

Grover's Mill Road, Mercer County, Before Improvement.



Grover's Mill Road, Mercer County, After Improvement.

TWELFTH ANNUAL REPORT

OF THE

Commissioner of Public Roads

FOR THE YEAR ENDING OCTOBER 31

1905

TRENTON, N. J.
MACBELLISH & QUIGLEY, STATE PRINTERS.

1906

OFFICE OF COMMISSIONER OF PUBLIC ROADS,
TRENTON, NEW JERSEY, December 19, 1905.

To His Excellency, Edward C. Stokes, Governor, and the Legislature of New Jersey:

I have the honor to submit the twelfth annual report of the Commissioner of Public Roads for the fiscal year ending October 31, 1905, with such comments, quotations and suggestions as existing circumstances seem to require.

E. C. HUTCHINSON,
Commissioner of Public Roads.

REPORT.

Road Improvement in New Jersey for the Year 1905.

The following is a condensed account of the road work done under the State Aid Law in the different counties this year:

Atlantic county completed the boulevard across the meadows from Pleasantville to Atlantic City. This work has been in process of construction since October, 1902, and its completion means much to Atlantic City, especially since the advent of the automobile. In fact, the owners of these machines could hardly wait for its completion, and are attesting their appreciation of it, by constant use. In addition to the motorists, the farmers and drivers of all kinds of vehicles are seen upon the road from morning until night. No new road we have ever built has had such immediate and constant use as this. The fact is easily explained when we recall that this is the only good road between Atlantic City and the main shore. Its entire length, including the extension through Chelsea Heights, is 4.51 miles, 3 miles of which were paid for in previous years, leaving 1.51 miles to be paid for this year.

Bergen is unique among the counties of the State, inasmuch as it builds no roads under the provisions of the State Aid Law, leaving this work entirely to its boroughs, villages and townships. The only road constructed under State supervision in this county this year was Midland avenue, which was built by the township of the same name. Its 2.22 miles connects the improvements of the eastern and western sections of the county.

Burlington county did not complete any roads this year, but has under construction a portion of the Westfield and Camden

turnpike, 1.20 miles, Red Lion and Tabernacle gravel road, 3.65 miles, and the Newbold's Corner and Eayrestown road, 2.51 miles. These roads were commenced so late in the season that it was impossible to complete them this year.

Camden county finished the Clementon road, 1.40 miles, early in the spring, but did nothing further, nor will it, until the turnpikes within its borders are bought and paid for.

Cape May county purchased the Sea Isle City turnpike, 2.63 miles, which extends across the meadows from Sea Isle City to the main land. It is the intention of the county to improve this road next year.

Essex county continued in the even tenor of its way, adding a few more miles to its already large stone road system, grading and paving Franklin avenue, 1.38 miles, Roosevelt avenue, 1.74 miles, Pier Lane, 1.34 miles, Wall street and Stuyvesant avenue, 2.90 miles, and South Orange avenue extension, .88 miles, a total of 8.24 miles, and, in addition, is building two roads through the Watchung mountains, the natural grades of which are so steep as to require cutting of from twenty-seven to thirty-one feet in depth. The consequent amount of work necessary to be done was so great that neither Bradford avenue, 1.46 miles, nor Mount Pleasant avenue, 1.07 miles, could be completed this year.

Hudson county has nearly finished the Belleville turnpike across the Hackensack meadows, 2.32 miles. Unfortunately, this expensive improvement stops at the edge of the meadows, thus leaving a gap of about one mile between it and the improved roads of northern Essex. This costly work, therefore, is almost wasted because the remainder of the road forms the line between the counties of Bergen and Hudson. Bergen has refused to do anything toward improving the road, and Hudson has no authority to do the work alone. We are pleased to say, however, that this disposition is shown nowhere else in the State of New Jersey.

Hunterdon county has its first state aid road under way, and the work is progressing satisfactorily at last. Its length is 5.55 miles. The road will not be finished, however, before next summer.

COMMISSIONER OF PUBLIC ROADS.

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Mercer still holds its place in the front rank of good roads counties, and has improved Olden avenue, 2.31 miles, Whitehead's Mill road, 1.02 miles, Pennington and Washington's Crossing and Central avenue, 2.79 miles, portion of Brunswick Pike, 4 miles, Grover's Mill road, 1.88 miles, Trenton and Allentown turnpike, 3.15 miles, and the Groveville road, 1.03 miles, a total of 16.18 miles.

Middlesex county completed the South Amboy and Keyport road, 1 mile, Plainsboro and Cranbury, 1.40 miles (these were both commenced in 1904), Woodbridge and Oak Tree, second section, 1.41 miles, Cranbury Neck, 1.46 miles, Dayton and Monmouth Junction, 1.46 miles, and, jointly with Somerset county, the remainder of the Franklin Park road, one-half of which is 1.605 miles, a total of 8.335 miles. The Applegarth and Prospect Plains gravel road, 2.93 miles, and the Landing Bridge and Stelton stone road, 2.05 miles, are under construction, but will not be completed before next year.

Monmouth county completed two roads commenced last year; namely, Corliss avenue, second section, 2.23 miles, and the Oceanic and Seabright, 1.51 miles, also constructed this year the Old Bridge road, .63 miles, and the Freehold and Colt's Neck road, first section, 3.10 miles, a total of finished road of 7.47 miles. The first section of the Allentown and New Egypt road, 3.36 miles, is in process of construction, but will not be completed before next year.

Morris county built two roads this year, one extending that built from Morristown to Green Village to the Madison borough line, a distance of 1.52 miles, and the other from Morris Plains through Littleton toward Parsippany, 2.07 miles, a total of 3.59 miles. The Montville and Mountain View road, 2.87 miles, was graded, but it was not stoned for two reasons; first, lack of funds, and second, the possible abandonment of the Morris canal. If the canal is abandoned, the present bridges with their steep approaches will be removed, and the road, consequently, will be made much more convenient for travel.

Ocean county completed the Stafford township road, second section, 2.66 miles, commenced in 1904, and built the Lacey

Township Main Shore road, 4.50 miles, a total of 7.16 miles. These roads are both part of the Main Shore road from Toms River to Tuckerton, the favorite route of automobilists from New York to Atlantic City.

Passaic county finished several roads that have been in process of construction for one or more years; namely, Paterson and Hamburg turnpike, 2.92 miles, East Twenty-seventh street, .44 miles, Randolph avenue, .96 miles, and Oldham road, 1.06 miles, a total of 5.38 miles. There are also two roads approaching completion; namely, Goffle Hill, 1.42 miles, and the Mountain View and Singac, 2.47 miles, the large amount of grading on these latter being the cause of the delay.

Somerset county completed its portion of the Franklin Park road, 1.605 miles, and the Wagner's Corner road, 1.08 miles, a total of 2.685 miles, but did not finish the Rocky Hill road, 5.60 miles.

Sussex, as a county, did nothing, but the borough of Sussex finished Hamburg avenue, Mill street, Bank street, Clove avenue and a part of Main street, making a line through the borough .98 miles long.

The result of the year's work, in brief, is 67.78 miles of road finished and 38.46 miles in process of construction, a total of 106.24 miles.

When the above roads are paid for, the appropriation will be so nearly consumed that road work for the year 1906 will have to cease, unless the Legislature sees fit to grant us at least \$130,000 in the supplemental bill.

COMMISSIONER OF PUBLIC ROADS. 9

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

COST OF ROADS.

Atlantic County.

Pleasantville and Atlantic City road, .....		.91 miles
Cost,	\$36,095 96	
State's share,	12,031 99	
Extension of Pleasantville and Atlantic City road, .....		.60 miles
Cost,	\$9,253 74	
State's share,	3,084 58	
Supervisor, paid by State,	156 00	
Total number of miles,		1.51
Total paid the county,		\$15,116 57

Bergen County.

Midland avenue,		2.22 miles
Cost,	\$8,754 40	
State's share,	2,918 13	
Total number of miles,		2.22
Total paid the county,		\$2,918 13

Camden County.

Clementon road,		1.40 miles
Cost,	\$11,928 96	
State's share,	3,976 32	
Total number of miles,		1.40
Total paid the county,		\$3,976 32

Cape May County.

Sea Isle City turnpike,		2.63 miles
Cost (purchase price),	\$6,000 00	
State's share,	2,000 00	
Total number of miles,		2.63
Total paid the county,		\$2,000 00

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Essex County.

Franklin avenue,		1.38 miles
Cost,	\$11,742 28	
State's share,	3,914 09	
Roosevelt avenue,		1.74 miles
Cost,	\$14,439 22	
State's share,	4,813 07	
Pier Lane,		1.34 miles
Cost,	\$7,639 50	
State's share,	2,546 50	
Wall street and Stuyvesant avenue,		2.90 miles
Cost,	\$22,518 21	
State's share,	7,506 07	
South Orange avenue extension, .....		.88 mile
Cost,	\$8,812 89	
State's share,	2,937 63	
Total number of miles,		8.24
Total paid the county,		\$21,717 36

Mercer County.

Olden avenue,		2.31 miles
Cost,	\$17,775 08	
State's share,	5,925 02	
Supervisor, paid by State,	354 00	
Whitehead's Mill road,		1.02 miles
Cost,	\$5,983 26	
State's share,	1,994 42	
Supervisor, paid by State,	120 00	
Pennington and Washington's Crossing road,		2.79 miles
Cost,	\$24,238 41	
State's share,	8,079 47	
Supervisor, paid by State,	399 00	
Portion of Brunswick pike,		4.00 miles
Cost,	\$30,782 96	
State's share,	10,260 99	
Supervisor, paid by State,	433 50	
Grover's Mill road,		1.88 miles
Cost,	\$16,328 04	
State's share,	5,442 68	
Supervisor, paid by State,	438 00	
Trenton and Allentown turnpike,		3.15 miles
Cost,	\$26,940 06	
State's share,	8,980 02	
Supervisor, paid by State,	333 00	
Groveville road,		1.03 miles
Cost,	\$9,034 19	
State's share,	3,011 40	
Supervisor, paid by State,	378 00	

COMMISSIONER OF PUBLIC ROADS.

Total number of miles,		16.18
Total paid supervisors,	\$2,455 50	
Total paid the county,		\$43,694 00

Middlesex County.

South Amboy and Keyport road,		1.00 mile
Cost,	\$8,577 00	
State's share,	2,859 00	
Plainsboro and Cranbury road,		1.40 miles.
Cost,	\$8,881 40	
State's share,	2,960 47	
Woodbridge and Oak Tree, second section,		1.41 miles
Cost,	\$13,019 80	
State's share,	4,339 93	
Franklin Park road, one-half,		1.605 miles
Cost,	\$8,993 14	
State's share,	2,997 71	
Cranbury Neck road,		1.46 miles
Cost,	\$11,022 00	
State's share,	3,674 00	
Supervisor, paid by State,	270 00	
Dayton and Monmouth Junction road,		1.46 miles
Cost,	\$8,563 00	
State's share,	2,854 33	
Supervisor, paid by State,	258 00	
Total number of miles,		8.335
Total paid supervisors,	\$528 00	
Total paid the county,		\$19,685 44

Monmouth County.

Corliss avenue, second section,		2.23 miles
Cost,	\$7,230 28	
State's share,	2,410 09	
Oceanic and Seabright road,		1.51 miles
Cost,	\$10,200 00	
State's share,	3,400 00	
Old Bridge road, .....		.63 mile
Cost,	\$7,033 10	
State's share,	2,344 37	
Supervisor, paid by State,	222 00	
Freehold and Colt's Neck road, first section,		3.10 miles
Cost,	\$22,946 77	
State's share,	7,648 92	
Supervisor, paid by State,	363 00	
Total number of miles,		7.47
Total paid supervisors,	\$585 00	
Total paid the county,		\$15,803 38

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Morris County.

Green Village and Madison road,		1.52 miles
Cost,	\$9,464 74	
State's share,	3,154 91	
Supervisor, paid by State,	156 00	
Morris Plains and Parsippany road,		2.07 miles
Cost,	\$12,784 42	
State's share,	4,261 47	
Supervisor, paid by State,	231 00	
Total number of miles,		3.59
Total paid supervisors,	\$387 00	
Total paid the county,		\$7,416 38

Ocean County.

Stafford Township road, second section,		2.66 miles
Cost,	\$6,669 15	
State's share,	2,223 05	
Lacey Township Main Shore road,		4.50 miles
Cost,	\$17,175 32	
State's share,	5,725 11	
Total number of miles,		7.16
Total paid the county,		\$7,948 16

Passaic County.

East Twenty-seventh street .....		.44 mile
Cost,	\$2,887 19	
State's share,	962 40	
Randolph avenue, .....		.96 mile
Cost,	\$9,623 40	
State's share,	3,207 80	
Oldham road,		1.06 miles
Cost,	\$10,404 79	
State's share,	3,468 26	
Paterson and Hamburg turnpike,		2.92 miles
Cost,	\$13,303 16	
State's share,	4,434 39	
Total number of miles,		5.38
Total paid the county,		\$12,072 85

Somerset County.

Franklin Park road, one-half,		1.605 miles
Cost,	\$8,993 14	
State's share,	2,997 71	
Wagner's Corner road,		1.08 miles
Cost,	\$5,383 24	
State's share,	1,794 41	
Total number of miles,		2.685
Total paid the county,		\$4,792 12

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Sussex County.

Hamburg avenue, Mill street, Bank street, Clove avenue,98 mile
Cost,	\$9,395 63	
State's share,	3,131 88	
Supervisor, paid by State,	264 90	
Total number of miles, . . . . .		.98
Total paid the county,		\$3,131 88
Total number of miles paid for in 1905,		67.78
Total cost to the State,	\$164,648 99	
Appropriation,	270,000 00	
Supplementary appropriation,	15,000 00	
Balance available for roads under construction,		120,583 54

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The following roads are approaching completion, but were not finished in time to receive the State's aid in December, 1905:

Burlington County.		
	<i>No of Miles.</i>	<i>Cost.</i>
Westfield and Camden turnpike,	1.20	\$9,300 00
Red Lion and Tabernacle,	3.65	8,366 10
Newbold's Corner and Eayrestown,	2.51	16,900 00
	<hr/>	<hr/>
	7.36	\$34,566 10
Essex County.		
Bradford avenue,	1.46	\$52,500 00
Mount Pleasant avenue,	1.07	26,100 00
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	2.53	\$78,600 00
Hudson County.		
Belleville turnpike,	2.32	\$94,718 40
Hunterdon County.		
Old York road,	5.55	\$47,900 49
Middlesex County.		
Landing Bridge and Stelton road,	2.05	\$14,293 97
Applegarth and Prospect Plains road,	2.93	6,413 22
	<hr/>	<hr/>
	4.98	\$20,707 19
Monmouth County.		
Allentown and New Egypt road, first section,	3.36	\$22,640 00
Morris County.		
Montville and Mountain View road,	2.87	\$13,688 38
Passaic County.		
Mountain View and Singac road,	2.47	\$20,388 73
Goffle Hill road,	1.42	15,566 22
	<hr/>	<hr/>
	3.89	\$35,954 95
Somerset County.		
Rocky Hill road,	5.60	\$33,339 66
Total number of miles approaching completion,		38.46
Total cost,		\$382,115 17
State's share,		127,371 72

COMMISSIONER OF PUBLIC ROADS.

