these objects of pride slipping away from us.

Our early macadam roads have almost served their purpose, and we must now look for something better. We, as engineers of New Jersey, do not like to admit that we know so little about permanent road building.

In Camden county we have tried various means to save our stone roads, with different degrees of success. Our first stone roads, built by the turnpike companies, were watered. This seemed too expensive. Then we frequently applied light coats of gravel. This made a fairly good cushion and prevented ravelling, but oh, the dust! This was more than the abutting property owners could stand. The neat, thrifty housewife exerted her quiet but powerful influence, and soon made this form of road maintenance unpopular. We then turned our attention to petroleum dressing, which relieved the dust nuisance but temporarily. Last year we tried a refined tar product, but our expectations were never quite realized. One application cost about \$450 per mile, including the necessary cost of screenings on top of the tar. This year we had to repeat the application of tar and screenings, and present appearances indicate that the same process will have to be gone through with next year. We may continue to experiment along these lines and perhaps find something reasonably permanent, but why not put a little more expense on our roads at the time of construction and build those which will be durable and dustless.

The year 1908 has marked almost a revolution in road building



in New Jersey. We are now having our first oiled dirt roads built. The writer understands they are no longer an experiment in the West. If the work now being done by Gloucester county, near Westville, is a success, road building in South Jersey, where we have no stone, will be easy. The only requirement is a proper mixture of asphaltum oil and dirt, shaped up and rolled, and the result is a perfect road, said to improve with age until the life of the asphaltum is exhausted. But even this may crystallize, as the tar dressing has already done, and lose its power of cohesion.

We are building a macadam road from Chew's to Blackwood, a distance of 2.40 miles, following the conventional state specifications until the one and one-half inch stone is in position and rolled dry. We then applied a very heavy asphaltum oil, obtained from Kentucky, which is rendered reasonably limpid by running high-pressure steam, from a portable boiler, through coils of pipe in the bottom of the oil-tank cars, and is then pumped into specially prepared sprinkling wagons. From these we applied the oil direct to the one and one-half inch stone, using this oil instead of water, covered the oil with coarse screenings, and rolled thoroughly. The tendency of the oil is to work up and come to the surface. It is wonderful how soon the whole becomes bound together, forming a magnificent smooth surface which has considerable resiliency. The durability of this pavement will depend upon the life of the asphaltum oil. There is a possibility of this oil oozing out next summer, in which event we will apply more screenings. We made but one application of oil, using three quarts to each square yard of surface treated.

Our latest experiment for the year is just completed in front of my home on the Evesham road. This was being improved by the ordinary eight inch macadam construction, costing ninety cents per square yard, when Mr. Joseph H. Amies, of Philadelphia, asked our road committee for its permission to demonstrate to us what he could do in road building. He offered to put the top coat on the four inch macadam foundation at fifty cents per square yard. The subject was quickly adjusted with the macadam contractors, and Mr. Amies began work. He deposited his treated stone on the road in a uniform layer about four inches thick, rolled it until it was compressed to about three inches, applied a light coat of treated coarse screenings, rolled it again and then covered the surface with a skim coat of white sand. As a result, we have two thousand



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square yards of most beautiful pavement, equal to sheet asphalt, which has cost us, including the macadam base, ninety-five cents per square yard. At present, it has all the requirements of a perfect highway, being light in color, free from dust, noiseless and elastic. The inventor claims that it will be entirely free from the effects of climatic conditions, neither hardening in winter nor softening in summer, and that it is entirely waterproof. He also claims that there will be no wear, as the stones do not touch each other, all being bedded in elastic asphaltum, which has been mixed with oil and treated with an alkali, thereby making a fixed oil. This, he claims, will not evaporate, crystallize nor decay, as all other exposed asphalts do in time. He assures the writer that he is able to sell the treated stone, dried, to the county or contractor, at such a price that we can afford to resurface our old, worn stone roads with it, thereby making them equal to sheet asphalt, but dustless, and removing all necessity for maintenance bills for many years to come.

The above seems almost like a dream. If the inventor's claims are verified, the writer predicts a great era of road building, but unless something of this kind does develop along these lines, the taxpayers will have almost enough to do to maintain the stone roads already built.

NEW JERSEY STATE LIBRARY

# Statements by Engineers and Supervisors.

Detailed statement of the cost of the May's Landing and Downstown road, townships of Hamilton and Buena Vista, county of Atlantic. Total length, 73,601 feet, or 13.94 miles.

Width of gravel-bed, 16 feet.  
Length of gravel-bed, 73,601 feet.  
Depth of gravel-bed, 7 inches.

Gravel, 25,442.32 cubic yards, at 96½ cents; total.....	\$24,551 84
Earth excavation, 31,076.24 cubic yards, at 30 cents; total.....	9,322 87
Grubbing, 20 acres, at \$50; total.....	1,000 00
<b>Total .....</b>	<b>\$34,874 71</b>
Supervisor's salary.....	798 00
Engineering expenses.....	1,743 71
<b>Total cost of road.....</b>	<b>\$37,416 42</b>
Lump sum, contract price.....	\$34,874 25
Total allowed by the State.....	34,874 25
One-third of above, amount paid by the State.....	11,624 75
Maximum grade before.....	7.00 per cent.
Maximum grade after.....	3.20 per cent.

E. D. RIGHTMIRE,  
*Engineer.*  
WILLIAM A. ELVINS,  
*Supervisor.*

Detailed statement of the cost of Rivervale, Demarest, Cedar and Piermont avenues, township of Rivervale, county of Bergen. Total length, 26,245 feet, or 4.97 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 26,245 feet.  
Depth of stone-bed, 6 inches.

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Macadam, 40,716.5 square yards, }	total .....	\$22,953 80
Telford, 109 square yards.....		
Earth excavation, 23,421 cubic yards, at 35 cents; total.....		8,197 35
Total .....		\$31,151 15
Supervisor's salary.....		399 00
Engineering expenses.....		1,557 56
Extras, paid by county.....		330 05
Total cost of road.....		\$33,437 76
Lump sum, contract price.....		\$31,151 15
Total allowed by the State.....		31,151 15
One-third of above, amount paid by the State.....		10,383 71
Maximum grade before.....		8.50 per cent.
Maximum grade after.....		5.00 per cent.

H. G. HERING, JR.,

*Engineer.*

GARRET S. M. HOLDRUM,

*Supervisor.*

Detailed statement of the cost of Westwood and Leslie avenues, township of Rivervale, county of Bergen. Total length, 6,265 feet, or 1.185 miles.

Width of stone-bed, 14 feet.

Length of stone-bed, 6,265 feet.

Depth of stone-bed, 6 inches.

Macadam, 8,714.61 square yards, at 65 cents; total.....	\$5,664 50
Telford, 1,000 square yards, at 90 cents; total.....	900 00
Earth excavation, 3,003 cubic yards, at 35 cents; total.....	1,061 05
Total .....	\$7,625 55
Supervisor's salary.....	99 00
Engineering expenses.....	381 28
Extras, paid by township.....	120 00
Total cost of road.....	\$8,225 83
Lump sum, contract price.....	\$7,625 55
Total allowed by the State.....	7,625 55
One-third of above, amount paid by the State.....	2,541 85
Maximum grade before.....	5.20 per cent.
Maximum grade after.....	4.50 per cent.

H. G. HERING, JR.,

*Engineer.*

GARRET BLAUVELT,

*Supervisor.*



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Detailed statement of the cost of Franklin turnpike, township of Hohokus, county of Bergen. Total length, 8,400 feet, or 1.59 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 8,400 feet.  
Depth of stone-bed, 6 inches.

Macadam, 13,066.6 square yards, at 50 cents; total.....	\$6,533 30
Earth excavation, 13,115.9 cubic yards, at 41—cents; total.....	5,375 70
Drain, 1,500 lineal feet, at 50 cents; total.....	750 00
Cobble stone gutter, 60 square yards, at 50 cents; total.....	30 00
<b>Total .....</b>	<b>\$12,689 00</b>
Supervisor's salary.....	1,149 00
Engineering expenses.....	465 25
Extras, paid by State and township for excavations, approaches, drains and cobble gutters.....	1,896 65
<b>Total cost of road.....</b>	<b>\$16,199 90</b>
<b>Lump sum, contract price.....</b>	<b>\$12,689 00</b>
Total allowed by the State.....	14,585 65
One-third of above, amount paid by the State.....	4,861 88
Maximum grade before.....	8.00 per cent.
Maximum grade after.....	2.82 per cent.

RICHARD WANAMAKER,  
*Engineer.*  
ABRAM C. ZABRISKIE,  
*Supervisor.*

Detailed statement of the cost of Summit and Woodcliff avenues, borough of Woodcliff, county of Bergen. Total length, 9,767 feet, or 1.85 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 9,745 feet.  
Depth of stone-bed, 8 inches.

Macadam, 14,755 square yards, at 67 cents; total.....	\$9,885 85
Telford, 404 square yards, at 77 cents; total.....	311 08
Earth excavation, 8,454 cubic yards, at 32 cents; total.....	2,705 28
Rock excavation, 1,665 cubic yards, at \$1.65; total.....	2,747 25
<b>Total .....</b>	<b>\$15,649 46</b>
Supervisor's salary.....	489 00
Engineering expenses.....	782 47
Extras, paid by borough.....	432 00
<b>Total cost of road.....</b>	<b>\$17,352 93</b>
<b>Lump sum, contract price.....</b>	<b>\$15,649 46</b>
Total allowed by the State.....	15,649 46
One-third of above, amount paid by the State.....	5,216 49

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Maximum grade before.....	13.00 per cent.
Maximum grade after.....	6.50 per cent.

H. G. HERING, JR.,  
*Engineer.*  
 FRANK T. MUSSON,  
*Supervisor.*

Detailed statement of the cost of the Red Lion and Tabernacle road, townships of Tabernacle and Southampton, county of Burlington. Total length, 19,254.5 feet, or 3.65 miles.

Width of gravel-bed, 12 feet.  
 Length of gravel-bed, 19,254.5 feet.  
 Depth of gravel-bed, 8 inches.

Gravel, 5,705 $\frac{1}{2}$ cubic yards, at \$1.40; total.....	\$7,987 05
Earth excavation, 517 cubic yards, at 30 cents; total.....	155 10
Grubbing, 1.65 acres, at \$100; total.....	165 00
Excess of lump sum over quantities.....	58 95
<b>Total .....</b>	<b>\$8,366 10</b>
Supervisor's salary.....	342 00
Engineering expenses.....	584 06
Extras, paid by county.....	3,315 10
<b>Total cost of road.....</b>	<b>\$12,607 26</b>
Lump sum, contract price.....	\$8,366 10
Total allowed by the State.....	8,366 10
One-third of above, amount paid by the State.....	2,788 70
Grade unchanged.	

FRANK EARL,  
*Engineer.*  
 ARTHUR HAINES,  
*Supervisor.*

Detailed statement of the cost of the Lumberton and Medford road, townships of Lumberton and Medford, county of Burlington. Total length, 20,611 feet, or 3.90 miles.

Width of stone-bed, 14 feet.  
 Length of stone-bed, 20,487 feet.  
 Depth of stone-bed—3,270 feet telford, 8 inches; 1,721.7 feet macadam,  
 6 inches.

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Macadam, 26,782 square yards, at 92 cents....	} total .....	\$29,950 00
Telford, 5,086 $\frac{2}{3}$ square yards, at 96 cents....		
Earth excavation, 2,100 cubic yards, at 20 cents,		
Substitute open ditch in lieu of underdrain....		

Total .....	\$29,950 00
Supervisor's salary.....	561 00
Engineering expenses.....	599 00
Total cost of road.....	\$31,110 00

Lump sum, contract price.....	\$29,950 00
Total allowed by the State.....	29,950 00
One-third of above, amount paid by the State.....	9,983 33

Maximum grade before.....	2.8 per cent.
Maximum grade after.....	2.8 per cent.

S. THORNTON HOLLINSHEAD,  
*Engineer.*

WM. P. YOUNKER,  
*Supervisor.*

Detailed statement of the cost of the Westfield and Camden turnpike, townships of Delran and Cinnaminson, county of Burlington. Total length, 16,475 feet, or 3.12 miles.

Width of stone-bed, 14 feet.

Length of stone-bed, 16,475 feet.

Depth of stone-bed, 8 inches.

Width of gravel on each side macadam, five feet. Selected from road.

Macadam, 26,153 square yards, at 98 cents.....	} total....	\$29,131 19
Macadam driveways, 965 square yards, at 65 cents..		
Earth excavation, 19,038 cubic yards, at 20 cents....		
Earth excavation, extra, 1,035 cubic yards, at 35 cents,		
Drain, 1,800 lineal feet, at 15 cents.....		
Cobble stone gutter, 83 square yards, at 80 cents.....		

Drain, 4-inch, 2,021 feet, at 15 cents; total.....	303 15
Drain, 6-inch, 900 feet, at 17.35 cents; total.....	156 15
Sodding, 526 square yards, at 35 cents; total.....	184 10
Macadam, 25.92 square yards, at 98 cents; total.....	25 40

Total .....	\$29,799 99
Supervisor's salary.....	717 00
Engineering expenses.....	595 99
Total cost of road.....	\$31,112 98

Lump sum, contract price.....	\$29,131 19
Total allowed by the State.....	29,799 99
One-third of above, amount paid by the State.....	9,933 33



## FIFTEENTH ANNUAL REPORT.

Maximum grade before.....	4.49 per cent.
Maximum grade after.....	2.94 per cent.

HOWARD PARRY,

*Engineer.*

WALLACE L. GENNETT,

*Supervisor.*

Detailed statement of the cost of the Camden, Ellisburgh and Marlton turnpike, townships of Pensauken and Delaware, county of Camden. Total length, 47,520 feet, or 9 miles.

Width of stone-bed, 16 feet.

Length of stone-bed, 47,520 feet.

Depth of stone-bed, 3½ inches.

Macadam, 10,104.65 tons, at \$2.76; total.....	\$27,888 83
Total .....	\$27,888 83
Supervisor's salary.....	339 00
Total cost of road.....	\$28,227 83
Lump sum, contract price.....	\$27,888 83
Total allowed by the State.....	27,888 83
One-third of above, amount paid by the State.....	9,296 28

J. J. ALBERTSON,

*Engineer.*

CHARLES C. STAFFORD,

*Supervisor.*

Detailed statement of the cost of the Blue Anchor road, townships of Waterford and Winslow, county of Camden. Total length, 12,301 feet, or 2.33 miles.

Width of gravel-bed, 14 feet.

Length of gravel-bed, 12,301 feet.

Depth of gravel-bed, 6 inches.

Gravel, 3,189.15 square yards.....	}total .....	\$3,722 00
Earth excavation, 7,322.6 cubic yards.....		
Total .....		\$3,722 00
Supervisor's salary.....		344 50
Engineering expenses.....		186 10
Total cost of road.....		\$4,251 60
Lump sum, contract price.....		\$3,722 00
Total allowed by the State.....		3,722 00
One-third of above, amount paid by the State.....		1,240 67

## COMMISSIONER OF PUBLIC ROADS.

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Maximum grade before.....	2.50 per cent.
Maximum grade after.....	2.033 per cent.

J. J. ALBERTSON,

*Engineer.*

JOB R. ALBERTSON,

*Supervisor.*

Detailed statement of the cost of Tuckahoe road, first section, township of Upper, county of Cape May. Total length, 17,946 feet, or 3.399 miles.

Width of gravel-bed, 14 feet.

Length of gravel-bed, 17,946 feet.

Depth of gravel-bed, 8 and 12 inches.

Compacted gravel, Class A, 3,978 cubic yards, at \$1.90; total....	\$7,558 20
Compacted gravel, Class B, 3,877 cubic yards, at \$1; total.....	3,877 00
Earth excavation and embankment, 24,002 cubic yards, at 40 cents; total.....	9,600 80
Pole foundation, 3,500 lineal feet, at 30 cents; total.....	1,050 00
Grubbing, 6 acres, at \$125; total.....	750 00
Excess lump sum bid, over calculation by quantities.....	144 00
Extra gravel.....	75 00

Total .....	\$23,055 00
Supervisor's salary.....	462 00
Engineering expenses.....	846 12
Extras paid by county for gravel, grubbing, iron pipe, etc.....	1,194 98

Total cost of road.....	\$25,558 10
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Lump sum, contract price.....	\$22,980 00
Total allowed by the State.....	23,055 00
One-third of above, amount paid by the State.....	7,685 00

Maximum grade before.....	2.80 per cent.
Maximum grade after.....	1.20 per cent.

R. FENDALL SMITH,

*Engineer.*

WINFIELD CORSON,

WASHINGTON VAN GILDER,

*Supervisors.*

Detailed statement of the cost of the West Fairfield and Clinton road, township of Caldwell, county of Essex. Total length, 11,162.35 feet, or 2.114 miles.

Width of stone-bed, 16 feet.

Length of stone-bed, 11,162.35 feet.

Depth of stone-bed, 8 inches.

## FIFTEENTH ANNUAL REPORT.

Telford, 19,866 square yards, at 77 cents; total.....	\$15,296 82
Earth excavation, 4,100 cubic yards, at 46 cents; total.....	1,886 00
Extra earth excavation, 77 cubic yards, at 46 cents; total.....	35 42
Total .....	\$17,218 24
Supervisor's salary.....	276 00
Total cost of road.....	\$17,494 24
Lump sum, contract price.....	\$17,221 00
Total allowed by the State.....	17,218 24
One-third of above, amount paid by the State.....	5,739 41
Maximum grade before.....	2.30 per cent.
Maximum grade after.....	1.10 per cent.

G. F. DRUM,

*Engineer.*

NICHOLAS B. WILLIAMS,

*Supervisor.*

Detailed statement of the cost of Westville avenue, boroughs of Caldwell and West Caldwell, county of Essex. Total length, 7,745.6 feet, or 1.467 miles.

Width of stone-bed, 16 feet.

Length of stone-bed, 7,720 feet.

Depth of stone-bed, 8 inches.

Telford, 13,872 square yards, at 60 cents; total.....	\$8,323 20
Earth excavation, 7,720 cubic yards, at 30 cents; total.....	2,316 00
Total .....	\$10,639 20
Supervisor's salary.....	465 00
Total cost of road.....	\$11,104 20
Total allowed by the State.....	\$10,639 20
One-third of above, amount paid by the State.....	3,546 40
Maximum grade before.....	5.86 per cent.
Maximum grade after.....	4.08 per cent.

G. F. DRUM,

*Engineer.*

WM. S. HARRISON,

*Supervisor.*



## COMMISSIONER OF PUBLIC ROADS.

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Detailed statement of the cost of Harrison street, township of Livingston and boroughs of West Caldwell and Essex Fells, county of Essex. Total length, 6,866 feet, or 1.30 miles.

Width of stone-bed, 16 feet.  
Length of stone-bed, 6,811 feet.  
Depth of stone-bed, 8 inches.

Telford, 12,212 square yards, at 60 cents; total.....	\$7,327 20
Earth excavation, 7,786 cubic yards, at 40 cents; total.....	3,114 40
Total .....	<hr/> \$10,441 60
Supervisor's salary.....	108 00
Total cost of road.....	<hr/> \$10,549 60
Total allowed by the State.....	\$10,441 60
One-third of above, amount paid by the State.....	3,480 53
Maximum grade before.....	8.37 per cent.
Maximum grade after.....	4.35 per cent.

G. F. DRUM,  
*Engineer.*  
ABRAM P. WILLIAMS,  
*Supervisor.*

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Detailed statement of the cost of Watchung avenue, town of Bloomfield, county of Essex. Total length, 4,630 feet, or .88 miles.

Width of stone-bed, 16 feet.  
Length of stone-bed, 4,563 feet.  
Depth of stone-bed, 8 inches.

Telford, 8,146 square yards, at 77 cents; total.....	\$6,272 42
Earth excavation, 24,338 cubic yards, at 43 cents; total.....	10,463 34
Total .....	<hr/> \$16,735 76
Supervisor's salary.....	339 00
Total cost of road.....	<hr/> \$17,074 76
Total allowed by the State.....	\$16,735 76
One-third of above, amount paid by the State.....	5,578 59
Maximum grade before.....	11.62 per cent.
Maximum grade after.....	5.27 per cent.

G. F. DRUM,  
*Engineer.*  
EDW. F. O'NEIL, JR.,  
*Supervisor.*

## FIFTEENTH ANNUAL REPORT.

Detailed statement of the cost of High street, towns of Nutley and Bloomfield, county of Essex. Total length, 5,239 feet, or .992 miles.

Width of stone-bed, 16 feet.  
Length of stone-bed, 5,221 feet.  
Depth of stone-bed, 8 inches.

Telford, 9,282 square yards, at 65 cents; total.....	\$6,033 30
Earth excavation, 7,962 cubic yards, at 50 cents; total.....	3,981 00
Cobble stone gutter, 566 square yards, at \$1; total.....	566 00
<hr/>	
Total .....	\$10,580 30
Supervisor's salary.....	237 00
<hr/>	
Total cost of road.....	\$10,817 30
<hr/>	
Lump sum, contract price.....	\$10,580 30
Total allowed by the State.....	10,580 30
One-third of above, amount paid by the State.....	3,526 77
<hr/>	
Maximum grade before.....	11.27 per cent.
Maximum grade after.....	6.65 per cent.

G. F. DRUM,  
*Engineer.*  
R. W. BOOTH,  
*Supervisor.*

Detailed statement of the cost of the Malaga and Downtown road, township of Franklin, county of Gloucester. Total length, 30,290 feet, or 5.74 miles.

Width of gravel-bed, 24 feet.  
Depth of gravel-bed, 9 inches in centre, 6 inches at points 7 feet on each side of centre line, and 1 inch at points 12 feet each side of centre line.

Earth excavation, 9,845 cubic yards, at 28 cents.....	\$2,756 60
Grubbing, 2½ acres, at \$100.....	250 00
Compacted gravel, 12,380 cubic yards, at 80 cents.....	9,904 00
<hr/>	
Total .....	\$12,910 60
Supervisor's salary.....	399 00
Engineering expenses.....	645 53
Advertising and printing.....	34 00
Expenses of road committee.....	51 00
<hr/>	
Total cost of road.....	\$14,040 13
<hr/>	
Lump sum, contract price.....	\$12,910 60
Total allowed by the State.....	12,910 60
One-third of above, amount paid by the State.....	4,303 53

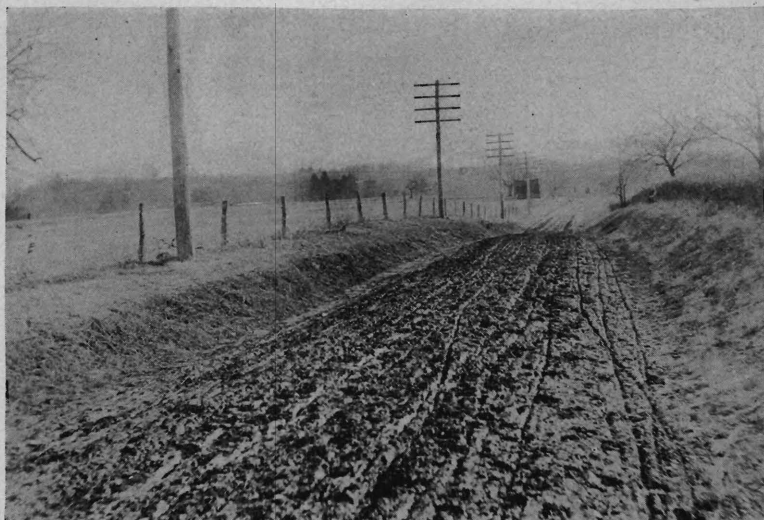


Malaga and Downtown Road, Gloucester County, Before Improvement.



Malaga and Downtown Road, Gloucester County, After Improvement.





Whitehouse and Flemington Road, First Section, Hunterdon County,  
Before Improvement.



Whitehouse and Flemington Road, First Section, Hunterdon County,  
After Improvement.

## COMMISSIONER OF PUBLIC ROADS.

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Maximum grade before.....	4.25 per cent.
Maximum grade after.....	2.00 per cent.

WM. C. CATTELL,  
*Engineer.*  
JACOB F. MAIER,  
*Supervisor.*

Detailed statement of the cost of the Whitehouse and Flemington road, first section, township of Readington, county of Hunterdon. Total length, 34,200 feet, or 6.478 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 34,200 feet.  
Depth of stone-bed, 6 inches.

Macadam, 53,200 square yards, at 70 cents; total.....	\$37,240 00
Telford foundation, 1,595 square yards, at 40 cents; total.....	638 00
Excavation, without classification, 26,761 cubic yards, at 41 cents; total .....	10,972 01
Extra excavation, 168 cubic yards, at 35 cents; total.....	58 80
Drain, 6,943 lineal feet, at 18 cents; total.....	1,249 74
Macadam driveways, 550 square yards, at 45 cents; total.....	247 50
Cobble stone gutter, 200 square yards, at 35 cents; total.....	70 00
Total .....	\$50,476 05
Supervisor's salary.....	603 00
Engineering expenses.....	1,090 00
Extras, paid by county, pipes and culverts.....	813 25
Total cost of road.....	\$52,982 30
Lump sum, contract price.....	\$48,851 00
Total allowed by the State.....	50,476 05
One-third of above, amount paid by the State.....	16,825 35
Maximum grade before.....	12.50 per cent.
Maximum grade after.....	5.00 per cent.

GRANT DAVIS,  
*Engineer.*  
I. H. HIGGINS,  
*Supervisor.*

Detailed statement of the cost of the improvements to the public highway in Mercer county, New Jersey, known as the Elm street, Rosedale and Pennington road, beginning at Lawrenceville and Princeton road, and extending to Van Kirk's Corner, in the townships of Princeton and Lawrence, and the borough of Princeton. Total length of road, 15,628 feet, or 2.96 miles.

Length of stone-bed, 15,496 feet.

Width of stone-bed, 14 feet.

Depth of stone-bed, Class B, or not less than 6 inches deep.

Average width of shoulders, 7 feet.

Average total width of improved roadway, 28 feet.

Excavations, 14,425 cubic yards, at 40 cents.....	\$5,770 00
Macadam, 25,170 square yards, at 67 cents.....	16,863 90
Macadam driveways, 374 square yards, at 67 cents.....	250 58
Belgian block gutters, 111 $\frac{1}{2}$ square yards, at \$2.20.....	244 42
Underdrains, 13,784 lineal feet, at 12 cents.....	1,654 08
Eighteen-inch C. I. pipe, 117 lineal feet, at \$4.75.....	555 75
Twenty-four-inch C. I. pipe, 42 lineal feet, at \$6.75.....	283 50
Thirty-inch C. I. pipe, 30 lineal feet, at \$8.50.....	255 00
Thirty-six-inch C. I. pipe, 30 lineal feet, at \$12.....	360 00
Forty-eight-inch C. I. pipe, 30 lineal feet, at \$15.....	450 00
Concrete retaining walls, 74 $\frac{3}{4}$ cubic yards, at \$9.....	672 75
Four-inch by 20-inch coping, 141 lineal feet, at \$1.20.....	169 20
Anchor bolts.....	25 00
Applying liquid asphalt, 25,170 square yards, at 8 $\frac{1}{4}$ cents.....	2,076 53
Total cost.....	<hr/> \$29,630 71
Lump sum, contract price.....	\$27,554 18
Supervisor's salary.....	432 00
Total of all costs.....	<hr/> \$27,986 18
Portion approved by the State.....	\$24,782 98
Total allowed by the State.....	26,859 51
One-third of above, paid by the State.....	8,953 17
Maximum grade before.....	10.20 per cent.
Maximum grade after.....	6.00 per cent.

FRANK J. EPPELE,  
*Engineer.*  
R. P. HENDERSON,  
*Supervisor.*



## COMMISSIONER OF PUBLIC ROADS.

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Detailed statement of the cost of the improvements to the public highway in Mercer county, New Jersey, known as the Etra and Perrineville road, beginning at Hightstown and Perrineville road, and extending to Monmouth county line in the township of East Windsor. Total length of road, 6,276 feet, or 1.19 miles.

Length of stone-bed, 6,276 feet.

Width of stone-bed, 14 feet.

Depth of stone-bed, Class B, or not less than 6 inches deep.

Average width of shoulders, 7 feet.

Average total width of improved roadway, 28 feet.

Excavations, 2,400 cubic yards, at 35 cents.....	\$840 00
Macadam, 10,013 square yards, at 75 cents.....	7,509 75
Macadam driveways, 201 square yards, at 40 cents.....	80 40
Twelve-inch C. I. pipe, 72 lineal feet, at \$1.50.....	108 00
Eighteen-inch C. I. pipe, 30 lineal feet, at \$3.....	90 00
Thirty-six-inch C. I. pipe, 24 lineal feet, at \$10.....	240 00
Concrete retaining walls, 27½ cubic yards, at \$8.....	220 00
Four-inch by 20-inch coping, 45⅔ lineal feet, at \$1.10.....	50 23
Anchor bolts.....	5 00

Total cost.....	\$9,143 38
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Lump sum, contract price.....	\$9,143 38
Supervisor's salary.....	186 00

Total of all costs.....	\$9,329 38
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Portion approved by the State.....	\$8,430 15
Total allowed by the State.....	8,430 15
One-third of above, paid by the State.....	2,810 05

Maximum grade before.....	2.10 per cent.
Maximum grade after.....	1.80 per cent.

FRANK J. EPPELE,

*Engineer.*

P. E. WILSON, JR.,

*Supervisor.*

Detailed statement of the cost of the improvements to the public highway in Mercer county, New Jersey, known as the Brunswick pike road, beginning at Station No. 270+06, on plan of road, and extending to Middlesex county line, in the township of West Windsor. Total length of road, 19,526 feet, or 3.70 miles.

Length of stone-bed, 19,474 feet.

Width of stone-bed, 16 feet.

Depth of stone-bed, Class C, or not less than 8 inches deep.

Average width of shoulders, 10 feet.

Average total width of improved roadway, 36 feet.

Excavations, 17,600 cubic yards, at 30 cents.....	\$5,280 00
Macadam, 35,286 square yards, at 76 cents.....	26,817 36
Underdrains, 5,920 lineal feet, at 12 cents.....	710 40
Twelve-inch C. I. pipe, 102 lineal feet, at \$3.....	306 00
Eighteen-inch C. I. pipe, 36 lineal feet, at \$4.75.....	171 00
Twenty-inch C. I. pipe, 36 lineal feet, at \$5.50.....	198 00
Twenty-four-inch C. I. pipe, 72 lineal feet, at \$6.75.....	486 00
Concrete retaining walls, 23 $\frac{1}{6}$ cubic yards, at \$9.....	208 50
Four-inch by 20-inch coping, 63 $\frac{2}{3}$ lineal feet, at \$1.20.....	76 40
Anchor bolts.....	8 00

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Total cost.....	\$34,261 66
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Lump sum, contract price.....	\$34,261 66
Supervisor's salary.....	402 00

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Total of all costs.....	\$34,663 66
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Portion approved by the State.....	\$32,807 76
Total allowed by the State.....	32,807 76
One-third of above, paid by the State.....	10,935 92

Maximum grade before.....	5.38 per cent.
Maximum grade after.....	1.95 per cent.

FRANK J. EPPELE,  
*Engineer.*  
W. M. MOUNT,  
*Supervisor.*

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Detailed statement of the cost of the Half Acre road, township of Monroe, county of Middlesex. Total length, 17,760 feet, or 3.37 miles.

Width of gravel-bed, 20 feet.  
Length of gravel-bed, 17,660 feet.  
Depth of gravel-bed, 9 inches in centre, 3 inches at sides.

Gravel, 6,541 square yards, at 55 cents; total.....	\$3,597 55
Earth excavation, 17,973 cubic yards, at 30 cents; total.....	5,391 90
Drain, 2,000 lineal feet, at 15 cents; total.....	300 00

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Total .....	\$9,289 45
Supervisor's salary.....	471 60
Extras paid by county, pipes, etc.....	200 84

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Total cost of road.....	\$9,961 89
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Lump sum, contract price.....	\$9,289 45
Total allowed by the State.....	9,289 45
One-third of above, amount paid by the State.....	3,096 48

## COMMISSIONER OF PUBLIC ROADS.

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Maximum grade before.....	6.50 per cent.
Maximum grade after.....	5.40 per cent.

MORGAN F. LARSON,  
*Engineer.*  
CHARLES W. HOAGLAND,  
*Supervisor.*

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Detailed statement of the cost of the Colonia and Avenel road, township of Woodbridge, county of Middlesex. Total length, 8,416 feet, or 1.59 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 8,416 feet.  
Depth of stone-bed, 6 inches.

Macadam, 13,068 square yards, at 71.4937 cents; total.....	\$9,342 80
Extra macadam, 134 square yards, at 79 cents; total.....	105 86
Earth excavation, 9,152 cubic yards, at 35 cents; total.....	3,203 20
Extra excavation, for intersecting streets, 1,431 cubic yards, at 40 cents; total.....	572 40
Macadam driveways, 90 square yards, at 60 cents; total.....	54 00
Extra driveways, 195 square yards, at 60 cents; total.....	117 00
Total .....	\$13,395 26
Supervisor's salary.....	399 00
Extras, paid by county, pipes, retaining walls, etc.....	650 35
Total cost of road.....	\$14,444 61
Lump sum, contract price.....	\$12,800 00
Total allowed by the State.....	13,395 26
One-third of above, amount paid by the State.....	4,465 09

Maximum grade before.....	5.60 per cent.
Maximum grade after.....	2.043 per cent.

MORGAN F. LARSON,  
*Engineer.*  
G. S. LIDDLE,  
*Supervisor.*

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Detailed statement of the cost of the Cranbury and Plainsboro road, township of Cranbury, county of Middlesex. Total length, 5,300 feet, or 1.004 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 5,300 feet.  
Depth of stone-bed, 6 inches.



## FIFTEENTH ANNUAL REPORT.

Macadam, 8,244 square yards, at 72.8784 cents; total.....	\$6,008 10
Driveways, 30 square yards, at 60 cents; total.....	18 00
Earth excavation, 1,993 cubic yards, at 30 cents; total.....	597 90
Total .....	\$6,624 00
Supervisor's salary.....	196 00
Extras, paid by county, pipes, etc.....	239 80
Total cost of road.....	\$7,059 80
Lump sum, contract price.....	\$6,624 00
Total allowed by the State.....	6,624 00
One-third of above, amount paid by the State.....	2,208 00
Maximum grade before.....	.24 per cent.
Maximum grade after.....	.95 per cent.

MORGAN F. LARSON,  
*Engineer.*

F. F. GROVE,  
*Supervisor.*

Detailed statement of the cost of Livingston avenue, township of North Brunswick, county of Middlesex. Total length, 5,910 feet, or 1.12 miles.

Width of stone-bed, 16 feet.  
Length of stone-bed, 5,910 feet.  
Depth of stone-bed, 8 inches.

Macadam, 10,507 square yards, at 87½ cents; total.....	\$9,193 62
Telford, 90 square yards, at 60 cents; total.....	54 00
Earth excavations, 3,467 cubic yards, at 30 cents; total.....	1,040 10
Total .....	\$10,287 72
Supervisor's salary.....	243 00
Extras, paid by county, pipes, etc.....	163 15
Total cost of road.....	\$10,693 87
Lump sum, contract price.....	\$10,287 72
Total allowed by the State.....	10,287 72
One-third of above, amount paid by the State.....	3,429 24
Maximum grade before.....	7.00 per cent.
Maximum grade after.....	2.50 per cent.

MORGAN F. LARSON,  
*Engineer.*

FRANCIS MULVEY,  
*Supervisor.*

## COMMISSIONER OF PUBLIC ROADS.

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Detailed statement of the cost of Main street, township of Woodbridge, county of Middlesex. Total length, 9,200 feet, or 1.75 miles.

Width of stone-bed, 14 feet.

Length of stone-bed, 9,200 feet.

Depth of stone-bed, 8 inches.

Macadam, 14,311 square yards, at 76 cents; total.....	\$10,876 36
Extra macadam, 215 square yards, at 76 cents; total.....	163 40
Driveways, 147 square yards, at 76 cents; total.....	111 72
Earth excavation, 11,340 cubic yards, at 45 cents; total.....	5,103 00
Extra excavation, 1,396 cubic yards, at 45 cents; total.....	628 20
Drain, 800 lineal feet, at 18 cents; total.....	144 00
Extra excavation for driveways, 184 square yards, at 75 cents; total .....	138 00
Total .....	<hr/> \$17,164 68
Supervisor's salary.....	519 00
Extras paid by county, pipes, retaining walls, etc.....	1,587 59
Total cost of road.....	<hr/> \$19,271 27
Lump sum, contract price.....	\$16,123 36
Total allowed by the State.....	17,164 68
One-third of above, amount paid by the State.....	5,721 56
Maximum grade before.....	14.00 per cent.
Maximum grade after.....	4.166 per cent.

MORGAN F. LARSON,  
*Engineer.*  
MICHAEL F. LEAHEY,  
*Supervisor.*

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Detailed statement of the cost of State street road, township of Woodbridge and city of Perth Amboy, county of Middlesex. Total length, 7,148 feet, or 1.35 miles.

Width of stone-bed, 14 feet.

Length of stone-bed, 6,983 feet.

Depth of stone-bed, 8 inches.

## FIFTEENTH ANNUAL REPORT.

Macadam, 10,863 square yards, at 70 cents; total.....	\$7,604 10
Earth excavation, 1,393 cubic yards, at 40 cents; total.....	557 20
Drain, extra, 6,448 lineal feet, at 30 cents; total.....	1,934 40
Total .....	\$10,095 70
Supervisor's salary.....	324 00
Extras paid by county.....	575 80
Total cost of road.....	\$10,995 50
Lump sum, contract price.....	\$8,161 30
Total allowed by the State.....	10,095 70
One-third of above, amount paid by the State.....	3,365 23
Maximum grade before.....	3.40 per cent.
Maximum grade after.....	2.10 per cent.

MORGAN F. LARSON,  
*Engineer.*  
GEORGE MARTINUSEN,  
*Supervisor.*

Detailed statement of the cost of the River road—Albany street to Landing road—townships of Raritan and Piscataway, county of Middlesex. Total length, 8,775 feet, or 1.66 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 8,775 feet.  
Depth of stone-bed, 8 inches.

Macadam, 13,650 square yards, at 81 cents; total.....	\$11,056 50
Driveways, 90 square yards, at 60 cents; total.....	54 00
Extra driveways, 131 square yards, at 60 cents; total.....	78 60
Earth excavation, 5,593 cubic yards, at 35 cents; total.....	1,957 55
Extra macadam, 354 square yards, at 81 cents; total.....	286 74
Drain, extra, 5,895 lineal feet, at 20 cents; total.....	1,171 80
Total .....	\$14,605 19
Supervisor's salary.....	423 00
Extras, paid by county, pipes, retaining walls, repairs to culverts, etc. ....	2,129 23
Total cost of road.....	\$17,157 42
Lump sum, contract price.....	\$13,068 05
Total allowed by the State.....	14,605 19
One-third of above, amount paid by the State.....	4,868 40



## COMMISSIONER OF PUBLIC ROADS.

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Maximum grade before.....	5.00 per cent.
Maximum grade after.....	2.50 per cent.

MORGAN F. LARSON,  
*Engineer.*

THOS. L. DIXON,  
*Supervisor.*

Detailed statement of the cost of the River road, township of Piscataway, county of Middlesex. Total length, 15,656 feet, or 2.97 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 15,656 feet.  
Depth of stone-bed, 8 inches.

Macadam, 24,354 square yards, at 80 cents; total.....	\$19,483 20
Extra macadam, 178 square yards, at 80 cents; total.....	142 40
Driveways, 508 square yards, at 65 cents; total.....	330 20
Earth excavation, 18,990.5 cubic yards, at 30 cents; total.....	5,697 15
Extra excavation, 1,608 cubic yards, at 75 cents; total.....	1,206 00
Drain, 11,781 lineal feet, at 30 cents; total.....	3,534 30
Cobble stone gutter, 583 square yards, at 75 cents; total.....	437 25

Total .....	\$30,830 50
Supervisor's salary.....	1,023 00
Extras, paid by county, pipes, retaining walls, etc.....	912 16

Total cost of road.....	\$32,765 66
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Lump sum, contract price.....	\$25,180 35
Total allowed by the State.....	30,830 50
One-third of above, amount paid by the State.....	10,276 83

Maximum grade before.....	5.00 per cent.
Maximum grade after.....	2.20 per cent.

MORGAN F. LARSON,  
*Engineer.*

THOMAS H. HOWLEY,  
*Supervisor.*

Detailed statement of the cost of the Jamesburg and Dayton road, township of Monroe, county of Middlesex. Total length, 15,125 feet, or 2.86 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 15,125 feet.  
Depth of stone-bed, 8 inches.

## FIFTEENTH ANNUAL REPORT.

Macadam, 23,528 square yards, at 81.5844 cents; total.....	\$19,195 18
Earth excavation, 19,588 cubic yards, at 20 cents; total.....	3,917 60
Total .....	<hr/> \$23,112 78
Supervisor's salary.....	507 00
Extras, paid by county.....	482 61
Total cost of road.....	<hr/> \$24,102 39
Lump sum, contract price.....	\$23,112 78
Total allowed by the State.....	23,112 78
One-third of above, amount paid by the State.....	7,704 26
Maximum grade before.....	15.00 per cent.
Maximum grade after.....	4.10 per cent.

MORGAN F. LARSON,  
*Engineer.*  
 S. ELMER VANDENBERG,  
*Supervisor.*

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Detailed statement of the cost of the Farmingdale and Hamilton road, first section, townships of Howell and Wall, county of Monmouth. Total length, 15,840 feet, or 3 miles.

Width of gravel-bed, 20 feet.  
 Length of gravel-bed, 15,840 feet.  
 Depth of gravel-bed, 3 to 9 inches.

Gravel, 5,680 cubic yards, at \$1; total.....	\$5,680 00
Earth excavation, 8,540 cubic yards, at 25 cents; total.....	2,135 00
Earth excavation, borrow, 600 cubic yards, at 25 cents; total....	150 00
Drain, 700 lineal feet, at 25 cents; total.....	175 00
Grubbing, 2 acres, at \$25; total.....	50 00
Extra excavation, 375 cubic yards, at 25 cents; total.....	93 75
Extra gravel, 141 cubic yards, at \$1; total.....	141 00
Total .....	<hr/> \$8,424 75
Supervisor's salary.....	513 00
Engineering expenses.....	294 86
Total cost of road.....	<hr/> \$9,232 61
Lump sum, contract price.....	\$8,190 00
Total allowed by the State.....	8,424 75
One-third of above, amount paid by the State.....	2,808 25

## COMMISSIONER OF PUBLIC ROADS.

75

Maximum grade before.....	1.40 per cent.
Maximum grade after.....	.40 per cent.

PETER FORMAN,  
*Engineer.*  
LEVI W. FARRY,  
*Supervisor.*

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Detailed statement of the cost of the Manalapan connecting road, county of Monmouth. Total length, 1,400 feet, or .265 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 1,400 feet.  
Depth of stone-bed, 6 inches.

Macadam, 2,489 square yards.....	} total.....	\$2,780 88
Macadam, 3 inches at church, 600 square yards.....		
Earth excavation, 600 cubic yards.....		
Earth excavation, borrow, 100 cubic yards.....	} total.....	403 00
Macadam approaches, 800 square yards, at 50 cents; total.....		
Total .....		\$3,183 88
Supervisor's salary.....		129 00
Engineering expenses.....		101 57
Extras, paid by county.....		202 00
Total cost of road.....		\$3,616 45
Lump sum, contract price.....		\$2,780 88
Total allowed by the State.....		3,183 88
One-third of above, amount paid by the State.....		1,061 29

PETER FORMAN,  
*Engineer.*  
HOWARD BAIRD,  
*Supervisor.*

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Detailed statement of the cost of the Rumson road, east portion, borough of Rumson, county of Monmouth. Total length, 4,041 feet, or .76 mile.

Width of stone-bed, 16 feet.  
Length of stone-bed, 4,041 feet.  
Depth of stone-bed, 6 inches.  
Width of gravel-wings, 14 feet.  
Length of gravel-wings, 4,041 feet.  
Depth of gravel-wings, 4 inches.



Macadam, 7,184 square yards, at 70 cents; total.....	\$5,028 80
Macadam driveways, 583 square yards, at 70 cents; total.....	408 10
Gravel, 662 cubic yards, at \$2.40; total.....	1,588 80
Earth excavation, 2,544 cubic yards, at 25 cents; total.....	636 00
Drain, 4,800 lineal feet, at 13 cents; total.....	624 00
Excess of lump sum bid over items.....	327 30

Total .....	\$8,613 00
Supervisor's salary.....	252 00
Engineering expenses.....	258 39

Total cost of road.....	\$9,123 39
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Lump sum, contract price.....	\$8,613 00
Total allowed by the State.....	8,613 00
One-third of above, amount paid by the State.....	2,871 00

Maximum grade before.....	1.90 per cent.
Maximum grade after.....	1.30 per cent.

E. E. THROCKMORTON,  
*Engineer.*  
JOHN YEOMANS,  
*Supervisor.*

Detailed statement of the cost of the Eatontown and Colt's Neck road, second section, townships of Atlantic, Shrewsbury and Eatontown, county of Monmouth. Total length, 17,497 feet, or 3.31 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 17,497 feet.  
Depth of stone-bed, 6 inches.

Macadam, 27,053 square yards, at 74 cents; total.....	\$20,019 22
Macadam driveways, 965 square yards, at 50 cents; total.....	482 50
Earth excavation, 8,996 cubic yards, at 30 cents; total.....	2,698 80
Drain, 10,464 lineal feet, at 12 cents; total.....	1,255 68
Cobble stone gutter, 777 $\frac{1}{3}$ square yards, at 60 cents; total.....	466 40

Total .....	\$24,922 60
Supervisor's salary.....	318 00
Engineering expenses.....	747 68

Total cost of road.....	\$25,988 28
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Lump sum, contract price.....	\$24,988 00
Total allowed by the State.....	24,922 60
One-third of above, amount paid by the State.....	8,307 53

# COMMISSIONER OF PUBLIC ROADS.

77

Maximum grade before.....	7.40 per cent.
Maximum grade after.....	3.80 per cent.

E. E. THROCKMORTON,  
*Engineer.*  
JAMES NORMAN,  
*Supervisor.*

Detailed statement of the cost of the Allentown road, township of Upper Freehold, county of Monmouth. Total length, 5,045 feet, or .955 miles.

Width of stone-bed, 18 feet.  
Length of stone-bed, 5,045 feet.  
Depth of stone-bed, 8 inches, finished.

Macadam, 10,090 square yards, at 86 cents; total.....	\$8,677 40
Extra macadam, 4 inches deep, 610 square yards, at 43 cents; total .....	262 30
Extra macadam, 8 inches deep, 384 square yards, at 86 cents; total .....	330 24
Earth excavation, 2,300 cubic yards, at 20 cents; total.....	460 00
Excavation, borrow, 499 <sup>8</sup> / <sub>10</sub> cubic yards, at 35 cents; total.....	174 96
Drain charged to excavation account by agreement, 400 lineal feet.	
Belgian block gutter, 100 square yards, at 80 cents; total.....	80 00
Total .....	\$9,984 90
Supervisor's salary.....	330 00
Engineering expenses.....	349 47
Total cost of road.....	\$10,664 37
Lump sum, contract price.....	9,312 40
Total allowed by the State.....	9,984 90
One-third of above, amount paid by the State.....	3,328 30
Maximum grade before.....	2.50 per cent.
Maximum grade after.....	1.90 per cent.

PETER FORMAN,  
*Engineer.*  
CHARLES R. DENNIS,  
*Supervisor.*

Detailed statement of the cost of the Eatontown and Colt's Neck road, first section, township of Atlantic, county of Monmouth. Total length, 17,160 feet, or 3.25 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 17,160 feet.  
Depth of stone-bed, 6 inches.

## FIFTEENTH ANNUAL REPORT.

Macadam, 26,693 square yards, at \$1.03; total.....	\$27,493 79
Macadam driveways, 876 square yards, at 50 cents; total.....	438 00
Earth excavation, 11,666 cubic yards, at 20 cents; total.....	2,333 20
Drain, 6,110 lineal feet, at 10 cents; total.....	611 00
<b>Total .....</b>	<b>\$30,875 99</b>
Supervisor's salary.....	637 50
Engineering expenses.....	926 28
<b>Total cost of road.....</b>	<b>\$32,439 77</b>
Lump sum, contract price.....	\$34,146 46
Total allowed by the State.....	30,875 99
One-third of above, amount paid by the State.....	10,291 99
Maximum grade before.....	4.30 per cent.
Maximum grade after.....	2.30 per cent.

E. E. THROCKMORTON,  
*Engineer.*  
 ISAAC B. DAVISON,  
*Supervisor.*

Detailed statement of the cost of the Bayhead and Seaside Park road, northern section, townships of Brick and Dover, county of Ocean. Total length, 24,663 feet, or 4.671 miles.

Width of gravel-bed, 24 feet.  
 Length of gravel-bed, 24,663 feet.  
 Depth of gravel-bed, 9 to 3 inches.

Gravel, 10,961 cubic yards, at \$1.50.....	} total .....	\$25,558 00
Earth excavation, 35,433 cubic yards, at 25 cents.....		
Drain, 320 lineal feet, at 40 cents.....		
Grubbing, 1.01 acres, at \$50.....		
Extra grubbing, .57 acres, at \$50; total.....		28 50
<b>Total .....</b>		<b>\$25,586 50</b>
Supervisor's salary.....		444 00
<b>Total cost of road.....</b>		<b>\$26,030 50</b>
Lump sum, contract price.....		\$25,558 00
Total allowed by the State.....		25,586 50
One-third of above, amount paid by the State.....		8,528 83



## COMMISSIONER OF PUBLIC ROADS.

79

Maximum grade before..... 2.00 per cent.  
Maximum grade after..... Level.

WM. SEGOINE,  
*Engineer.*  
E. T. VAN CAMP,  
*Supervisor.*

Detailed statement of the cost of the Lakehurst and Lakewood road, townships of Manchester and Jackson, county of Ocean. Total length, 33,451.5 feet, or 6.335 miles.

Width of gravel-bed, 24 feet.  
Length of gravel-bed, 33,351.5 feet.  
Depth of gravel bed, 9 and 3 inches.

Gravel, 14,822.6 cubic yards, at 66½ cents.....	} total .....	\$22,015 00
Earth excavation, 29,706 cubic yards, at 36 cents .....		
Grubbing, 6.2 acres, at \$67.....		
Turfing, 1,149.4 square yards, at 30 cents; total.....		344 83
Total .....		\$22,359 83
Supervisor's salary.....		943 50
Engineering expenses.....		701 06
Total cost of road.....		\$24,004 39
Lump sum, contract price.....		\$22,015 00
Total allowed by the State.....		22,359 83
One-third of above, amount paid by the State.....		7,453 28

Maximum grade before..... 6.00 per cent.  
Maximum grade after..... 1.90 per cent.

I. H. CRAMER,  
*Engineer.*  
LEWIS WORREL HOLMAN,  
*Supervisor.*

Detailed statement of the cost of the Midvale (Greenwood Lake) road extension, township of Pompton, county of Passaic. Total length, 16,523.5 feet, or 3.13 miles.

Width of stone-bed, 16 feet.  
Length of stone-bed, 16,523.5 feet.  
Depth of stone-bed, 4 inches.

Macadam, 29,375 square yards, at 41 cents; total.....	\$12,043 75
Macadam driveway, 430 square yards, at 41 cents; total.....	176 30
Extra earth excavation, 1,132 cubic yards, at 40 cents; total.....	452 80
Earth excavation, 33,342 cubic yards, at 36 cents; total.....	12,003 12
Special earth excavation, 89 cubic yards, at 40 cents; total.....	35 60
Rock excavation, 8,288.31 cubic yards, at \$1.60; total.....	13,261 30
Loose rock, 777 cubic yards, at 70 cents; total.....	543 90
Drain, 648 lineal feet, at 30 cents; total.....	194 40
Cutting down trees for extra driveway.....	15 00
Cobble stone gutter, 367.3 square yards, at 60 cents; total.....	220 38

Total .....	\$38,946 55
Supervisor's salary.....	450 00
Extras, paid by county, 8 culverts, bridges, etc.....	4,025 50

Total cost of road.....	\$43,422 05
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Lump sum, contract price.....	\$38,913 17
Total allowed by the State.....	38,946 55
One-third of above, amount paid by the State.....	12,982 18

Maximum grade before.....	18.00 per cent.
Maximum grade after.....	7.50 per cent.

GARWOOD FERGUSON,  
*Engineer.*  
WILLIAM E. GREEN,  
*Supervisor.*

Detailed statement of the cost of the Macopin road, township of West Milford, county of Passaic. Total length, 9,840 feet, or 1.86 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 9,840 feet.  
Depth of stone-bed, 4 inches.

Macadam, 15,352 square yards, at 45 cents; total.....	\$6,908 40
Macadam, extra driveways, 200 square yards, at 30 cents; total...	60 00
Earth excavation, 9,734 cubic yards, at 35 cents; total.....	3,406 90
Extra earth excavation, 500 cubic yards, at 35 cents; total.....	175 00
Rock excavation, 4,461 cubic yards, at \$1.75; total.....	7,806 75
Loose rock, 261 cubic yards, at 40 cents; total.....	104 40
Drain, 2,560 lineal feet, at 9½ cents; total.....	243 20
Cobble stone gutter, 166 square yards, at 60 cents; total.....	99 60

Total .....	\$18,804 25
Supervisor's salary.....	616 50
Extras, paid by county.....	1,123 34

Total cost of road.....	\$20,544 09
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Lump sum, contract price.....	\$18,706 65
Total allowed by the State.....	18,804 25
One-third of above, amount paid by the State.....	6,268 08

# COMMISSIONER OF PUBLIC ROADS.

81

Maximum grade before.....13.60 per cent.  
Maximum grade after..... 6.20 per cent.

COLIN R. WISE,  
GARWOOD FERGUSON,  
*Engineers.*  
DAVID WICKHAM,  
*Supervisor*

Detailed statement of the cost of the Mannington road in the township of Mannington, county of Salem. Total length, 8,330 feet, or 1.58 miles.

Width of shell-bed, 16 and 24 feet.  
Length of shell-bed, 8,330 feet.  
Depth of shell-bed, 1 to 12 inches.

Shells, 115,803 bushels, at 7½ cents; total.....	\$8,685 22
Earth excavation, 919 cubic yards, at 40 cents; total.....	367 60
Fill in excess, 1,560 cubic yards, at 80 cents; total.....	1,248 00
Excess of lump sum over estimate by quantities.....	599 18

Total lump sum, contract price.....	\$10,900 00
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Lump sum, contract price.....	\$10,900 00
Less deduction, 216 cubic yards fill, at 80 cents.....	172 80

\$10,727 20

Extras (not called for in contract):

Two loads shells, 130 bushels, at 7½ cents.....	\$5 75
Used in making approach at Pointers, 9 loads shells, 587 bushels, at 7½ cents.....	43 87
Used in making approach for Vanneman, 30 cubic yards fill, at 80 cents.....	24 00

73 62

Supervisor's salary.....	\$10,800 82
Engineering expenses.....	29 25
Extras paid by county (pipes, culverts, etc.).....	186 50
	272 73

Total cost of road.....	\$11,289 30
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Total allowed by the State.....	\$11,298 30
One-third of above, amount paid by the State.....	3,766 10

H. B. KEASBEY,  
*Engineer.*  
JOHN DAWSON,  
*Supervisor.*



## FIFTEENTH ANNUAL REPORT.

Detailed statement of the cost of the Aldine road, township of Alloway, county of Salem. Total length, 7,001 feet, or 1.326 miles.

Width of gravel-bed, 20 feet.  
Length of gravel-bed, 7,001 feet.  
Depth of gravel-bed, 9 and 3 inches.

Gravel, 2,601.23 cubic yards, at \$1.84—; total.....	\$4,779 94
Gravel, extra, 10 cubic yards, at \$2.90; total.....	29 00
Earth excavations, as amended, 10,281.91 cubic yards, at 50 cents; total .....	5,140 96
Earth excavation, extra, 18 cubic yards, at 50 cents; total.....	9 00
Drain (tile), 900 lineal feet, at 40 cents; total.....	360 00
<hr/>	
Total .....	\$10,318 90
Supervisor's salary.....	279 00
Engineering expenses.....	338 50
Extras, paid by county.....	173 71
<hr/>	
Total cost of road.....	\$11,110 11
<hr/>	
Lump sum, contract price, as amended.....	\$9,920 90
Total allowed by the State.....	10,318 90
One-third of above, amount paid by the State.....	3,439 63
<hr/>	
Maximum grade before.....	8.00 per cent.
Maximum grade after.....	3.80 per cent.

JOSIAH MILLER,  
*Engineer.*  
CHARLES JOHNSON,  
*Supervisor.*

Detailed statement of the cost of the South Bound Brook road, township of Franklin, county of Somerset. Total length, 11,900 feet, or 2.25 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 11,900 feet.  
Depth of stone-bed, 8 inches.

## COMMISSIONER OF PUBLIC ROADS.

83

Macadam, 8 inches, 18,511 square yards, at 63 cents; total.....	\$11,661 93
Macadam, 4 inches, driveways, etc., 524 square yards, at 40 cents; total .....	209 60
Earth excavation, 18,031 cubic yards, at 35 cents; total.....	6,310 85
Drain, 2,800 lineal feet, at 15 cents; total.....	420 00
Cobble stone gutter, 100 square yards, at 50 cents; total.....	50 00
<b>Total .....</b>	<b>\$18,652 38</b>
Supervisor's salary.....	450 00
Engineering expenses.....	964 15
Extras, paid by county and State, private driveways, cutting, binder and drains.....	1,047 20
<b>Total cost of road.....</b>	<b>\$21,113 73</b>
Lump sum, contract price.....	\$18,702 38
Total allowed by the State.....	19,699 58
One-third of above, amount paid by the State.....	6,566 53
Maximum grade before.....	6.13 per cent.
Maximum grade after.....	4.00 per cent.

JOSHUA DOUGHTY, Jr.,  
*Engineer.*

E. C. TAGGART,  
*Supervisor.*

Detailed statement of the cost of the Dead River road, township of Bernards,  
county of Somerset. Total length, 11,223 feet, or 2.12 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 11,223 feet.  
Depth of stone-bed, 8 inches.

Macadam, 8 inches, 17,456 square yards, at 71 cents; total.....	\$12,393 76
Macadam, 4 inches, 798 square yards, at 50 cents; total.....	399 00
Earth excavation, 7,443 cubic yards, at 40 cents; total.....	2,977 20
Drain, 2,500 lineal feet, at 20 cents; total.....	500 00
Cobble stone gutter, 225 square yards, at 75 cents; total.....	168 75
<b>Total .....</b>	<b>\$16,438 71</b>
Supervisor's salary.....	387 00
Engineering expenses.....	447 53
Extras, paid by county and State.....	1,316 80
<b>Total cost of road.....</b>	<b>\$18,590 04</b>
Lump sum, contract price.....	\$16,438 71
Total allowed by the State.....	17,755 51
One-third of above, amount paid by the State.....	5,918 50

## FIFTEENTH ANNUAL REPORT.

Maximum grade before.....	5.08 per cent.
Maximum grade after.....	3.95 per cent.

JOSHUA DOUGHTY, JR.,  
*Engineer.*  
 WILLIAM D. ACKEN,  
*Supervisor.*

Detailed statement of the cost of West Grand street, First avenue and Locust street, township of Linden and city of Elizabeth, county of Union. Total length, 11,805 feet, or 2.23 miles.

Width of stone-bed, 16 feet.

Length of stone-bed, 11,805 feet.

Depth of stone-bed, 8 inches and 4 inches.