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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:

<i>County.</i>	<i>Miles.</i>	<i>Amount.</i>
Atlantic,	75.51	\$76,367 35
Bergen,	12.615	21,988 47
Burlington,	171.521	258,254 80
Camden,	72.18	133,195 46
Cape May,	22.454	33,041 55
Cumberland,	1.22	14,773 23
Essex,	89.014	199,401 63
Gloucester,	74.895	85,128 27
Hudson,	2.44	8,944 60
Mercer,	116.544	295,619 76
Middlesex,	116.569	208,888 16
Monmouth,	84.22	144,014 20
Morris,	60.505	119,090 54
Ocean,	32.86	35,493 59
Passaic,	49.237	74,844 85
Salem,	22.227	30,980 47
Somerset,	60.165	97,642 88
Sussex,	7.598	15,416 58
Union,	6.203	8,796 50
Warren,	33.332	63,558 25
	1,111.309	\$1,925,441 14

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	Total Number Miles Built In Each County
Atlantic,					12.00	10.00	6.84	4.03		7.03	20.10	13.00	1.00	1.51	75.51
Bergen,											1.02		9.375	2.22	12.615
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		171.521
Camden,		13.62		8.25		4.125	12.79	2.23	1.00	4.48	8.80	9.50	5.985	1.40	72.18
Cape May,										6.00	5.394	6.20	2.23	2.63	22.454
Cumberland,												1.22			1.22
Essex,				6.50	6.00	4.91	9.276	12.07	9.60	9.36	8.723	5.79	8.545	8.24	89.014
Gloucester,				7.75	6.00	5.50	7.59	11.40	4.61	17.44	6.875	7.73			74.895
Hudson,										2.44					2.44
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	116.544
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	116.569
Monmouth,					3.75	5.00	5.10	14.46	5.64	6.67	13.25	17.67	5.21	7.47	84.22
Morris,						6.13	6.30	10.46	6.53	4.306	10.079	7.13	5.98	3.59	60.505
Ocean,											3.90	9.97	11.83	7.16	32.86
Passaic,						4.79	5.48	8.67	6.73	3.987	6.57	6.09	1.54	5.38	49.237
Salem,				2.67				2.17	2.05		3.25	4.61	7.477		22.227
Somerset,						6.23	7.27	6.60	6.65	7.93	5.88	6.24	10.68	2.685	60.165
Sussex, .....										.893		4.03	1.695	.98	7.598
Union,											2.141		.63		6.203
Warren, .....								.08		3.432	7.43	8.792	3.94	13.09	33.332
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	67.78	1,111.309

Amount Available for Road Building in Each County.

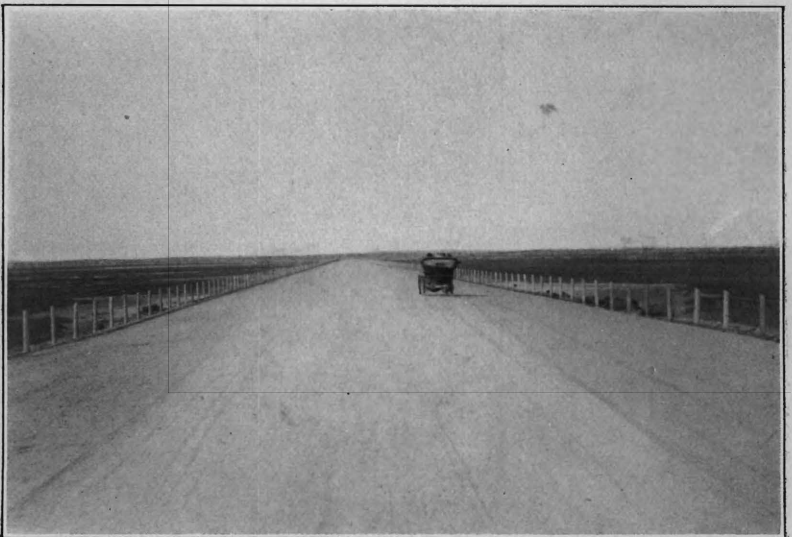
Under the State Aid Law, the estimated cost of all improvements made under this act, together with the estimated cost of repairs of roads already constructed in any county in any one year, shall not exceed one-half of one per centum of the ratables of such county for the last preceding year.

The following table will show at a glance the limitations of expenditures in each county, also the amount that can be expended, provided the State appropriation is liberal enough to meet it. For example, Atlantic county, with ratables amounting to \$57,051,796.00, could expend per year, if State appropriation were sufficient, \$285,258.98, a rate, if applied to all the counties, even with the cost of repairs to roads already built deducted, would, in a few years, cover all our leading roads with stone and gravel:

<i>County.</i>	<i>Abstract of Ratables for 1904.</i>	<i>One-half of one per cent.</i>
Atlantic,	\$57,051,796 00	\$285,258 98
Bergen,	51,692,679 00	258,463 39
Burlington,	24,404,915 00	122,024 58
Camden,	50,114,972 00	250,574 86
Cape May,	11,356,700 00	56,783 50
Cumberland,	18,528,000 00	92,640 00
Essex,	266,539,637 00	1,332,698 18
Gloucester,	16,430,582 00	82,152 91
Hudson,	240,738,648 10	1,203,693 24
Hunterdon,	18,522,277 00	92,611 39
Mercer,	55,944,600 00	279,723 00
Middlesex,	38,548,290 00	192,741 45
Monmouth,	58,692,845 00	293,464 22
Morris,	32,100,362 00	160,501 82
Ocean,	10,794,344 00	53,971 72
Passaic,	79,325,284 00	396,626 42
Salem,	14,727,155 00	73,635 78
Somerset,	20,343,499 00	101,717 50
Sussex,	12,525,111 00	62,625 55
Union,	55,260,709 00	276,303 54
Warren,	20,040,556 00	100,202 78



**Pleasantville and Atlantic City Boulevard, Showing Meadow over
Which Road was Built. Atlantic County.**



**Pleasantville and Atlantic City Boulevard, Atlantic County,
After Improvement.**

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Description of Roads Improved in 1905.

ATLANTIC COUNTY.

Pleasantville and Atlantic City Road, 4.51 Miles Long.

This boulevard begins on the main shore at Pleasantville and extends through the Chelsea Heights section to Atlantic City proper. It can be said with truth that the completion of this road, three miles of which were paid for in previous years, fills a long felt want, as by means of the extension, .60 of a mile in length, built under a separate contract, Atlantic City is connected with the main land, thus affording the farmers, truck raisers and other residents of Atlantic county a good road to market. There is another class of persons to whom the completion of this road means much—the tourists from our own and neighboring states, Atlantic City having long been their Mecca.

The fine roads extending across the State, eastward from Camden and southward from Long Branch, Asbury Park and Lakewood, came to an abrupt end at Pleasantville, four miles from Atlantic City. Between these places stretched a treacherous salt marsh, in many places apparently without bottom, over which meandered a so-called turnpike. In its best estate this turnpike was a few degrees better than nothing, and, after its absorption by the trolley company, almost useless; therefore, the demand for the improvement of this road became imperative, and its consummation one of far reaching interest.

The road is built of gravel, 60 feet wide and 6 inches thick.

John B. Hess and W. H. LeChard, Atlantic City, New Jersey, were the contractors for the main boulevard.

A. Brooks Celiac and J. Spencer Caldwell, Philadelphia, Pa., were the contractors for the Chelsea Heights extension.

The road was and is practically level.

The total cost of 3.91 miles, built under the original contract, was \$106,951.59.

The total cost of the Chelsea Heights extension, or .60 of a mile, was \$10,787.75.

BERGEN COUNTY.

Midland Avenue, 2.22 Miles Long.

This macadam road, twelve feet wide and five inches thick, commences at the bridge over Spring brook, the borough line of Riverside, and extends to the macadam previously laid eastwardly from the borough of Ridgewood. The completion of this work connects the stone roads of the Hackensack valley with those of Passaic county, by means of the improved streets of the borough of Ridgewood. It is also the link between the two main north and south lines of good roads in Bergen county.

Colfax and Steele, Pompton, New Jersey, were the contractors.

The maximum grade was reduced from 9 per cent. to 6 per cent.

The price per contract, lump sum, was \$8,754.40.

The total cost was \$9,567.40.

CAMDEN COUNTY.

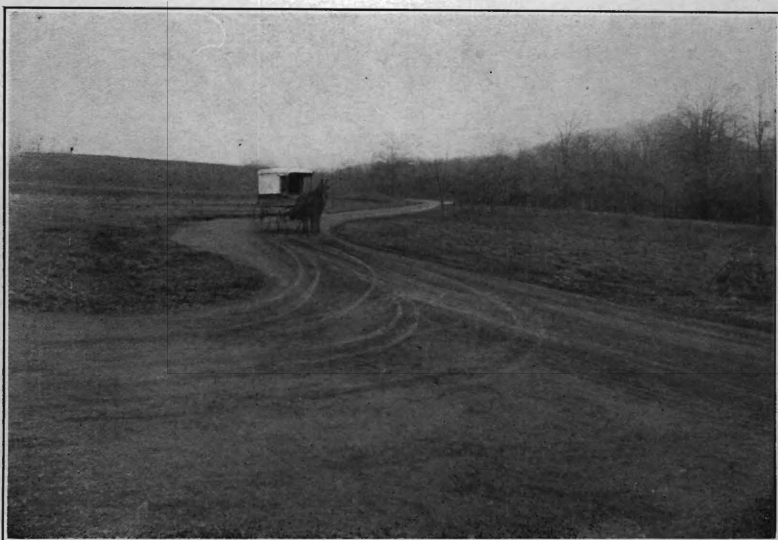
Clementon Road, 1.40 Miles Long.

This street is in the village of Clementon, within a short distance of the Berlin and Camden turnpike, and will be, ere long, connected with it. The country through which it passes is very rolling and is covered with a second growth of oak timber. The absence of cultivated land is one of the striking features of the stretch of country through which the road is built, yet at each end are found many acres of fertile farm land.

The value of this road lies in the fact that it furnishes a good means of access for the farmers to the mills and railway station at Clementon. It is built of macadam, twelve feet wide and eight inches thick.



Franklin Avenue, Essex County, Before Improvement.



Franklin Avenue, Essex County, After Improvement.

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B. F. Sweeten and Son, Camden, New Jersey, were the contractors.

The maximum grade was reduced from 6.80 per cent. to 4.00 per cent.

The price per contract, lump sum, was \$12,812.25.

The total cost was \$12,690.10.

ESSEX COUNTY.

Franklin Avenue, 1.38 Miles Long.

The paving of this road connects the stone roads of Nutley with those of Bloomfield. It is also of a semi-public character, as its southern end runs through the grounds of one of Essex county's public institutions. This improvement is in line with the recent work in Essex county; that is, it connects two of the east and west improved roads which Essex has built in the years gone by. The road is built through a comparatively unsettled section of eastern Essex, and its improvement will enhance the value of those heretofore made at Soho Park, Bloomfield and Nutley. The construction is the Essex county standard, an eight-inch telford, sixteen feet wide.

Robert Wright and Stuart Lindsley, Orange, New Jersey, were the contractors.

The maximum grade was reduced from 7.25 per cent. to 5.20 per cent.

The total cost was \$12,663.28.

Roosevelt Avenue, 1.74 Miles Long.

This road, which is built of telford, sixteen feet wide and eight inches thick, commences at the intersection of the Northfield and Roseland avenue stone roads, opposite Northfield Church, and extends northwesterly to Mount Pleasant avenue at Morehousetown.

The unique feature of this improvement is the number of previous improvements that it connects; namely, Northfield

avenue, Roseland avenue, Mount Pleasant avenue and Swamp road. By the completion of this work Northfield Church is made the most accessible place of worship in western Essex at all seasons of the year.

Robert Wright and Stuart Lindsley, Orange, New Jersey, were the contractors.

The maximum grade was reduced from 8.34 per cent. to 3.70 per cent.

The total cost was \$15,521.22.

Pier Lane, 1.34 Miles Long.

This telford road, having a depth of eight inches and a width of sixteen feet, commences at Dutch Lane, at the point where the latter makes a sharp turn to the westward, and extends northwardly in the same general direction as that of the main portion of Dutch Lane. The road might be properly called the northern end of Dutch Lane, as it pursues the general course of that road and connects it and the region tributary thereto with the Paterson and Hamburg turnpike and the Little Falls road.

Owing to the nature of the soil over which this telford is laid, the changed condition of the road, especially in wet weather, is very marked. Pier Lane forms an outlet for the farmers and dairymen of Caldwell township to the markets of Paterson that they have long desired, and the improvement is greatly appreciated.

James H. and Sherman G. Francisco, Little Falls, New Jersey, were the contractors.

The maximum grade was reduced from 3.15 per cent. to 1.28 per cent.

The total cost was \$8,589.50.

Wall Street and Stuyvesant Avenue, 2.90 Miles Long.

This work continues the improvements made in the borough of Vailsburg through the sparsely settled territory lying between this borough and Irvington, thence it is carried across Springfield



Hobart Gap Road, Essex County, Before Improvement.



Hobart Gap Road, Essex County, After Improvement.



Olden Avenue Road, Mercer County, Before Improvement.



Olden Avenue Road, Mercer County, After Improvement.

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avenue, through Irvington, down to the Union county line, connecting South Orange and Springfield avenues, the two old and long established stone highways from Newark to the Passaic river. By the construction of such roads as this the true spirit of the State Aid Road Law is most clearly exemplified; that is, that the State's work begins where the city's work ends. The pavement, like all other in Essex county, is sixteen feet wide and eight inches deep.