Macadam, 8 inches, 14,960 square yards, at 70 cents; total.....	\$10,472 00
Macadam, 4 inches, 5,837 square yards, at 40 cents; total.....	2,334 80
Stone filling, 320 tons, at \$1.90; total.....	608 00
Earth excavation, 7,620 cubic yards, at 30 cents; total.....	2,286 00
Relaying block pavement, 400 square yards, at 35 cents; total...	140 00
Manhole heads reset, 11, at \$1; total.....	11 00
Cobble stone gutter, 550 square yards, at \$1; total.....	550 00
Total .....	\$16,401 80
Supervisor's salary.....	333 00
Total cost of road.....	\$16,734 80
Lump sum, contract price.....	\$15,845 00
Total allowed by the State.....	16,390 80
One-third of above, amount paid by the State.....	5,463 60
Maximum grade before.....	6.00 per cent.
Maximum grade after.....	2.75 per cent.

J. L. BAUER,  
*Engineer.*  
 THOMAS KIDD,  
*Supervisor.*



## COMMISSIONER OF PUBLIC ROADS.

85

Detailed statement of the cost of North Broad street and Elizabeth avenue, township of Union and city of Elizabeth, county of Union. Total length, 5,060 feet, or .956 miles.

Width of stone-bed, 16 feet and 23 feet.

Length of stone-bed, 5,060 feet.

Depth of stone-bed, 12 inches and 8 inches.

Macadam, 8 inches, 8,073½ square yards, at 90 cents; total.....	\$7,266 15
Macadam, 12 inches, 3,604½ square yards, at \$1.05 cents; total..	3,784 73
Earth excavation, 6,047 cubic yards, at 30 cents; total.....	1,814 10
Gutter boxes.....	46 00
Drain, 6,400 lineal feet, at 30 cents; total.....	1,920 00
Additional stone over drain, 60 cubic yards, at \$2; total.....	120 00
Cobble stone gutter, new, 567 square yards, at 75 cents; total....	425 25
Cobble stone gutter, relaid, 458 square yards, at 30 cents; total..	137 40
<hr/>	
Total .....	\$15,513 63
Supervisor's salary.....	288 00
<hr/>	
Total cost of road.....	\$15,801 63
<hr/>	
Lump sum, contract price.....	\$14,481 00
Total allowed by the State.....	15,513 63
One-third of above, amount paid by the State.....	5,171 21
<hr/>	
Maximum grade before.....	6.00 per cent.
Maximum grade after.....	4.00 per cent.

J. L. BAUER,

*Engineer.*

J. F. CHAPMAN,

*Supervisor.*

Detailed statement of the cost of the Terrill road, city of Plainfield, borough of Fanwood, township of Fanwood, county of Union. Total length, 5,494.8 feet, or 1.04 miles.

Width of stone-bed, 16 feet.

Length of stone-bed, 5,392.8 feet.

Depth of stone-bed, 8 inches.

Macadam, 9,587.2 square yards, at 57½ cents; total.....	\$5,512 61
Macadam wings and approaches, 120 square yards, at 57½ cents; total .....	69 00
Macadam approaches, 6 inches deep, North avenue, 120 square yards, at 35 cents; total.....	42 00
Macadam approaches, varying depth, East Front street, 533 square yards, at lump sum.....	100 00
Earth excavation, 770¾ cubic yards, at 35 cents; total.....	269 76
Earth excavation for embankment, 4,054 cubic yards, at 35 cents; total .....	1,418 90
Earth excavation for embankment, East Front street approach, and raising pipe, lump sum.....	104 00
Total .....	\$7,516 27
Supervisor's salary.....	162 00
Engineering expenses.....	375 81
Total cost of road.....	\$8,054 08

Lump sum, contract price.....	\$7,201 27
Total allowed by the State.....	7,516 27
One-third of above, amount paid by the State.....	2,505 42

Maximum grade before (over railroad).....	9.00 per cent.
Maximum grade after (over railroad).....	7.00 per cent.

F. J. HUBBARD,

*Engineer.*

C. VAN HERWERDEN,

*Supervisor.*

Detailed statement of the cost of the Lopatcong road, township of Lopatcong, county of Warren. Total length, 13,688 feet, or 2.59 miles.

Width of stone-bed, 14 feet.  
Length of stone-bed, 13,688 feet.  
Depth of stone-bed, 8 inches.

Telford, 21,292½ square yards, at 61 cents; total.....	\$12,988 39
Excavation, without classification, 8,588 cubic yards, at 41 cents; total .....	3,521 08
Drain, 500 lineal feet, at 50 cents; total.....	250 00
Cobble stone gutter, 32 square yards, at 60 cents; total.....	19 20
Total .....	\$16,778 67
Supervisor's salary.....	315 00
Engineering expenses.....	250 00
Extras, paid by county, { Piping ..... \$915 20 Twenty-two yards dry retaining wall ..... 24 50	939 70
Total cost of road.....	\$18,283 37

Lump sum, contract price.....	\$16,849 46
Total allowed by the State.....	16,778 67
One-third of above, amount paid by the State.....	5,592 89

## COMMISSIONER OF PUBLIC ROADS.

87

Maximum grade before.....	9.66 per cent.
Maximum grade after.....	4.87 per cent.

S. W. SALMON,  
*Engineer.*  
 CHAS. D. GINDER,  
*Supervisor.*

Detailed statement of the cost of the Harmony road, township of Harmony, county of Warren. Total length, 28,286 feet, or 5.36 miles.

Width of stone-bed, 14 feet.  
 Length of stone-bed, 28,286 feet.  
 Depth of stone-bed, 8 inches.

Macadam, over bridges, $68\frac{44}{100}$ square yards, at 60 cents; total...	\$41 06
Telford, 43,923 square yards, at 58 cents; total.....	25,480 56
Excavation, without classification, 30,720 cubic yards, at 49 cents; total.....	15,052 80
Extra excavation, 55 cubic yards, at 49 cents; total.....	26 95
Drain, 100 lineal feet, at \$1; total.....	100 00
Extra drain, 110 lineal feet, at 24 cents; total.....	26 40
Cobble stone gutter, $4,605\frac{1}{3}$ square yards, at 60 cents; total....	2,763 20

Total .....	\$43,490 97
Supervisor's salary.....	574 50
Engineering expenses.....	650 00
Extras, paid by county.....	3,061 82

Total cost of road.....	\$47,777 29
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Lump sum, contract price.....	\$43,432 98
Total allowed by the State.....	43,490 97
One-third of above, amount paid by the State.....	14,496 99

Maximum grade before.....	15.25 per cent.
Maximum grade after.....	6.60 per cent.

S. W. SALMON,  
*Engineer.*  
 SAM'L S. STEWART,  
*Supervisor.*



## NEW JERSEY STATE LIBRARY

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# APPENDICES.

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# Appendix A.

## STANDARD STATE AID SPECIFICATIONS FOR STONE ROADS.

### SPECIFICATIONS.

FOR A STONE ROAD IN.....COUNTY, NEW  
JERSEY, KNOWN AS.....  
BEGINNING AT.....  
EXTENDING TO.....  
A DISTANCE OF.....FEET OR.....MILES  
STONE..... FEET WIDE.....INCHES DEEP  
EARTH.....FEET WIDE. TOTAL WIDTH.....FEET

### WORK TO BE PERFORMED.

1. The work to be performed will consist in furnishing all material, tools, machinery and labor necessary for the efficient and proper grading of roadway, side ditches and side banks, laying, spreading and rolling of road metal, and leaving the roadway complete in every manner ready for immediate use.

### PLANS AND DRAWINGS.

2. The plan, profile and cross-sections on file in the office of the State Commissioner of Public Roads and at the office of.....  
County Engineer.....New Jersey, show general location, profile, details and dimensions. The work will be constructed in all respects according to the above-mentioned plan, profile and cross-sections, which form part of these specifications.

3. Any variation of location, profile, size and dimensions from that shown on the plan, as may be required by the exigencies of construction, will, in all cases, be determined by the engineer, but the contractor shall not, on any pretense, save that of the written order of the contracting parties and the

State Commissioner of Public Roads, deviate from the intent of the plan or specifications.

4. On all drawings, figured dimensions are to govern in cases of discrepancy between scale and figures.

#### GRADING.

5. Under this head will be included all excavation and embankment required for the formation of the highway, cutting all ditches or drains about or contiguous to the road, removing all fences, walls, buildings, trees, poles or other encumbrances, the excavation and embankment necessary for reconstructing cross or branch roads or entrances to dwellings in cases where they are destroyed or interfered with in the formation of the roadway, and all other excavations and embankments connected with or incidental to the construction of the said road.

#### EXCAVATION.

6. The roadway to the widths and depths as shown on plans must be excavated or built to the same curvature as that of the surface of the road when finished. The grade, from centre to sides, must be as shown on plans.

7. The earth taken from any cut or ditch shall be deposited where the engineer may direct, either within or without the line of the road, but no earth shall be removed from the line of the road without the order of the engineer.

8. The grading shall be completed for the full width of the road, from gutter to gutter, before any macadamizing is commenced.

#### EMBANKMENT.

9. Material taken from the excavations, except when otherwise directed by the engineer, shall be deposited in the embankments, either on the roadway or sidewalks. Rejected or excess material will be used to increase the width of the embankments or deposited in spoil banks or waste piles, as and where the engineer may direct.

10. When there is not sufficient material in the excavations of the road to form the embankments, the deficiency must be supplied by the contractor from without the road. The character of said material and place of excavation must be approved by the engineer.

11. The embankments will be formed in layers of such depth, generally one (1) foot, and the material deposited and distributed in such a manner as the engineer may direct, the required allowance for settling being added. Each layer shall be carried across the entire width of the embankment and completed before commencing another, and this method shall be followed with each succeeding layer until the established grade is reached.

#### SLOPES.

12. Slopes in both embankment and excavation shall be one and one-half ( $1\frac{1}{2}$ ) horizontal to one (1) vertical, when the width of the road will permit; if the road is too narrow to allow the full slope within its side lines, the engineer shall not calculate the quantities, either in embankment or excavation, beyond said side lines, unless the required ground shall be first dedicated to the public in writing by the owner or owners thereof.



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## WIDTH AND DEPTH.

13. The construction to be.....inches deep and.....feet wide, as shown on plan and detail sheet.

## ROADWAY.

*Sub-Foundations.*

14. When the excavations and embankments have been brought to a proper depth below the intended surface of the roadway, the cross-section thereof conforming in every respect to the cross-section of the road when finished, the same shall be rolled with a.....ton roller until it is.....inches below the intended surface of the road and is approved by the engineer and supervisor. If any depressions form under such rolling, owing to improper material or vegetable matter, the same shall be removed and good earth substituted, and the whole re-rolled until thoroughly solid and to above-mentioned grade. Water must be applied in advance of the roller, when, in the opinion of the engineer and supervisor, it is necessary.

## STONE CONSTRUCTION.

*Telford Foundations.*

15. After the roadbed has been formed and rolled, as above specified, and has passed the inspection of the engineer and supervisor, a bottom course of stone, of an average depth of.....inches, is to be set by hand as a close, firm, pavement, the stones to be placed on their broadest edges lengthwise across the road in such manner as to break joints as much as possible, the breadth of the upper edge not to exceed four (4) inches. The interstices are then to be filled with stone chips, firmly wedged by hand with a hammer, and projecting points broken off. No stone of greater length than ten (10) inches, or width of four (4) inches, shall be used, except each alternate stone on outer edge, which shall be double the length of the others and well tied into the bed of the road. All stones with a flat, smooth surface must be broken. The whole surface of this pavement must be subjected to a thorough settling or ramming with heavy sledge-hammers, and thoroughly rolled with a.....ton.....roller. No stone larger than two and one-half ( $2\frac{1}{2}$ ) inches shall be left loose on top of telford.

## MACADAM.

*First Course of Broken Stone.*

16. After the roadbed has been formed and rolled as above specified, and has passed the inspection of the engineer and supervisor, the first layer of broken stone, consisting of two and one-half ( $2\frac{1}{2}$ ) inch stone, or stone that will pass through a ring three (3) inches in diameter, shall be deposited in a uniform layer, having a depth of.....inches, and rolled repeatedly with a.....ton.....roller until compacted to the satisfaction of the

engineer and supervisor. No stone in this course shall be less than two (2) inches in length.

17. The depth of loose stone in this and all other courses must be measured by blocks the required thickness of the said loose stone. These blocks must be placed at frequent intervals amid the loose stone when being spread.

#### BINDER BETWEEN FIRST AND SECOND COURSE FOR TELFORD OR MACADAM.

18. On the first course of stone a quantity of..... binder shall be spread in a uniform layer, and the whole rolled until the stones cease to sink or creep in front of the roller. The quantity and quality of this and all other binding shall be subject to the approval of the engineer and supervisor. Water must be applied in advance of the roller, if ordered by the engineer or supervisor.

#### SECOND COURSE OF BROKEN STONE FOR MACADAM OR TELFORD.

19. The second course of broken stone shall consist of one and one-half ( $1\frac{1}{2}$ ) inch stone; that is, every piece of stone shall be broken so that it can be passed through a ring two (2) inches in diameter, and no stone shall be more than two (2) inches or less than one (1) inch long. This course shall be spread in a uniform layer.....inches in depth and rolled until thoroughly settled into place to the satisfaction of the engineer and supervisor. Water must be applied as ordered by the engineer or supervisor.

#### BINDER ON SECOND COURSE OF STONE.

20. Binder on this course of stone must be applied in the same manner as binder on first course of stone (see Art. 18), as directed by engineer and supervisor.

#### SURFACE.

21. When the two courses are rolled to the satisfaction of the engineer and supervisor, a coat of fifty (50) per cent. of three-quarters ( $\frac{3}{4}$ ) inch stone and fifty (50) per cent. of screenings, properly mixed, is to be spread, of sufficient thickness to make a smooth and uniform surface to the road, then again rolled until the road becomes thoroughly consolidated, hard and smooth.

22. Rolling must be done by the contractor with a.....ton..... roller, approved by the engineer.

23. Any depressions formed during the rolling, or from any other cause, are to be filled with one and one-half ( $1\frac{1}{2}$ ) inch stone, or three-quarter ( $\frac{3}{4}$ ) inch stone, or both, and screenings, approved by the engineer, and the roadway brought to the proper grade and curvature as determined by him.

24. Water must be applied in such quantities and in such manner as directed by the engineer or supervisor.

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## MANNER OF ROLLING.

25. In the rolling the roller must start from the side lines of the stone-bed and work towards the center, unless otherwise directed. The rolling shall at all times be subject to the directions of the engineer and supervisor, who may, from time to time, direct such methods of procedure as in their opinion the necessities of the case may require.

## QUALITY OF MATERIAL.

26. All stone must be as nearly cubical as possible, broken with the most approved modern stone crushing machinery, free from all screenings, earth and other objectionable substances, of uniform size, and the same kind and quality, or equally as good in every particular, as that shown in the engineer's office. The one and one-half ( $1\frac{1}{2}$ ) inch stone, three-quarter ( $\frac{3}{4}$ ) inch and screenings for binder and final finish must be of the best trap rock, free from loam or clay.

27. The contractor must furnish samples to the engineer of the kind of stone to be used in the work before the opening of the bids, and to the State Commissioner of Public Roads before the approval of the contract by him.

## ENTRANCES TO DWELLINGS.

28. All driveways leading to dwellings along the road shall be macadamized with the second course and finished in the same manner as prescribed for the main road. The macadamizing shall be carried to a distance of not more than six feet beyond the gutter line of the road, as indicated by the engineer's stakes, but in no case shall the macadamizing be carried beyond the side line of the road as indicated by the fences.

## SHOULDERING.

29. A shoulder of firm earth or gravel is to be left or made on each side, extending at the same grade and curvature of road to side ditches or gutters. This shoulder is to be rolled according to the directions of the engineer.

## COBBLE GUTTERS.

30. Cobble gutters shall be laid from station number.....to station number..... The cobbles used must be good, hard, sound stone. Medium sized stone, not over five-inch face on its longest diameter, must be used, except for centers or sides, where eight-inch cobbles may be used. The cobbles must be bedded in not less than six inches of good, sharp sand or gravel, and laid with the longest diameter of stone parallel with the road, and thoroughly rammed into shape and place. All stone broken in ramming must be removed and replaced with perfect stone.



SIDE DITCHES OR GUTTERS.

31. The side ditches or gutters are to be excavated as per stakes furnished by engineer, in order to give an easy flow of water, so that no water shall be left standing on the road or in the ditches, for which no extra payment will be made.

UNDERDRAINS.

32. Underdrains, if found necessary, shall be constructed by the contractor of good.....inch.....tile, laid upon a board of not less than one (1) inch in thickness and six (6) inches in width. The top of the tile shall be at least.....inches deep, unless otherwise directed by the engineer; the joints shall be covered with salt hay, or material equally as good, and the trench filled with pervious earth. These drains must be constructed whenever and wherever the engineer and supervisor shall decide.

33. When directed by the engineer, a stone drain may be used in place of the tile drain. A trench one foot wide and one foot six inches deep shall be excavated below the subgrade, said excavation to be filled with loose broken stone to a depth required by the engineer.

BROAD-TIRE WAGONS.

34. All wagons and carts used during the construction for hauling stone, earth or any other material must have tires not less than three and one-half (3½) inches in width.

NO EXTRA PRICE.

35. No allowance in measure of depth of pavement will be made on account of any material which may be driven into the roadbed by rolling. The pavement, when completed, must conform to the grade and the cross-sections, and be satisfactory to the engineer and State Commissioner of Public Roads, whose decisions shall be final.

36. No extra work will be paid for unless the price has been agreed upon between the contracting parties, including the State Commissioner of Public Roads, and endorsed upon the agreement, witnessed by the engineer.

37. All clay or gravel for shouldering or binder and all extra hauling is to be done at the contractor's expense.

BIDS.

38. Bids will only be received under these specifications for the road complete. The prices per yard for excavation, telford, macadam, &c., are intended for the use of the engineer in making estimate to the Board of Chosen Freeholders of work done. No bid will be received in which all of the following items are not filled out:

(1) Price per cubic yard for earth excavations, without classification, as per cross-sections throughout the length and width of the road.

(2) Price per cubic yard for any necessary earth excavations and removing material without classification and measured in excavation, not included in the length and width of the road.

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- (3) Price per square yard for macadam driveways to dwellings.
- (4) Price per square yard for telford road complete.
- (5) Price per square yard for macadam road complete.
- (6) Price per square yard for cobble gutters complete.
- (7) Price per lineal foot for underdrains, furnishing all labor and material.
- (8) Price (lump) for the whole road complete, according to above specifications and plans.

## ESTIMATE OF QUANTITIES.

39. (1) Excavation, earth.....cubic yards.
- (2) Extra excavation.....cubic yards.
- (3) Macadam driveways.....square yards, as specified.
- (4) Telford .....square yards, as specified.
- (5) Macadam .....square yards, as specified.
- (6) Cobble gutters.....square yards, as specified.
- (7) Underdrains .....lineal feet.
- (8) .....

40. These quantities are the result of calculation, but are to be considered as approximate. The county will not be responsible for any excess in above quantities, should any occur. The contractor is expected to satisfy himself as to the nature, character and quantity of the labor and material required by a personal examination of the work contemplated.

## CHECK ACCOMPANYING BIDS.

41. Bids shall be accompanied with a certified check, payable to the order of the Director of the Board of Chosen Freeholders, in the sum of one thousand dollars (\$1,000), as a guarantee that if the contract shall be awarded to him he will, when required by said board, execute an agreement in writing to perform the work according to the specifications. Upon failure by the contractor to enter into said agreement with the said Board of Chosen Freeholders, said certified check shall be forfeited and considered as liquidated damages.

## LIABILITIES OF CONTRACTOR.

42. He shall maintain sufficient guards by day and night to prevent accidents from travel, and will be liable for any damage which may arise from his neglect to do so, or from any omission on his part.

43. He shall keep the road sprinkled until the certificate of completion by the engineer is given.

44. He is to commence and prosecute the work upon the road at the end farthest from the source of supply of broken stone, unless otherwise ordered by the engineer, within.....days from and after the signing of the contract, and shall continue work thereon until completion, except as herein provided.

45. He further agrees to complete the same on or before the.....day of.....A. D..... Twenty dollars for each day that the work shall remain uncompleted, after the time allowed by contract, may be deducted, as liquidated damages, from any moneys due the contractor, unless otherwise

agreed upon by the Board of Chosen Freeholders, after presentation of certificate of the engineer recommending the extension of the time limit of completion.

46. The contractor shall keep the finished roadway, earthwork, side ditches and underdrains in repair for the period of one year from the date of its completion and acceptance, and, in addition thereto, for as much longer as for any period or periods during said year it shall be out of proper condition. If, during that time, the roadway or any part of the work shall, in the judgment of the engineer and the Board of Chosen Freeholders, require repairing, and they shall duly notify the contractor to make such repairs as required, and the contractor should refuse or neglect to do so to the satisfaction of the said engineer and the Board of Chosen Freeholders, within five days from the date of service of notice, then the said engineer and the Board of Chosen Freeholders shall have the right to have the work done properly by other parties and recover the cost for the same from the said contractor or his surety.

47. The contractor will be required to preserve all stakes and bench marks made and established on the line of work until duly authorized by the engineer to remove the same. All stakes or bench marks disturbed or removed by the contractor or his agents without the permission of the engineer shall be replaced at the expense of the contractor.

48. The contractor shall not disturb the position of title stones (the corners of properties adjacent to the road), but where they appear he will either lift or lower them, under the personal supervision of the engineer.

49. The contractor must also preserve the roadway on which he is working from needless obstruction, and where necessary he must construct safe and commodious crossings, to be maintained in good order. He shall afford all proper and reasonable means for the accommodation of the public, and leave the roadway complete in every manner ready for immediate use.

50. All loss or damage arising from the nature of the work to be done, or from any unforeseen or unusual obstruction or difficulty which may be encountered in the prosecution of said work, or from the action of the elements shall be sustained by the contractor.

#### PROVISION FOR DRAINAGE.

51. If it is necessary in the prosecution of the work to interrupt or obstruct the natural drainage of the surface, or the flow of artificial drains, the contractor shall provide for the same, during the progress of the work, in such a way that no damage shall result to either public or private interest. He shall be held liable for all damages which may result from any neglect to provide for either natural or artificial drainage, which he may have interrupted.

#### RIGHT TO BUILD BRIDGES, CULVERTS, ETC., AND SUSPENSION OF WORK.

52. The right of the county to build bridges, culverts, lay pipes or other appurtenances in said road during the progress of the work is expressly reserved, as well as suspending the work, or any part thereof, during the construction of the same, for the purposes above stated, without further compensation to the contractor for such suspension than an extension of time for completing the work as much as it may have been delayed.



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## STOPPING WORK ON ACCOUNT OF WEATHER.

53. The State Commissioner of Public Roads, engineer or supervisor, may stop any portion of the work, if in their judgment the weather is such as to prevent the same being done properly. No allowance of any kind will be made for such stoppage, except an extension of the time for the completion of the work as herein provided.

## ABANDONMENT OF CONTRACT.

54. If at any time the work under contract should be abandoned, or if at any time the engineer should judge and so certify in writing that said work, or any part thereof, is unnecessarily delayed, or that the contractor is willfully violating any of the conditions or covenants of this contract, or is executing the same in bad faith, then in that case, the Board of Chosen Freeholders shall notify the said contractor to discontinue all work under this contract. It may employ other parties to complete the work in such manner as it may decide, and use such material as may be procured upon the line of aforesaid work, and, if necessary, procure other material for its completion, and charge the expense of the said labor and material to the contractor, which expense shall be deducted from any moneys due him under contract. In case these expenses shall exceed the sum which would have been payable under contract, if the same had been completed by said contractor, he or his bondsmen shall pay the amount of the excess to the Board of Chosen Freeholders, on notice from the engineer.

## ENGINEER.

55. The engineer shall be selected or appointed by the Board of Chosen Freeholders and paid by it. He shall furnish all surveys, profiles, plans, specifications and estimates of quantities of all kinds before specifications are signed, and in such a clear manner that lump bids can be made upon the work. He shall furnish all lines and grades required for the completion of the work. He shall furnish estimates for quantities of work done before partial payments can be made, the quantity of road laid being determined by surface measurements. Should any difference arise between the contracting parties as to the meaning or intent of these specifications, his decisions on these matters are to be final and conclusive. The work is to be done according to his directions, and if any material of which he does not approve is brought upon the road, it is to be removed at the expense of the contractor. If the contractor fails or neglects to do any part of the work as specified or as directed by the engineer, then, in that case, all other work shall be discontinued, on notice from the engineer to the contractor, or to the superintendent or foreman in charge of the work for the contractor, until such time as the work complained of has been done to the satisfaction of the engineer, and the contractor will not be entitled to or allowed any compensation or extension of time for such discontinuation or suspension of the work.

SUPERVISOR.

56. Nothing in these specifications relating to the duties of the engineer shall be taken or construed in any manner to conflict with the duties of the supervisor, as specifically set forth in the act entitled "An act to provide for the permanent improvement of public roads in this State," approved March 27th, 1905, but they shall co-operate as far as practicable.

INCOMPETENT WORKMEN.

57. The contractor shall employ competent men to do the work, and whenever the engineer and supervisor shall inform him, or his representative in charge, in writing, that any man on the work is unfitted for the place, or is working contrary to the provisions of the specifications or the instructions of the engineer and supervisor, he shall thereupon be discharged.

INSPECTION.

58. All directions and determinations necessary to give due and full effect to any of the provisions of these specifications shall be given by the engineer and supervisor.

59. All material and workmanship of any kind shall be subject at all times to the inspection of the engineer and supervisor. Whenever unfaithful and imperfect work is discovered, it shall be immediately repaired or replaced by the contractor, after due notification from the engineer and supervisor.

SUB-LETTING OF CONTRACT.

60. The contractor shall not assign or sub-let any portion of this contract without the consent of the Board of Chosen Freeholders and the State Commissioner of Public Roads.

PAYMENTS.

61. ....monthly payments will be made by the Board of Chosen Freeholders to the contractor for work performed, upon presentation by him of the proper certificates of the engineer and supervisor, in a sum not to exceed eighty per cent. of the amount then due, together with releases from all liens, if required. Fifteen per cent. will be paid at the completion of the work and the acceptance of the same in writing by the Board of Chosen Freeholders and the State Commissioner of Public Roads. The remainder, or five per cent., will be retained by the Board of Chosen Freeholders for a period of one year as security for the faithful performance of Article 46.

BOND OF CONTRACTOR.

62. The contractor will be required to execute, within thirty days of giving of contract, a bond in such sum and with such securities as shall be approved by the Board of Chosen Freeholders, conditioned for the faithful performance

# COMMISSIONER OF PUBLIC ROADS.

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of the contract, to indemnify and save harmless the Board of Chosen Freeholders from all suits or actions of any name or description brought against them on account of any act or omission of the contractor or his agents, and for the faithful performance of the contract by the contractor. Said bond shall be in a sum of not less than the estimated cost of the road when completed. Any change made in the plans, specifications, agreements or quantities without the consent of the bondsmen shall in no way vitiate said bond. The contractor hereby further agrees that so much of the money due him, under and by virtue of this agreement, as shall be considered necessary by the Board of Chosen Freeholders, may be retained by it until all such suits or claims for damages aforesaid shall have been settled, and evidence to that effect furnished to the satisfaction of the Board of Chosen Freeholders.

## CONTRACTOR TO INSURE PAYMENT FOR LABOR, MATERIAL, ETC., ON FINAL ESTIMATE.

63. The contractor must also furnish the engineer with satisfactory evidence that all persons who did work, or furnished material for this contract, or who have sustained damage or injury by reason of any act, omission or carelessness on his part or his agents in the prosecution of the work, have been duly paid or secured. He shall also give notice to the engineer within ten days after the completion of the work, and before final estimate is made, that any balance for such work or materials, or compensation for such damages due, has been fully paid or released.

64. The right is reserved to reject any or all bids, if deemed to the interest of the county or State.

.....  
*County Engineer.*

Approved this....., A. D....., by resolution of the Board of Chosen Freeholders of the county of.....

.....  
*Director of Board of Chosen Freeholders.*

.....  
*Clerk of Board of Chosen Freeholders.*

## OFFICE STATE COMMISSIONER OF PUBLIC ROADS, TRENTON, N. J.

I have this day carefully read and examined the foregoing specifications, and the same are hereby approved.

Any departure from these specifications must have the written consent of the State Commissioner of Public Roads.

Given under my hand, this.....A. D. 190

.....  
*State Commissioner of Public Roads.*



PROPOSALS.

*To the Board of Chosen Freeholders, County of.....and State of New Jersey:*

GENTLEMEN—The undersigned hereby declare....that....he....ha....carefully examined the annexed specifications and the drawings therein referred to, and will provide all necessary machinery, tools, apparatus and other means of construction, and do all the work and furnish all the material called for by said specifications in the manner prescribed by the specifications and the requirements of the engineer and supervisor under them, for the following prices:

- (1) Price per cubic yard for earth excavations, without classification, as per cross-sections throughout the length and width of the road.
- (2) Price per cubic yard for any necessary earth excavations and removing material without classification and measured in excavation, not included in the length and width of the road.
- (3) Price per square yard for macadam driveways.
- (4) Price per square yard for telford road complete.
- (5) Price per square yard for macadam road complete.
- (6) Price per square yard for cobble gutters.
- (7) Price per lineal foot for underdrains, furnishing all labor and material.
- (8) Price (lump) for the whole road complete, according to the specifications and plans.

Accompanying this proposal is a certified check for the sum of one thousand dollars (\$1,000), payable to the order of the Director of the Board of Chosen Freeholders of.....county, which check is to be forfeited as liquidated damages if, in case this proposal is accepted, the undersigned shall fail to execute a contract with said Board of Chosen Freeholders, under the conditions of this proposal, within the time provided for by the foregoing advertisement for proposals; otherwise, said check is to be returned to the undersigned.

Signed.....

Address.....

.....N. J., .....

CONTRACT.

This agreement, made the.....day of....., in the year of our Lord one thousand nine hundred....., between THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., party of the first part, and....., party of the second part,

*Witnesseth*, That the said party of the second part, for and in consideration of the payments hereinafter specified and agreed to be made by the party of the first part, hereby covenant and agree to furnish and deliver all the materials and to do and perform all the work and labor required to be furnished and delivered, done and performed in and about the macadamizing of..... beginning at.....and extending to.....in the township of.....a distance of..... in strict and entire conformity with the plans on file in the engineer's office and with the specifications hereto annexed and duly approved by resolution of THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF.....

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.....adopted the.....day of.....in the year of our Lord one thousand nine hundred.....and approved by the State Commissioner of Public Roads on the.....day of.....in the year of our Lord one thousand nine hundred .....which said plans and specifications are hereby made part of this agreement as fully and with the same effect as if the same had been set forth at length in the body of this agreement.

In consideration of the premises the party of the first part hereby agrees to pay to the party of the second part for said work, when completed in accordance with the said specifications, the sum of.....payments to be made as provided in said specifications upon presentation of the proper certificates of the engineer and supervisor and upon the terms set forth in the annexed specifications.

This contract to be binding upon THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., its successors or assigns, and upon.....the party of the second part.....

*In Witness Whereof*, The director of THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., by authority of a resolution of said board, hath hereunto set his hand and affixed the corporate seal of the said board and the said party of the second part ha.. hereunto set.....hand.. and seal.. the day and year first above written.

.....  
*Director of the Board of Chosen Freeholders of the County of*

Attest:

.....  
*Clerk.*

Signed, sealed and delivered in the presence of

.....  
This contract approved this.....day of....., 190..

.....  
*State Commissioner of Public Roads.*

KNOW ALL MEN BY THESE PRESENTS, That we,.....  
.....and.....of the county of.....  
and State of New Jersey, are held and firmly bound unto THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., in the sum of.....dollars, lawful money of the United States, to be paid to the said THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., its successors or assigns, to which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, jointly and severally, firmly by these presents.

Sealed with our seals and dated this.....day of....., A. D. nineteen hundred and.....

*The Condition of this Obligation is such*, That if the above bounden..... shall well and truly perform his part of the contract hereto annexed, and all the covenants and conditions therein perform, then this obligation to be void, otherwise to remain in full force and virtue.

SIGNED, SEALED AND DELIVERED  
IN THE PRESENCE OF

.....

This Bond approved this.....day of....., A. D. 190..

.....  
*Director.*

.....  
.....  
.....  
.....  
.....

*Be it Remembered* on this.....day of.....in the year of our Lord one thousand nine hundred and.....before me, a Master in Chancery of the State of New Jersey, personally appeared.....and..... who acknowledged that they signed, sealed and delivered the foregoing bond as their voluntary act and deed for the uses and purposes therein expressed.

.....

JUSTIFICATION OF SURETY.

STATE OF NEW JERSEY, }  
COUNTY OF..... } ss.

On this.....day of....., A. D. 190.., before me, a Notary Public in and for the county and State aforesaid, personally appeared.....who, being duly sworn, on his oath declares that he is a resident of the county of....., in the State of New Jersey; that he is a freeholder in said county, and that he owns real estate in said county, in his own right, to the amount of.....over and above all his indebtedness and after all his debts are paid, and over any contingent liability by reason of being bail, surety, endorser or guarantor.

Subscribed and sworn to before me, this.....day of....., A. D. 190.. I hereby certify that the contents of the above have been carefully made known to affiant before execution.

.....



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STATE OF NEW JERSEY, }  
COUNTY OF..... } ss.

On this.....day of....., A. D. 190..., before me, a Notary Public in and for the county and State aforesaid, personally appeared.....who, being duly sworn, on his oath declares that he is a resident of the county of....., in the State of New Jersey; that he is a freeholder in said county, and that he owns real estate in said county, in his own right, to the amount of.....over and above all his indebtedness and after all his debts are paid, and over any contingent liability by reason of being bail, surety, endorser or guarantor.

Subscribed and sworn to before me, this.....day of....., A. D. 190..  
I hereby certify that the contents of the above have been carefully made known to affiant before execution.

.....

NEW JERSEY STATE LIBRARY

# STANDARD STATE AID SPECIFICATIONS FOR GRAVEL ROADS.

## SPECIFICATIONS.

FOR A GRAVEL ROAD IN.....COUNTY, NEW  
JERSEY, KNOWN AS.....  
BEGINNING AT.....AND  
EXTENDING TO.....  
A DISTANCE OF.....FEET, OR.....MILES.  
GRAVEL.....FEET WIDE.....INCHES DEEP.  
SHOULDERS.....FEET WIDE. TOTAL WIDTH OF ROAD.....FEET.

## WORK TO BE PERFORMED.

1. The work to be performed will consist in furnishing all materials, tools, machinery and labor necessary for the efficient and proper grading of roadway, side ditches and side banks, laying, spreading and rolling of road material, and leaving the roadway complete in every manner ready for immediate use.

## PLANS AND DRAWINGS.

2. The plan, profile and cross-sections on file in the office of the State Commissioner of Public Roads and at the office of.....County Engineer.....New Jersey, show general location, profile, details and dimensions. The work will be constructed in all respects according to the above-mentioned plan, profile and cross-sections, which form part of these specifications.

3. Any variation of location, profile, size and dimensions from that shown on the plan, as may be required by the exigencies of construction, will, in all cases, be determined by the engineer, but the contractor shall not, on any pretense, save that of the written order of the contracting parties and the State Commissioner of Public Roads, deviate from the intent of the plan or specifications.

4. On all drawings, figured dimensions are to govern in cases of discrepancy between scale and figures.

## GRADING.

5. Under this head will be included all excavations and embankments required for the formation of the highway, cutting all ditches or drains about or contiguous to the road, removing all fences, walls, buildings, trees, poles or other encumbrances, the excavation and embankment necessary for reconstructing

cross or branch roads or entrances to dwellings in cases where they are destroyed or interfered with in the formation of the roadway, and all other excavations and embankments connected with or incidental to the construction of the said road.

#### EXCAVATION.

6. The roadway to the width of.....feet as shown on plan must be excavated or built to the same curvature as that of the surface of the road when finished; the grade, from centre to sides, must be as shown on plans.

7. The earth taken from any cut or ditch shall be deposited where the engineer may direct, either within or without the lines of the road, but no earth shall be removed from the line of the road without the order of the engineer.

#### EMBANKMENT.

8. Material taken from the excavations, except when otherwise directed by the engineer, shall be deposited in the embankments, either on the roadway or sidewalks.

9. When there is not sufficient material in the excavations of the road to form the embankments, the deficiency must be supplied by the contractor from without the road. The character of said material and place of excavation must be approved by the engineer.

10. The embankments must be formed in layers of such depth, generally twelve (12) inches, and the material deposited and distributed in such manner as the engineer may direct, the required allowance for settling being added. Each layer must be carried across the entire width of the embankment and completed before commencing another, and this method shall be followed with each succeeding layer until the established grade is reached.

#### SLOPES.

11. Slopes in both embankment and excavation shall be one and one-half ( $1\frac{1}{2}$ ) horizontal to one (1) vertical, when the width of the road will permit; if the road is too narrow to allow the full slope within its side lines, the engineer shall not calculate the quantities, either in embankment or excavation, beyond said side lines, unless the required ground shall be first dedicated to the public in writing by the owner or owners thereof.

#### ROADWAY.

##### *Sub-Foundations.*

12. When the excavations and embankments have been brought to a proper depth below the intended surface of the roadway, the cross-section conforming in every respect to the cross-section of the road when finished, the same shall, if ordered by the engineer, be rolled until approved by him. If any depressions form under such rolling, owing to improper material or vegetable matter, the same shall be removed and good earth substituted, and the whole re-rolled until thoroughly solid and to above-mentioned grade.



#### SHOULDERING.

13. A shoulder of firm earth or gravel is to be left or made on each side of the gravel-bed, extending at the same grade and curvature of road to side ditches or gutters. This shoulder is to be rolled according to the directions of the engineer.

#### UNDERDRAINS.

14. Underdrains, if found necessary, shall be constructed by the contractor (at prices named in bids) of good.....inch.....tile, laid upon a board of not less than one (1) inch in thickness and six (6) inches in width, whenever and wherever the engineer shall decide; top of tile or pipe must be at least.....inches deep, unless otherwise directed by the engineer; the joints of the tile or pipe must be covered with salt hay, or material equally as good, and trench filled with pervious earth.

15. When directed by the engineer a stone drain may be used in place of the tile drains. A trench one foot in width and one foot six inches in depth shall be excavated below the subgrade, said excavation to be filled with loose broken stone to a depth required by the engineer.

#### MATERIALS.

16. The material to be used in surfacing the road is to be furnished by the contractor.

17. The engineer and State Commissioner of Public Roads will pass upon and approve all gravel to be used in surfacing the road. The contractor is to dig, cart and place upon the road, in accordance with the specifications, the gravel selected and use no other. Should any objectionable material be used, he is to remove the same at his own expense.

18. The contractor must furnish, to the engineer and State Commissioner of Public Roads, samples of the kind of gravel to be used in the work before the opening of the bids.

19. The gravel is to be placed upon the road in such manner as shall be approved by the engineer, and be thoroughly rolled and solidified until it is consolidated, firm and approved by the engineer. The gravel shall be of such thickness that when it is thoroughly compacted and approved, it shall be.....inches deep in the center and slope at a regular grade to.....inches in depth at a distance of.....feet on each side of the center line.

20. Should any depressions appear these are to be carefully filled with gravel, so that the finished road will conform to the approved profile.

21. The contractor is to be paid by the cubic yard, as per depths above named, for the compacted gravel that he puts on the road, at the price named in the accepted bid, which shall include finishing the road and shaping the shoulders as above specified.

22. The contractor is to place sufficient gravel on the road to allow it to shrink thirty-three per cent. in rolling and settling.

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### SIDEWALKS.

23. The contractor will also be required, when the engineer so directs, to grub and remove from a strip of land.....feet on outside of curb-lines all material objectionable to the engineer, such as trees, stumps, roots and brush, and refill the holes with earth, thereby completing the opening of the entire road to a width of.....feet, which shall be.....feet on each side of the center line.

24. The grubbing and removing of such objectionable material that is ordered by the engineer shall be styled as "grubbing," and paid for by the acre at price named in accepted bid.

### OPEN DITCHES.

25. The contractor is to grade the shoulders and open all necessary side ditches (as per stakes furnished by the engineer) so that there will be no water allowed to stand by the side of the road or upon it, for which no extra payment will be allowed.

### EXTRA DEEP.

26. Should the engineer and State Commissioner of Public Roads so order, the contractor is to build in all respects, as already specified, the gravel-bed to a greater depth or thickness than that already named. The contractor is to do the same at a price named per square yard for each extra inch in depth.

### NO EXTRA PRICE.

27. No allowance in measure of depth of pavement will be made on account of any material which may be driven into the roadbed by rolling. The pavement, when completed, must conform to the grade and cross-section and be satisfactory to the engineer and State Commissioner of Public Roads, whose decision shall be final.

28. No extra work will be paid for unless the price has been agreed upon between the contracting parties, including the State Commissioner of Public Roads, and endorsed upon the agreement, witnessed by the engineer.

### BROAD-TIRE WAGONS.

29. All wagons and carts used during the construction, for hauling stone, earth or any other material must have tires not less than three and one-half ( $3\frac{1}{2}$ ) inches in width.

### BIDS.

30. Bids will be received under these specifications for the road complete as follows:

(1) Price per cubic yard for earth excavation, without classification, as per plans and cross-sections throughout the length and width of the road.

(2) Price per acre for grubbing and removing objectionable material from sidewalks.

- (3) Price per lineal foot for completed tile drain.
  - (4) Price per cubic yard for compacted gravel as specified.
  - (5) Price per square yard for each ordered inch in depth in excess of thickness named.
  - (6) Price (lump) for the whole road complete, according to the specifications and plans prepared by the engineer.
- No bid will be received in which all the above items are not filled out.

#### ESTIMATE OF QUANTITIES.

31. (1) Earth excavation.....cubic yards.
- (2) Grubbing .....acres.
- (3) Tile drain.....lineal feet.
- (4) Compacted gravel.....cubic yards.

32. These quantities are the result of calculation, but are to be considered as approximate. The county will not be responsible for any excess in above quantities, should any occur. The contractor is expected to satisfy himself by a personal examination of the work contemplated, about the nature, character and quantity of the labor and material required.

#### CHECK ACCOMPANYING BIDS.

33. Bids shall be accompanied with a certified check, payable to the Director of the Board of Chosen Freeholders, for the sum of one thousand dollars (\$1,000), as a guarantee that if the contract shall be awarded to him he will, when required by said board, execute an agreement in writing to perform the work according to the specifications, and upon failure by the contractor to enter into said agreement with the said Board of Chosen Freeholders, said certified check shall be forfeited and considered as liquidated damages.

#### LIABILITIES OF CONTRACTOR.

34. He shall keep up sufficient guards by day and night to prevent accidents from travel, and will be liable for any damage which may arise from his neglect to do so, or from any omission on his part.

35. He is to commence and prosecute the work upon the road at such points as may be directed by the engineer, within.....days from and after the signing of the contract, and shall continue work thereon until completion, except as herein provided.

36. He further agrees to complete the same on or before the..... day of....., A. D.

37. Twenty dollars for each day that the work shall remain uncompleted, after the time allowed by contract, may be deducted, as liquidated damages, from any moneys due contractor, unless otherwise agreed upon by the Board of Chosen Freeholders, after presentation of certificate of the engineer recommending the extension of the time limit of completion.

38. The contractor shall keep the finished roadway, earthwork, side ditches and underdrains in repair for the period of one year from the date of its com-



# COMMISSIONER OF PUBLIC ROADS.

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pletion and acceptance, and, in addition thereto, for as much longer as for any period or periods during said year it shall be out of proper condition. If, during that time, the roadway or any part of the work shall, in the judgment of the engineer and the Board of Chosen Freeholders, require repairing, and they shall duly notify the contractor to make such repairs as required, and the contractor should refuse or neglect to do so to the satisfaction of the said engineer and Board of Chosen Freeholders, within five days from the date of service of notice, then the said engineer and Board of Chosen Freeholders shall have the right to have the work done properly by other parties and recover the cost for the same from the said contractor or his surety.

39. The contractor will be required to preserve all stakes and bench-marks made and established on the line of work until duly authorized by the engineer to remove the same.

40. The contractor shall not disturb the position of title-stones (the corners of properties adjacent to the road), but where they appear he will either lift or lower them, under the personal supervision of the engineer.

41. The contractor must also preserve the roadway on which he is working from needless obstruction, and where necessary construct safe and commodious crossings, to be maintained in good order. He shall afford all proper and reasonable means for the accommodation of the public, and leave the roadway complete in every manner ready for immediate use.

42. All loss or damage arising from the nature of the work to be done, or from any unforeseen or unusual obstruction, or difficulty, which may be encountered in the prosecution of said work, or from the action of the elements, shall be sustained by the contractor.

## PROVISION FOR DRAINAGE.

43. If it is necessary in the prosecution of the work to interrupt or obstruct the natural drainage of the surface, or the flow of artificial drains, the contractor shall provide for the same during the progress of the work in such a way that no damage shall result to either public or private interests. He shall be held liable for all damages which may result from any neglect to provide for either natural or artificial drainage, which he may have interrupted.

## RIGHT TO BUILD BRIDGES, CULVERTS, ETC., AND SUSPENSION OF WORK.

44. The right of the county to build bridges, culverts, lay pipes or other appurtenances in said road during the progress of the work, is expressly reserved, as well as suspending the work, or any part thereof, during the construction of the same, for the purposes above stated, without further compensation to the contractor for such suspension than an extension of time for completing the work as much as it may have been delayed.

## STOPPING THE WORK ON ACCOUNT OF WEATHER.

45. The State Commissioner of Public Roads, engineer or supervisor may stop any portion of the work if, in their judgment, the weather is such as to prevent the same being done properly. No allowance of any kind will be made for such stoppage, except an extension of the time for the completion of the work as herein provided.

ABANDONMENT OF CONTRACT.

46. If at any time the work under contract should be abandoned, or if at any time the engineer should judge and so certify in writing that said work, or any part thereof, is unnecessarily delayed, or that the contractor is willfully violating any of the conditions or covenants of this contract, or is executing the same in bad faith, then, and in that case, the Board of Chosen Freeholders shall notify the said contractor to discontinue all work under this contract. It may employ other parties to complete the work in such manner as it may decide, and use such material as may be procured upon the line of aforesaid work, and, if necessary, to procure other material for its completion, and charge the expense of the said labor and material to the contractor, which expense shall be deducted from any moneys due him under contract. In case these expenses shall exceed the sum which would have been payable under contract, if the same had been completed by said contractor, he or his bondsmen shall pay the amount of the excess to the Board of Chosen Freeholders, on notice from the engineer.

ENGINEER.

47. The engineer shall be selected or appointed by the Board of Chosen Freeholders and paid by it. He shall furnish all surveys, profiles, plans, specifications and estimates of quantities of all kinds before specifications are signed, and in such a clear manner that lump bids can be made upon the work. He shall furnish all lines and grades required for the completion of the work. He shall furnish estimates for quantities of work done before partial payments can be made, the quantity of road laid being determined by surface measurements. Should any difference arise between the contracting parties as to the meaning or intent of these specifications, his decisions on these matters are to be final and conclusive. The work is to be done according to his directions, and if any material of which he does not approve is brought upon the road, it is to be removed at the expense of the contractor. If the contractor fails or neglects to do any part of the work as specified or as directed by the engineer, then, in that case, all other work shall be discontinued, on notice from the engineer to the contractor, or to the superintendent or foreman in charge of the work for the contractor, until such time as the work complained of has been done to the satisfaction of the engineer, and the contractor will not be entitled to or allowed any compensation or extension of time for such discontinuation or suspension of the work.

SUPERVISOR.

48. Nothing in these specifications relating to the duties of the engineer shall be taken or construed in any manner to conflict with the duties of the supervisor, as specifically set forth in the act entitled "An act to provide for the permanent improvement of public roads in this State," approved March 27th, 1905, but they shall co-operate as far as practicable.

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### INCOMPETENT WORKMEN.

49. The contractor shall employ competent men to do the work, and whenever the engineer and supervisor shall inform him, or his representative in charge, in writing, that any man on the work is unfitted for the place, or is working contrary to the provisions of the specifications or the instructions of the engineer and supervisor, he shall thereupon be discharged.

### INSPECTION.

50. All directions and determinations necessary to give due and full effect to any of the provisions of these specifications shall be given by the engineer and supervisor.

51. All material and workmanship of any kind shall be subject at all times to the inspection of the engineer and supervisor. Whenever unfaithful and imperfect work is discovered, it shall be immediately repaired or replaced by the contractor, after due notification from the engineer and supervisor.

### SUB-LETTING OF CONTRACT.

52. The contractor shall not assign or sub-let any portion of this contract without the consent of the Board of Chosen Freeholders and the State Commissioner of Public Roads.

### PAYMENTS.

53. ....monthly payments will be made by the Board of Chosen Freeholders to the contractor for work performed, upon presentation by him of the proper certificates of the engineer and supervisor, in a sum not to exceed eighty per cent. of the amount then due, together with releases from all liens, if required. Fifteen per cent. will be paid at the completion of the work and the acceptance of the same in writing by the Board of Chosen Freeholders and the State Commissioner of Public Roads. The remainder, or five per cent., will be retained by the Board of Chosen Freeholders for a period of one year as security for the faithful performance of Article 38.

### BOND OF CONTRACTOR.

54. The contractor will be required to execute, within thirty days of giving of contract, a bond in such sum and with such securities as shall be approved by the Board of Chosen Freeholders, conditioned for the faithful performance of the contract, to indemnify and save harmless the said Board of Chosen Freeholders from all suits or actions of any name or description brought against it on account of any act or omission of the contractor or his agents, and for the faithful performance of the contract by the contractor. Said bond shall be in a sum of not less than the estimated cost of the road when completed. Any change made in said plans, specifications, agreements or quantities without the consent of the bondsmen shall in no way vitiate said bond. The said contractor hereby further agrees that so much of the money due him,



under and by virtue of this agreement, as shall be considered necessary by the Board of Chosen Freeholders, may be retained by it until all such suits or claims for damages aforesaid shall have been settled, and evidence to that effect furnished to the satisfaction of the said Board of Chosen Freeholders.

CONTRACTOR TO INSURE PAYMENT FOR LABOR, MATERIAL, ETC., ON FINAL ESTIMATE.

55. The contractor must also furnish said engineer with satisfactory evidence that all persons who did work, or furnished material for this contract, or who have sustained damage or injury by reason of any act, omission or carelessness on his part or his agents in the prosecution of the work, have been duly paid or secured; he shall also give notice to said engineer within ten days after the completion of the work, and before final estimate is made, that any balance for such work or materials, or compensation for such damages due, has been fully paid or released.

56. The right is reserved to reject any or all bids, if deemed to the interest of the county or State.

.....  
*County Engineer.*

Approved this.....day of ....., A. D. 190..., by resolution of the Board of Chosen Freeholders of the county of.....

.....  
*Director of Board of Chosen Freeholders.*

.....  
*Clerk of Board of Chosen Freeholders.*

OFFICE STATE COMMISSIONER OF PUBLIC ROADS, TRENTON, N. J.

I have this day carefully read and examined the foregoing specifications, and the same are hereby approved.

Any departure from these specifications must have the written consent of the State Commissioner of Public Roads.

Given under my hand, this.....day of....., A. D.....

.....  
*State Commissioner of Public Roads.*

PROPOSAL.

To the Board of Chosen Freeholders, County of.....and State of New Jersey:

GENTLEMEN—The undersigned hereby declare... that...he...ha... carefully examined the annexed specifications and the drawings therein referred to, and will provide all necessary machinery, tools, apparatus and other means of construction, and do all the work and furnish all the material called for

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by said specifications in the manner prescribed by the specifications and the requirements of the engineer and supervisor under them, for the following prices:

- (1) Price per cubic yard for earth excavation, without classification, as per plans and cross-sections throughout the length and width of the road .....per cubic yard.
- (2) Price per acre for grubbing and removing objectionable material from sidewalks.....per acre.
- (3) Price per lineal foot for completed tile drain.....per lineal foot.
- (4) Price per cubic yard for compacted gravel as specified.....per cubic yard.
- (5) Price per square yard for each ordered inch in depth in excess of thickness named.....per square yard.
- (6) Price (lump) for the whole road complete, according to the specifications and plans prepared by the engineer.....

Accompanying this proposal is a certified check for the sum of one thousand dollars (\$1,000), payable to the order of the Director of the Board of Chosen Freeholders of.....county, which check is to be forfeited as liquidated damages if, in case this proposal is accepted, the undersigned shall fail to execute a contract with said Board of Chosen Freeholders, under the conditions of this proposal, within the time provided for by the foregoing advertisement for proposals; otherwise, said check is to be returned to the undersigned.

Signed.....

Address.....

.....N. J., .....

## CONTRACT.

This agreement, made the.....day of....., in the year of our Lord one thousand nine hundred....., between THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., party of the first part, and....., party of the second part.

*Witnesseth*, That the said party of the second part, for and in consideration of the payments hereinafter specified and agreed to be made by the party of the first part, hereby covenant and agree to furnish and deliver all the materials and to do and perform all the work and labor required to be furnished and delivered, done and performed in and about the graveling of.....beginning at.....and extending to....., in the township of....., a distance of....., in strict and entire conformity with the plans on file in the engineer's office and with the specifications hereto annexed and duly approved by resolution of THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF..... adopted the.....day of....., in the year of our Lord one thousand nine hundred....., and approved by the State Commissioner of Public Roads, on the.....day of.....in the year of our Lord one thousand nine hundred.....which said plans and specifications are hereby made part of this agreement as fully and with the same effect as if the same had been set forth at length in the body of this agreement.

In consideration of the premises the party of the first part hereby agrees to pay to the party of the second part for said work, when completed in accordance with the said specifications, the sum of.....payments to be made

as provided in said specifications upon presentation of the proper certificates of the engineer and supervisor and upon the terms set forth in the annexed specifications.

This contract to be binding upon THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., its successors and assigns, and upon.....the party of the second part.....

*In Witness Whereof*, The director of THE BOARD OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., by authority of a resolution of said board, hath hereunto set his hand and affixed the corporate seal of the said board and the said party of the second part ha.. hereunto set ..... hand.. and seal.. the day and year first above written.

.....  
*Director of the Board of Chosen Free-  
holders of the County of.....*

Attest:

.....  
*Clerk.*

Signed, sealed and delivered in the presence of

.....  
This contract approved this.....day of....., 190..

.....  
*State Commissioner of Public Roads.*

KNOW ALL MEN BY THESE PRESENTS, That we,.....  
.....and.....of the county of.....  
and State of New Jersey, are held and firmly bound unto THE BOARD OF  
CHOSEN FREEHOLDERS OF THE COUNTY OF....., in the sum of.....  
dollars, lawful money of the United States, to be paid to the said THE BOARD  
OF CHOSEN FREEHOLDERS OF THE COUNTY OF....., its successors or  
assigns, to which payment well and truly to be made, we bind ourselves, our  
heirs, executors and administrators, jointly and severally, firmly by these  
presents.

Sealed with our seals and dated this.....day of....., A. D. nine-  
teen hundred and.....

*The Condition of this Obligation is such*, That if the above bounden.....  
shall well and truly perform his part of the contract hereto annexed, and all  
the covenants and conditions therein perform, then this obligation to be void,  
otherwise to remain in full force and virtue.



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SIGNED, SEALED AND DELIVERED  
IN THE PRESENCE OF

.....  
This Bond approved this.....day of....., A. D. 190..

.....  
*Director.*  
.....  
.....  
.....

*Be it Remembered* on this.....day of....., in the year of our Lord one thousand nine hundred and....., before me, a Master in Chancery of the State of New Jersey, personally appeared.....and..... who acknowledged that they signed, sealed and delivered the foregoing bond as their voluntary act and deed for the uses and purposes therein expressed.  
.....

JUSTIFICATION OF SURETY.

STATE OF NEW JERSEY, } ss.  
COUNTY OF..... }

On this.....day of....., A. D. 190.., before me, a Notary Public in and for the county and State aforesaid, personally appeared.....who being duly sworn, on his oath declares that he is a resident of the county of.....; in the State of New Jersey; that he is a freeholder in said county, and that he owns real estate in said county, in his own right, to the amount of.....over and above all his indebtedness and after all his debts are paid, and over any contingent liability by reason of being bail, surety, endorser or guarantor.

Subscribed and sworn to before me, this.....day of....., A. D. 190.. I hereby certify that the contents of the above have been carefully made known to affiant before execution.  
.....

STATE OF NEW JERSEY, } ss.  
COUNTY OF..... }

On this.....day of....., A. D. 190.., before me, a Notary Public in and for the county and State aforesaid, personally appeared.....who, being duly sworn, on his oath declares that he is a resident of the county of....., in the State of New Jersey; that he is a freeholder in said county, and that he owns real estate in said county, in his own right, to the amount of.....over and above all his indebtedness and after all his debts are paid, and over any contingent liability by reason of being bail, surety, endorser or guarantor.

Subscribed and sworn to before me, this.....day of....., A. D. 190.. I hereby certify that the contents of the above have been carefully made known to affiant before execution.  
.....

## Appendix B.

### CHAPTER 58.

An act to provide for the permanent improvement of public roads in this State (Revision of 1905). With amendment of 1906.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. The board of chosen freeholders of any county in this State may, at any time, by resolution, direct that any public road or section of road, located within said county, being at least thirty-three feet in width and at least one mile in length, or, being less than one mile in length, is an extension of or connection with some permanently improved or paved road or street, be improved by the construction of a macadamized road, or a telford or other stone road, or a road constructed of gravel, oyster shells or other similar materials, in such manner that the same, of whatever materials constructed, shall, with reasonable repairs thereto, at all seasons of the year, be firm, smooth and convenient for travel. When more roads are applied for than can be constructed in any one year, the board of chosen freeholders and State Commissioner of Public Roads shall have power and authority to select from the roads petitioned for the ones first to be constructed, having first regard to the most important roads and the distribution of the benefits of this act to all parts of their counties. The board of chosen freeholders may, before approval of any road, require as a condition of said approval that the township or townships or other municipality through which said road runs shall pay ten per centum of the cost of said improvement, said payment to

Improve-  
ments of  
roads by  
freeholders.

Selection of  
roads.

Township  
assistance.

be applied to the improvement of roads constructed under this act.

Survey  
made.

2. The said board, after the passage of the resolution, shall cause a survey of said road so to be improved to be made, and plans, cross-sections and specifications of the work to be done on the same to be prepared. The survey shall indicate the width and length of said road, and shall also show how much of said road may be improved by deviation from the then existing lines, but no survey shall be commenced until the consent of the State Commissioner of Public Roads shall have been first obtained. When the said plans, cross-sections and specifications shall have been prepared, they shall be submitted to the board of chosen freeholders for its approval or rejection.

Approval by  
board and  
commissioner.

If such board shall approve the same, they shall then be submitted to the State Commissioner of Public Roads for his approval or rejection, whose duty it shall be, before approving of said plans, cross-sections and specifications, to ascertain, by personal inspection or otherwise, the natural character of the soil upon which such road is proposed to be constructed, and any and all other facts that he may deem important. If, after examination of the plans, cross-sections and specifications, and an inspection of the road, as aforesaid, he shall be satisfied as to the advisability of the improvement of the road as contemplated, and that one-third of the cost of the construction of said road, together with one-third of the cost of the construction of all other roads or sections of roads in this State, under plans and specifications previously approved by him, will not in any one year exceed the sum of four hundred thousand dollars, or such sum as shall in each year be appropriated for that purpose, then he shall approve said plans, cross-sections and specifications, otherwise he shall reject the same.

Limit of  
State ex-  
penditure.

Proposals  
invited.

3. Within thirty days after approval of the plans, cross-sections and specifications by the Commissioner of Public Roads, it shall be the duty of the board of chosen freeholders to advertise for bids for said work in two or more of the public papers printed in said county, and in at least one engineering journal published in the city of



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New York, for three weeks successively, at least once in each week. This advertisement shall state the place where bidders may examine said plans, cross-sections and specifications, and the time and place where bids for said work will be received by the board of chosen freeholders, or a committee of said board. Each bidder must accompany his bid with a certified check, payable to the director of the board of chosen freeholders, for one thousand dollars, as a guarantee that if said work is awarded to him he will enter into a contract with said board for the same. Bidder's guarantee.