Ludwig Batt, Fred Ardrey and Lewis P. Taylor, South Orange, New Jersey, were the contractors.

The maximum grade was reduced from 4.75 per cent. to 3.70 per cent.

The total cost was \$23,932.21.

South Orange Avenue Extension, .88 Miles Long.

The building of this stretch of telford, sixteen feet wide and eight inches deep, from the present stone work to Columbia bridge, completes the improvement of South Orange avenue across the entire county of Essex, from the Passaic river on the east to the same river on the west. The noticeable feature of this construction is that it completes the last stone road leading to a bridge across the Passaic river on the western side of Essex county. Now Essex county has done its part, it remains for Morris to carry these improvements westward.

Robert Wright and Stuart Lindsley, Orange, New Jersey, were the contractors.

The maximum grade was reduced from 6.75 per cent. to 2.48 per cent.

The total cost was \$9,203.89.

MERCER COUNTY.

Olden Avenue, 2.31 Miles Long.

This road begins as a city street at Hamilton avenue and follows a southeasterly course, past St. Mary's cemetery, to the road from White Horse to Mercerville. It is built of macadam,

fourteen feet wide and six inches thick, over a very heavy clay soil, and, in consequence, the improvement is very marked, as the road was formerly almost impassable in wet weather. This was especially trying to the many funeral processions to St. Mary's cemetery, as it was often a question whether the horses could reach their destination or not. Now nothing except a drifting snow can affect travel over it.

Owing to its proximity to Trenton, this road will soon be lined with residences.

The C. B. Walton Company, Trenton, New Jersey, was the contractor.

The maximum grade was reduced from 8.80 per cent. to 2.70 per cent.

The price per contract, lump sum, was \$16,651.20.

The total cost was \$21,288.68.

Whitehead's Mill Road, 1.02 Miles Long.

This road begins at the Trenton and Allentown turnpike, in the Millham section of Trenton, and extends across the main line of the Pennsylvania railroad, past the railroad shops, to Whitehead's Mill. It will prove a very useful road, owing to the large and heavy loads that have no other means of reaching Trenton save this. It is built of macadam, fourteen feet wide and eight inches thick.

Richard Newton, Trenton, New Jersey, was the contractor.

The maximum grade was reduced from 3.4 per cent. to 1 per cent.

The price per contract, lump sum, was \$5,907.26.

The total cost was \$6,440.54.

Pennington and Washington's Crossing Road and Central Avenue, 2.79 Miles Long.

Commencing at the Pennington stone road, this road follows a southwesterly and westerly course to Woolsey's branch of Jacob's creek, where it strikes the old roadbed of the Mercer and



**Pennington and Washington's Crossing Road, Mercer County,
Before Improvement.**



**Pennington and Washington's Crossing Road, Mercer County,
After Improvement.**



Brunswick Pike Road, Mercer County, Before Improvement.



Brunswick Pike Road, Mercer County, After Improvement.

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Somerset railroad. In addition to this main line there is a branch commencing at Maddock's corner and extending easterly to the Trenton and Pennington road. This, together with the main line, is constructed of macadam, fourteen feet wide and eight inches thick.

The object of this work is to connect the three main improved lines that have been constructed northwardly from Trenton; namely, The Trenton, and Pennington, Scotch, and Asylum roads. It also affords the inhabitants of Pennington a fine outlet to the Delaware river, something they have long desired.

The maximum grade was reduced from 9.20 per cent. to 3.70 per cent.

The C. B. Walton Company, Trenton, New Jersey, was the contractor.

The price per contract, lump sum, was \$19,563.96.

The total cost was \$29,798.98.

Portion of Brunswick Pike, 4 Miles Long.

This turnpike, which was formerly the property of the Pennsylvania railroad, was deeded by them to the townships through which it passes because it demanded upon their part a continual outlay and practically no revenue. The portion improved this year begins at the bridge over the Shabbakunk creek, and extends in a straight line to Clarksville. It is built of macadam, sixteen feet wide and eight inches thick.

The change made by this improvement is perhaps more marked than that of any other road in the vicinity of Trenton. Prior to the macadamizing the condition of this road was a cause of continual complaint and protest.

The maximum grade was reduced from 6.80 per cent. to 2.00 per cent.

Richard Newton, Trenton, New Jersey, was the contractor.

The price per contract, lump sum, was \$28,610.00.

The total cost was \$33,856.25.

Grover's Mill Road, 1.88 Miles Long.

Starting from the Dutch Neck stone road at Princeton Junction, this improved highway extends through a rich farming country to the Middlesex county line. Grover's Mill, which gives the road its name, is situated about midway, and, as this is the great collecting and distributing point for all of this region, a good road at all seasons of the year had become a necessity. The large crops raised along it could not be carted at some seasons, and at no time could more than that which would be considered half a load on a stone road be pulled through the heavy sand which composed the natural surface. From the foregoing it will be readily seen that this improvement is a very marked one. The macadam is fourteen feet wide and eight inches thick.

The maximum grade was reduced from 7.40 per cent. to 3.00 per cent.

Richard Newton, Trenton, New Jersey, was the contractor.

The price per contract, lump sum, was \$13,724.00.

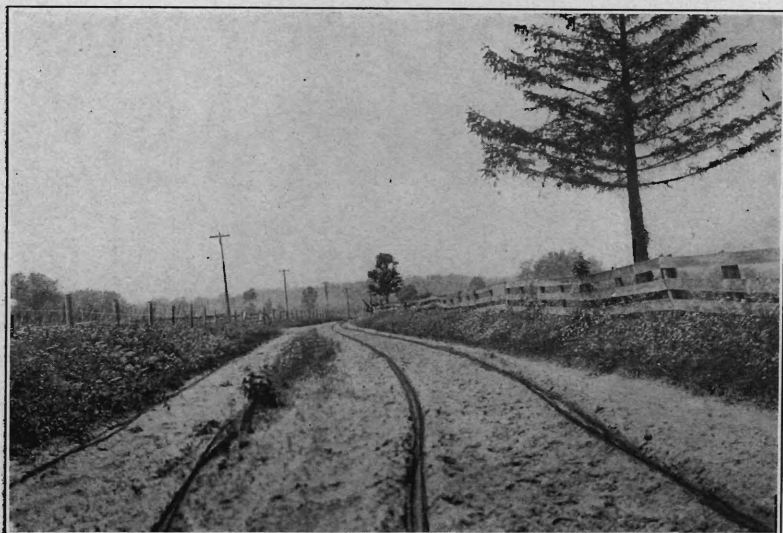
The total cost was \$20,034.88.

Trenton and Allentown Turnpike, 3.15 Miles Long.

The grading and macadamizing, just completed under this contract, finishes the improvement of this old turnpike from the New York division of the Pennsylvania railroad, in the city of Trenton, to the Monmouth county line at Allentown. The pavement is fourteen feet wide and eight inches thick.

The work this year commenced at Newtown, the center of a rich farming district and also the railway station and shipping point for Allentown, the latter being the banking, milling and merchandising town of western Monmouth. In fact, it is a question whether this road is of more value to Mercer or Monmouth county, but as to its importance and benefit to both there is not the least doubt.

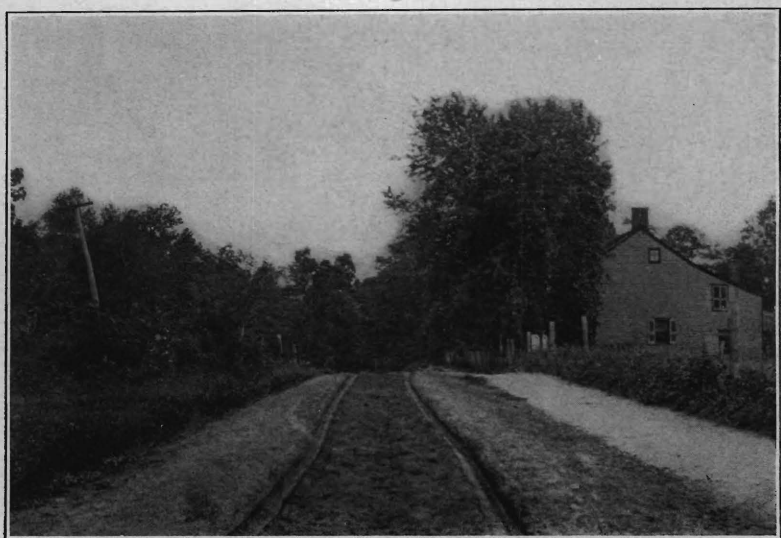
The maximum grade was reduced from 5.4 per cent to 2 per cent.



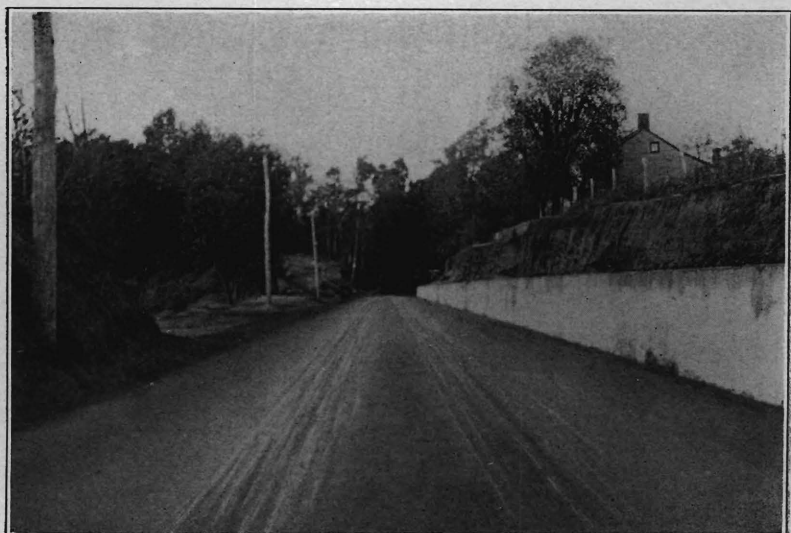
Grover's Mill Road, Mercer County, Before Improvement.



Grover's Mill Road, Mercer County, After Improvement.



Groveville Road, Mercer County, Before Improvement.



Groveville Road, Mercer County, After Improvement.

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The C. B. Walton Company, Trenton, New Jersey, was the contractor.

The price per contract, lump sum, was \$23,494.08.

The total cost was \$31,204.83.

Groveville Road, 1.03 Miles Long.

From the stone road at Yardville, this road is built southerly over Doctor's creek to Main street, Groveville, thence follows the latter street to the Burlington county line at Crosswicks creek. It is built of macadam, fourteen feet wide and six inches thick.

The road, though short, was an expensive one to build, owing to the very steep bank on the southerly side of Doctor's creek, in consequence of which it was necessary to make a cut fifteen feet in depth in order to reduce the grade from a maximum of ten feet to one of five feet to the hundred. The value of this change is very evident, as it is now possible to draw loads three times as heavy as had ever been hauled over the road before.

The B. M. and J. F. Shanley Company, Philadelphia, Pa., was the contractor.

The price per contract, lump sum, was \$8,008.05.

The total cost was \$12,505.48.

MIDDLESEX COUNTY.

South Amboy and Keyport Road, 1 Mile Long.

This improvement begins at the end of the stone road built through South Amboy year before last, and follows a general southerly course to Cheesequakes bridge and Morgan's station. It is constructed of macadam, twelve feet wide and eight inches thick.

This is a still further continuation of our shore line road and carries the improvement onward toward the ocean. It is hoped that another year will see the few remaining gaps filled in, at least as far as Keyport. From a commercial, as well as from a

recreation standpoint, the completion of this through line will be of great advantage to the State of New Jersey.

Rue and Fountain, Old Bridge, New Jersey, were the contractors.

The maximum grade was reduced from 8.10 per cent. to 5.00 per cent.

The contract price was \$8,577.00.

The total cost was \$8,950.15.

Plainsboro and Cranbury Road, 1.40 Miles Long.

This road is a continuation of the pavement laid last year from the Pennsylvania railroad to the Trenton and New Brunswick trolley. It is of great value to the many farmers and dairymen living along its line, as it furnishes them with something they have never possessed, namely, a good, smooth highway, be the weather either wet or dry. It is of macadam construction, twelve feet wide and eight inches thick.

James H. Butcher, Ardena, New Jersey, and Charles R. LeCompte, Lakewood, New Jersey, were the contractors.

The maximum grade was reduced from 6 per cent. to 3.8 per cent.

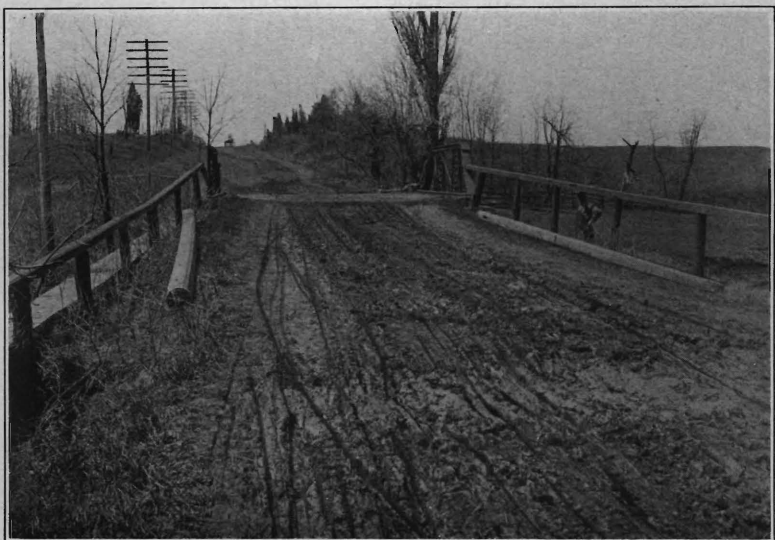
The price per contract, lump sum, was \$7,813.40.

The total cost was \$9,489.50.

Woodbridge and Oak Tree Road, Second Section, 1.41 Miles Long.

The peculiar feature of the grading and macadamizing of this road was that one end was built one year, the other end the next, and the middle this year.

Owing to the formation of the ground, the grading was the important thing to be done, the macadamizing being only secondary. The old road was a succession of steep hills and deep hollows, hence the necessary thing to be done was to cut down the one and fill up the other. This has been so effectually accom-



**Franklin Park Road, Middlesex and Somerset Counties,
Before Improvement.**



**Franklin Park Road, Middlesex and Somerset Counties,
After Improvement.**

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plished that the old road is hardly recognizable. The eight-inch macadam, though only twelve feet wide, is flanked by well rolled shoulders, seven feet in width, thus forming a good, wide roadway.