This contract must be executed, together with a bond of the successful bidder, in the penal sum of at least the estimated cost of said work, with two or more sureties, freeholders of the county, or a surety or trust company created by this State, or a surety or trust company of another state, authorized to transact business within this State, to be approved by the director of the board of chosen freeholders, conditioned for the faithful performance of said work in strict conformity with the plans, cross-sections and specifications for the same, within thirty days from the awarding of the contract. Contract.

The contract, before any work is done thereunder, must be exhibited to the State Commissioner of Public Roads for his approval, in writing, thereon, and said commissioner is hereby authorized, whenever, in his judgment, the best interests of the county require him so to do, to reject the same, in which case he shall write upon said contract the word "rejected," and append thereto his signature and official title of office, and said contract and the bond required to accompany the same shall, from the time of such rejection, be absolutely null and void, but such rejection shall in nowise operate to prevent said board from readvertising for bids and proceeding thenceforth under the provisions of this act; *provided*, such action is taken within four months after such rejection, otherwise said approval shall be null and void. Approved by commissioner.

The time and manner of payment for work done under any contract awarded under this act shall be set forth in said contract, and at least five per centum of the contract price shall not be paid to the contractor until after the expiration of one May reject contract.

Proviso.

As to payment under contract.

Excess over  
contract  
allowable.

year from the completion of the work and acceptance thereof in writing by the Commissioner of Public Roads.

4. The estimated amount of all contracts for road improvements awarded in any one year by the board of chosen freeholders, together with the estimated cost of repairs of roads already constructed, shall not exceed (in excess of the amount which any county may raise in any one year) one-fifth of one per centum of the ratables of the county, as reported to the State Comptroller for the preceding year, exclusive of the state appropriation for road purposes apportioned to any county.

Copy of speci-  
fications, &c.,  
filed with  
commissioner.

5. A true copy of the specifications, bid, contract, bond and justification of surety, certified to be such by the director of the board of chosen freeholders, shall, immediately after the awarding of any contract, be furnished by the board of chosen freeholders to the State Commissioner of Public Roads, to be filed and remain of record in the office of such commissioner.

Supervisor  
appointed by  
commissioner.

6. Immediately after the awarding of any contract under the provisions of this act, the State Commissioner of Public Roads shall appoint a competent supervisor to take charge of the work required to be performed under said contract, who shall receive for his services the sum of three dollars per day, to be paid to the said supervisor, out of the sum hereinafter appropriated for the one-third of the cost of all roads constructed under this act, on the approval of the State Commissioner of Public Roads.

Per diem.

Oath.

Such supervisor, before assuming the duties of his office, shall make and subscribe an oath or affirmation, before any officer authorized to administer the same, that he will faithfully, and to the best of his ability and understanding, perform all the duties of his office. The State Commissioner of Public Roads may, however, summarily discharge any supervisor and may appoint a new supervisor in the place of the one so discharged. Where any contract provides for partial payments based upon the amount of work done, it shall be the duty of the supervisor, as each payment becomes due, to present to the board of chosen freeholders a certificate, signed by such

May be  
summarily  
dismissed.

Certificate of  
partial pay-  
ments.



## COMMISSIONER OF PUBLIC ROADS.

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supervisor and the engineer, in which certificate shall be stated, as near as can be, the amount of work done for which payment is to be made, and that the same has been done, in all respects, in strict conformity with the contract, plans and specifications. When the work done under any contract shall have been fully completed, the supervisor and engineer shall prepare a detailed and itemized statement, in quadruplicate, of the cost of the improvement, one copy whereof shall be filed with the board of chosen freeholders, one with the clerk of the county and two with the State Commissioner of Public Roads.

Final statement on completion of contract.

7. One-third of the cost of all roads constructed under this act, not exceeding in any one year the sum of four hundred thousand dollars, shall be paid out of the State treasury, out of any moneys not otherwise appropriated, if the same be first appropriated in the annual appropriation act. The Governor and State Commissioner of Public Roads shall certify from time to time to the State Comptroller the amount to be paid to any county, township, town, borough, village or other municipality for such year, and the State Comptroller shall draw his warrant on the State Treasurer in favor of the county collector or collector of the township, town, borough, village or municipality, as the case may be, for the amount so certified, and the State Treasurer shall thereupon pay the same.

State appropriation.

Payments to various municipalities.

8. On or before the day fixed by law for the meeting of the county board of assessors in any county in each year, the board of chosen freeholders of such county shall certify to the said county board of assessors, either in the annual tax budget or separately, two-thirds of the estimated cost of all work contracted for under the provisions of this act since the day fixed by law for the meeting of the board of assessors in the year next preceding. The county board of assessors shall include in their assessment of county taxes the sum so certified, and the same shall be collected and paid over to the county in the same manner and at the same time that other county taxes are collected and paid over; if a deficiency shall exist, in

Notice to county board of assessors.

Assessment and collection of road moneys.

If deficiency.



assessors shall include the said sum in the annual tax levy or assessment for said year, and the same shall be collected and paid over in the same manner and at the same time as other county taxes.

10. Any road constructed under the provisions of this act, or of any previous act entitled "An act to provide for the permanent improvement of public roads in this State," and any road accepted by any board of chosen freeholders under chapter one hundred and fourteen of the laws of one thousand nine hundred and four shall forever hereafter be a county road, and the duty of keeping the same in repair shall devolve exclusively upon the board of chosen freeholders and the county supervisor, as hereinafter mentioned, and all other powers and duties respecting such road shall be imposed upon and vested in the said board of chosen freeholders, to the exclusion of all township, town, borough, village, or other municipal officers; *provided, however*, that nothing in this act shall divest the municipal authorities of townships or boroughs of their power to construct, grade, curb, pave or repair the sidewalks along said county roads, nor shall this power of said governing bodies divest the board of chosen freeholders of their right to construct across or under the sidewalks the necessary culverts or other provisions for the maintenance of such county roads. If any such road shall become out of repair, and shall not be repaired within sixty days after notice in writing so to do, given by the State Commissioner of Public Roads to the board of chosen freeholders, or to its director, the said Commissioner of Public Roads shall certify such neglect or refusal to the State Comptroller, who shall withhold payment to such county of any moneys already apportioned, or that may thereafter be apportioned, to such county by the State, and no payment shall be made to said county until the State Commissioner of Public Roads shall certify to the State Comptroller that said road has been placed in a good state of repair.

Improved  
roads to be  
county roads.

Maintained  
by free-  
holders.

Proviso.

Road appro-  
priation with-  
held for  
failure to  
maintain.

11. After the first county road shall have been constructed under this act in any county, it shall be the duty of the board of chosen freeholders to appoint some suita-

County  
supervision  
of roads.

If surplus.	<p>consequence of the cost exceeding the estimate, or in consequence of the receipt of less than one-third of the cost from the State, the board of chosen freeholders shall have authority to borrow, on temporary loans, such deficiency, and the said board shall certify to the county board of assessors the total amount of such deficiency, which shall be included in the next annual tax levy, and shall be assessed, collected and paid over as other taxes are assessed, collected and paid over. If there be a surplus, by reason of the estimate exceeding the cost, the same shall be retained and used in the construction of other roads under this act, or in repairs to roads constructed under this act.</p>
Bonds instead of tax.	<p>9. The board of chosen freeholders may, instead of certifying to the county board of assessors the two-thirds cost of any work done under this act, as required by the eighth section of this act, by resolution, adopted by a vote of at least two-thirds of all its members, issue bonds of the county for two-thirds of the estimated cost of said work. These bonds shall be designated as "road improvement bonds," and shall be for such sums and in such amounts, payable in not less than six nor more than thirty years from date thereof, with interest at a rate not exceeding five per centum per annum, payable annually or semi-annually, as said board of chosen freeholders, by said resolution, may determine. The said bonds shall be signed by the director of the board of chosen freeholders and by the county collector, sealed with the seal of the board, properly numbered, and a registry thereof kept by the board, and may be either coupon or registered bonds; if coupon bonds, the coupons shall be signed by the director of the board, and shall be numbered to correspond to the several bonds to which they shall be severally attached. The board of chosen freeholders shall, when bonds are issued under the provisions of this section, certify to the county board of assessors, in each and every year, so long as any of said bonds remain outstanding, a sum sufficient to pay the interest accruing on said bonds for said year and the principal of any bond or bonds that shall mature in said year, and the said county board of</p>
Amount, rate, time.	
Amount annually raised.	



Term.	ble person as county supervisor of roads, who, before assuming the duties of his office, shall make and subscribe an oath or affirmation that he will faithfully perform all the duties of his office to the best of his ability and understanding. Such supervisor shall hold his office for three years and until his successor is appointed and qualified.
Bond.	He shall give bond to the board of chosen freeholders in the penal sum of one thousand dollars, conditioned for the faithful performance of the duties of his office, with such surety or sureties as the board shall approve, and shall receive such compensation for his services as the said board shall determine. Said supervisor may be summarily dismissed at any time by the board of chosen freeholders or the State Commissioner of Roads, whenever in their or his judgment such supervisor is incompetent or neglectful in the performance of his duties, in which event the board of chosen freeholders shall immediately appoint a new supervisor to hold for the unexpired term of the supervisor so discharged. The said board of chosen freeholders shall appropriate all moneys necessary to keep any and all roads constructed under this act in good repair and free from obstructions, and if the board shall have no money which may be lawfully used for such purposes, it shall have the power to borrow the same, on the credit of the county, until the next annual taxes shall have been levied and collected. The cost of all repairs and removal of obstructions shall be paid by the county collector, upon the order of the board of chosen freeholders, and all bills for repairs and removal of obstructions shall be verified by affidavit, and shall be certified to be correct by the county supervisor of roads.
Subject to dismissal.	
Moneys for maintenance and repairs.	
Cost of repairs paid by county collector.	
Acquire lands for road purposes.	12. Whenever it is deemed advisable by the board of chosen freeholders of any county of this State to acquire land for the purpose of laying out, widening, changing or straightening any road to be made or improved under the provisions of this act, said board is hereby authorized to agree with the owner or owners of any land or lands required for that purpose as to the compensation to be paid by said board for a conveyance of said land or lands, and to make compensation therefor out of any moneys appli-
By purchase.	



cable for road improvement purposes, or, if there be no money on hand for such purpose, said board may borrow the necessary sum or sums on temporary loans, on the credit of the county, until the next annual taxes shall have been levied and collected. In case said board cannot agree with the owner or owners of any land for the acquisition of the same by the said board for road improvement purposes, said board shall have the power to acquire said land by condemnation, in the manner prescribed by law, and shall have authority and power to pay all necessary costs and expenses from any moneys applicable for road improvement purposes, or may borrow so much as may be necessary on temporary loans, on the credit of the county, until the next annual taxes shall have been levied and collected; nothing in this act contained, however, shall be so construed as to prevent said board from acquiring any land for road improvement purposes by gift.

By condemnation.

13. If all the owners of property abutting on any road or highway, in any county, which has not been improved, or is not undergoing improvement, desire said road, or any section thereof, to be improved, and shall certify, in writing, to the board of chosen freeholders, that they are willing to bear the entire expense of such improvement, the county engineer, or other competent engineer, shall prepare plans, cross-sections and specifications for the work to be done on such road, or any section thereof, so to be improved, and shall submit the same to the owners, and if satisfactory to such owners, they are hereby authorized to enter into contract for such work, said contract to be first submitted to the board of chosen freeholders for its approval. Upon the completion of the work to the satisfaction of the county supervisor and the board of freeholders, and upon the submission to said board of proper receipts showing full payment for all work done, the said board of chosen freeholders may, by resolution, declare that said road, or any portion thereof, be thereafter a county road. The location of any portion of said road may be changed, if deemed desirable, upon acquiring the consent, in writing, of the owner or owners of land abutting on such portion of road so to be changed,

Improvement of road by abutting owners.

Such road to be a county road.

Change of location of road.

and upon acquiring, without expense to the county, the land necessary for such change. The county supervisor shall be paid the sum of twenty-five dollars for supervising said work, to be paid by said owners.

Improve  
approaches  
to dwellings.

14. The board of chosen freeholders shall have full power to lay out, open, construct and improve all necessary approaches to any dwelling along the line of such road which may have been destroyed or damaged by any alteration in the existing grade, whether within or without the line of such road, and all costs and expenses incurred therefor shall be paid by the said board of chosen freeholders in the same way and manner as other work done under this act is paid for.

Improvement  
of roads  
bordering  
on State  
property.

15. Whenever any public road is sought to be improved under the provisions of the thirteenth section of this act, upon which road any lands or real estate owned by the State of New Jersey may front or border, the board of managers, or other body having the control and management of said lands and real estate, are hereby authorized to consent to the improvement of said road and to enter into contract for the same in the manner directed by said section, and to pay for said improvement out of any moneys appropriated to said board of managers, or other governing body.

Boundary  
line roads.

16. The provisions of this act shall extend to the improvement of any road, or section of road, constituting the boundary line between two counties, whenever said improvement shall be agreed to by the board of chosen freeholders of both counties.

Act not to  
apply to  
cities.

17. The provisions of this act shall extend to townships, towns, boroughs, villages, or any municipality or municipalities except cities. The common council or other governing body, the assessor or assessors, the mayor or other chief executive officer, the clerk and collector respectively, of any township, town, borough, village, or other municipality, shall have the power and shall perform all the duties as are in this act cast upon the board of chosen freeholders, the county board of assessors, the director of the board of chosen freeholders, the county



## COMMISSIONER OF PUBLIC ROADS.

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clerk and county collector, respectively. Any of said municipalities may raise, by taxation, funds with which to pay for the cost of the construction of any road or roads, or may issue bonds for the payment of the same, in the same manner, as nearly as may be, as the board of chosen freeholders may do under this act, it being the expressed intention of this section to confer upon townships, towns, boroughs, villages, or other municipalities, full power to improve any road, or section of road, under the provisions of this act, all proceedings conforming, as nearly as may be practicable, to the provisions of this act. Any such road, or section of road, so constructed by any township, town, borough, village, or other municipality, other than by the county, shall be exclusively under the jurisdiction and control of such township, town, borough, village, or other municipality, and shall be repaired and maintained by such municipality. Nothing, however, contained in section four of this act shall be held to apply to any township, town, borough, village, or other municipality.

Right of  
municipalities  
to improve  
roads.

Control  
thereof.

Exception.

18. Whenever any road, or section of road, constructed by the board of chosen freeholders, shall lie within the corporate limits of any city, such city may enter into an agreement, in writing, with the board of chosen freeholders for the repair and maintenance of said road, or section of road, and from and after the making of said agreement, and the approval thereof by the State Commissioner of Public Roads, said road shall be exclusively under the jurisdiction and control of such city, and shall be repaired and maintained by the same.

As to roads  
in cities.

19. All acts and parts of acts inconsistent with the provisions of this act be and the same are hereby repealed; *provided*, that this repealer shall not revive any act heretofore repealed, nor shall any proceeding for the improvement of any public road entered into before the passage of this act abate, but such proceeding shall continue as prescribed in the act under which the improvement was commenced.

Repealer.

Proviso.

20. This act shall take effect immediately.

Approved March 27, 1906.



CHAPTER 53.

A Supplement to an act entitled "An act to provide for the permanent improvement of public roads in this State (Revision of 1905)," approved March twenty-fifth, one thousand nine hundred and five.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Upon petition setting forth certain facts, road to be improved.

1. Whenever there shall be presented to the board of chosen freeholders of any county a petition signed by the owners of at least two-thirds, either in lineal feet or in area, of the land and real estate, fronting or bordering on any public road or section of road in such county, taking in said estimate of area all the lands of every such owner, which are assessed for taxes in said county, and which lie together in any farm tract or lot of which a part has a frontage on said road or section of road, praying the board to cause such road or section to be improved, under the act to which this act is a supplement, and setting forth that the township or other municipality within which the same shall lie has appropriated the ten per centum of the estimated cost of the said road as required by the said act, it shall be the duty of the board to cause such improvement to be made; *provided*, that the road or section desired to be so improved shall be at least one mile in length and be an extension of or connection with some other permanently improved or paved road or street.

Proviso.

2. This act shall take effect immediately.

Approved April 1, 1908.

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CHAPTER 54.

A Supplement to an act entitled "An act to provide for the permanent improvement of public roads in this State" (Revision 1905), approved March twenty-seventh, one thousand nine hundred and five.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. A resolution passed by the township committee of any township, or the governing body of any other municipality, through which said road runs, to pay ten per centum of the cost of said improvement provided for in the first section of the act to which this is a supplement, shall be binding upon such township, or such other municipality, as the case may be.

Resolution to pay ten per cent. of cost of road binding on township.

2. This act shall take effect immediately.

Approved April 1, 1908.

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CHAPTER 46.

A Supplement to an act entitled "A general act relating to boroughs" (Revision of 1897), approved April twenty-fourth, one thousand eight hundred and ninety-seven.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Whenever, in the judgment of the council of any borough of this State, it is necessary to construct a drain for surface water for the joint purpose of draining one or more improved roads of the county in which such borough is situate, and one or more roads or streets of said borough, and the board of chosen freeholders of the said county in which said borough is situate shall have approved the plans for such proposed drain and

Providing for surface draining improved roads and streets.

shall have appropriated a specific sum towards the construction of such drain, with the proviso that such drain shall be constructed by said borough, and that said borough shall pay the balance of the cost of the same, then and in such case the said council may, by ordinance or resolution, cause such drain for surface water to be constructed, and may provide for the payment of the balance of the cost of the same by the appropriation of any money remaining in the borough treasury unpledged at the end of the preceding fiscal year; *provided*, that the amount of money in the borough treasury unpledged at the end of such preceding fiscal year shall be sufficient for such purpose.

2. This act shall take effect immediately.

Approved April 1, 1908.

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## CHAPTER 69.

A Further Supplement to an act entitled "An act to authorize the board of chosen freeholders of any of the several counties of this State to lay out, open, construct, improve and maintain a public road therein," approved April seventh, one thousand eight hundred and eighty-eight.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

Relative to  
rebuilding  
improved  
roads to meet  
increased  
requirements.

1. Whenever, in any county of this State, where a road or roads shall have been constructed, improved and maintained under the provisions of the act to which this is a supplement, or the acts supplementary thereto and amendatory thereof, it shall become necessary, in the opinion of the body vested by law with the care of such road or roads, as expressed by resolution duly passed at a regular meeting of said body, to reinforce, relay, reconstruct, or rebuild any portion of the roadway paving, the curb and gutters, the drainage system, the lighting plant, including the laying of conduits and plac-



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ing cables therein, or bridges, or all of them upon such road or roads, to meet the requirements incident to increase of population, traffic and use, it shall be lawful for such body to so reinforce, reconstruct and rebuild such parts of said road or roads hereinbefore designated; *provided*, that all work exceeding in cost one thousand (\$1,000) dollars shall be done by contract, after advertisement in the public press, in the same manner as prescribed for work authorized under the act to which this is a supplement. Proviso.

2. Before advertising for proposals for any contract for work authorized by this act, the body vested by law, with the care of such road or roads, shall, from time to time, submit a full statement of the work necessary and proposed to be executed at that time, with the estimated cost of such work, prepared by a competent engineer, and a requisition for the amount of such cost to the body vested by law, with the control of the finances of said county. Estimates

On receipt of said statement, estimate and requisition, the said body having control of the finances of said county shall make such financial arrangements as shall be necessary to provide the funds necessary to pay for the work so proposed, and until such financial arrangements are made, no further steps shall be taken in the prosecution of said proposed work. Financial arrangements.

3. The moneys necessary for defraying the costs, charges and expenses of the work herein authorized, shall be raised and obtained, and the bonds issued therefor in the manner and by the methods provided in said act to which this is a supplement, including provision for annual interest payments, and payments into a sinking fund, and shall be paid out by the county collector on the order of the body vested by law with the control of said road or roads; *provided*, that no payments for work done under any contract shall be made, except on the certificate of the engineer, approved by said body to take charge of said work. Bond Issue

4. The total cost of all work authorized by this act, shall not exceed a sum equal to two-tenths of one per cent. of Proviso.  
Limitation as to cost.

the total assessed value of the ratables of said county assessed for county purposes in the year in which the last work authorized by this act shall be completed.

Funds not  
used for  
ordinary  
maintenance.

5. Nothing in this act shall authorize the expenditure of any moneys secured by the sale of bonds for the ordinary maintenance, repairs, and lighting of said road or roads.

Repealer.

6. All acts and parts of acts inconsistent herewith, be and the same are hereby repealed, and this act shall take effect immediately.

Approved April 2, 1908.

## CHAPTER 238.

An Act to authorize boards of chosen freeholders to lay out, open, widen, straighten, alter, change the grade or location of or otherwise improve any public highway under their control and for that purpose to acquire lands by gift, purchase or condemnation, and to vacate any part of said public highway that may be rendered unnecessary for public travel by the widening, straightening, altering or changing of location of said public highway or any part thereof.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Freeholders  
may acquire  
lands for im-  
provement  
of highways.

1. The board of chosen freeholders of any county in this State shall have power to lay out, open, widen, straighten, alter, change the grade or location of or otherwise improve any public highway under its control or any part thereof, and to cause a map to be made and filed in the office of the clerk of the county showing the proposed laying out, opening, widening, straightening, altering, change of grade or location of any such highway and after such map shall be made and filed as aforesaid it shall be lawful for such board to acquire by gift or purchase in its corporate name any real estate in the county that may be necessary for that purpose,



and in case such board and the owner of any real estate required for such purpose cannot agree upon the price or terms of sale thereof, whether by reason of disagreement as to the price or the legal incapacity or absence of the owner, or his inability to convey valid title, or by reason of any other cause whatsoever, it shall be lawful for one of the justices of the Supreme Court or a Circuit Court judge on application in writing made by or on behalf of such board and verified by the oath of the engineer or agent of the board, and filed in the office of the clerk of said county, setting forth a particular description of the land and property required and the names and residences, if the same can be ascertained of the owners and occupants, if any there be, and of the persons appearing of record to have any interest in said land and property, to appoint three disinterested freeholders as commissioners to fix the compensation to be paid for such land and property.

Commission-  
ers to fix  
compensation.

2. The justice or judge to whom such application shall be made, shall assign, by order, a time and place for the hearing of said application before himself or any other justice of the Supreme Court or Circuit Court judge not less than ten days after the date of the order, and direct not less than six days notice thereof to be given said owners, occupants and persons interested therein, which notice shall be served upon parties residing in this State, either personally or by leaving at their residence, if known, and when the residence is unknown or out of the State, notice shall be given and published as the justice or judge shall direct, by publication for not less than one week, and by mailing to parties whose address can be ascertained, and notice given in the manner prescribed by said justice or judge shall be valid and effectual to bind all parties interested in the land or property; the order shall be filed in the office of the clerk of the county where the land or other property lies, and a notice of the pendency of the proceedings, which notice shall name the parties interested if known, and describe the land taken, shall be recorded in the same manner and place and for the same fees as notices

Notice of  
hearing.

Service.

Order filed ;  
what to show.



of suits pending in chancery; in default whereof persons acquiring an interest in the property pending the proceedings without notice thereof, shall not be bound thereby.

When title  
in dispute.

3. Where the title to the land or property shall appear to be in dispute, all known claimants may be made parties, and where it shall appear to the justice or judge that the ownership is in doubt, or that the names of the owners cannot be ascertained, he may direct notice to be published addressed to the unknown owners of the property, which shall be described in the notice, and the notice shall also set forth such statement of the former or last known owner as the justice or judge may direct, and the publication of such notice in the manner directed shall have the same force and effect as if personally served on such unknown owners.

Commission-  
ers to ex-  
amine and ap-  
praise land.

4. Upon the day fixed for the hearing upon said application and filing in the office of the county clerk evidence satisfactory to the justice or judge before whom the hearing is held that notice has been served or published as required by this act, the said justice or judge shall appoint under his hand three disinterested freeholders, residents of the county where the land or property to be taken lies, commissioners to examine and appraise the said land or property and to assess the damages on at least six days notice to be given to the persons interested in the land or property in such manner as shall be directed by said justice or judge, who shall in the order of appointment fix the date on or before which the commissioners must file their report; the justice or judge may by order extend the time, and the report shall be made on or before the day limited by said justice; the order of appointment shall be filed in the county clerk's office.

Oath of com-  
missioners.

5. The commissioners having first taken and subscribed an oath or affirmation faithfully and impartially to examine the matter in question and to make a true report according to the best of their skill and understanding shall meet at the time and place appointed and proceed to view and examine the land or other property,

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and, after hearing if practicable such owner or his agent or representative, shall make a just and equitable appraisement of the value of the same, and an estimate and assessment of the damages that any such owner will sustain by the taking of said lands or other property with the appurtenances for the purposes aforesaid; in making such estimate and assessment of damages the commissioners shall take into account the benefits, if any, conferred by the improvement on the remainder of any lot or tract of land partly taken; in all cases where the lines of such public highway when the same shall be laid out, opened, widened, straightened, altered or the location thereof changed or otherwise improved shall include or bisect any building or the location thereof, the said commissioners may determine, as to them shall seem most just, either to condemn and cause to be taken the whole of said building, or so much thereof as stands upon the land required for such purpose, or to require the owner thereof to remove such building beyond the proposed lines of said road in case the owner has land enough left for that purpose, and the estimate or appraisement of damages of said commissioners, having due regard to all attendant expenses, shall be made accordingly; and the said commissioners shall in such case estimate and take into account the amount likely to be realized from the sale of any building or part of any building necessary to be taken, removed or disposed of for the purpose aforesaid; and the said commissioners shall also where any such public highway or any part thereof shall be vacated, estimate and take into account the benefits likely to accrue to any owner or owners by reason of such vacation; the report of said commissioners shall state the amount to be paid by the said board of chosen freeholders for such land or other property and damage aforesaid, as of the date of filing of the petition and order therein, which report shall be made in writing under the hands of said commissioners or any two of them, and filed by them within the time limited by the justice or judge in the office of the clerk of the county in which the land or other property is

Considerations in making assessment.

Removal of buildings.

Report.



Vacancy in  
commission.

situate, to remain of record therein; if the report is not made within the time limited the powers of the commissioners shall cease, and an application may be made to a justice of the Supreme Court or a Circuit Court judge for the appointment of new commissioners on such notice as the justice or judge may direct; in case any commissioner shall die pending the proceedings, or is disqualified, or is unable to act, or shall fail or refuse to act and perform the duties of the appointment the other two commissioners shall proceed to perform the duties of their appointment with the same powers as if all three were acting.

Subsequent  
proceedings.

6. Upon the filing of the report of the commissioners all subsequent proceedings had or taken relative thereto shall be in the manner provided by "An act to regulate the ascertainment and payment of compensation for property condemned or taken for public use" (Revision of 1900), approved March twentieth, one thousand nine hundred, and the supplements and amendments thereto, and from said report the said board or the owner of any of the land or property taken may appeal in the manner provided by said hereinbefore mentioned act.

Use of ac-  
quired land.

7. Said lands when so acquired shall be incorporated in and become a part of said public highway and thereafter built, maintained and kept as a county road.

All expenses  
met by free-  
holders.

8. The compensation for services rendered by commissioners appointed in pursuance of this act and the necessary disbursements incurred by them in the discharge of their duties, together with counsel fees and other necessary expenses shall be fixed by order of said justice or judge and paid by the board of chosen freeholders of the county.

Borrow to  
meet obliga-  
tions.

9. It shall be lawful for the board of chosen freeholders to borrow such sum or sums of money as may be necessary in complying with the provisions of this act, and to issue notes therefor, the payment of which shall be provided for in the tax levy next thereafter made.

10. This act shall take effect immediately.

Approved April 13, 1908.



CHAPTER 114.

An act to enable boards of chosen freeholders to accept as county roads, roads or sections of roads, in townships, which have been or shall hereafter be permanently improved without state or county aid.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. Whenever any public road or section of road, located in any township in this State, has been or shall hereafter be permanently improved, without state or county aid, by the construction thereon of a macadamized road, or telford or other stone road, so that the same is or shall be, with reasonable repairs thereto, firm, smooth and convenient for travel at all seasons of the year, and approved by the State Commissioner of Public Roads, such public road or section of road may, upon the petition in writing of the township committee of the township wherein such public road or section of road so improved lies, addressed to and filed with the board of chosen freeholders of the county within which such township is situate, accompanied by a map or survey of the public road or section of road so improved, and a copy of the specifications under which such improvements were made, together with proofs showing full payment to the contractor or contractors for all work done, be, by said board of chosen freeholders, by resolution, accepted as and declared to be a county road, if in the judgment of said board of freeholders said road is of sufficient public importance; and such public road or section of road shall, upon such acceptance, forever thereafter be a county road and subject to the exclusive jurisdiction of said board of chosen freeholders, in the same manner as roads built by state aid, and the duty of keeping the same in repair shall devolve exclusively upon such board of chosen freeholders.

Roads improved by townships may be transferred to county on petition.

Becomes a county road.

Petition may  
include.

2. More than one public road or section of road in the same township may be included in one petition.

3. This act shall take effect immediately.

Approved March 28, 1904.

## CHAPTER 38.

An act to enable boards of chosen freeholders of two or more counties of this State, where such counties now are or hereafter may be charged by law with the maintenance and repair, or now are or hereafter may be in the possession and control of any road or roads lying wholly in one or partly in one and partly in other such county or counties, to rebuild, reconstruct, change the grade of, widen and improve such road or roads, and to acquire lands for such widening by gift, devise, purchase or condemnation, and to agree as to the proportion of the total expense thereof to be borne by each, and to issue bonds for the payment of the same, and to agree with any street railway company using or hereafter using such road or roads as to the share of the expenses thereof to be borne by it for and towards such improvement.

*BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:*

Joint im-  
provement  
and mainte-  
nance of  
roads by  
counties.

1. Whenever two or more counties of this State now are or hereafter may be charged by law with the maintenance and repair, or now are or hereafter may be in the possession and control, of any road or roads lying wholly in one or partly in one and partly in other such county or counties, it shall be lawful for such counties to jointly rebuild, reconstruct, change the grade of, improve and widen such road or roads, and to acquire lands for such widening by gift, devise, purchase or condemnation, and agree as to the proportion of the total expense thereof to

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be borne by each; and it shall and may be lawful also for such boards to agree with any street railway company using or hereafter using such road or roads as to the share of the expense thereof to be borne by it for and towards such improvement.

Agreement with street railway companies.

2. If such boards shall determine to make the improvements and do the work authorized by this act, it shall have prepared plans and specifications of such work; and if the cost thereof is in excess of one thousand dollars, shall advertise for bids, for two weeks, in at least two daily newspapers, or four weeks in two weekly newspapers, in each of such counties; and the contract shall be awarded to the lowest responsible bidder who shall furnish satisfactory security, to be approved of by said boards; and said boards, voting separately, shall approve of the plans and specifications and award the contract.

Plans and cost.

Award of contract.

3. In order to receive the bids each board shall appoint certain of its members, who together shall constitute a joint committee, and such joint committee shall receive the bids at the time and place specified in the advertisement, and shall open the bids, in open meeting of such committee, and publicly announce the amount or items comprising each bid, and the members of the committee from each county shall forthwith report the bids to their board for action thereon.

Receipt and opening of bids.

4. The contract for said work shall specify the share or proportion of the cost thereof to be borne and paid by each county, and each county shall be severally liable only for such share or proportion.

Proportionate cost.

5. If in the opinion of said boards, or either of them, to be determined by a resolution passed by either of said counties separately for the purpose, to place in the tax levy for any one fiscal year its share or proportion of the cost of acquiring said lands, doing the work and making the improvements herein authorized, would be too burdensome on the taxpayers of such county or counties, then it shall be lawful for such board to issue the bonds of such county, to raise the funds wherewith to defray the cost aforesaid, which bonds shall run for a period not ex-

Bonds may be issued.



Time and  
rates.

ceeding fifty years, shall bear interest at not exceeding four per centum per annum, and shall be sold for not less than par, and shall be signed by the director of the board and the county collector, under the corporate seal of the county; and the board so issuing such bonds shall annually thereafter place in the tax levy a sufficient sum to meet the interest on said bonds, and a further sum to be deposited in a sinking fund, to be created for the purpose, to pay and discharge said bonds at maturity.

Sinking fund.

6. This act shall take effect immediately.

Approved March 27, 1906.

## CHAPTER 185.

An act relative to past due assessments under an act entitled "An act to provide for the permanent improvement of public roads in this State," approved March twenty-second, one thousand eight hundred and ninety-five.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Satisfaction  
of assessment  
by county  
clerk.

1. It shall be the duty of the collector or receiver of taxes in any city, township, borough, or other municipality, in which may lie the lands assessed for the amount of peculiar benefits conferred thereon in the manner prescribed by the act of the Legislature of this State entitled "An act to provide for the permanent improvement of public roads in this State," approved March twenty-second, one thousand eight hundred and ninety-five, to accept the amount due thereon, both of principal and all interest, as prescribed by the said statute, in full satisfaction of such assessments, and to give a receipt for the amount paid in satisfaction thereof to the person paying the same, which receipt, signed by such collector or receiver of taxes, shall be sufficient evidence of the payment and satisfaction of such assessments, and upon presentation thereof to the clerk of the county in which such land

is situate, he shall satisfy the assessment and other record or records in his office relating to such unpaid assessments so far as relates to the payment of the said assessment on payment to him of a fee of twenty cents for his services. Fee.

2. This act shall take effect immediately.

Approved May 2, 1906.

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## CHAPTER 189.

Supplement to an act entitled "An act to provide for the permanent improvement of public roads in this State" (Revision of 1905), approved March twenty-seventh, one thousand nine hundred and five.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Wherever any road or portion thereof is on the dividing line between two or more counties of this State, and part of the width thereof is in one county and part in another, or part of the length and part of the width thereof is in one county and part in another, and (a) the boards of chosen freeholders of such counties, or (b) the board or boards of chosen freeholders of such county or counties, together with one or more of the municipalities of such county or counties abutting on said road, or any part thereof, or (c) the municipalities of different counties abutting on said road or any part thereof, desire the said road, or a portion thereof, should be improved within the limits of said counties, in accordance to the act to which this is a supplement, and the supplements thereto and the amendments thereof, it shall and may be lawful for such board or boards of chosen freeholders and municipalities, or any of said municipalities acting together, or such municipalities of different counties abutting on said road, or any part thereof, acting together, to improve said road for its entire length, or any portion thereof, within the limits of such counties, regardless of whether or not a portion or portions thereof may be wholly in one

Joint improvement of road lying in different municipalities.

county or more counties, and agree upon the proportion of the expense thereof to be borne by such board or boards of chosen freeholders and the municipality or municipalities undertaking said improvement.

Resolutions  
of intent.

2. If said boards of chosen freeholders and said municipalities, or such of them as are authorized to make said improvement under the first section of this act, desire to undertake said improvement, such board or boards of chosen freeholders shall pass a resolution in accordance to the act to which this is a supplement, and any supplement thereto and amendment thereof; and if such municipality or municipalities desire to make said improvement either in conjunction with or without such board or boards of chosen freeholders, the governing body of such municipality or municipalities shall pass a resolution in the form and in accordance with the terms of the act to which this is a supplement, and any supplement thereto and amendment thereof, which said resolution or resolutions shall be passed and approved (if approval is necessary) in the same manner that resolutions are passed and approved by such board or boards of chosen freeholders or governing body of such municipality or municipalities.

Surveys  
made and  
plans prepared.

3. That after the passage of said resolutions, the board or boards of chosen freeholders and municipality or municipalities undertaking said improvement shall cause surveys to be made, and plans, cross-sections and specifications of the work to be done on the road to be prepared and do and cause to be done the various acts and things required to be done under the act to which this is a supplement, and the supplements thereto and amendment thereof, in the same manner as if such road or portion thereof lay wholly within one county and the improvement was undertaken by the board of chosen freeholders of such county.

Joint committee.

4. In order to receive bids, the board or boards of chosen freeholders or municipality or municipalities undertaking said improvement shall each appoint certain of its members, who together shall constitute a joint committee, and such joint committee shall organize by elect



ing a chairman and clerk. Said joint committee shall advertise for bids under the terms, conditions, and in the manner specified in the act to which this is a supplement, and the supplements thereto and the amendments thereof, which advertisement shall have at the foot thereof the names of the chairman and clerk of said joint committee, and said bids shall be received at the time and place specified in the advertisement and opened in open meeting of such joint committee, and the amount or items composing each bid shall be publicly announced, and the members of the committee from said board or boards of chosen freeholders or municipality or municipalities appointing them shall forthwith report the bids to the board or body so appointing them for action thereon; and thereupon the board or boards of chosen freeholders and the governing body or bodies of such municipality or municipalities undertaking said improvement, voting separately, shall by resolution award the contract for said improvement in the same manner provided in the act to which this is a supplement, and the supplements thereto and amendments thereof, as if said road lay wholly in the body of one county and the improvement was undertaken by the board of chosen freeholders of such county.

Invite proposals.

Opening of bids.

Award contract.

5. The contract for said work shall specify the share or proportion of the cost of such improvement to be borne and paid by the county or counties and municipality or municipalities engaging in said improvement, and each of the respective boards or bodies engaging in said improvement shall be liable for such share or proportion, and no more.

Proportionate cost.

6. If in the opinion of any board of chosen freeholders or any municipality joining in or undertaking such improvement, to be determined by a resolution passed by such board of chosen freeholders or the governing body of such municipality in the manner that resolutions are passed and approved (if such approval is necessary) by such board or body, to place in the tax levy for any one fiscal year the proportion of the expense of said improvement to be borne by it would be too burdensome on the taxpayers of such county or municipality, then it shall be

May issue bonds to meet expense.

Title of bonds.	<p>lawful for such board or municipality to issue bonds for its proportion of the expense of said improvement to be borne by it. These bonds shall be designated as "road improvement bonds," and shall be for such sums and such amounts, payable in not less than six nor more than thirty years from the date thereof, with interest at a rate not exceeding five per centum per annum, payable annually or semi-annually, as such board of chosen freeholders or governing body of such municipality by resolution may determine. Said bonds may be either registered or coupon and interchangeable from registered to coupon or coupon to registered at the will of the holder thereof, and shall be signed, sealed and executed in the manner that bonds of such county or municipality are usually signed, sealed and executed, or as such board of chosen freeholders or governing body of such municipality may by resolution direct; that annually after the issue of such bonds there shall be placed in the tax levy of such board or municipality issuing said bonds a sum sufficient to pay the interest accruing on said bonds, and likewise a sum which, with interest and accumulations thereon, will be sufficient to pay off and discharge said bonds at maturity, which said sums of money collected for the discharge of principal, together with the accumulations and interest, shall be deposited and kept in a sinking fund, to be used for the payment of said bonds at maturity.</p>
Time and rate.	<p>7. After the completion of the said improvement, the said road or portion thereof shall be maintained by the municipalities abutting said road or portion thereof so improved, unless the board of chosen freeholders of either county, by resolution, passed by a majority of the whole board, shall accept and adopt said road or the portion thereof so improved as a county road, in which case the duty of maintaining that part of said road or portion thereof so improved lying in such county shall thereafter be upon such board of chosen freeholders.</p>
Payment at maturity.	<p>8. This act shall not be taken or construed to repeal any existing act.</p>
By whom road maintained.	<p>9. This act shall take effect immediately.</p> <p>Approved May 2, 1906.</p>
Act construed.	

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CHAPTER 322.

An act concerning roads.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Whenever any road or section of road which has been or shall be constructed by the board of chosen freeholders of any county, with or without state aid, shall lie within the corporate limits of any borough, town, township or other municipality, such borough, town, township or other municipality, except cities, may enter into an agreement, in writing, with said board of freeholders, whereby said borough, town, township or other municipality shall hereafter assume the repair and maintenance of said road or section of road, and from and after the making of said agreement, and the approval thereof by the State Commissioner of Public Roads, said road or section thereof shall cease to be a county road and shall be exclusively under the jurisdiction and control of said borough, town, township or other municipality, and shall thereafter be repaired and maintained by the same under the supervision of the State Commissioner of Public Roads.

Repair and maintenance of roads.

2. All acts and parts of acts inconsistent with the provisions of this act be and the same are hereby repealed.

3. This act shall take effect immediately.

Approved June 26, 1906.



## CHAPTER 239.

A supplement to an act entitled "An act to provide for the permanent improvement of public roads in the State," approved April first, one thousand nine hundred and three.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Joint improvement of roads.

Specifications and proposals.

Awarding contract.

Apportion cost.

1. Wherever any road in this State runs in or through two or more counties, and said counties engage in the maintenance and operation thereof in its entirety, at joint expense, it shall and may be lawful for the boards of chosen freeholders of such counties, by resolution, to be passed separately by each board, to declare their intention to cause such road, in its entirety, or any portion thereof, to be improved under the provisions of the above entitled act, and the supplements thereto and amendments thereof, as well as this supplement; and to cause all necessary surveys to be made and specifications to be prepared; and after said specifications shall be approved by such boards of freeholders, by resolutions passed separately by each board, the said specifications shall be certified to the State Commissioner of Public Roads, for his approval or rejection, and if approved by him, such boards are authorized to appoint members from their board, to comprise a joint committee, to advertise for bids for said improvement, which bids shall be furnished in sealed envelopes and presented to the committee in open meeting, at the time called for in the advertisement, and the amount of each of said bids shall, in open meeting, be publicly announced, and thereafter the members of the committee from each county shall report the amount of the bids to their respective boards, with their recommendations, and the contract shall be awarded, on resolution of each board voting separately, to the lowest responsible bidder, who shall furnish satisfactory security to be approved of by said boards; that the contract for such improvement shall specify the proportion of the cost

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that each county will bear of said improvement, as between themselves, and neither county shall be liable for a greater amount than the proportion so specified; and the joint committee shall advertise for bids in at least two daily newspapers, printed and circulating in each county, for the period of two weeks, or in at least two weekly newspapers, printed and circulating in each of said counties, for at least four weeks; and all proceedings touching and concerning the improvement of such road shall conform, as nearly as possible, to the proceedings mentioned in the act to which this is a supplement, or any supplement thereto or amendment thereof, except as modified by this act; and such counties taken together shall be entitled to receive one-third of the cost of the improvement set out in the specifications presented to the State Road Commissioner, as aforesaid, or as modified with his consent, in the manner specified in said act for the payment to any county for improving a road wholly within its limits; *provided, however*, that of said one-third so paid by the State each county shall receive the same proportion as it bears or is charged with on account of the cost of said improvement.

Advertising.

Proceedings.

State aid.

Proviso.

2. If, in the opinion of either of such boards, to place on the tax levy for any one fiscal year the moneys necessary to pay for the work aforesaid would be too burdensome on the taxpayers of such county, then, in order that each county may raise the funds wherewith to pay its share of the cost of such improvement, either board being of the opinion aforesaid may, by a resolution adopted by a vote of at least two-thirds of all its members, borrow such sum or sums of money as may be necessary for the payment of its share or proportion of such cost, by the sale of the bonds of such county, issued in the name of the board of chosen freeholders thereof, and in such sum as the board may deem proper, said bonds to bear interest at a rate not exceeding five per cent. per annum, and to be sold for not less than par, and said bonds shall not exceed in the aggregate the cost of the improvement to said board, and shall be so divided that one-tenth of the amount of the bonds issued shall fall due in one year

Meeting cost.

May issue bonds.

When payable.

Interest and  
principal.

from their date and one-tenth each succeeding year thereafter, for the period of ten years from their date, and shall be either coupon or registered bonds, as the board of freeholders may determine; the principal and interest thereof shall be made payable at the office of the county collector of such county; said bonds shall be signed by the director of such board and the county collector, and shall be sealed with the seal of the county, and the county collector shall keep a record thereof; it shall be the duty of the board of chosen freeholders each year to place in the tax levy for such county, in each year, so long as said bonds shall run, a sufficient sum to pay the interest accruing thereon for said year and the principal of the bonds that shall mature in said year.

Paving public  
roads.

3. Whenever the character of the soil or foundation of any road, or any part thereof, sought to be improved, and the traffic over the same, are such that in the opinion of any board seeking the same, if the road lies wholly within one county, or in the opinion of the boards jointly engaged in the maintenance and operation of a road in its entirety, running through two or more counties, ascertained by resolution passed by such boards separately for such purpose, it is necessary to build a foundation for such road and pave the same with a block or other substantial pavement other than that specifically mentioned in the first section of the act to which this is a supplement, it shall be lawful for such boards to include such work in the specifications for said work to be presented to the State Commissioner of Public Roads, as aforesaid.

4. This act shall take effect immediately.

Approved April 8, 1903.



CHAPTER 231.

Supplement to an act entitled "An act to provide for the permanent improvement of public roads in this State," approved April first, one thousand nine hundred and three.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Whenever any public road has been or shall hereafter be improved under the provisions of the act to which this is a supplement, in the course of improving such road the grade of the roadbed shall have been or shall be changed so that it shall not conform to the grade of the remaining portion of the road, including the sidewalks, it shall be lawful for the municipal authorities of each municipality through which such road passes to cause the remaining portion of such road within the limits of their several municipalities to be graded and formed so as to conform in grade to that established for the roadway constructed under the provisions of the act to which this is a supplement, and to cause such work to be done under the same proceedings and in the same manner as may be provided by law in their several municipalities for the grading of the streets of such municipalities.

Cause portions of road to conform to altered grade.

Proceedings.

2. The proper municipal authorities of any municipality through which any such road may run shall have full power and authority to make any municipal improvement upon or within any such road within the limits of their several municipalities which may be authorized by law to be made in any of the other public streets or roads of such municipalities; *provided, however,* no such improvement shall be made by such municipal authorities which may in any way interfere with or impair the roadway improved under the provisions of the act to which this is a supplement, without the approval and consent of the board of chosen freeholders of the county within which such road may be located.

Municipalities may improve road.

Proviso.

Assessment  
for benefits.

3. The cost and expense of any of the public improvements authorized by this act shall, so far as the same can be, be assessed upon the lands and real estate specially benefited by the improvement in proportion to the benefit received; and no lot or parcel of land shall be assessed more than it is so specially benefited, and such assessment shall be made in the same manner and under the same procedure as is directed by law for the making of other assessments for street improvements within every such municipality.

Maintenance  
of road.

4. Nothing in this act contained shall be construed to in any way impose upon any such municipality therein referred to any part of the cost of the maintenance and repair of the roadway of any road improved under the provisions of the act to which this is a supplement.

5. This act shall take effect immediately.

Approved April 8, 1903.

## CHAPTER 61.

An act to authorize the board of chosen freeholders of any of the several counties of this State to straighten, change the location of and vacate any portion of any public road or highway heretofore or hereafter acquired, constructed and improved in any such county by the board of chosen freeholders thereof, and to improve the portion included in such changed location; *provided*, any owner or owners of real estate along such portion is or are willing to contribute the whole cost and expense thereof; *and provided further*, every owner of land upon that part of said road proposed to be vacated under this act shall consent in writing to such change of location and vacation.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

Change and  
improve  
roads.

1. The board of chosen freeholders of any of the several counties of this State shall have the power and au-

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authority to straighten, change the location of and vacate any portion of any public road or highway heretofore or hereafter acquired, constructed and improved in any such county by the board of chosen freeholders thereof, and to improve the portion included in such changed location; *provided*, any owner or owners of real estate along such portion is or are willing to contribute the whole cost and expense thereof; *and provided further*, every owner of land upon that part of such road or highway proposed to be vacated under this act shall consent in writing to such change of location and vacation. Proviso.

2. The property owner or owners desiring such straightening, change of location and vacation, and the improvement of the portion included in such changed location, may present to the board of chosen freeholders of any such county a petition therefor, which shall be accompanied by a map and specifications showing the proposed straightening, change of location and vacation, and in what manner the portion included in such changed location is to be improved, and offering to contribute the whole cost and expense thereof; and said board, if it approve of the same, and is satisfied that every owner of land upon that part of said road or highway proposed to be vacated consents thereto, shall authorize the same; and thereupon it shall be lawful for said board to acquire the land necessary for said change of location, by gift, grant for nominal consideration, or by exchange of said portion so vacated for said portion necessary to be acquired; and said board is empowered, if required in any such exchange, to make, execute and deliver a deed or deeds of conveyance, conveying in fee-simple the title, if any, of any such board to the land so conveyed by it; and it shall be further lawful for said board, upon such terms as it shall determine, or as shall be agreed upon with such owner or owners, either to proceed and make the said improvement itself, the whole cost and expense thereof to be paid by said owner or owners, or to allow the said owner or owners to make the same themselves, subject to the approval of said board, and after the completion of the same, the portion which shall be superseded by said Presentation  
by owners.  
Map and  
specifications.  
Powers of  
freeholders.



Repealer.

changed location shall be deemed and taken as vacated a part of said county or public road or highway.

3. All acts and parts of acts inconsistent with this act be and the same are hereby repealed, and this act to be deemed and taken as a public act, to take effect immediately.

Approved March 24, 1903.

## CHAPTER 264.

An act to enable boards of chosen freeholders to accept roads or sections of roads in cities, towns, townships or boroughs, and to maintain the same as county roads.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

Improved roads in different municipalities accepted and maintained as county road.

1. Whenever any public road or street, or section of road or street, located in any township, town, city, borough or other municipality in this State, runs to the boundary of such township or other municipality and is maintained as a township road, and at the boundary of such municipality meets and is continued as another road or street in another municipality in the same county, the board of chosen freeholders of such county may, upon the petition of the common council, township committee or other governing body of such municipalities, respectively accept such road and thereafter maintain the same as county road and have exclusive jurisdiction thereof in the same manner as other county roads are maintained and cared for.

2. This act shall take effect immediately.

Passed October 10, 1907.

**CHANGING LOCATION OR IMPROVING.**

**CHAPTER 75.**

An act to amend an act entitled "An act to provide for the permanent improvement of public roads in this State," approved March twenty-second, one thousand eight hundred and ninety-five.

*BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:*

1. The eighteenth section of the said act shall be amended so as to read as follows:

18. That if any property owners or owner along any road in any county of this State which has not been improved or is not undergoing improvement under the previous sections of this act shall desire any section of any road in such county to be improved or to be changed in location and improved, and are or is willing to contribute the whole expense of such improvement, and provided every owner of land upon that part of the road proposed to be vacated under this act shall consent in writing to such vacation, the supervisor of roads of such county shall, upon a written request of such owners or owner, make a plan of such sections of roads so to be improved or changed in location and improved, in which shall be given the levels and distances, and also specifications stating the materials that may be used and the manner of using them; and a copy of such plan, location, change of location, specifications and of any bids to do such work shall then be submitted by such owners or owner to the board of chosen freeholders, and if such board shall approve them and any change of location which may be proposed, it shall then be lawful for such owners or owner to accept any bid or bids so approved from among the bidders, or at their own expense to proceed to build such section of road according to such plan,

Property owners to contribute whole expense of improvement.

Owner to  
have control  
of expendi-  
tures.

Old road  
vacated.

location and specifications, and such owners or owner shall have control of the expenditure of moneys used to make such improvements, subject to the approval and supervision of the supervisor of such county; and upon the completion of the improvement to the satisfaction of the said supervisor and said board of chosen freeholders, and upon the submission to said board of receipts showing full payment for materials furnished and work done under the plan and specifications, such section of road so improved shall, if the board of chosen freeholders shall so declare, thereafter be a county road, but otherwise shall remain an ordinary public highway, and any and all portions of any road now existing which may have been rendered unnecessary or be superseded by the new road so constructed shall be vacated and abandoned as a public road, without other action or proceedings than the approval of the board of chosen freeholders as hereinbefore provided; and the said supervisor shall be paid by the aforesaid owners or owner the sum of ten dollars for making the plan, the sum of five dollars for drawing the specifications, and the sum of five dollars for the supervision of the work, and in case such supervisor is not a civil engineer, and actual survey is necessary, then such owners or owner, at their or his expense, shall procure a survey, which shall be subject to the approval of such supervisor, which survey shall take the place of the plan before mentioned, and shall include all the new roads proposed to be constructed and all the old roads proposed to be abandoned.

Approved March 23, 1896.



CHAPTER 119.

An act providing for the widening of certain county roads.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. It shall be lawful for the board of chosen freeholders of any county in this State to acquire by purchase lands adjoining any public road under the care of said board or any commission in said county, and running through two or more municipalities therein, for the purpose of widening said road at any point where such widening shall, in the judgment of said board, for any reason be desirable. In case such board shall be unable to agree with the owners of said lands for the purchase thereof, then it may acquire the same by condemnation in the manner provided in "An act to regulate the ascertainment and payment of compensation for property condemned or taken for public use (Revision of 1900)," approved March twentieth, one thousand nine hundred, and the supplements thereto.

Freeholders may acquire lands to widen road.

2. Said lands when so acquired shall be incorporated in and become a part of said public road.

Public road.

3. Said board of chosen freeholders shall have power to pay for said lands, when purchased or condemned, by the issuance and sale, for not less than par, of temporary loan bonds, bearing interest at not exceeding four per centum per annum, payable half-yearly. The payment of said bonds, with interest, shall be provided for in the tax levy or budget next thereafter made.

Bonds to meet payment.

4. The total limit of expenditure under this act in any county shall not exceed five thousand dollars.

Amount.

5. This act shall take effect immediately.

Approved April 6, 1905.

## CHAPTER 63.

An act to provide for the extension and maintenance of public roads in this State.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Extension of  
highways to  
become  
county roads.

1. Whenever the common council, board of aldermen, town council, township committee or other governing body of any city, town, township, borough or other municipality in this State shall, by resolution in writing, consent to the extension of any public road, boulevard or highway constructed under the provisions of chapter ninety-seven of the laws of one thousand nine hundred and three, or any supplement thereto or amendment thereof, or by any board of freeholders or under the jurisdiction of any board of freeholders in this State, under any act authorizing such construction, and which lies partly within such municipality, and shall, in such resolution, request the further extension of such public road, boulevard or highway as a county road for the purpose of making and effectuating a complete and continuous county road in or through or partly in such municipality, then and in such case it shall be lawful for the board of chosen freeholders of the county wherein said city, town, township, borough or other municipality is situated, by resolution to lay out, open, construct, reconstruct, extend, improve and maintain an extension of any such public road in and through any such city, town, township, borough or other municipality; and for such purpose such board of chosen freeholders shall have the right to improve, reconstruct, take over, accept and maintain any public road, or section of road, already laid out in such city, town, township, borough or other municipality, in such manner as the said board of chosen freeholders shall deem necessary.

Rights of  
freeholders.

Conditions of  
acceptance.

Such extension of such public road can be authorized, accepted and adopted by said board of chosen freeholders only upon the following conditions:

(a) The extension must be, in the judgment of such board of chosen freeholders, of public importance. Necessary.

(b) The State Commissioner of Public Roads shall approve the resolution authorizing such extension before the same shall become effective. Approval by road commissioner.

(c) The consent presented to such board of chosen freeholders by any such city, town, township, borough or other municipality must be accompanied by a certificate that the whole of the proposed road, or section of road, if any, which is to be used for the purpose of such extension, has been permanently improved without state or county aid by the construction thereon of a macadamized road, or telford or other stone road, so that the same is, or shall be, with reasonable repairs thereto, firm, smooth and convenient for travel at all seasons of the year; and accompanied by a map or survey of such road, or section of road, and a brief description of the specifications under which such improvements were made, together with evidence that full payment to the contractor or contractors for all work done has been made. Certificate of consent.  
Capable of repairs.  
Map.

Any such extension of such county road, upon its acceptance by any such board of chosen freeholders, shall forever thereafter be a county road and subject to the exclusive jurisdiction of said board of chosen freeholders, except as hereinafter provided. It shall be constructed, reconstructed, laid out, improved and maintained under the provisions of chapter ninety-seven of the laws of one thousand nine hundred and three, or any supplement thereto or amendment thereof, and the duty of keeping the same in repair shall devolve exclusively upon such board of chosen freeholders. Freeholders to have exclusive jurisdiction.

2. Except for the purpose of maintaining such road in good repair for the purposes aforesaid, and for such other purposes as are set forth in chapter ninety-seven of the laws of one thousand nine hundred and three, or any supplement thereto or amendment thereof, such city, town, township, borough or other municipality in which such extension shall be constructed, reconstructed, laid out, improved and maintained, shall have the right to light the road. Lighted by municipality.



same, as part of the system of streets in such city, town or township, borough or other municipality.

Repealer.

3. Chapter one hundred and twenty-nine of the laws of 1905, one thousand eight hundred and ninety-seven, and all other acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

4. This act shall take effect immediately.

Approved March 28, 1905.

## REPAIR OF COUNTY ROADS.

### CHAPTER 182.

A supplement to an act entitled "An act to enable boards of chosen freeholders to acquire, improve and maintain public roads," approved March nineteenth, one thousand eight hundred and eighty-nine.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Maintenance  
of county  
roads.

1. It shall be lawful for the boards of chosen freeholders in the several counties of this State that have heretofore acquired and improved, or that may hereafter acquire and improve, any road or roads under the act to which this is a supplement, to keep and maintain such roads in repair in the same manner and to the same extent as state aid roads may now be repaired and maintained under the act entitled "An act to provide for the permanent improvement of public roads in this State (Revised of 1905)," and it shall not be necessary to advertise or contract for work or materials for such repair otherwise than as required for state aid road repairs in and by the last-mentioned act, its supplements and amendments.

Under county  
supervisor of  
roads.

2. It shall be lawful for the board of chosen freeholders of any county that has heretofore acquired and improved any road or roads under the act to which this is a supplement (and which has a county supervisor of state aid roads), by resolution, to place the repair and maintenance

# COMMISSIONER OF PUBLIC ROADS.

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of all such roads, so acquired and improved, under the charge and supervision of such county supervisor of roads.

3. This act shall take effect immediately.

Approved May 13, 1907.

## CHAPTER 77.

### An act concerning roads.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. The board of chosen freeholders in any county in this State that shall have improved any roads or streets in such county, and shall be charged with the repair of such roads or streets, shall have power, by resolution, to regulate or prohibit the tearing up or excavating in any such roads or streets for the laying, replacing or repairing of water, gas or sewer pipes, for making any drain or for any other purpose; to prevent the disturbing or tearing up of such roads or streets by the locking of wheels of any vehicle or attaching a drag to such vehicle; to prevent the filling up of gutters along such roads or streets, and to prevent obstruction and damage to such roads or streets by spilling or throwing stones, dirt or other materials on such roads or streets.

Freeholders to regulate use of improved streets or roads.

2. The board of chosen freeholders of any such county may prescribe a penalty by a fine not exceeding one hundred dollars for the violation of any such resolution or any section thereof, and that the court of justice before whom proceedings shall be instituted shall determine the amount of the fine, not to exceed the sum of one hundred dollars, and may commit the defendant to the county jail until the fine is paid, with costs.

Penalty for violation.

3. Complaint against any person violating said resolution, or any section thereof, may be made before a district court of any city in such county, or in case there shall not be any district court in such county, then before

Procedure for complaint and process.

any justice of the peace of such county, and such court or justice shall issue process at the suit of such county in the nature of a summons, and the same procedure shall be had thereunder as is prescribed in the act entitled "An act concerning townships (Revision of 1899)," for the violation of any ordinance of a township.

Resolution  
advertised.

4. Such resolution before it shall take effect shall be published at least once a week for two weeks in two newspapers published and circulated in such county.

5. This act shall take effect immediately.

Approved April 16, 1907.

## CHAPTER 182.

An act concerning streets and highways in townships.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Securing  
land for  
streets in  
townships.

1. The township committee of any township shall have power and authority by ordinance to lay out, open, widen, straighten, name, alter or vacate any street, avenue, road or highway, or any part or section of the same, and to take and appropriate for any of such purposes any lands and real estate, upon making compensation therefor in the manner now or hereafter provided by law for the taking of lands in townships for other public improvements, or by agreement with the owner.

Public notice  
of intention.

2. No ordinance exercising the powers given by this act shall be adopted until ten days' notice of the time and place fixed for its consideration shall have been given by publication for one insertion in a newspaper printed in the county and circulating in the township. Such notice shall state in general terms the object of the proposed ordinance and the property to be affected.