The importance of the work just completed lies in the fact that it forms a direct line between Woodbridge and the interior of the State.

The maximum grade was reduced from 8.5 per cent. to 4 per cent.

The Delaware River Quarry and Construction Company, Jersey City, New Jersey, was the contractor.

The price per contract, lump sum, was \$12,275.74.

The total cost was \$13,923.90.

Franklin Park Road, 5.74 Miles Long, 2.53 Miles of Which Were Completed Last Year, and the Remainder, or 3.21 This Year.

This old stage road begins at New Brunswick and extends westwardly to and through Franklin Park. It is a portion of the main highway between New Brunswick and Trenton, and, with few exceptions, it has maintained its original width of sixty-six feet. It is built of macadam, twelve feet wide and eight inches thick, except forty-five hundred feet through low, wet land, which is of telford, eleven inches thick.

The work was carried forward through a red shale country, which has long been famous for the quality and abundance of its farm products. The houses and farm buildings along the line attest the prosperity of the owners, but this soil, while admirably adapted to the production of crops, is, at certain seasons of the year, the worst and least desirable for road purposes, inasmuch as it absorbs and retains a large percentage of the water which falls upon it, the result being that during rainy seasons this highway was in many places almost impassable. Now, all this is changed. Anyone may travel over this pavement with ease, comfort and safety, and this famous old road promises soon to regain its former popularity. When the five mile gap between this and

the Inter-county road from Kingston is closed, the State will have one of the finest thoroughfares to be found in the United States.

The maximum grade was reduced from 7.00 per cent. to 2.44 per cent.

As this is a boundary line road, the expense of its construction was borne by Middlesex and Somerset counties equally, hence one-half of the length, or 1.605 miles, was paid for by each county.

Moran and Sutton, New Brunswick, New Jersey, were the contractors.

The price per contract, lump sum, less underdrains not laid, was \$17,291.23.

The total cost was \$19,450.78.

Middlesex county's share of the contract price was \$8,645.62.

Middlesex county's share of the total cost was \$9,725.39.

Cranbury Neck Road, 1.46 Miles Long.

This road begins at the stone road in Cranbury village and extends westerly along Cranbury Neck toward the Mercer county line. It runs through a rolling farming country, over a light sandy soil. Cranbury Neck has long been famous for its agricultural products. In connection with the roads formerly improved, the work just completed will give the farmers along its line a convenient outlet to Cranbury station on the Camden and Amboy railroad. It is built of macadam, fourteen feet wide and eight inches thick.

The maximum grade was reduced from 4.00 per cent. to 1.23 per cent.

Rue and Fountain, Old Bridge, New Jersey, were the contractors.

The price per contract, lump sum, was \$10,740.00.

The total cost was \$11,414.00.

Dayton and Monmouth Junction Road, 1.46 Miles Long.

This stretch of macadam, twelve feet wide and eight inches thick, connects the village of Dayton with Monmouth Junction,

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one of the important shipping stations on the main line of the Pennsylvania railroad. The improvement stops a short distance from the railroad crossing, as it is the intention of the company to build an overhead bridge at this point.

Owing to the heavy, sandy nature of the soil, the work just completed is highly appreciated by the people who have been compelled to plow through the sand of the old road for so many years.

The maximum grade was reduced from 5.00 per cent. to 1.70 per cent.

Butcher and LeCompte, Ardena and Lakewood, New Jersey, were the contractors.

The price per contract, lump sum, was \$8,443.00.

The total cost was \$8,982.26.

MONMOUTH COUNTY.

Corliss Avenue, Second Section, 2.23 Miles Long.

In 1903 Corliss avenue was macadamized from Main street, Asbury Park, to a point 2.10 miles distant. The improvement was carried 2.37 miles further this year. On the score of economy the second section was built of gravel, sixteen feet in width, and six inches in thickness after compression. This road forms the principal inlet and outlet for the farmers of eastern Monmouth to Asbury Park and Ocean Grove.

This was a very much needed improvement, and is highly appreciated by the residents of this section, its beneficial effects being already evidenced by the numerous improvements completed and in process of erection along this highway.

The maximum grade was reduced from 7.40 per cent. to 3.50 per cent.

William C. Shanley, Jersey City, New Jersey, was the contractor.

The price per contract, lump sum, for graveling was \$7,230.28.

The total cost of graveling was \$7,813.49.

Oceanic and Sea Bright Road, 1.51 Miles Long.

Beginning in the town of Oceanic at Washington street, this road extends easterly and southerly to the middle of the Ridge road, thence along the Ridge road to the road of Two Rivers, and thence southerly to the middle of the Rumson road. The principal value of this improvement is that it connects several others, and thus enhances the value of all. It connects the Red Bank and Oceanic road with the Rumson road. It also connects the Rumson road with the bridge over the Navesink river and thence with Atlantic Highlands. It may be properly termed a pleasure drive.

The maximum grade was reduced from 4.00 per cent. to 2.10 per cent.

The price per contract, lump sum, was \$10,200.00.

The total cost was \$11,652.78.

Old Bridge Road, .63 Miles Long.

This road begins at Main street, Matawan, and extends to the gully bridge or Middlesex county line. It is constructed of macadam, fourteen feet wide and eight inches deep.

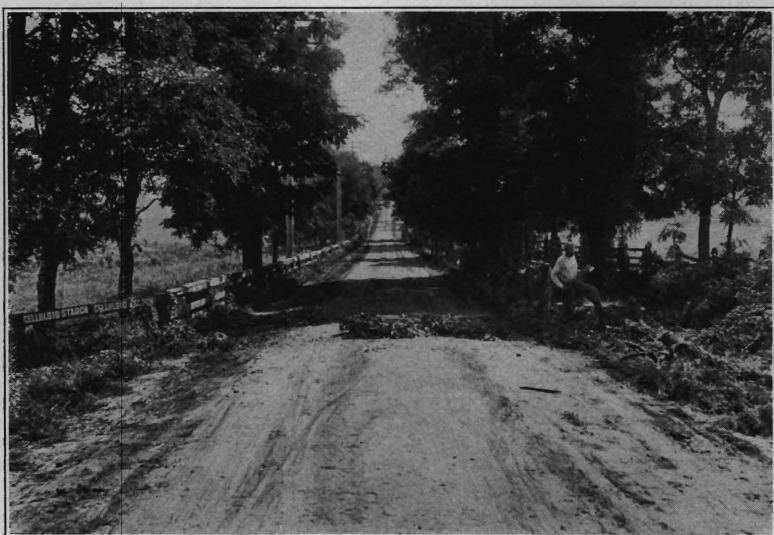
This road fills the only gap remaining between Matawan and Keyport and the stone road system of northern New Jersey. While it is of immediate benefit to the property owners along its line, its usefulness is not limited to the neighborhood through which it is built, but extends to all of those who, either on business or pleasure bent, travel from the northern portion of our State to the resorts along its ocean front.

William C. Shanley, Newark, New Jersey, was the contractor.

The maximum grade was reduced from 9 per cent. to 4 per cent.

The price per contract, lump sum, was \$6,408.00.

The total cost was \$7,465.50.



**Freehold and Colt's Neck Road, Monmouth County,
Before Improvement.**



**Freehold and Colt's Neck Road, Monmouth County,
After Improvement.**

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Freehold and Colt's Neck Road, First Section, 3.10 Miles Long.

Commencing where the macadam ends, in the county town of Freehold, this improvement has been carried easterly toward Colt's Neck. It is of macadam, fourteen feet wide and eight inches thick, and forms one more section of the cross state line from Trenton through Freehold to the seashore. Its local importance lies in the fact that it furnishes a good surface for the teams that are employed in hauling truck to the canning factory at Freehold.

The maximum grade was reduced from 4.08 per cent. to 2.50 per cent.

William C. Shanley, Newark, New Jersey, was the contractor. The price per contract, lump sum, was \$22,874.00.

The total cost was \$23,767.25.

MORRIS COUNTY.

Green Village and Madison Road, 1.52 Miles Long.

Starting at Green Village from the end of the macadam built from Morristown in 1903, this improvement has been carried through Hickory Tree to the Madison borough line, where it connects with the improved streets of that beautiful borough, and over these latter with the whole stone road system of northern New Jersey. The macadam pavement is fourteen feet in width and six inches in thickness, and the road is graded and improved for a width of from twenty-four to thirty-two feet.

The maximum grade was reduced from 8.00 per cent. to 5.25 per cent.

Dickerson and Gill, Rockaway, New Jersey, were the contractors.

The price per contract, lump sum, was \$9,497.74.

The total cost was \$9,860.14.

Morris Plains and Parsippany Road, 2.07 Miles Long.

This pavement begins at the Denville stone road, opposite the Morris Plains railroad station, and extends northerly through

Littleton to the road to Halseytown. The improvement has long been desired by the owners of the handsome country places which line it on either side. It is the intention of the local authorities to continue the work to Boonton in the near future. We will then have a fine, smooth highway, with easy grades, from Boonton to Morristown.

The road is graded for a width of from twenty-eight to thirty-four feet, and its center is macadamized for a width of fourteen feet and a depth of six inches.

The maximum grade was reduced from 7 per cent. to 2 per cent.

Dickerson and Gill, Rockaway, New Jersey, were the contractors.

The price per contract, lump sum, was \$13,044.92.

The total cost was \$13,457.97.

OCEAN COUNTY.

Stafford Township Road, Second Section, 2.66 Miles Long.

The main shore road of Ocean county is being improved from year to year. Commencing at Tuckerton in 1903, the work was pushed forward to the Stafford township line, where it was stopped by the approach of winter. In 1904 work was carried on in Stafford, Union and Ocean townships, and was finished in all of them except a small portion in Stafford township, which was completed this year. It is built of gravel, sixteen feet wide, nine inches thick.

The maximum grade was reduced from 2.50 per cent. to .88 per cent.

John W. Horner and George W. Mott, Tuckerton, New Jersey, were the contractors.

The price per contract, lump sum, was \$6,669.15.

The total cost was \$7,308.61.

Lacey Township Main Shore Road, 4.50 Miles Long.

This, another portion of the Main Shore road, was improved this year from Oyster creek, where last year's work ended, north-



**Second Section Stafford Township Road, Ocean County,
Before Improvement.**



**Second Section Stafford Township Road, Ocean County,
After Improvement.**



Lacey Township Road, Ocean County, Before Improvement.



Lacey Township Road, Ocean County, After Improvement.

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erly through Forked river and Lanoka, to the Berkeley township line at Cedar creek. As this work was carried through a thickly settled community, the width of the gravel was increased to twenty-four feet, with a depth varying from nine inches in the center to three inches at the sides.

The improvement of the Main Shore road has been so marked that it has drawn forth words of praise and commendation, not only from our own citizens, but from those of New York, Pennsylvania and the New England states.

The maximum grade has been reduced from 5.40 per cent. to 1.77 per cent.

Louis Rafetto, Philadelphia, Pa., was the contractor.

The price per contract, lump sum, was \$17,132.87.

The total cost \$18,400.08.

PASSAIC COUNTY.

East Twenty-seventh Street, Paterson, .44 Miles Long.

This street, in the eastern part of Paterson, was macadamized for a width of twenty-eight feet and to a depth of four inches between Park avenue and Market street. There was no change of grade, as the street was already curbed and guttered.

The purpose of this improvement was to connect the two main lines running easterly from the heart of Paterson.

McKiernan and Bergin, Paterson, New Jersey, were the contractors.

The total cost was \$2,977.19.

Randolph Avenue, .96 Miles Long.

This beautiful drive begins at President street in the city of Passaic and extends southerly along the westerly bank of the Passaic river, until it meets the River Drive in Acquackanonk township. Its completion marks a still further extension of the

River Drive northward, and will serve to improve what was practically an undeveloped section of the city of Passaic.

As this avenue will soon be built up, it was deemed wise to macadamize it to a width of twenty-four feet, while, owing to the nature of the soil, four inches was deemed to be a sufficient depth.

The maximum grade was not reduced.

William A. Ferguson, Little Falls, New Jersey, was the contractor.

The total cost was \$10,142.15.

Oldham Road, 1.06 Miles Long.

Commencing at the Lower Preakness road, this road winds its way gradually to the top of the mountain. Owing to the fact that the road is built along and over a trap ridge, a great deal of blasting was necessary, the maximum grade being reduced from 14.84 per cent. to 5.00 per cent.

The improvement furnishes a link that has long been needed between the roads running westerly from Paterson. It was macadamized for a width of sixteen feet and to a depth of not less than four inches. The phrase "not less than four inches" is used advisedly, as the foundation of the road is for a portion of its length solid trap rock; in other sections the depth of the broken stone varies from one to four feet.

The Preakness Crushing Company, Paterson, New Jersey, was the contractor.

The total cost was \$11,833.99.

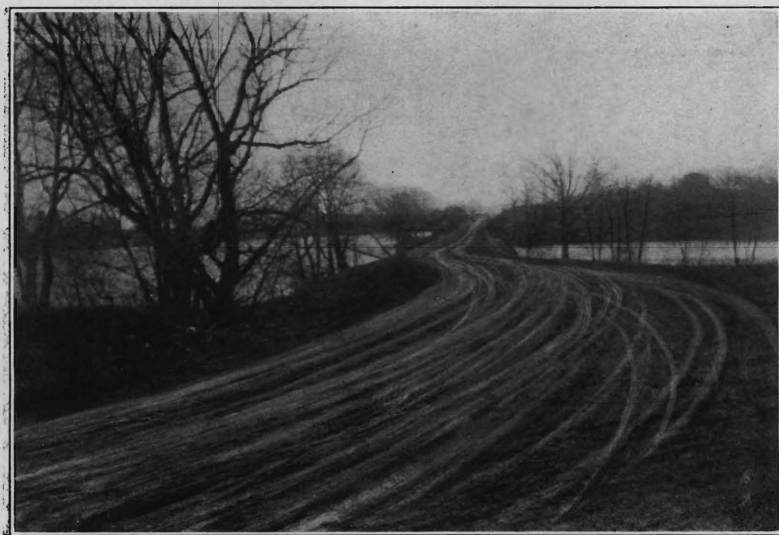
Paterson and Hamburg Turnpike, 3.61 Miles Long.

This road begins at the Morris county line at Newfoundland and extends to the Sussex county line. It is constructed of macadam, fourteen feet wide and four inches thick.