Assessment  
for benefits.

3. Whenever a petition for any such improvement shall have been presented to the township committee, signed by twenty-five owners of property to be benefited thereby, then the expenses thereof, including the compen-



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sation, if any, paid for lands so taken, may be assessed upon the property benefited in proportion to the benefits received, but not to exceed the benefit so received. Such assessment shall be made in the manner now or hereafter provided by law for assessing the benefits of any public improvements in townships, and shall include an assessment against every petitioner. How made.

4. This act shall take effect immediately, but its provisions shall not become operative in any township until assented to by a majority of the votes cast by the legal electors thereof at an election to be held in said township at any time to be fixed by the township committee thereof. Act must be assented to.

No such election shall be called unless a petition for the same, signed by not less than one hundred taxpayers of said township, shall be filed with such township committee. The township clerk of said township shall cause public notice of the time and place of holding such election and the purpose thereof to be given by advertisements set up in at least five public places in said township and published for at least one insertion in one or more newspapers published in said county and circulating in said township, at least ten days previous to the date of such election. Said clerk shall provide for each elector voting at such election printed ballots, on which shall be either the words "for the adoption by this township of the provisions of an act to permit the township committee to lay out, open, widen, straighten, name, alter or vacate any street, avenue, road or highway, or any section of the same," or the words "against the adoption by this township of the provisions of an act to permit the township committee to lay out, open, widen, straighten, name, alter or vacate any street, avenue, road or highway, or any section of the same." The polls for such election shall be held at the usual places of holding elections therein, and shall be opened at one o'clock in the afternoon and close at seven o'clock in the evening, and such election shall be conducted by the proper election officers of said township for the time then being, and such officers shall return to the township committee of said township a true and correct statement, in writing, under their hands, of the result Petition.

Ballots.

Polls.

Limitations  
to act.

of said election, which shall be entered at large upon the minutes of said body.

5. Nothing in this act shall give authority to any township committee or other body to lay out, open, widen, straighten, name, alter or vacate any street, avenue, road or highway, or section of the same, in or through any portion of the grounds of any incorporated camp meeting association, nor to condemn any lands used for railroad purposes.

Approved April 20, 1905.

### **, INCREASED POWER TO BORROW.**

An amendment to an act entitled "A supplement to an act entitled 'An act to enable boards of chosen freeholders to acquire, improve and maintain public roads,'" approved March nineteenth, one thousand eight hundred and eighty-nine, which supplement was approved April ninth, one thousand eight hundred and ninety-two.

*BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:*

Section be  
amended.

1. The first section of an act entitled "A supplement to an act entitled 'An act to enable boards of chosen freeholders to acquire, improve and maintain public roads,'" approved March nineteenth, one thousand eight hundred and eighty-nine, which supplement was approved April ninth, one thousand eight hundred and ninety-two, amended so as to read as follows:

*BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:*

Amount  
authorized  
to raise and  
bonds issued.

1. In counties of the second class it shall be lawful to raise a sum not to exceed four hundred thousand dollars for which bonds may be issued by the board of chosen freeholders of any such county, under the act to which this is a supplement, or any supplement or amendment

thereof; *provided, however*, that if work under said act and supplements or amendments has already been done to an amount exceeding said sum, bonds under said act and supplements may be issued to an amount sufficient to raise and pay for such work; *and provided also*, that no county road bond shall be issued to such an amount as, in addition to existing debt, shall raise the debt of the county for all purposes above three per centum of the assessed value of the real estate therein; and in case any such bonds shall be issued in excess of the limit aforesaid, all such bonds so issued in excess shall be void in the hands of any person or party, notwithstanding any recitals therein or any representations that may be made concerning the same; in case application has already been made to the circuit court and a certificate shall have been recorded and filed, as required by said act, such application need not be repeated in case of any subsequent issue of such bonds where the original certificate on file shows that the new issue of bonds will not exceed three per centum of the assessed value of the real estate in said county as limited by this act.

Proviso.

Proviso.

2. The second section of said act be amended so as to read as follows:

2. In any county of the second class wherein the board of chosen freeholders thereof shall heretofore or may hereafter issue bonds under said act and supplements, that such board of such county shall not use any of the money so raised for any other purpose except to grade, macadamize or improve any road in any such county, under the provisions of the act to which this is a supplement and the several supplements and amendments thereof; *provided*, nothing herein shall prohibit the doing of the necessary repair of any road heretofore graded, macadamized or improved by any such board or that may be hereafter graded, macadamized or improved under said act and supplements.

Board not to use money raised except to grade, &c.

Proviso.

3. All acts and parts of acts inconsistent herewith be and the same are, so far only as they conflict herewith, repealed, and that this act shall take effect immediately.

Approved March 24, 1897.



CHAPTER 93.

POWER OF FREEHOLDERS TO BORROW.

A supplement to an act entitled "An act in relation to county expenditures," approved April second, one thousand eight hundred and seventy-eight.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Repair of  
roads dam-  
aged by  
freshets.

1. In case of the injury or destruction by freshets or otherwise of any of the roads or sections of roads in this State that have become county roads under and by virtue of any law of this State whereby it shall be deemed necessary for the board of chosen freeholders, within the limits of whose county such roads or sections of roads so injured or destroyed may lie, to repair or rebuild the same, the said board of chosen freeholders may order and cause such roads or sections of roads to be repaired or rebuilt, notwithstanding the expense of repairing or rebuilding the same shall exceed the limit of the appropriations made for that year; and such board of chosen freeholders may borrow money on temporary loans for that purpose in anticipation of the next tax levy; and in the said tax levy there shall be incorporated a special appropriation under the head of "debts and interest, special deficiency," to pay for such temporary loans.

Special  
charge.

2. This act shall take effect immediately.

Approved April 2, 1902.

## CHAPTER 132.

An act to provide for the acquirement of turnpike roads for free public use, and for the permanent improvement and maintenance of the same.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Whenever there shall be presented to the State Commissioner of Public Roads a petition signed by the owners of at least two-thirds of the land and real estate fronting or bordering on any turnpike road, praying that said road may be acquired for free public use, and setting forth that they are willing that the peculiar benefits conferred on the lands fronting or bordering on said road shall be assessed thereon to an amount not exceeding ten per centum of the entire purchase price of the said road, together with the amount necessary to resurface, rebuild or improve the said road in the manner prescribed for other roads in the act entitled "An act to provide for the permanent improvement of the public roads in this State," approved March twenty-second, anno domini one thousand eight hundred and ninety-five, and the supplements thereto, said commissioner shall thereupon notify the Governor of such action, and the Governor shall thereupon appoint five commissioners from the county or counties through which the said road runs; the said commissioners, when appointed, shall take an oath or affirmation faithfully and fairly to perform their duties, and shall thereupon proceed to estimate and determine the fair and just value of the said road and of the portions thereof in each county in which the same is located, having given ten days' notice of the time and place when and where they will meet to hear any representation in behalf of the said corporation or of the board or boards of chosen freeholders of the various counties through which the said road runs, or of the applying freeholders in the said matter; said notice shall be served upon the president or other chief officer, of the turnpike company, upon the

Acquirement  
of turnpike  
road for free  
public use.

Appointment  
of commis-  
sioners by  
Governor.

Hearing.

Report to  
State Com-  
missioner of  
Roads.

director of the said board or boards of chosen freeholders, and shall be published at least one week prior to the time of meeting in one newspaper published in each county through which said turnpike runs; such meeting shall be adjourned from time to time at the discretion of the said commissioners; when the said commissioners shall have arrived at a price or value of the said turnpike road satisfactory to themselves they shall report the same to the State Commissioner of Public Roads, who may thereupon ratify the same and report it to the board or boards of chosen freeholders of the counties through which the said road runs, which said board may thereupon purchase the same, or whenever the board of chosen freeholders of any county in this State shall agree with the owner or owners of any turnpike road or toll road within such county upon the price to be paid for such turnpike road or toll road, and shall, by resolution, accept the same, and said proceeding be approved by the State Commissioner of Public Roads in writing, said board may thereupon purchase the same and said road shall be paid for and maintained as a county road as hereinafter provided for; and they are hereby empowered to make temporary loans upon the credit of the said county or counties for the acquirement of the said roads as aforesaid.

One-third  
paid from  
State appro-  
priation.

Proviso.

2. One-third of the cost of all roads so acquired, together with one-third of the amount expended in improving the same as aforesaid, which improvement shall be made in the manner prescribed for the roads under the aforesaid act, shall be paid for out of the state road appropriation; *provided*, that the amount so paid shall not in one year exceed the amount of forty thousand dollars. If one-third of such cost shall exceed the sum of forty thousand dollars, the said sum of forty thousand dollars shall be appropriated by the Governor and State Commissioner of Public Roads among the counties of this State in proportion to the cost of the roads acquired by them for such year, as shown by the statement of cost filed in the office of the State Commissioner of Public Roads. The Governor and the said commissioner shall, between December fifteenth and thirty-first in each year, certify



to the State Comptroller the amount to be paid to each county for such year, and the State Comptroller shall thereupon draw his warrants in favor of the respective county collectors for the sums certified to as aforesaid upon the State Treasurer, who shall pay the same out of any moneys in the state treasury not otherwise appropriated; *provided further*, that the cost of all turnpike roads acquired under this act in any county in any one year, together with all roads built or repaired, shall not exceed one-half of one per centum of the ratables of such county for the last preceding year. Proviso.

3. On or before August first in each and every year it shall be the duty of the board of chosen freeholders to certify to the county board of assessors, either in the annual tax budget or separately, the two-thirds of the cost of purchasing and improving of all turnpike roads acquired and improved as aforesaid during the year, and the county board of assessors shall include the sum so certified in the county tax assessed for such year, and the same shall be assessed, collected and paid over to the county in the same manner and within the same time that other county taxes are assessed, collected and paid over. If a deficiency shall exist in consequence of the receipt of less than one-third of the cost from the state treasury, the board of chosen freeholders shall have authority to borrow on temporary loans to the amount of such deficiency until the next annual taxes shall be assessed, collected and paid over to the county. Duty of  
county board  
of assessors.  
  
Loan to meet  
deficiency.

4. If the said road shall run through more than one county, the petition to the State Commissioner of Public Roads shall be signed by at least two-thirds of the owners of the land and real estate bordering on said road in each county before the Governor shall be required to appoint the five commissioners mentioned in the first section of this act; and each of the said counties shall bear the expense of the acquirement of the said road in proportion to the value thereof within the said counties, and all proceedings after the appointment of the said five commissioners that may be required by virtue of this act shall be When turn-  
pike in two  
or more  
counties.

had separately and independently in each of the said counties.

Maintenance.

5. Any road so acquired shall forever thereafter be free county road, and shall be kept in good order and repair and in the same manner as are other county roads.

Assessment of benefits.

6. When the said turnpike roads shall have been acquired and improved by petition as aforesaid, the board of chosen freeholders shall apply to the Circuit Court of the county for the appointment of commissioners to estimate and to assess the peculiar benefits conferred by such acquirement and improvement upon the lands and real estate bordering on the road so acquired and improved of the time and place of which application notices shall be given by ten days' publication in two daily newspapers printed and circulating within the said counties, or by four weeks' publication in two weekly newspapers printed and circulating therein, at which time and place, or such other time and place as the court shall designate, shall without unnecessary delay, appoint three commissioners who shall be freeholders and residents of the county in which the application is made, to assess the benefits aforesaid. The said court shall have power to remove any commissioner and appoint another in his place, and also fill any vacancy that may occur in the office of any commissioner at any time.

Manner of assessment.

7. The said commissioners shall then proceed in like manner as the commissioners appointed to assess the benefits conferred by the improvement of the public roads of this State under and by virtue of an act of the Legislature, entitled "An act to provide for the permanent improvement of the public roads of this State," approved March twenty-second, one thousand eight hundred and ninety-five, and supplements thereto, and the report of the said commissioners when filed and approved shall be a lien upon the properties assessed in like manner, and the said assessment shall be collected in like manner as the assessment in the said act last before mentioned.

Report a lien.

Approved March 22, 1901.



## VACATION OF TURNPIKE.

## SUPPLEMENT.

Sec. 1. That whenever any turnpike company of this State shall execute to any city, township or other municipality of this State a deed of cession and transfer of all or any part of any turnpike road lying within the limits of any such city, township or other municipality, and shall have the same duly proven in the manner required for the proof of deeds or conveyances of lands, and shall deliver the same, together with a map or survey of the road, or of the part of road, so ceded and transferred to the common council, township committee or other governing board of such city, township or other municipality, and the said common council, township committee or other governing board shall accept the said deed of cession and transfer, by a writing indorsed thereon, the said deed, proof, map or survey and acceptance shall then be recorded in the office of the clerk of the county in which the road so ceded and transferred lies, in the book containing the records of public roads for said county, and after being so recorded shall be filed in the office of the Secretary of State; *provided*, that where the charter or act of incorporation of any city or other municipality prescribes the manner in which deeds of dedication of lands for public highways or streets shall be accepted, the proceedings for the acceptance of any deed of cession and transfer by a turnpike company as aforesaid shall, in any such city or other municipality, be the same as is required for the acceptance of a deed of dedication of lands for a public highway or street.

Deed of cession and transfer of turnpike road, how executed and filed.

Proviso.

Sec. 2. That any turnpike company making a cession and transfer of any part of their turnpike road in the manner aforesaid shall, from the date of filing the deed of cession and transfer in the office of the Secretary of State, be released and discharged from all authority and control over the part or parts of their road so ceded and transferred, and from all liability on account of the same,

Company released from control, &c., of part of road ceded when deed is filed in office of Secretary of State.



and the same shall thereafter be, to all intents and purposes, a public road or highway in such city, township or other municipality, and be subject to the same jurisdiction, authority and control by such city, township or other municipality as it has over other public roads or highways within the limits thereof.

Approved February 13, 1884.

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An act authorizing turnpike companies to vacate or dispose of a portion of its road and property.

When turnpike company may vacate or dispose of portion of road.

Sec. 1. That when any turnpike company in this State may deem it advisable to dispose or vacate any portion of their road, not in excess of one-half of its entire length, they shall hereby have the power and privilege of so doing at any time when the same may be favored by a vote represented by those owning two-thirds of the capital stock of said company, to be voted at a special meeting of said stockholders called by the officers of said company, and the notice of said meeting being published in at least one newspaper in each county where said road is located, for the space of thirty days, once in each week, said notice to state the time and object of said meeting. The said stockholders may, by a vote represented by those owning two-thirds of the capital stock of said company, authorize and empower their president and secretary to sell or vacate to the freeholders of the county or counties the portion so desired; and if vacated without compensation, a committee of the board of freeholders of the county or counties may view the same and report to the said board upon what terms they have agreed to take said road, and the action of a majority of said board of freeholders in accepting or rejecting said report shall be final.

Approved April 20, 1885.

An act to authorize turnpike companies to abandon a portion of their roads and property.

Sec. 1. That any turnpike company in this State may abandon any portion of their road not exceeding two-thirds of the entire length of the road, when the same may be favored by a vote of those owning a majority of the capital stock of said company; the resolution to abandon a portion of said turnpike shall describe the part so abandoned, and shall be signed by the president and secretary of said turnpike company, duly acknowledged before an officer authorized to take the acknowledgment of deeds in this State, and shall thereupon be recorded in the office of the clerk of the county wherein such turnpike company is situated; *provided*, that the part of said turnpike so abandoned shall be in all respects in as good repair as when the said company began operating the same.

Turnpike companies may abandon portion of road.

Passed June 1, 1886.

### CHAPTER 63.

A supplement to an act entitled "An act to provide for the acquirement of turnpike roads for free public use," approved May eleventh, one thousand eight hundred and ninety-seven.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. The pay of the commissioners heretofore or hereafter appointed under said act shall be a sum not exceeding five dollars per day, and necessary expenses not exceeding two dollars per day, for actual number of days employed in such service.

Compensation.

2. If the freeholders of the county or counties fail to accept the turnpike roads appraised under the act to which this is a supplement within twelve months after the commission have submitted their award to the State Road

Settlement when road not accepted.

Commissioner, the bill of said commissioners, upon the approval of the State Road Commissioner and the signature of the Governor, shall be presented to the Comptroller of the State, who thereupon shall draw his warrant therefor upon the State Treasurer, who shall pay the same out of the annual state appropriation for roads.

3. This act shall take effect immediately.

Approved March 20, 1900.

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## CHAPTER 133.

A supplement to an act entitled "An act to provide for the acquirement of turnpike roads for free public use, and for the permanent improvement and maintenance of the same," approved March twenty-second, one thousand nine hundred and one.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. When any commissioner heretofore or hereafter appointed under the act to which this act is a supplement shall die pending the proceedings under the said act to which this act is a supplement, or shall be disqualified or shall be unable to act or shall fail or refuse to act and perform the duties of his appointment, the other four commissioners appointed under said act shall proceed to perform the duties of their appointment with the same powers and effect as if all the commissioners were acting, and a report signed by the other four of said commissioners shall have the same force and effect as a report signed by all of the commissioners appointed under the said act, and a majority of said commissioners shall have the power to adjourn their meetings from time to time.

2. When any commissioner heretofore appointed under the act to which this act is a supplement shall have died pending the proceedings under the said act, or shall have been disqualified or unable to act or shall have failed or refused to act and to perform the duties of his appoint-



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ment or to attend the meetings of the commissioners appointed under the said act, all the proceedings heretofore had and acts heretofore performed by the other four of the commissioners appointed under the said act are hereby confirmed and made valid, legal and effectual to the same extent that the same would have been valid, legal and effectual if all the commissioners appointed under the said act had taken part in all of said proceedings.

3. This act shall take effect immediately.

Approved March 28, 1904.

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CHAPTER 138.

A further supplement to an act entitled "An act to provide for the control and operation of roads and bridges owned or claimed to be owned by any plank road company whose charter has expired or may expire," approved March twenty-second, one thousand nine hundred and one.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. After such road shall have been acquired and taken possession of by any board or boards of chosen freeholders of any county or counties in this State, such road may be widened to any width not exceeding one hundred feet, providing the board or boards of chosen freeholders of the county or counties in which said road may lie and be situate shall adopt a resolution determining that such widening is of public importance, and setting forth the width proposed and the location of said widening, and the points between which such widening is to be made; such resolution, in case said road lies in two or more counties, shall receive the approval of each of said counties before the same shall be valid and operative.

Widening  
plank roads  
acquired by  
county.

2. The title to the lands required for such widening may be acquired by gift, devise, purchase or condemna-

Acquirement  
of lands.

tion, and shall vest in the county corporation of the county or counties within the territorial limits of which the lands acquired may lie, respectively, and the cost and expense of acquiring such lands shall be paid by the county within which the same shall lie, but nothing in this act contained shall be construed to alter or in anywise affect the provisions of law under which such road, including the bridges thereof, are or shall be constructed, renewed, repaired or maintained.

3. This act shall take effect immediately.

Approved March 28, 1904.

### CHAPTER 173.

An act to provide for the purchase, by boards of chosen freeholders, of turnpike or toll roads, or portions thereof, which have been improved by the construction thereon of a macadam, telford, rubble or other stone road, for free public use as county roads, and for their repair, improvement and maintenance of the same.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Freeholders  
may purchase  
turnpike and  
maintain  
same as  
county road.

1. The board of chosen freeholders of any county may agree with the owner or owners of any turnpike or toll road, or portion thereof, lying within such county and being not less than one mile in length, which has been improved by the construction thereon of a macadam, telford, rubble or other stone road, upon the price to be paid for the same, and may by resolution agree to purchase the same for free public use at the price agreed upon, subject to the approval of the State Commissioner of Public Roads, and upon receiving the approval of said commissioner, in writing, the said board may thereupon purchase such turnpike or toll road, or portion thereof, at the price agreed upon, and the road or portion of road so purchased shall thereupon be and become a county road and shall be cared for, repaired, improved and main-

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tained for free public use in the same manner that other county roads are cared for, repaired, improved and maintained.

2. The board of chosen freeholders may, before purchasing any such turnpike or toll road, or portion thereof, require as a condition of such purchase that each township or other municipality in which said road or any portion thereof intended to be purchased lies shall pay ten per centum of the cost of the part lying within such township or other municipality, said payment to be applied to the purchase price of the road or portion of road acquired under this act.

Require part  
cost paid by  
municipality.

3. One-third of the cost of any turnpike or toll road, or portion thereof purchased in accordance with the provisions of this act, shall be paid for out of the state road appropriation; *provided*, that the amount paid out of said appropriation for all turnpike or toll roads acquired pursuant to the provisions of this or any other act of the Legislature of this State now in force, shall not exceed in any year the sum of fifty thousand dollars. If one-third of the entire cost of the turnpike or toll roads so acquired in any year shall exceed the sum of fifty thousand dollars, the said sum of fifty thousand dollars shall be appropriated by the Governor and the State Commissioner of Public Roads first in payment of any deficiency remaining due from the State to any county or counties in any previous year, for one-third of the cost of turnpike or toll roads purchased as aforesaid, and afterwards among the several counties in proportion to the cost of the turnpike or toll roads acquired by each of them respectively during the current year pursuant to the provisions of this or any other act of the Legislature of this State now in force, as shown by the statements of cost filed in the office of the State Commissioner of Public Roads, the Governor and the said commissioner shall, between December fifteenth and thirty-first in each year, certify to the State Comptroller the amount to be paid to each county for such year for such deficiency, if any, and on account of the purchase of turnpike or toll roads, or portions thereof, in such county, and the State Comptroller shall draw his warrant

State's por-  
tion.

Proviso.

Amount.

If deficiency.



Proviso.

on the State Treasurer in favor of the county collector for the amount certified, and the State Treasurer shall thereupon pay the same; *provided further*, that the cost of all turnpike or toll roads or portions thereof acquired under this or any other act of the Legislature of this State now in force, by any county in any one year, together with all the roads built or repaired therein under the provisions of any act of the Legislature of this State providing for the permanent improvement of public roads in this State, shall not exceed one-half of one per centum of the ratables of such county for the last preceding year.

Notice to  
county as-  
sessors.

4. On or before the day fixed for the meeting of the county board of assessors in any county in each year, the board of chosen freeholders of such county shall certify to the said county board of assessors, either in the annual tax budget or separately, two-thirds of the cost of any turnpike or toll road or portion thereof purchased or agreed to be purchased pursuant to the provisions of this act since the day fixed by law for the meeting of the board of assessors in the year next preceding. The county board of assessors shall include in their assessment of county taxes the sum so certified, and the same shall be collected and paid over to the county in the same manner and at the same time that other county taxes are collected and paid over. If a deficiency shall exist, in consequence of the receipt of less than one-third of the cost from the State, the said board of chosen freeholders shall have authority to borrow, on temporary loans, such deficiency, until such time as the same shall be paid by the State, as provided by section three of this act.

Collection of  
assessment.

If deficiency  
temporary  
loan.

Turnpike ac-  
quired free  
of indebted-  
ness.

5. Any board of chosen freeholders that shall enter into an agreement for the purchase of a turnpike or toll road or portion thereof, in accordance with the provisions of this act, shall, on or before making payment for the same, require the turnpike or toll road or portion thereof so purchased to be released and discharged from the lien of any mortgage given to secure a bonded or other indebtedness, and from any other lien or incumbrance whatsoever.

6. This act shall take effect immediately.

Approved April 18, 1905.

# COMMISSIONER OF PUBLIC ROADS.

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## CHAPTER 145.

an act to amend the title of and a supplement to an act entitled "An act to provide for the purchase, by boards of chosen freeholders, of turnpike or toll roads, or portions thereof, which have been improved by the construction thereon of a macadam, telford, rubble or other stone road, for free public use as county roads, and for the repair, improvement and maintenance of the same," approved April eighteenth, nineteen hundred and five.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. The title of the act to which this is a supplement is hereby amended to read as follows, to wit:

Title amended to read.

An act to provide for the purchase or condemnation, by boards of chosen freeholders, of turnpike or toll roads, or portions thereof, which have been improved by the construction thereon of a macadam, telford, rubble or other stone road, for free public use as county roads, and for the repair, improvement and maintenance of the same.

2. Whenever the board of chosen freeholders of any county shall be unable to agree with the owner or owners of any turnpike or toll road, or portion thereof, lying within such county and being not less than one mile in length, which has been improved by the construction thereon of a macadam, telford, rubble or other stone road, upon the price to be paid for the same, and shall by resolution adjudge it to be advisable that the same should be required for free public use, notwithstanding such inability to agree upon a price for the same, it shall and may be lawful, and such board of chosen freeholders is hereby authorized and empowered, upon receiving the approval, in writing, of the State Commissioner of Public Roads, to condemn such turnpike or toll road, or portion thereof, lying within such county, in the manner provided by the act of the Legislature entitled "An act to regulate the

Condemnation of turnpikes by counties.

Action approved by road commissioner.

ascertainment and payment of compensation for property condemned or taken for public use" (Revision of 1900), approved March twentieth, one thousand nine hundred, and the acts amendatory thereof and supplemental thereto.

Borrow  
money to  
make pay-  
ment.

3. Upon the filing of the report of the commissioners, and the approval, in writing, of the State Commissioner of Public Roads, such board of chosen freeholders is hereby empowered to borrow temporarily, upon the credit of the county, such sum or sums of money as shall be necessary to pay, in the first instance, the amount awarded by said commissioners, but one-third of the cost of any turnpike or toll road, or portion thereof, condemned in accordance with the provisions of this act shall be paid out of the state road appropriation, as provided by the act to which this is a supplement, in case of the purchase thereof.

State's share  
one-third.

Liability of  
subdivisions  
of county.

4. Any board of chosen freeholders may, before commencing such condemnation proceedings, require that each township or other municipality in which such turnpike or toll road, or portion thereof, lies shall agree to assume and pay ten per centum of the cost of the part or portion of such turnpike or toll road lying within such township or other municipality.

Collection of  
county's  
share by  
taxation.

5. Two-thirds of the cost of any turnpike or toll road, or portion thereof, condemned in accordance with the provisions of this act, less the sum or sums assumed and paid by any township or other municipality as herein provided, shall be certified to the county board of assessors, and assessed and collected in the manner provided by the fourth section of the act to which this a supplement.

6. This act shall take effect immediately.

Approved April 20, 1906.



**VIADUCT.****CHAPTER 31.**

An act to amend an act entitled "An act to enable the board of chosen freeholders of any county in this State to erect, construct and maintain a viaduct between two or more municipalities in such county, connecting streets or roads of such county or municipalities, and to extend roads to connect with such viaduct, and to acquire lands for the same, and to issue bonds for the payment of the cost of the erection, construction and acquisition thereof," approved March twenty-eighth, one thousand nine hundred and four.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. Section two (2) of the act to which this is an amendment be and the same is hereby amended to read as follows:

Section  
amended.

2. If, in the judgment of such board, it is wise and expedient to erect such viaduct at a point where it does not connect at one or more ends with a public highway, then it shall and may be lawful for such board to construct and maintain a road or roads from either one or more ends of such viaduct, to connect with a street or streets, road or roads, of such county or municipalities; and such viaduct proper and the road or roads so constructed shall be considered and classed as a viaduct within the meaning of this act; and wherever in this act the word "viaduct" is used it shall be construed, treated and considered as referring to such viaduct proper as well as the road or roads which may be constructed at either one or more ends thereof as aforesaid. If in the construction of such viaduct it becomes necessary to construct the elevated portion thereof through a portion of the length of any street or road of any municipality, it shall be lawful for said board to take and use such portion of such street or road for such elevated structure, and divert and continue such

Lawful to  
construct  
connecting  
roads.

Use of street  
for elevated  
structure.

Care of diverted portion. street or road to and on either side of such elevated structure, and improve the portion so diverted and continued in the same manner that the said street or road was theretofore improved, and thereafter such portion of such street or road so diverted and continued shall become and be a road of the municipality, and under the care, custody and control thereof.

Section amended. 2. Section four (4) of the act to which this is an amendment be and the same is hereby amended to read as follows:

Freeholders may acquire lands. 4. If it shall become necessary to acquire lands for the building of such viaduct, or for the diversion and continuance of a street or road on either side of the elevated portion of such viaduct, the board of chosen freeholders of such county is authorized to acquire such lands by gift, grant, purchase or in the manner set out under the act entitled "An act to regulate the ascertainment and payment of compensation for property condemned or taken for public use," approved March twentieth, one thousand nine hundred (Revision of 1900), and the supplements thereto and amendments thereof, and the title to the lands shall be taken in the name of such board.

Section amended. 3. Section five (5) of the act to which this is an amendment be and the same is hereby amended to read as follows:

Total expenses allowable. 5. The total expense of viaducts contracted to be built under this act in any one year shall not exceed one-fourth of one per centum of the ratables of such county, as ascertained for the then current fiscal year; nor shall there be issued for the erection of viaducts under this act in any period of five years bonds in the aggregate to exceed one-fourth of one per centum of the ratables as aforesaid.

Section amended. 4. Section six (6) of the act to which this is an amendment be and the same is hereby amended to read as follows:

May issue bonds. 6. If, in the opinion of the board of chosen freeholders of such county, to place the entire cost of such viaduct including the acquisition of lands authorized hereunder and the improvement of any street or road diverted and continued as aforesaid, in the tax levy for any one fiscal

year would be too burdensome to the taxpayers of such county, it shall and may be lawful for such board to issue the bonds of such county to defray the expense thereof, which said bonds shall be of the denomination of one thousand dollars each, and be registered or coupon, as such board may determine, and shall bear interest at a Rate; time. rate not exceeding four per centum per annum, payable semi-annually, and shall run for a period not exceeding thirty years, and shall be signed by the director and clerk of such board and countersigned by the county collector, and shall be sold at public sale to the highest bidder for not less than par; and said county shall annually thereafter place in the tax levy a sum sufficient to pay the interest on such bonds as they mature, and shall likewise Sinking fund. create a sinking fund for the payment of said bonds at maturity, and place in the tax levy annually thereafter a sum sufficient, with the accumulations thereof, to pay off and discharge said bonds at maturity; or the board, in its judgment, may, from time to time, place part of such cost in the tax levy year by year, and raise part only of said cost by the issue of the bonds aforesaid. If the board should at any time, or from time to time, pass a resolution or resolutions to place in the tax levy a certain sum to be used for the purposes authorized and mentioned in this act and the act amended hereby, such moneys shall be available forthwith, and the board may raise such sum Temporary loan bond. by the issue of temporary loan bond or bonds, to run not exceeding two years, and to bear interest not exceeding the rate of five per centum per annum, in anticipation of the collection of such taxes; and at the time of making How met. up the next tax budget of such county after the passage of such resolution or resolutions said board shall, pursuant to said resolution or resolutions, place therein a sum sufficient to pay off and discharge said temporary loan bond or bonds at maturity, with the interest thereon, as it accrues.