This is still another section of the famous old Paterson and Hamburg turnpike which, year by year, we have been building,



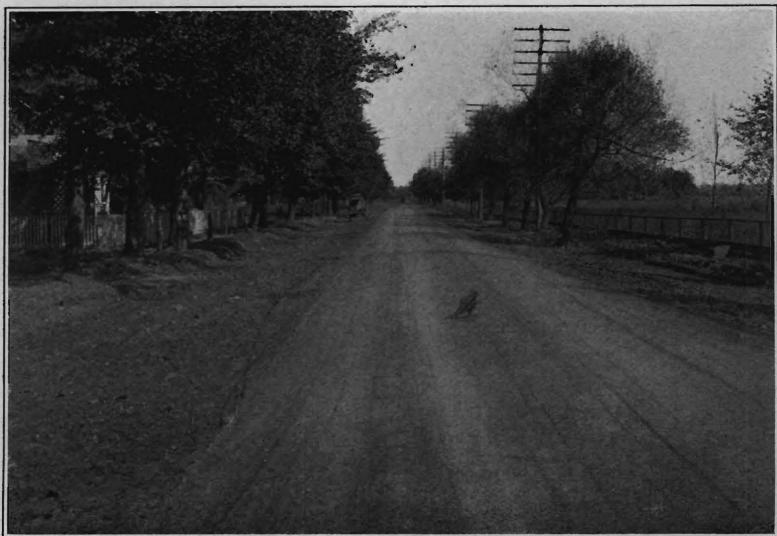
Randolph Avenue, Passaic County, Before Improvement.



Randolph Avenue, Passaic County, After Improvement.



**Franklin Park Road, Middlesex and Somerset County,
Before Improvement.**



**Franklin Park Road, Middlesex and Somerset County,
After Improvement.**

and extending the blessing of improved roads to this almost forgotten portion of our State, thus rendering accessible one of its most picturesque portions. With the completion of this road we will have reached the borders of old Sussex, and by this means arouse the inhabitants thereof from their Rip Van Winkle slumbers. In fact, they are already arousing themselves and preparing to push the good work toward the head waters of the Delaware, the goal of so many of our early turnpikes.

Samuel E. Cotter was the contractor.

The maximum grade was reduced from 12.60 per cent. to 8.00 per cent.

The price per square yard for four inch macadam was 18 cents.

The total cost was \$18,680.30.

SOMERSET COUNTY.

Franklin Park Road (one-half), 1.605 Miles Long.

This road was built of macadam, twelve feet wide and eight inches thick. It is a county line road, consequently one-half belongs to Middlesex and one-half to Somerset county.

For description of the entire road see Middlesex county. The 1.605 miles above is Somerset county's one-half of the road built this year.

Moran and Sutton, New Brunswick, New Jersey, were the contractors.

Somerset county's share of the contract price was \$8,645.61.

Somerset county's share of the total cost was \$9,725.39.

Wagner's Corner Road, 1.08 Miles Long.

This road, otherwise known as Grove street, commences at the bridge over Peter's brook and extends northerly to the road to Pluckamin, where it turns to the east for a distance of 1,300 feet, when it turns again sharply to the north for a distance of 1,150 feet, and then to the east for a distance of 650 feet, opposite

the terminus of Gaston avenue. It is built of macadam, twelve feet wide and eight inches deep.

The maximum grade was reduced from 6.32 per cent. to 3 per cent.

Augustus Munson and Company, Rockaway, New Jersey, were the contractors.

The price per contract, lump sum, was \$5,683.24.

The total cost was \$5,711.79.

SUSSEX COUNTY.

Hamburg Avenue, Mill Street, Bank Street, Clove Avenue and Part of Main Street, Borough of Sussex, .98 Miles Long.

The grading of these several streets through the borough of Sussex was commenced in 1904, but was not completed until this year. Owing to a lack of funds, North Main street from Spring street to Clove avenue was not macadamized, consequently the length of the completed improvement is only .95 miles. The width of the macadam is sixteen feet and its depth six inches, except on Mill street and in front of the Baptist Church, where, owing to the nature of the soil, it was deemed wise to increase the depth to eight inches.

The improvement as just outlined extends through the borough of Sussex from south to north, swerving to the west along Mill street, in order to avoid the hill on Main street. The change in maximum grade from 20 per cent. to 5 per cent. gives one some idea of the amount of work that had to be done before this could be called a finished improvement.

A. B. Card, Hamburg, New Jersey, was the contractor for the grading and Colfax and Steele did the macadamizing.

The price per contract was \$8,012.75.

The total cost was \$10,329.98.

NEW JERSEY STATE LIBRARY

Recommendations.

The enforcement of the requirement of the new road law, passed last winter, that the counties should keep the roads, built under State Aid, in good repair, or have the moneys due them withheld until the State Commissioner of Public Roads should certify that they have been placed in good repair, has had a marked effect upon the condition of our roads. Their surface is smooth, their sides are free from weeds and grass, the gutters and ditches are clean, and unsightly and injurious pipes and culverts have been removed. The change is so marked in some sections that the roads are hardly recognizable, but, if our vigilance relaxes, we fear that the local authorities will become careless. The result would be that New Jersey would lose the reputation which it now has for being the home of good roads. Other states claim preeminence in agricultural products or manufactures, but New Jersey's position as the first good roads state in the Union is as yet unchallenged. As we have so long excelled, we are naturally anxious to hold the high position we have gained.

One of the evils of the old freeholder law has struck us most forcibly; namely, that the appropriations for the year shall be made at the stated meeting held on the second Wednesday in May. This makes it impossible to commence any new work before the first of July, and three months of the best road building portion of the year are lost; consequently, it is often impossible to complete a road in one year and the same has to be carried over until the next. We would, therefore, most earnestly recommend, in order to remove any question, that the freeholder law be amended by striking out the "second Wednesday in May," and substituting therefor the first day of January, as it is at this meeting that the boards make their appropriations for the year. They could then determine before their regular meeting in Feb-

ruary, or, at the latest March, what roads they were going to improve. These could then be submitted to the Commissioner for his approval, and, if the same were granted, the board could advertise the roads for the required three weeks and award the contracts at their April meeting. By this means we would obtain better roads and also be able to complete them before the end of the fiscal year.

The automobile is now a recognized means of conveyance, and as such is entitled to the use of the highways, but there are certain appliances used upon them which are very detrimental to our roads. They are the armored tire, the chain tire and the blower.

The damage done to the surface of our macadam and gravel roads by these appliances is so great that the question of a remedy is creating considerable agitation all over the different counties of the State. The temptation to get all the speed possible out of any means of locomotion is almost irresistible; therefore, no one should be allowed to run a machine upon our public highways without first obtaining a license, granted after a proper examination, as the majority of the accidents are caused by incompetent chauffeurs. If the high speed machines are to be allowed upon our highways, they should be taxed in proportion to the maximum speed of which they are capable. In other words, they should pay for the damage they do, and all money paid into the State Treasury for such licenses should be applied to the maintenance and repair of our roads.

The dust raised by an automobile, when running at a rate of less than twenty miles an hour, is not any worse than that raised by many wagons, but when this limit is exceeded, the automobile becomes the dust nuisance. Many cures for the dust annoyance have been suggested, as the sprinkling of our roads with crude oil and different solutions of absorbent salts. These will prevent the dust, but are too expensive to be generally used. Our remedy, therefore, would be a strict enforcement of the speed limit, the abolition of armored tires, chain tires and blowers, and a sprinkling of all of our improved roads early in the morning and late in the evening. This would preserve the roads and would reduce the cost of repairs very materially, at the same time giving us a better, smoother and more dustless surface than we now

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enjoy. There is no better or cheaper way of preserving our roads than by sprinkling. Water for this purpose can be obtained from neighboring streams, and, in those sections where there are none, from wells driven beside the road. In either case it is better and cheaper to pump the water into a tank, from which it can be drawn into the wagons, thereby saving much time.

There is one other cause of unnecessary wear and damage to our roads that should be removed. It is the narrow tire on heavily loaded wagons. The present law provides that townships may allow a rebate of taxes to all owners of wagons or carts, used for the transportation of merchandise, having tires of not less than four inches in width. We would suggest that this law be amended so as to include every municipality in the State. The premium of one dollar per year for each wheel would be money well and profitably expended, as the resultant saving of our road covering would be many times this amount, to say nothing of the added comfort to all.

Massachusetts and Connecticut have gone still farther and impose a penalty, not exceeding one hundred dollars, on all wagons having tires of less than a prescribed width for a given size of axle. As they are, next to New Jersey, the leading good roads states, we think that their example might be profitably followed by us.

Road Maintenance.

BY ROBERT A. MEEKER.

The maintenance of a road, already in good condition and of sufficient strength, if properly carried on, is almost entirely a question of wear. The rapidity of this wear varies with the nature of the rock used for the road covering, but, even with the softer rocks, there need be no deterioration if proper attention is given to maintenance.

The problem is to reduce the wear, both from traffic and the weather, to a minimum by substituting other material for that worn out, and to do this in the most economical manner.

The conditions under which wear will be reduced to a minimum, under a certain traffic, are good drainage of surface and subsoil. To attain this object the material used for the surface should be hard, in order to resist the wear of the traffic, should not contain too much small stone to absorb moisture, and should be thoroughly consolidated and of sufficient depth to bear the loads to which the road is subjected, so that the wear may be confined to the surface. On very few roads are these conditions to be found, but their attainment should be kept in view, and it is certain that in proportion as they are attained will be the economy of maintenance.

Drainage almost always requires attention, and there is usually a great deal that can be done to improve it, at a slight expense, and nothing pays so well in the end. Proper care of the surface is generally all that is needed to prevent water from standing on the road or in the gutters, but a dry surface is not enough. On a flat, water may be seen standing in the ditches to within a few inches of the surface of the road, in which case both the subsoil and road coating must be softened by it and remain so long after the water in the ditch is gone. A deeper ditch, a

larger culvert, or a drain cleaned out through the adjoining land is usually sufficient to remove a cause of great mischief. On a hillside, springs under the road and land water from the sides can be cut off and led away by underdrains at a trifling cost.

It is cheaper to procure good material from a distance than to try to save money by using inferior stone found along the line of the road.

The road coating may often be improved in composition and rendered harder by scraping, and a fairly good surface can be maintained at all times by proper care. With material of all sorts, the influence that a good surface has in keeping down wear is greater than might be supposed.

Everything should be done to make a road strong enough to bear the traffic without bending or cross-breaking and a reserve of strength is always desirable.

Fluctuations of traffic are most trying. A road may be strong enough to bear the ordinary loads that pass over it and still be unable to support the excessive weights that may be brought upon it. When we know a road is to be subjected to heavy strains, it is always better to strengthen it by placing an extra coating upon the surface, rather than wait until the road is broken and disrupted. When a road is broken or cut into by excessive weights, it is no longer a mere matter of replacing wear, but of expensive repair, and, in many cases, of entire rebuilding.

To replace wear that is unavoidable is a very simple matter when constant attention is given to the road. It is only when the surface is neglected for a long period that the matter of repairs becomes a serious one. A little attention to drainage, the removal of slight obstructions from the gutters, the clearing away of rubbish from the mouths of culverts, the removal of grass and brush from ditches and the careful spreading of small quantities of stone over depressions, as soon as they begin to appear, will keep a road in fine condition until it is almost entirely worn out. Nothing is more neglected than the removal of worn material from the road. It seems to be regarded merely as a clearing of the surface from mud, and, as such, an unnecessary expense, while, in reality, this worn material affects the entire composition of the road covering; consequently, un-

less the mud is washed away by nature from the surface, scraping or sweeping is necessary to preserve the proper proportion of solid stone in the road. Careful tests of the composition of our best road coverings have shown that from three-fourths to four-fifths of the material is solid stone, the remainder being material fine enough to be washed through a cheesecloth. Further careful tests have demonstrated that as this proportion of fine stuff is exceeded will the road be soft, easily acted upon by traffic, water and frost; in consequence, there will be an excessive waste of road material.

From the foregoing it is readily seen that the matter of road repair and maintenance is one that requires constant and careful attention. To attain the best results the most successful means so far employed is to assign a certain section to one man and hold him personally responsible for the condition of the road. It is also the most economical, because the seasons of the year when the road surface is most in need of attention are those when the farmer and laborer have least to do. The proper season for laying the bulk of the fresh materials is in the autumn and early winter, as soon as the surface of the road becomes softened by the fall rains and before the ground freezes. Materials laid at this season consolidate more quickly and become more thoroughly incorporated with the body of the road, hence are less liable to become loosened in dry weather. A thorough cleaning out of all gutters, culverts and bridges should take place in the fall, as soon as the dry weather is past. If all silt and road dirt are then removed down to the hard bottom, leaving nothing to give a hold to grass or weeds, this will, in the majority of cases, be sufficient for a general cleaning up. All ditches and side drains should be carefully cleaned out and opened, every precaution being taken to remove all water from the line of the road as soon as possible. No water should be allowed to stand in any gutter along the road, as it seriously injures the foundation. If these things are done before the ground freezes, the road will require but little work in the spring, except surfacing, and the resultant saving in material will be very great.

Good roads require constant attention or they will cease to be. This fact cannot be too often repeated or too strongly dwelt upon.

Road Repairs.

BY JAMES OWEN, COUNTY ENGINEER OF ESSEX.

The repair of the roads in New Jersey will be, in the future, a matter of more care and solicitude than at the present, and, with the increasing use of the highways for different kinds of travel, the means and methods of repair may have to undergo considerable modification to completely fill the public want.

In the first place, it is to be noted that the public mind has been educated to such a high standard that medium or inferior surfaces will not be tolerated. Second, the demand for a higher standard has been generally accompanied with a willingness to furnish the necessary money for the purpose. Third, the accomplishment and maintenance of a proper surface to the highway has resulted in a vast increase of vehicular travel, rendering the wear much greater. Fourth, this increase of travel is not only in the number of vehicles but in the enormous increase of weight and load of each, especially motor cars.

The problem, therefore, is to consider all the elements of wear and tear, and devise the proper methods to overcome them.

The process of deterioration in any given road is due to the following causes:

From travel—

The hammering of horses' feet, which tends to loosen the surface.

The pounding of the wheels wearing the stones out.

The displacement of the surface due to undue loads and inherent weakness of the road covering.

The displacement of the surface from the high velocity and extreme weight of automobiles.

From Weather—

The breaking up of the road surface, due to frost in winter and dry weather in summer.

The softening of the surface in excessive rains.