5. This act shall take effect immediately.

Approved April 9, 1907.



An act for the better protection of travelers, pedestrians, vehicles and animals on the public streets and highways.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

Penalty for placing glass, bottles, &c., upon public highways.

1. Whoever places upon the surface of any public street, highway or other way customarily and lawfully used for public travel, or upon any sidewalk appurtenant to such way, any broken glass, bottle, metal, loose stones, earthenware, or other substance of a nature likely to cause injury to travelers or pedestrians, or to carriages, bicycles or other vehicles traveling or moving on said way, or which might wound, disable or injure any horse or other animal, or which might injure, cut or puncture any pneumatic tire, shall forfeit for each offense five dollars, to be sued for and recovered in an action of debt by any person who will sue for the same.

Broken stone of dimension one inch or more placed on highways to be covered.

2. Any overseer of the highways, committeeman, contractor, or other person whomsoever, who shall place or spread broken stone on any of the highways of this State, for the purpose of improving or repairing the same, shall, if such stone be of the dimension of an inch and one-half or more in diameter, cause the same to be covered with fine stone, earth or screenings, within such period of time as it shall be possible to obtain such fine stone, earth or screenings after said broken stones are spread upon said road, unless prevented by causes beyond his control, under a penalty of twenty dollars for each offense, to be sued for in an action of debt and recovered, with costs, by any person who shall be injuriously affected by the willful neglect or failure to cover said stone as herein provided.

3. This act shall take effect immediately.

Approved May 12, 1896.

# COMMISSIONER OF PUBLIC ROADS.

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## CHAPTER 98.

Further supplement to an act entitled "An act concerning roads," approved April sixteenth, one thousand eight hundred and forty-six.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

1. The owner or occupant of land abutting on any highway in any township in this State shall, during the month of September of each year, cut and remove all brush, briars and weeds growing in or upon such portion of such highway as his or her lands abut upon, and in case such owner or occupant shall fail to perform the duty imposed hereby, the township committee of the township in which such lands abut as aforesaid shall cause such work to be done, and the owner of such lands shall pay the expense thereof, with costs, to be recovered in an action upon contract before any justice of the peace of the county at the suit of such township committee.

Highway must be kept clear of weeds, &c.

2. This act shall take effect immediately.

Approved March 23, 1900.

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## LAYING OUT ROADS.

Receiving many inquiries how to proceed to lay out roads, change location, etc., to save correspondence we give the following quotations from the statutes:

### *Laying Out Roads by Freeholders After General Election.*

It shall be lawful for the board of chosen freeholders of any of the several counties of this State, when said board deems it for the best interests of such county, to lay out, construct and maintain public roads extending

through such county in any direction, to submit, by resolution, the question whether or not such public roads shall be laid out to the electors of said county, at an election to be held at the same time and place of holding the general election in and for said county for members of the General Assembly of this State, by the same officers, but in separate ballot-box, and if at such election a majority of the electors shall vote "against public roads," nothing in this act shall apply or be effective in said county; but if a majority of the electors vote "in favor of public roads," then the board shall proceed as directed by the act entitled "An act to authorize the board of chosen freeholders of any of the several counties of this State to lay out, open, construct, improve and maintain a public road therein," approved April 7th, 1888. P. L. 1888, page 397.

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LAYING OUT, VACATING OR ALTERING PUBLIC ROADS BY  
SURVEYORS OF HIGHWAYS. (Revised Statutes,  
page 2828-119, Sec. 1.)

That when ten or more persons, being freeholders, shall think a public road necessary, or any public road which hath been or shall be laid out unnecessary, or any alteration in such road necessary in any part of the county in which they reside, it shall be lawful for the said persons to make application, in writing, to the Inferior Court of Common Pleas of the said county, in open court, having given previous notice for at least ten days of such intended application, and also of the day on which such application is intended to be made, by advertisements, under their hands, and set up at three of the most public places in the township in which the said road is proposed to be laid out, vacated or altered, and if there be more townships than one through which the said road may run, by advertisements, to be set up at three of the most public places in each township; and the said court, when applied to as aforesaid, on due proof being made that the



advertisements have been set up according to law, on which the judgment of the court shall be final and conclusive, are hereby authorized and required to appoint six of the surveyors of the highways of the said county, ever having regard to the appointment of the surveyors of the highways of the township or townships where the said road shall be so applied for to be laid out, vacated or altered; *provided*, that no surveyor shall be appointed through whose land the road may run, or who for any other reason which the court in their discretion shall deem sufficient, think ought not to be appointed; and the said surveyors shall meet at such time and place as the said court shall direct, a copy of which appointment shall be served on each of the said surveyors at least six days prior to the time of their meeting; and two of the said applicants shall, at least twelve days prior to the said time, sign and set up advertisements at three of the most public places in the said township or townships, setting forth the time and place of the meeting of the surveyors agreeably to the directions of the court, and designating the points or places from and to which the said road is proposed to be laid out, vacated or altered. (See Secs. 138 and 168, *post*.)

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VACATING AND RELAYING OF PUBLIC ROADS BY FILING  
CONSENT WITH CLERK AND RECORDING.

138. Sec. 1. That whenever ten or more persons, being freeholders, shall think any alteration of any public road necessary in any part of the county wherein they reside, by having such road or a portion thereof vacated, and the same relaid or another road substituted therefor, they may make application in writing to the Inferior Court of Common Pleas of such county, or to one of the judges thereof, setting forth in writing the road or portion thereof as aforesaid which it is proposed to have vacated, describing the same by courses and distances, and also describing the road as it is to be relaid, or the road which is to be

substituted therefor, to which description there shall be attached a map showing the location of the road or portion of the road to be vacated and the road as relaid, or the road which is to be substituted therefor; and if within ten days after such application shall have been made as aforesaid, or if at the time of making such application there shall be presented to said court or judge the consent in writing of the owners of all the lands intersected by such old road or portion thereof proposed to be vacated, and of all the property intersected by the road as proposed to be relaid, or by the road which it is proposed to substitute therefor, and also the written consent of the township committee of the township wherein such road or roads do lie, that said application shall be granted, then it shall be lawful for said court or judge to cause said application, with the accompanying survey, map and return, and the written consents of the owners of lands as aforesaid, and of the township committee, to be filed with the clerk of the county, to be by him recorded in the book of roads for said county; and when said application and other papers shall have been so filed, such old road or portion thereof shall thereupon and thereby be deemed to be vacated, and the road as relaid, or the new road substituted therefor, shall thereupon and thereby be deemed and taken to be a public road.

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VACATION OF PUBLIC ROADS BY CONSENT AND FILING  
WITH COUNTY CLERK.

186. Sec. 1. That whenever ten or more persons, being freeholders, shall think the vacation of a part of any public road necessary in any part of the county wherein they reside, they may make application in writing to the Inferior Court of Common Pleas of such county or to one of the judges thereof, setting forth in writing the road or portion thereof which it is proposed to have vacated, describing the same by courses and distances, to which description there shall be attached a map showing the loca-

## COMMISSIONER OF PUBLIC ROADS.

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tion of the road or portion thereof to be vacated, and if within ten days after such application shall have been made as aforesaid, or if at the time of making such application, there shall be presented to said court or judge the consent in writing of the owners of all the lands by such old road or portion thereof proposed to be vacated, and also the written consent of the township committee of the township wherein such lands do lie, that such application shall be granted, then it shall be lawful for said court or judge to cause said application, with the accompanying survey, map and return, and the written consents of the owners of lands as aforesaid, and of the township committee to be filed with the clerk of the county, to be by him recorded in the book of roads for said county, and when said application and papers have been so filed, such portion of such old road shall thereupon and thereby be deemed to be vacated; *provided*, that no portion of any old road proposed to be vacated under this act shall exceed one thousand yards in length.



## Appendix C.

### NUMBER OF TONS OF STONE PER MILE REQUIRED TO BUILD THE FOLLOWING DEPTHS AND WIDTHS.

For the information of intending road builders, we have compiled the following tables, which approximate the number of tons of thoroughly rolled stone necessary to construct each mile at the designated depths and widths.

The basis is 3,000 tons of loose stone or 3,500 tons of compressed stone for a road one mile long, sixteen feet wide and eight inches deep. A road eight inches deep, when finished, will have required at least ten inches of stone. It should be placed in two layers of five inches each, and each layer rolled down to four inches. Then the application of the three-quarter inch and screenings will bring the road to the prescribed depth; for other thickness the stone should be placed in proportion to the intended finished depths.

An observance of this rule will insure the contract thickness for the roadbed, and save the sometimes necessary expense of resurfacing before acceptance from the contractor.

A road 8 feet wide and 4 inches deep will require 875 tons of stone per mile.

"	8	"	"	6	"	"	1,312½	"	"	"
"	8	"	"	8	"	"	1,750	"	"	"
"	8	"	"	10	"	"	2,187½	"	"	"
"	8	"	"	12	"	"	2,625	"	"	"
"	9	"	"	4	"	"	984¾	"	"	"
"	9	"	"	6	"	"	1,476 <sup>9</sup> / <sub>16</sub>	"	"	"
"	9	"	"	8	"	"	1,968¾	"	"	"
"	9	"	"	10	"	"	2,460 <sup>15</sup> / <sub>16</sub>	"	"	"
"	9	"	"	12	"	"	2,953¾	"	"	"
"	10	"	"	4	"	"	1,093¾	"	"	"
"	10	"	"	6	"	"	1,640 <sup>5</sup> / <sub>8</sub>	"	"	"
"	10	"	"	8	"	"	2,187½	"	"	"
"	10	"	"	10	"	"	2,734¾	"	"	"
"	10	"	"	12	"	"	3,281¼	"	"	"

A road 11 feet wide and 4 inches deep will require 1,203 $\frac{1}{8}$  tons of stone per m

"	11	"	"	6	"	"	1,804 $\frac{11}{16}$	"	"	"
"	11	"	"	8	"	"	2,406 $\frac{1}{4}$	"	"	"
"	11	"	"	10	"	"	3,007 $\frac{13}{16}$	"	"	"
"	11	"	"	12	"	"	3,609 $\frac{3}{8}$	"	"	"
"	12	"	"	4	"	"	1,312 $\frac{1}{2}$	"	"	"
"	12	"	"	6	"	"	1,968 $\frac{3}{4}$	"	"	"
"	12	"	"	8	"	"	2,625	"	"	"
"	12	"	"	10	"	"	3,281 $\frac{1}{4}$	"	"	"
"	12	"	"	12	"	"	3,937 $\frac{1}{2}$	"	"	"
"	13	"	"	4	"	"	1,421 $\frac{7}{8}$	"	"	"
"	13	"	"	6	"	"	2,132 $\frac{13}{16}$	"	"	"
"	13	"	"	8	"	"	2,843 $\frac{3}{4}$	"	"	"
"	13	"	"	10	"	"	3,554 $\frac{11}{16}$	"	"	"
"	13	"	"	12	"	"	4,265 $\frac{5}{8}$	"	"	"
"	14	"	"	4	"	"	1,531 $\frac{1}{4}$	"	"	"
"	14	"	"	6	"	"	2,296 $\frac{7}{8}$	"	"	"
"	14	"	"	8	"	"	3,062 $\frac{1}{2}$	"	"	"
"	14	"	"	10	"	"	3,828 $\frac{1}{8}$	"	"	"
"	14	"	"	12	"	"	4,593 $\frac{3}{4}$	"	"	"
"	15	"	"	4	"	"	1,640 $\frac{5}{8}$	"	"	"
"	15	"	"	6	"	"	2,460 $\frac{13}{16}$	"	"	"
"	15	"	"	8	"	"	3,281 $\frac{1}{4}$	"	"	"
"	15	"	"	10	"	"	4,101 $\frac{9}{16}$	"	"	"
"	15	"	"	12	"	"	4,921 $\frac{7}{8}$	"	"	"
"	16	"	"	4	"	"	1,750	"	"	"
"	16	"	"	6	"	"	2,625	"	"	"
"	16	"	"	8	"	"	3,500	"	"	"
"	16	"	"	10	"	"	4,375	"	"	"
"	16	"	"	12	"	"	5,250	"	"	"
"	17	"	"	4	"	"	1,859 $\frac{3}{8}$	"	"	"
"	17	"	"	6	"	"	2,789 $\frac{1}{10}$	"	"	"
"	17	"	"	8	"	"	3,718 $\frac{3}{4}$	"	"	"
"	17	"	"	10	"	"	4,648 $\frac{7}{10}$	"	"	"
"	17	"	"	12	"	"	5,578 $\frac{1}{8}$	"	"	"
"	18	"	"	4	"	"	1,968 $\frac{3}{4}$	"	"	"
"	18	"	"	6	"	"	2,953 $\frac{1}{8}$	"	"	"
"	18	"	"	8	"	"	3,937 $\frac{1}{2}$	"	"	"
"	18	"	"	10	"	"	4,921 $\frac{7}{8}$	"	"	"
"	18	"	"	12	"	"	5,906 $\frac{1}{4}$	"	"	"
"	19	"	"	4	"	"	2,078 $\frac{1}{8}$	"	"	"
"	19	"	"	6	"	"	3,117 $\frac{3}{16}$	"	"	"
"	19	"	"	8	"	"	4,156 $\frac{1}{4}$	"	"	"
"	19	"	"	10	"	"	5,195 $\frac{5}{16}$	"	"	"
"	19	"	"	12	"	"	6,234 $\frac{3}{8}$	"	"	"

A road 20 feet wide and 4 inches deep will require	2,187½	tons of stone per mile.
“ 20 “ “ 6 “ “	3,281¼	“ “ “
“ 20 “ “ 8 “ “	4,375	“ “ “
“ 20 “ “ 10 “ “	5,468¾	“ “ “
“ 20 “ “ 12 “ “	6,562½	“ “ “

## TABLES.

As many persons interested in the construction of stone roads are asking questions about their cost, we enclose a table to show at a glance the number of square yards at different widths in a mile of road; also the cost at different widths, and various prices per square yard. Any variations from these prices can be quickly ascertained by adding, subtracting, multiplying and dividing for a less or greater width. For example, a road eight feet wide has  $4,693\frac{1}{3}$  square yards in one mile. To obtain the number of square yards in a road having a width of nine feet, add one-eighth to the foregoing figures, and in one having a width of seven feet, subtract one-eighth; in one of twice the width given in the table, multiply by two.

SQUARE YARDS IN ONE MILE OF

8	feet in width	4,693 <sup>1</sup> / <sub>3</sub>	square yards.	4,693 <sup>1</sup> / <sub>3</sub>	square yards.
10	"	5,866 <sup>2</sup> / <sub>3</sub>	"	5,866 <sup>2</sup> / <sub>3</sub>	"
12	"	7,040	"	7,040	"
14	"	8,213 <sup>1</sup> / <sub>3</sub>	"	8,213 <sup>1</sup> / <sub>3</sub>	"
16	"	9,386 <sup>2</sup> / <sub>3</sub>	"	9,386 <sup>2</sup> / <sub>3</sub>	"
18	"	10,560	"	10,560	"
8	feet wide, or	4,693 <sup>1</sup> / <sub>3</sub>	square yards, at 25c. per yard	\$1,173	33 <sup>1</sup> / <sub>3</sub>
10	"	5,866 <sup>2</sup> / <sub>3</sub>	" 25c. "	1,466	66 <sup>2</sup> / <sub>3</sub>
12	"	7,040	" 25c. "	1,760	00
14	"	8,213 <sup>1</sup> / <sub>3</sub>	" 25c. "	2,053	33 <sup>1</sup> / <sub>3</sub>
16	"	9,386 <sup>2</sup> / <sub>3</sub>	" 25c. "	2,346	66 <sup>2</sup> / <sub>3</sub>
18	"	10,560	" 25c. "	2,640	00
8	"	4,693 <sup>1</sup> / <sub>3</sub>	" 30c. "	1,408	00
10	"	5,866 <sup>2</sup> / <sub>3</sub>	" 30c. "	1,760	00
12	"	7,040	" 30c. "	2,112	00
14	"	8,213 <sup>1</sup> / <sub>3</sub>	" 30c. "	2,464	00
16	"	9,386 <sup>2</sup> / <sub>3</sub>	" 30c. "	2,816	00
18	"	10,560	" 30c. "	3,168	00



8 feet wide, or	4,693 $\frac{1}{3}$	square yards, at 35c. per yard.....	\$1,642 66 $\frac{2}{3}$ / <sub>3</sub>
10 "	5,866 $\frac{2}{3}$	" 35c. " .....	2,053 33 $\frac{1}{3}$ / <sub>3</sub>
12 "	7,040	" 35c. " .....	2,464 00
14 "	8,213 $\frac{1}{3}$	" 35c. " .....	2,874 66 $\frac{2}{3}$ / <sub>3</sub>
16 "	9,386 $\frac{2}{3}$	" 35c. " .....	3,285 33 $\frac{1}{3}$ / <sub>3</sub>
18 "	10,560	" 35c. " .....	3,696 00
8 "	4,693 $\frac{1}{3}$	" 40c. " .....	1,877 33 $\frac{1}{3}$ / <sub>3</sub>
10 "	5,866 $\frac{2}{3}$	" 40c. " .....	2,346 66 $\frac{2}{3}$ / <sub>3</sub>
12 "	7,040	" 40c. " .....	2,816 00
14 "	8,213 $\frac{1}{3}$	" 40c. " .....	3,285 33 $\frac{1}{3}$ / <sub>3</sub>
16 "	9,386 $\frac{2}{3}$	" 40c. " .....	3,754 66 $\frac{2}{3}$ / <sub>3</sub>
18 "	10,560	" 40c. " .....	4,224 00
8 "	4,693 $\frac{1}{3}$	" 45c. " .....	2,112 00
10 "	5,866 $\frac{2}{3}$	" 45c. " .....	2,640 00
12 "	7,040	" 45c. " .....	3,168 00
14 "	8,213 $\frac{1}{3}$	" 45c. " .....	3,696 00
16 "	9,386 $\frac{2}{3}$	" 45c. " .....	4,224 00
18 "	10,560	" 45c. " .....	4,752 00
8 "	4,693 $\frac{1}{3}$	" 50c. " .....	2,346 66 $\frac{2}{3}$ / <sub>3</sub>
10 "	5,866 $\frac{2}{3}$	" 50c. " .....	2,933 33 $\frac{1}{3}$ / <sub>3</sub>
12 "	7,040	" 50c. " .....	3,520 00
14 "	8,213 $\frac{1}{3}$	" 50c. " .....	4,106 66 $\frac{2}{3}$ / <sub>3</sub>
16 "	9,386 $\frac{2}{3}$	" 50c. " .....	4,693 33 $\frac{1}{3}$ / <sub>3</sub>
18 "	10,560	" 50c. " .....	5,280 00
8 "	4,693 $\frac{1}{3}$	" 55c. " .....	2,581 33 $\frac{1}{3}$ / <sub>3</sub>
10 "	5,866 $\frac{2}{3}$	" 55c. " .....	3,226 66 $\frac{2}{3}$ / <sub>3</sub>
12 "	7,040	" 55c. " .....	3,872 00
14 "	8,213 $\frac{1}{3}$	" 55c. " .....	4,517 33 $\frac{1}{3}$ / <sub>3</sub>
16 "	9,386 $\frac{2}{3}$	" 55c. " .....	5,162 66 $\frac{2}{3}$ / <sub>3</sub>
18 "	10,560	" 55c. " .....	5,808 00
8 "	4,693 $\frac{1}{3}$	" 60c. " .....	2,816 00
10 "	5,866 $\frac{2}{3}$	" 60c. " .....	3,520 00
12 "	7,040	" 60c. " .....	4,224 00
14 "	8,213 $\frac{1}{3}$	" 60c. " .....	4,928 00
16 "	9,386 $\frac{2}{3}$	" 60c. " .....	5,632 00
18 "	10,560	" 60c. " .....	6,336 00
8 "	4,693 $\frac{1}{3}$	" 65c. " .....	3,050 66 $\frac{2}{3}$ / <sub>3</sub>
10 "	5,866 $\frac{2}{3}$	" 65c. " .....	3,813 33 $\frac{1}{3}$ / <sub>3</sub>
12 "	7,040	" 65c. " .....	4,576 00
14 "	8,213 $\frac{1}{3}$	" 65c. " .....	5,338 66 $\frac{2}{3}$ / <sub>3</sub>
16 "	9,386 $\frac{2}{3}$	" 65c. " .....	6,101 33 $\frac{1}{3}$ / <sub>3</sub>
18 "	10,560	" 65c. " .....	6,864 00

## COMMISSIONER OF PUBLIC ROADS.

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feet wide, or	4,693 $\frac{1}{3}$	square yards, at	70c. per yard.....	\$3,285	33 $\frac{1}{3}$ / <sub>3</sub>
"	5,866 $\frac{2}{3}$	"	70c. " .....	4,106	66 $\frac{2}{3}$ / <sub>3</sub>
"	7,040	"	70c. " .....	4,928	00
"	8,213 $\frac{1}{3}$	"	70c. " .....	5,749	33 $\frac{1}{3}$ / <sub>3</sub>
"	9,386 $\frac{2}{3}$	"	70c. " .....	6,570	66 $\frac{2}{3}$ / <sub>3</sub>
"	10,560	"	70c. " .....	7,392	00
"	4,693 $\frac{1}{3}$	"	75c. " .....	3,520	00
"	5,866 $\frac{2}{3}$	"	75c. " .....	4,400	00
"	7,040	"	75c. " .....	5,280	00
"	8,213 $\frac{1}{3}$	"	75c. " .....	6,160	00
"	9,386 $\frac{2}{3}$	"	75c. " .....	7,040	00
"	10,560	"	75c. " .....	7,920	00
"	4,693 $\frac{1}{3}$	"	80c. " .....	3,754	66 $\frac{2}{3}$ / <sub>3</sub>
"	5,866 $\frac{2}{3}$	"	80c. " .....	4,693	33 $\frac{1}{3}$ / <sub>3</sub>
"	7,040	"	80c. " .....	5,632	00
"	8,213 $\frac{1}{3}$	"	80c. " .....	6,570	66 $\frac{2}{3}$ / <sub>3</sub>
"	9,386 $\frac{2}{3}$	"	80c. " .....	7,509	33 $\frac{1}{3}$ / <sub>3</sub>
"	10,560	"	80c. " .....	8,448	00
"	4,693 $\frac{1}{3}$	"	85c. " .....	3,989	33 $\frac{1}{3}$ / <sub>3</sub>
"	5,866 $\frac{2}{3}$	"	85c. " .....	4,986	66 $\frac{2}{3}$ / <sub>3</sub>
"	7,040	"	85c. " .....	5,984	00
"	8,213 $\frac{1}{3}$	"	85c. " .....	6,981	33 $\frac{1}{3}$ / <sub>3</sub>
"	9,386 $\frac{2}{3}$	"	85c. " .....	7,978	66 $\frac{2}{3}$ / <sub>3</sub>
"	10,560	"	85c. " .....	8,976	00
"	4,693 $\frac{1}{3}$	"	90c. " .....	4,224	00
"	5,866 $\frac{2}{3}$	"	90c. " .....	5,280	00
"	7,040	"	90c. " .....	6,336	00
"	8,213 $\frac{1}{3}$	"	90c. " .....	7,392	00
"	9,386 $\frac{2}{3}$	"	90c. " .....	8,448	00
"	10,560	"	90c. " .....	9,504	00
"	4,693 $\frac{1}{3}$	"	95c. " .....	4,458	66 $\frac{2}{3}$ / <sub>3</sub>
"	5,866 $\frac{2}{3}$	"	95c. " .....	5,573	33 $\frac{1}{3}$ / <sub>3</sub>
"	7,040	"	95c. " .....	6,688	00
"	8,213 $\frac{1}{3}$	"	95c. " .....	7,802	66 $\frac{2}{3}$ / <sub>3</sub>
"	9,386 $\frac{2}{3}$	"	95c. " .....	8,917	33 $\frac{1}{3}$ / <sub>3</sub>
"	10,560	"	95c. " .....	10,032	00
"	4,693 $\frac{1}{3}$	"	\$1.00 " .....	4,693	33 $\frac{1}{3}$ / <sub>3</sub>
"	5,866 $\frac{2}{3}$	"	1.00 " .....	5,866	66 $\frac{2}{3}$ / <sub>3</sub>
"	7,040	"	1.00 " .....	7,040	00
"	8,213 $\frac{1}{3}$	"	1.00 " .....	8,213	33 $\frac{1}{3}$ / <sub>3</sub>
"	9,386 $\frac{2}{3}$	"	1.00 " .....	9,386	66 $\frac{2}{3}$ / <sub>3</sub>
"	10,560	"	1.00 " .....	10,560	00

## TABLE FOR GRAVEL.

Table showing number of cubic yards of gravel required in the construction of one mile of gravel road, of widths varying from 6 feet to 20 feet, and depths from 6 to 12 inches. The within quantities should be multiplied by  $1\frac{1}{2}$  to give the number of cubic yards of loose gravel required to make the within depths of compact gravel.

ONE MILE IN LENGTH.	Number of feet in width.	Number of cubic yards in road 6 inches deep.	Number of cubic yards in road 7 inches deep.	Number of cubic yards in road 8 inches deep.	Number of cubic yards in road 9 inches deep.	Number of cubic yards in road 10 inches deep.	Number of cubic yards in road 11 inches deep.	Number of cubic yards in road 12 inches deep.
One mile.....	6 feet wide.....	586 $\frac{3}{4}$	684 $\frac{1}{2}$	782 $\frac{3}{4}$	880	977 $\frac{1}{2}$	1,075 $\frac{1}{2}$	1,173 $\frac{1}{2}$
One mile.....	7 feet wide.....	684 $\frac{3}{4}$	798 $\frac{1}{2}$	912 $\frac{3}{4}$	1,026 $\frac{3}{4}$	1,140 $\frac{3}{4}$	1,254 $\frac{3}{4}$	1,368 $\frac{3}{4}$
One mile.....	8 feet wide.....	782 $\frac{3}{4}$	912 $\frac{1}{2}$	1,042 $\frac{3}{4}$	1,173 $\frac{1}{2}$	1,303 $\frac{1}{2}$	1,434 $\frac{1}{2}$	1,564 $\frac{1}{2}$
One mile.....	9 feet wide.....	880	1,026 $\frac{3}{4}$	1,173 $\frac{3}{4}$	1,320	1,466 $\frac{3}{4}$	1,613 $\frac{3}{4}$	1,760
One mile.....	10 feet wide.....	977 $\frac{1}{2}$	1,140 $\frac{3}{4}$	1,303 $\frac{3}{4}$	1,466 $\frac{3}{4}$	1,629 $\frac{1}{2}$	1,792 $\frac{1}{2}$	1,955 $\frac{1}{2}$
One mile.....	11 feet wide.....	1,075 $\frac{1}{2}$	1,254 $\frac{3}{4}$	1,434 $\frac{3}{4}$	1,613 $\frac{3}{4}$	1,792 $\frac{1}{2}$	1,971 $\frac{1}{2}$	2,151 $\frac{1}{2}$
One mile.....	12 feet wide.....	1,173 $\frac{1}{2}$	1,368 $\frac{3}{4}$	1,564 $\frac{3}{4}$	1,760	1,955 $\frac{1}{2}$	2,151 $\frac{1}{2}$	2,346 $\frac{1}{2}$
One mile.....	13 feet wide.....	1,271 $\frac{1}{2}$	1,482 $\frac{3}{4}$	1,694 $\frac{3}{4}$	1,906 $\frac{3}{4}$	2,118 $\frac{1}{2}$	2,330 $\frac{1}{2}$	2,542 $\frac{1}{2}$
One mile.....	14 feet wide.....	1,368 $\frac{3}{4}$	1,597 $\frac{1}{2}$	1,825 $\frac{3}{4}$	2,053 $\frac{3}{4}$	2,281 $\frac{1}{2}$	2,509 $\frac{1}{2}$	2,737 $\frac{1}{2}$
One mile.....	15 feet wide.....	1,466 $\frac{3}{4}$	1,711 $\frac{1}{2}$	1,955 $\frac{3}{4}$	2,200	2,444 $\frac{1}{2}$	2,688 $\frac{1}{2}$	2,933 $\frac{1}{2}$
One mile.....	16 feet wide.....	1,564 $\frac{3}{4}$	1,825 $\frac{3}{4}$	2,085 $\frac{3}{4}$	2,346 $\frac{3}{4}$	2,607 $\frac{1}{2}$	2,868 $\frac{1}{2}$	3,128 $\frac{1}{2}$
One mile.....	17 feet wide.....	1,662 $\frac{3}{4}$	1,919 $\frac{1}{2}$	2,216 $\frac{3}{4}$	2,493 $\frac{1}{2}$	2,770 $\frac{1}{2}$	3,047 $\frac{1}{2}$	3,324 $\frac{1}{2}$
One mile.....	18 feet wide.....	1,760	2,053 $\frac{3}{4}$	2,346 $\frac{3}{4}$	2,640	2,933 $\frac{1}{2}$	3,226 $\frac{1}{2}$	3,520
One mile.....	19 feet wide.....	1,857 $\frac{1}{2}$	2,167 $\frac{1}{2}$	2,477 $\frac{1}{2}$	2,786 $\frac{3}{4}$	3,096 $\frac{3}{4}$	3,405 $\frac{5}{8}$	3,715 $\frac{5}{8}$
One mile.....	20 feet wide.....	1,955 $\frac{1}{2}$	2,281 $\frac{1}{2}$	2,607 $\frac{1}{2}$	2,933 $\frac{1}{2}$	3,259 $\frac{1}{2}$	3,585 $\frac{1}{2}$	3,911 $\frac{1}{2}$



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