The destruction of the surface from heavy washes from the same causes.

Taking the above lists they can be classified as either perennial or incidental, and the treatment in each case may vary.

The action of horses' feet occurs only in narrow roads, little used, with a single line of travel, or in the spring of the year when the snow is disappearing and the long caulks of the horse shoes root up the stone. The first trouble is difficult to overcome, except with a coating of screenings, or sand or loam, and is apt to be continuous under the conditions noted. The second usually disappears with the spring rains.

The grinding up of the surface material by the wheels can only be replaced by the insertion of similar material.

The displacement of the surface, due to heavy loads, which usually appears in the form of ruts, can be obviated either by recoating the road or filling up the ruts. In filling the ruts, however, the edges should be picked over to a width of six inches before the new material is put on.

The displacement of the surface due to automobiles is becoming a subject of grave consideration on the part of those having charge of road repair. There seems to be a double action in the process; first, a grinding action, somewhat similar to the ordinary wheel travel; second, a kicking action, throwing the loosened material to the side. In dry, dusty weather the surface of a macadam pavement, after the passage of a heavy automobile at a high velocity, shows an incipient rut of light dimensions, but plainly to be discerned. This is not like the rut formed by ordinary vehicles, which merely displace the dusty surface, but is due to the tearing out of a portion of the consolidated macadam, and the result is a great increase in the rate of deterioration. Fortunately automobiles do not travel in a straight line like a horse and wagon, therefore the tendency to continuous ruts is not apparent, and so far there is no tendency of the automobiles to break up the surface in any more

serious manner. With the steady increase of their use, however, such a condition might arise.

The repairs due to the action of weather can be handled as follows:

With macadam, the breaking up of the surface by frost means either a releveling of the surface before it is dried out or re-coating with stone. Such an occurrence with telford is very rare, but when it does happen it necessitates relaying the road in the part affected.

When the surface is broken in dry weather a coating of screenings, loam or sand is absolutely necessary unless rain intervenes.

The softening of the surface by excessive rains is incidental to the work, but can be greatly modified by good grades and plenty of crown, thereby shedding the water quickly.

In the treatment of the destruction of surface by heavy rains the degree of damage governs the method. In many cases that used to replace ordinary wear will be sufficient, but if gullies are washed, fresh stone should be put in, and if a dry spell succeeds the rain, screenings or loam may be required.

The renewal of the surface, made necessary from any of the above causes, should be made with the same care and on the same principle as the original construction. The material and methods are, of course, subject to locality, but it is safe to say that the business of building and repairing roads is as much an expert matter as building railroads and bridges, and only those with full knowledge of their business should be put in authority.

In the early part of the last century railroads superseded highways, but with the introduction of mechanical propulsion on our roads the use of the same has been so vastly increased that their construction and maintenance are on a par with railroads in importance, and demand the same skill and intelligence.

When we remember that between one and two million dollars is being spent annually in the improvement of our highways, the importance of skilled supervision is at once apparent.

Dust and Its Prevention.

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

When the good roads movement was first started in New Jersey, our citizens were led to believe that the improvement would be permanent.

From our childhood we were imbued with the idea that there was nothing more lasting than stone, and that time, even in our trying climate, had but little effect upon it; hence, it was the most natural thing that we should turn to stone as the most suitable road material.

It is a well-known fact that the hardest spring wheat grinds into flour more readily than the tougher winter wheat. The same principle applies to our road surfacing material; namely, that there is as much difference in stone as there is in wheat. We should, therefore, be particularly careful to ascertain the quality of the stone before we use it. Applying the illustration just given to road building, the solid foundation will represent the under millstone, the narrow tire of the heavy freight wagon the upper millstone and the road covering the wheat. The harder and more brittle this road covering, the more readily it grinds to powder, and our early idea of the permanent stone road, without constant attention, disappears in dust. Keeping this thought in mind, it becomes evident that if we wish to preserve our stone roads we must give them constant care. The degree of care depends upon many contingencies, the chief of which is the weight and quantity of traffic. Near the large cities the freight wagons cause the greatest destruction to the roads by crushing and grinding the road metal as the millstones grind the grain. Under this heavy traffic it is readily seen that different kinds of surfacing stones show marked difference in their resistance to wear.

This fact has become so evident that the United States Government and some of the states have installed appliances to determine the relative wearing qualities of stone. The writer is impressed with the importance of thoroughly testing all stone or other material used for road building. From outward appearance, no one, even an expert, can tell positively the relative wearing qualities of similar grades of stone; hence, a mechanical test is necessary. From numerous tests made at the Massachusetts Experiment Station it was shown that two samples of stone, both called trap rock and used for surfacing in New Jersey, had relative wearing qualities in about the proportion of one to two. This being a fact, the better stone is by far the cheaper at double the price per ton, as the freight, carting and applying cost the same in either case.

In view of the above statements, it really seems that our State should have some way to determine mechanically the relative wearing qualities of its different surfacing stones. Since the good stone will wear twice as long as the poor one, it must necessarily follow that when the former is used we will have a smaller proportion of dust. The dust question is one with which we are now confronted. When we consider the composition of these fine particles, which are distributed into every conceivable place by the rapidly moving vehicles, it becomes evident at once that something should be done to abate this dangerous nuisance. There are several remedies suggested and many experiments have been made, but a satisfactory solution has not yet been reached. In California asphaltum oil is used with very satisfactory results, but it is not applicable in less arid regions, and it would be too expensive to be used in sections far removed from the asphaltum oil district. There are some patented preparations, with petroleum as their base, which are being largely advertised. In France coal tar has been used satisfactorily and some experiments have been made with it in New Jersey, but not on a large enough scale to determine its practicability. There is one thing which we all know will keep dust down, and that is a liberal and frequent application of water. All the thickly inhabited localities have a public water system from which tank wagons can be filled at small cost. In the more

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sparsely settled sections tanks may be erected into which water may be pumped from streams crossing the road. The water should then be applied at least twice a day during the dry weather. Gravel is a good substitute for water when the latter cannot be obtained, but as it is soon ground to powder and in that condition only adds to the dust nuisance, it can be considered only as a make shift.

While our scientists are studying the question of dust prevention by some cheap and efficient method, I would strongly insist upon the use of water on all our roads, especially those running through our built up districts. This would add greatly to the health and comfort of the traveling public and make life much more endurable in the dwellings adjacent to our main roads, at the same time reducing the wear of the surface and prolonging the life of the road.

NEW JERSEY STATE LIBRARY

Quarries in New Jersey Producing Road Metal.

BERGEN COUNTY.

LOCATION OF QUARRY.	OWNERS.	P. O. ADDRESS.
Edgewater,	Cody Bros.,	Edgewater, N. J.
Linwood,	Carpenter Bros.,	Linwood, N. J.
Shady Side,	Brown & Fleming,	Englewood, N. J.
Fairview,	Fairview Stone Crushing Co.,	1996 Chambers St., N. Y.

ESSEX COUNTY.

Montclair,	Osborne & Marcellis,	Upper Montclair, N. J.
Montclair,	F. J. Marley,	Little Falls, N. J.
Orange,	Geo. Spottswood & Co.,	Orange, N. J.
Millburn,	G. A. Lighthipe & Son,	Millburn, N. J.
Cedar Grove,	F. J. Marley,	Little Falls, N. J.
Montclair,	Francisco Bros.,	Orange, N. J.
Short Hills,	Stewart Hartshorn,	Orange, N. J.
Caldwell,	P. A. Matthews,	Caldwell, N. J.

HUDSON COUNTY.

Bergen Hill,	B. M. & F. J. Shanley,	Newark, N. J.
Palisades,	Palisade Construction Co.,	
	No. 1 Montgomery St.,	Jersey City, N. J.
Palisades,	Hudson County Contracting Co.,	
	No. 367 Communipaw Ave.,	Jersey City, N. J.
Guttenberg,	Meeks,	Guttenberg, N. J.
Granton,	Wagner & Duff,	Granton, N. J.
Granton,	F. J. Marley,	Little Falls, N. J.
Woodcliff,	John S. Lane & Sons,	Guttenberg, N. J.
Shady Side,	Bull's Ferry Land Co.,	Guttenberg, N. J.

HUNTERDON COUNTY.

Byram Station,	B. M. & J. F. Shanley,	Newark, N. J.
Byram Station,	Trenton Stone and Construction Co.,	Trenton, N. J.
Lambertville,	W. N. Ireland, Agent,	1241 Filbert St., Phila., Pa.
Middle Valley,	Middle Valley Trap Rock Co.,	Middle Valley, N. J.

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MERCER COUNTY.

LOCATION OF QUARRY.	OWNERS.	P. O. ADDRESS.
Moores,	Delaware River Quarry and Construction Co.,	Lambertville, N. J.
Goat Hill,	B. M. & J. F. Shanley,	Jersey City, N. J.
Hopewell,	Hopewell Quarry Co.,	Hopewell, N. J.
Titusville,	Trenton Stone and Construction Co.,	Trenton, N. J.
Belmont,	Mercer County Workhouse,	Trenton, N. J.

MIDDLESEX COUNTY.

Deans,	James & George Law,	Monmouth Junction, N. J.
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MORRIS COUNTY.

Nearly all road-building material in this county is of native rock, gneiss, granite and shale. The traps are mostly imported from other counties.

Millington,	Morris County Crushed Stone Co., ..	Morristown, N. J.
Mountain View,	Standard Paving Co.,	Mountain View, N. J.

PASSAIC COUNTY.

Garret Mountain, ...	Francisco Bros.,	Little Falls, N. J.
Paterson,	F. J. Marley,	Little Falls, N. J.
Paterson,	Paterson Crushed Stone Co.,	Paterson, N. J.
Paterson,	New Jersey Stone Co.,	Rutherford, N. J.
Paterson,	McKiernan & Bergen,	Paterson, N. J.
Notch Road,	F. J. Marley,	Little Falls, N. J.
Notch Road,	Dowling Construction Co.,	Paterson, N. J.
Haledon,	R. M. Torbet,	Haledon, N. J.
Hawthorne,	Daniel & D. Stanley,	Hawthorne, N. J.
Preakness,	Colfax & Steele,	Pompton, N. J.
Great Notch,	Wright & Lindsley,	Orange, N. J.
Paterson,	Preakness Stone Crushing Co.,	Paterson, N. J.

SOMERSET COUNTY.

Dunellen,	Garrison & Gray,	Dunellen, N. J.
North Plainfield, ...	N. B. Smalley,	Plainfield, N. J.
Bernardsville,	Somerset Stone Crushing Co.,	Bernardsville, N. J.
Mine Brook,	James Freeman,	Mine Brook, N. J.
Plainfield,	J. H. Wilson & Co.,	Plainfield, N. J.
Millington,	Millington Stone Co.,	Millington, N. J.
Chimney Rock,	Bound Brook Crushed Stone Co., ..	Bound Brook, N. J.

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LOCATION OF QUARRY.	OWNERS.	P. O. ADDRESS.
Somerville,	William Hardgrove,	Somerville, N. J.
Rocky Hill,	Rocky Hill Stone Storage Co.,	Rocky Hill, N. J.
Bernardsville,	Frank S. Tainter,	Morristown, N. J.
Far Hills,	Grant Schley,	Far Hills, N. J.
Bernardsville,	Mine Brook Stone Co.,	Bernardsville, N. J.

SUSSEX COUNTY.

Newton,	Newton State Quarry,	Newton, N. J.
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UNION COUNTY.

Scotch Plains,	Hatfield & Weldon,	Scotch Plains, N. J.
Murray Hill,	Commonwealth Co.,	Murray Hill, N. J.
Summit,	A. A. Potter,	Summit, N. J.
West Summit,	Victor G. Smythe,	West Summit, N. J.
Springfield,	Stewart Hartshorn,	Springfield, N. J.

Gravel Pits In New Jersey Used for Road Building.

ATLANTIC COUNTY.

LOCATION OF PITS.	OWNERS.	P. O. ADDRESS.
May's Landing,	Estate of Wm. Post,	May's Landing, N. J.
May's Landing,	D. E. Izard,	May's Landing, N. J.
Estelville,	A. E. Bourgeois,	Estelville, N. J.
Tuckahoe,	Henry D. & Wm. G. Moore, Haddonfield, and 931 Chestnut St., Phila., Pa.	
May's Landing,	J. E. P. Abbott,	May's Landing, N. J.
May's Landing,	Samuel Champion,	May's Landing, N. J.
Pleasantville,	West Jersey and Seashore Railroad,	Camden, N. J.
Pleasantville,	P. and A. C. Railroad,	Pleasantville, N. J.

BURLINGTON COUNTY.

Riverton,	Lewis Connor,	Riverton, N. J.
Westfield,	Enoch Evans,	Westfield, N. J.
Westfield,	Estate of Wm. R. Lippincott,	Westfield, N. J.
Palmyra,	Isaac Evaul,	Palmyra, N. J.
Palmyra,	Wm. F. Morgan,	Palmyra, N. J.
Burlington,	Frank Warren,	Burlington, N. J.
Riverton,	Franklin T. Hunter,	Riverton, N. J.
Bridgeboro,	Edwin M. Brock,	Bridgeboro, N. J.
Moorestown,	Michael Flynn,	Moorestown, N. J.
Hartford,	John Warrick,	Hartford, N. J.
Rancocas,	James W. Stokes,	Rancocas, N. J.
Columbus,	Thomas A. Bunting,	Columbus, N. J.
Columbus,	Thomas H. Rogers,	Columbus, N. J.
Kinkora,	C. G. Kinsley,	Kinkora, N. J.
Columbus,	Edward Wilson,	Columbus, N. J.
Columbus,	Charles Sharp,	Columbus, N. J.
Florence,	George Browne,	Florence, N. J.
Georgetown,	John P. Hutchinson,	Georgetown, N. J.
Jobstown,	Charles Black,	Jobstown, N. J.
Centerton,	Allen Austin,	Centerton, N. J.
Willingboro,	Mrs. John Buzby,	Willingboro, N. J.
Beverly,	J. H. Comb,	Beverly, N. J.
Burlington,	Samuel Johnson,	Burlington, N. J.
Beverly,	William Baggs,	Beverly, N. J.
Beverly,	Joshua Fenimore,	Beverly, N. J.
Moorestown,	Samuel C. Decou,	Moorestown, N. J.

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CAPE MAY COUNTY.

LOCATION OF PITS.	OWNERS.	P. O. ADDRESS.
Belle Plain,	West Jersey and Seashore Railroad,	Camden, N. J.

CUMBERLAND COUNTY.

Millville,	John Golder,	Millville, N. J.
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MIDDLESEX COUNTY.

Old Bridge,	I. Biddle Herbert,	Old Bridge, N. J.
Helmetta,	Geo. W. Helme,	Helmetta, N. J.
Jamesburg,	James Buckalew's Sons,	Jamesburg, N. J.
Englishtown,	Charles Hoffman,	Englishtown, N. J.

MONMOUTH COUNTY.

Hopping,	D. G. Campbell,	Middletown, N. J.
Navesink,	D. R. G. Andrews,	Navesink, N. J.
Hopping,	Peter L. Conover,	Atlantic Highlands, N. J.
Leonardville,	John T. Hopping,	Leonardville, N. J.
Red Bank,	Mrs. Henry Field,	Red Bank, N. J.
Red Bank,	James Hubbard,	Red Bank, N. J.
Red Bank,	John L. Applegate,	Red Bank, N. J.
Chapel Hill,	Geo. T. Hopping,	Chapel Hill, N. J.
Middletown,	J. D. Conover,	Middletown, N. J.
Farmingdale,	Manasquan Gravel Co.,	Asbury Park, N. J.
Allenwood,	Manasquan Gravel Co.,	Asbury Park, N. J.
Shark River,	Manasquan Gravel Co.,	Asbury Park, N. J.
Navesink,	Webster Swan,	Navesink, N. J.
Holmdel,	William Crawford,	Holmdel, N. J.
Red Bank,	Red Bank Gravel Co.,	Red Bank, N. J.

OCEAN COUNTY.

Stafford,	Staffordville Gravel Co.,	Staffordville, N. J.
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Pleasantville and Atlantic City Boulevard—Pleasantville End—
Atlantic County.



Pleasantville and Atlantic City Boulevard Extension, Atlantic County,
After Improvement.

Statements by Engineers and Supervisors.

MAGNOLIA, N. J., October 27th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Pleasantville and Atlantic City road, township of Egg Harbor and borough of Pleasantville, county of Atlantic, State of New Jersey, for which a previous certificate was not given in 1903 or 1904. Total length, 4,801.7 feet, or .91 miles.

Width of gravel-bed, 60 feet.
 Length of gravel-bed, 18,937.58 feet.
 Depth of gravel-bed, 6 inches.

Fill near Shore road made by D. Myers, 1,000 cubic yards, at 25 cents; total,	\$250 00
Sand fill, pumped, 2,995.2 cubic yards, at 18 cents; total,	539 14
Gravel, 21,041.75 square yards, at \$1.00; total,	21,041 75
Railing, 33,831.26 feet, at 10 cents; total,	3,383 13
Trestle bridges, exclusive of draw spans, 17.7 lineal feet, at \$6.25; total,	110 63
Extra stringers in position on bulkheads at 4 cents per foot; total,	409 69
Extra work on Fish creek and Rainbow thoroughfares,	361 62
Payment as per supplemental agreement,	10,000 00
Total,	\$36,095 96
Supervisor's salary,	609 00
Engineering expenses,	1,249 99
Legal expenses,	126 56
Advertising and printing,	56 39
Stripping bark from posts,	22 75
Total cost of road,	\$38,160 65
Lump sum, contract price,	\$36,095 96
Total allowed by the State,	36,095 96
One-third of above, amount paid by the State,	12,031 99

Maximum grade before. There was no road, only meadow flats.

Maximum grade after, perfectly level except approaches to bridges, where there is 1 per cent. grade.

TWELFTH ANNUAL REPORT.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 6 inches.

Respectfully yours,

J. J. ALBERTSON,
County Engineer.
H. W. BREDER,
Supervisor.

MAGNOLIA, N. J., October 27th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the extension of Pleasantville and Atlantic City road in Atlantic City, county of Atlantic, State of New Jersey. Total length, 3,184.45 feet, or .60 miles.

Width of gravel-bed, 58 feet.
Length of gravel-bed, 3,184.45 feet.
Depth of gravel-bed, 6 inches.

Gravel, 3,420.33 cubic yards, at \$1.48; total,	\$5,062 08
Sand fill, 4,139.1 cubic yards, at 38 cents; total,	1,572 86
Sand bought for fill, 3,546 cubic yards, at 30 cents; total,	1,063 80
Railing, 495 lineal feet, at 24 cents; total,	118 80
Extra as per supplemental agreement,	2,500 00
Total,	\$9,253 74
Supervisor's salary, paid by State,	156 00
Engineering expenses,	314 21
Total cost of road,	\$10,787 75
Lump sum, contract price,	\$9,073 29
Total allowed by the State,	9,253 74
One-third of above, amount paid by the State,	3,084 58

Maximum grade before. There was no road, meadow flats.
Maximum grade after, .2 per cent., except at bridge, where it is 4 per cent. for 100 feet.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 6 inches.

Respectfully yours,

J. J. ALBERTSON,
Engineer.
H. W. BREDER,
Supervisor.

COMMISSIONER OF PUBLIC ROADS. 63

October 16th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Midland avenue, township of Midland, county of Bergen, State of New Jersey. Total length, 11,694 feet, or 2.22 miles.

Width of stone-bed, 12 feet.
 Length of stone-bed, 11,694 feet.
 Depth of stone-bed, 5 inches.

Macadam, 15,592 square yards, at 41½ cents; total,	\$6,470 68
Earth excavation, 7,797 cubic yards, at 22 cents; total,	1,715 34
Rock excavation, 40½ cubic yards, at \$1.00; total,	40 50
Cobble stone gutter, 996 lineal feet, at 53 cents; total,	527 88
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Total,	\$8,754 40
Supervisor's salary,	285 00
Engineering expenses,	528 00
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Total cost of road,	\$9,567 40
	<hr/>
Lump sum, contract price,	\$8,754 40
Total allowed by the State,	8,754 40
One-third of above, amount paid by the State,	2,918 13
Maximum grade before,	9 per cent.
Maximum grade after,	6 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 5 inches.

Respectfully yours,
 JOHN A. DOOLITTLE,
Engineer.
 DAVID H. HOPPER,
Supervisor.

MAGNOLIA, N. J., October 25th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Clementon road, township of Clementon, county of Camden, State of New Jersey. Total length, 7,385 feet, or 1.40 miles.

Width of stone-bed, 12 feet.
 Length of stone-bed, 7,385 feet.
 Depth of stone-bed, 8 inches.

TWELFTH ANNUAL REPORT.

Macadam, 9,846 $\frac{2}{3}$ square yards, at \$1.00; total,	\$9,846.66
Preparing road bed,	342 75
Earth excavation, 6,958.2 cubic yards, at 25 cents; total,	1,739 55
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Total,	\$11,928 96
Supervisor's salary,	396 00
Engineering expenses,	365 14
<hr/>	
Total cost of road,	\$12,690 10
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Lump sum bid, awarded on unit prices,	\$12,812 25
Total allowed by the State,	11,928 96
One-third of above, amount paid by the State,	3,976 32
<hr/>	
Maximum grade before,	6.80 per cent.
Maximum grade after,	4 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 J. J. ALBERTSON,
County Engineer.
 WILLARD T. GIBBS,
Supervisor.

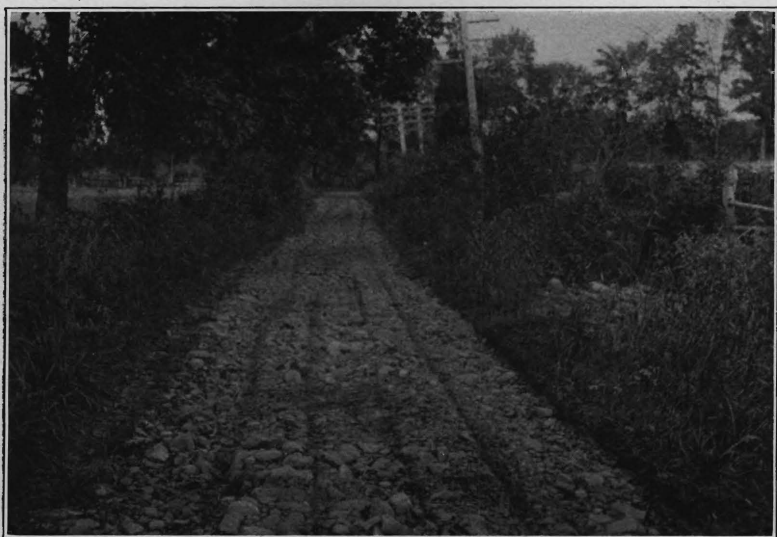
NEWARK, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

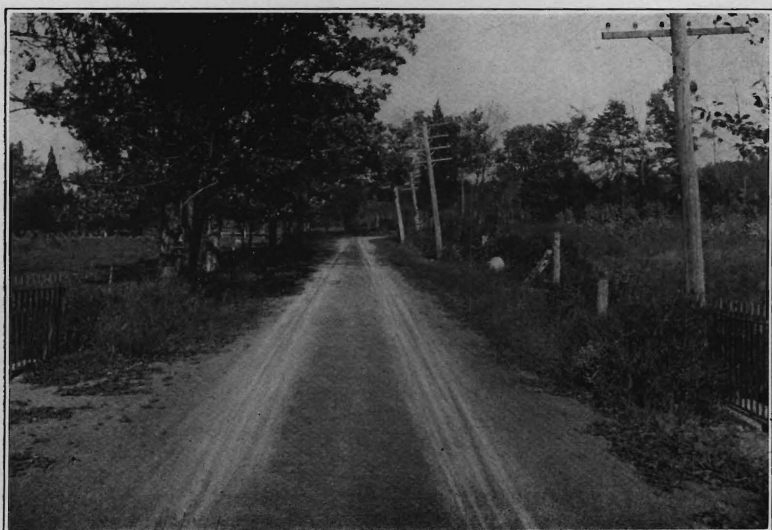
DEAR SIR—Below find an exact detailed statement of the cost of Franklin avenue, townships of Nutley and Belleville, county of Essex, State of New Jersey. Total length, 7,270 feet, or 1.38 miles.

Width of stone-bed, 16 feet.
 Length of stone-bed, 7,156 feet.
 Depth of stone-bed, 8 inches.

Telford, 12,891 square yards, at 58 cents; total,	\$7,476 78
Earth excavation, 11,225 cubic yards, at 38 cents; total,	4,265 50
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Total,	\$11,742 28
Supervisor's salary,	318 00
Engineering expenses,	603 00
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Total cost of road,	\$12,663 28
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Total allowed by the State,	\$11,742 28
One-third of above, amount paid by the State,	3,914 09



Hobart Gap Road, Essex County, Before Improvement.



Hobart Gap Road, Essex County, After Improvement.

COMMISSIONER OF PUBLIC ROADS. 65

Maximum grade before, 7.25 per cent.
 Maximum grade after, 5.20 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 JAS. OWEN,
Engineer.
 WILLIAM KETCHAM,
Supervisor.

NEWARK, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Roosevelt avenue, township of Livingston, county of Essex, State of New Jersey. Total length, 9,175 feet, or 1.74 miles.

Width of stone-bed, 16 feet.
 Length of stone-bed, 9,175 feet.
 Depth of stone-bed, 8 inches.

Telford, 16,396 square yards, at 59 cents; total,	\$9,673 64
Earth excavation, 12,541 cubic yards, at 38 cents; total,	4,765 58
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Total,	\$14,439 22
Supervisor's salary,	345 00
Engineering expenses,	737 00
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Total cost of road,	\$15,521 22
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Total allowed by the State,	\$14,439 22
One-third of above, amount paid by the State,	4,813 07

Maximum grade before, 8.34 per cent.
 Maximum grade after, 3.70 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 JAS. OWEN,
Engineer,
 GEORGE W. MOOREHOUSE,
Supervisor.

NEWARK, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Pier Lane, township of Caldwell, county of Essex, State of New Jersey. Total length, 7,084 feet, or 1.34 miles.

Width of stone-bed, 16 feet.
 Length of stone-bed, 7,084 feet.
 Depth of stone-bed, 8 inches.

Telford, 12,930 square yards, at 50 cents; total,	\$6,465 00
Earth excavation, 3,915 cubic yards, at 30 cents; total,	1,174 50
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Total,	\$7,639 50
Supervisor's salary,	306 00
Engineering expenses,	644 00
	<hr/>
Total cost of road,	\$8,589 50
	<hr/>
Total allowed by the State,	\$7,639 50
One-third of above, amount paid by the State,	2,546 50
Maximum grade before,	3.15 per cent.
Maximum grade after,	1.28 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,

JAS. OWEN,
Engineer.

WILLIAM E. KENT,
Supervisor.

NEWARK, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Wall street and Stuyvesant avenue, township of Irvington and city of Newark, county of Essex, State of New Jersey. Total length, 15,300 feet, or 2.90 miles.

Width of stone-bed, 16 feet.
 Length of stone-bed, 15,124 feet.
 Depth of stone-bed, 8 inches.

Telford, 26,968 square yards, at 65.5 cents; total,	\$17,664 04
Earth excavation, 18,548 cubic yards, at 25 cents; total,	4,637 00
Belgian block gutter, 124.1 square yards, at \$1.75; total,	217 17
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Total,	\$22,518 21

COMMISSIONER OF PUBLIC ROADS. 67

Supervisor's salary,	\$486 00
Engineering expenses,	928 00
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Total cost of road,	\$23,932 21

Total allowed by the State,	\$22,518 21
One-third of above, amount paid by the State,	7,506 07
Maximum grade before,	4.75 per cent.
Maximum grade after,	3.70 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 JAS. OWEN,
Engineer,
 WILLIAM A. SHERMAN,
Supervisor.

NEWARK, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of South Orange avenue extension, township of Livingston, county of Essex, State of New Jersey. Total length, 4,647 feet, or .88 mile.

Width of stone-bed, 16 feet.
 Length of stone-bed, 4,647 feet.
 Depth of stone-bed, 8 inches.

Telford, 8,501 square yards, at 69 cents; total,	\$5,865 69
Earth excavation, 6,140 cubic yards, at 48 cents; total,	2,947 20
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Total,	\$8,812 89
Supervisor's salary,	129 00
Engineering expenses,	262 00
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Total cost of road,	\$9,203 89

Total allowed by the State,	\$8,812 89
One-third of above, amount paid by the State,	2,937 63
Maximum grade before,	6.75 per cent.
Maximum grade after,	2.48 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 JAS. OWEN,
Engineer.
 JOHN C. WILLIAMS,
Supervisor.

October 2d, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Olden avenue, township of Hamilton, county of Mercer, State of New Jersey. Total length, 12,195 feet, or 2.31 miles.

Width of stone-bed, 14 feet.	
Length of stone-bed, 12,195 feet.	
Depth of stone-bed, Class B or 6 inches.	
Macadam, 19,222 square yards, at 60 cents; total,	\$11,533 20
Additional 4-inch macadam, 22 square yards, at 30 cents; total,...	6 60
Earth excavation, 17,060 cubic yards, at 30 cents; total,	5,118 00
Additional excavation, 218 cubic yards, at 60 cents; total,	130 80
Drain, 4,484 lineal feet, at 22 cents; total,	986 48
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Total,	\$17,775 08
Supervisor's salary,	354 00
Engineering expenses,	510 60
Extras, paid by county, for piping and bridges,.....	2,649 00
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Total cost of road,	\$21,288 68
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Lump sum, contract price,	\$16,651 20
Total allowed by the State,	17,775 08
One-third of above, amount paid by the State,	5,925 02
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Maximum grade before,	8.8 per cent.
Maximum grade after,	2.7 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class B or 6 inches.

Respectfully yours,

FRANK J. EPPELE,
Engineer.

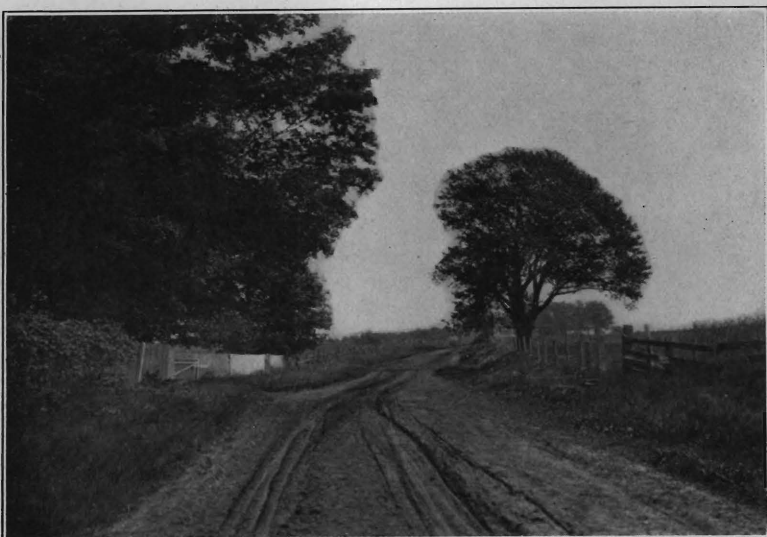
JOEL H. SPRAGUE,
Supervisor.

July 21st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Whitehead's Mill road, township of Hamilton, county of Mercer, State of New Jersey. Total length, 5,393 feet, or 1.02 miles.

Width of stone-bed, 14 feet.
Length of stone-bed, 5,393 feet.
Depth of stone-bed, Class C or 8 inches.



**Pennington and Washington's Crossing Road, Mercer County,
Before Improvement.**



**Pennington and Washington's Crossing Road, Mercer County,
After Improvement.**

COMMISSIONER OF PUBLIC ROADS. 69

Macadam, 8,244 square yards, at 61.284 cents; total,	\$5,052 26
Earth excavation, 2,850 cubic yards, at 30 cents; total,	855 00
Additional earth excavation, 80 cubic yards, at 40 cents; total, ...	32 00
Drain, 200 lineal feet, at 22 cents; total,	44 00
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Total,	\$5,983 26
Supervisor's salary,	120 00
Engineering expenses—	
On macadam road,	\$149 58
On extras, paid by county,	4 58
	<hr/>
	154 16
Extras, paid by county,	183 12
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Total cost of road,	\$6,440 54
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Lump sum, contract price,	\$5,907 26
Total allowed by the State,	5,983 26
One-third of above, amount paid by the State,	1,994 42
Maximum grade before,	3.4 per cent.
Maximum grade after,	1.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class C or 8 inches.

Respectfully yours,

FRANK J. EPPELE,
Engineer.

JOHN COXON, JR.,
Supervisor.

October 25th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Pennington and Washington's Crossing road, from Search's Corner to Woolsey's Branch of Jacob's creek; also Central avenue, from Maddock's Corner to Sked's Corner, township of Hopewell, county of Mercer, State of New Jersey. Total length, 14,745 feet, or 2.79 miles.

- Width of stone-bed, 14 feet.
- Length of stone-bed, 14,665 feet.
- Depth of stone-bed, Class C or 8 inches.

Macadam, 23,193 square yards, at 72 cents; total,	\$16,698 96
Earth excavation, 9,550 cubic yards, at 30 cents; total,	2,865 00
Additional earth excavation, 55 cubic yards, at 75 cents; total, ...	41 25
Drain, 21,060 lineal feet, at 22 cents; total,	4,633 20
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Total,	\$24,238 41

TWELFTH ANNUAL REPORT.

Supervisor's salary,	\$399 00
Engineering expenses,	717 07
Extras, paid by county, for piping and bridges,	4,444 50
	<hr/>
Total cost of road,	\$29,798 98
	<hr/>
Lump sum, contract price,	\$19,563 96
Total allowed by the State,	24,238 41
One-third of above, amount paid by the State,	8,079 47
	<hr/>
Maximum grade before,	9.2 per cent.
Maximum grade after,	3.7 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class C or 8 inches.

Respectfully yours,

FRANK J. EPPELE,
Engineer.
H. W. PHILLIPS,
Supervisor.

November 28th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of a portion of Brunswick pike road, townships of Lawrence and West Windsor, county of Mercer, State of New Jersey. Total length, 21,120 feet, or 4.00 miles.

Width of stone-bed, 16 feet.
Length of stone-bed, 20,949 feet.
Depth of stone-bed, Class C or 8 inches.

Macadam, 38,208 square yards, at 60.3305/9552 cents; total,	\$23,057 00
Earth excavation, 18,510 cubic yards, at 30 cents; total,	5,553 00
Additional earth excavation, 258 cubic yards, at 40 cents; total, ..	103 20
Drain, 9,408 lineal feet, at 22 cents; total,	2,069 76
	<hr/>
Total,	\$30,782 96
Supervisor's salary,	433 50
Engineering expenses,	815 19
Extras, paid by county, for piping and bridges,	1,824 60
	<hr/>
Total cost of road,	\$33,856 25
	<hr/>
Lump sum, contract price,	\$28,610 00
Total allowed by the State,	30,782 96
One-third of above, amount paid by the State,	10,260 99

COMMISSIONER OF PUBLIC ROADS. 71

Maximum grade before, 6.8 per cent.
 Maximum grade after, 2.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class C or 8 inches.

Respectfully yours,
FRANK J. EPPELE,
Engineer.
 EDWIN O. SEELY,
Supervisor.

November 28th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Grover's Mill road, township of West Windsor, county of Mercer, State of New Jersey. Total length, 9,940 feet, or 1.88 miles.

Width of stone-bed, 14 feet.
 Length of stone-bed, 9,940 feet.
 Depth of stone-bed, Class C or 8 inches.

Macadam, 15,623 square yards, at 70.14040/15623 cents; total,	\$11,076 50
Earth excavation, 8,825 cubic yards, at 30 cents; total,	2,647 50
Additional earth excavation, 2,516 cubic yards, at 40 cents; total,	1,006 40
Drain, 7,262 lineal feet, at 22 cents; total,	1,597 64
<hr/>	
Total,	\$16,328 04
Supervisor's salary,	438 00
Engineering expenses,	477 97
Extras, paid by county, for piping and bridges,	2,790 87
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Total cost of road,	\$20,034 88

Lump sum, contract price,	\$13,724 00
Total allowed by the State,	16,328 04
One-third of above, amount paid by the State,	5,442 68
Maximum grade before,	7.4 per cent.
Maximum grade after,	3.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class C or 8 inches.

Respectfully yours,
FRANK J. EPPELE,
Engineer.
 DAVID D. GROVER,
Supervisor.

TWELFTH ANNUAL REPORT.

September 20th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Trenton and Allentown turnpike from Newtown to Monmouth county line, township of Washington, county of Mercer, State of New Jersey. Total length, 16,608 feet, or 3.15 miles.

Width of stone-bed, 14 feet.
 Length of stone bed, 16,608 feet.
 Depth of stone-bed, Class C or 8 inches.

Macadam, 26,237 square yards, at 74.10380/26237 cents; total,	\$19,519 08
Additional 5-inch macadam, 310 square yards, at 42 cents; total, . . .	130 20
Earth excavation, 13,250 cubic yards, at 30 cents; total,	3,975 00
Additional earth excavation, 562 cubic yards, at 60 cents; total, . . .	337 20
Drain, 13,539 lineal feet, at 22 cents; total,	2,978 58
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Total,	\$26,940 06
Supervisor's salary,	333 00
Engineering expenses—	
On macadam road,	\$673 50
On extras, paid by county,	79 47
	<hr/>
	752 97
Extras, paid by county, for piping and bridges,	3,178 80
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Total cost of road,	\$31,204 83
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Lump sum, contract price,	\$23,494 08
Total allowed by the State,	26,940 06
One-third of above, amount paid by the State,	8,980 02
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Maximum grade before,	5.4 per cent.
Maximum grade after,	2.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class C or 8 inches.

Respectfully yours,

FRANK J. EPPELE,
Engineer.
 GEO. T. FORD,
Supervisor.

October 26th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Groveville road, township of Hamilton, county of Mercer, State of New Jersey. Total length, 5,464.5 feet, or 1.03 miles.



**Trenton and Allentown Turnpike, Mercer County,
Before Improvement.**



**Trenton and Allentown Turnpike, Mercer County,
After Improvement.**

COMMISSIONER OF PUBLIC ROADS.

Width of stone-bed, 14 feet.
 Length of stone-bed, 5,360.5 feet.
 Depth of stone-bed, Class B or 6 inches.

Macadam, 9,105 square yards, at 61 cents; total,	\$5,554 05
Additional macadam, 239 square yards, at 61 cents; total,	145 79
Earth excavation, 12,270 cubic yards, at 20 cents; total,	2,454 00
Additional earth excavation, 1,167 cubic yards, at 35 cents; total, ..	408 45
Drain, 30 lineal feet, at 15 cents; total,	4 50
Belgian block gutter, 168 square yards, at \$1.95; total,	327 60
Cobble stone gutter, 466 square yards, at 30 cents; total,	139 80
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Total,	\$9,034 19
Supervisor's salary,	378 00
Engineering expenses—	
On road contract,	\$225 85
On extras, paid by county,	69 94
	<hr/>
	295 79
Extras, paid by county, for piping and bridges,	2,797 50
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Total cost of road,	\$12,505 48
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Lump sum, contract price,	\$8,008 05
Total allowed by the State,	9,034 19
One-third of above, amount paid by the State,	3,011 40
Maximum grade before,	9.8 per cent.
Maximum grade after,	5.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was Class B or 6 inches.

Respectfully yours,

FRANK J. EPPELE,
Engineer.

CHAS. J. BORDEN,
Supervisor.

NEW BRUNSWICK, N. J., October 25th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the South Amboy and Keyport road, township of Sayreville, county of Middlesex, State of New Jersey. Total length, 5,280 feet, or 1 mile.

Width of stone-bed, 12 feet.
 Length of stone-bed, 5,280 feet.
 Depth of stone-bed, 8 inches.

TWELFTH ANNUAL REPORT.

Macadam, 7,040 square yards, at 57.4886 cents; total,	\$4,047 20
Earth excavation, 19,260 cubic yards, at 23 cents; total,	4,429 80
Drain, 1,000 lineal feet, at 10 cents; total,	100 00
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Total,	\$8,577 00
Supervisor's salary,	219 00
Engineering expenses,	154 15
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Total cost of road,	\$8,950 15
<hr/>	
Lump sum, contract price,	\$8,577 00
Total allowed by the State,	8,577 00
One-third of above, amount paid by the State,	2,859 00
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Maximum grade before,	8.1 per cent.
Maximum grade after,	5.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,

R. J. DOUGHERTY,
Engineer.

C. W. FISHER,
Supervisor.

NEW BRUNSWICK, N. J., December 4th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Plainsboro and Cranbury road, township of South Brunswick, county of Middlesex, State of New Jersey. Total length, 7,410 feet, or 1.4 miles.

Width of stone-bed, 12 feet.
Length of stone-bed, 7,410 feet.
Depth of stone-bed, 8 inches.

Macadam, 9,880 square yards, at 65.9255 cents; total,	\$6,513 40
Macadam, extra, 600 square yards, at 68 cents; total,	408 00
Gravel, extra fill at trolley, 500 cubic yards, at 22 cents; total, ...	110 00
Gravel, extra fill at railroad, 2,500 cubic yards, at 22 cents; total,	550 00
Earth excavation, 5,000 cubic yards, at 22 cents; total,	1,100 00
Drain, 1,000 lineal feet, at 20 cents; total,	200 00
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Total,	\$8,881 40
Supervisor's salary,	193 00
Engineering expenses,	165 10

COMMISSIONER OF PUBLIC ROADS. 75

Extras, paid by county—	
Carting and placing C. I. pipe, \$75; carting and placing terra-cotta pipe, \$75,	\$150 00
Furnishing and placing old railroad ties for cribbing on fill, ...	100 00
	<hr/>
Total cost of road,	\$9,489 50
	<hr/>
Lump sum, contract price,	\$7,813 40
Total allowed by the State,	8,881 40
One-third of above, amount paid by the State,	2,960 47
Maximum grade before,	6.00 per cent.
Maximum grade after,	3.80 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 R. J. DOUGHERTY,
Engineer.
 LEWIS OKESON,
Supervisor.

NEW BRUNSWICK, N. J., November 27th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Woodbridge and Oak Tree road, second section, township of Woodbridge, county of Middlesex, State of New Jersey. Total length, 7,447.5 feet, or 1.41 miles.

Width of stone-bed, 12 feet.
 Length of stone-bed, 7,447.5 feet.
 Depth of stone-bed, 8 inches.

Macadam, 9,929.6 square yards, at 67 cents; total,	\$6,652 83
Macadam, extra spurs, 693.3 square yards, at 67 cents; total,	464 51
Macadam, extra to connect with end of old road, 80 square yards, at 80 cents; total,	64 00
Earth excavation, 17,744 cubic yards, at 29.9985 cents; total,	5,322 91
Earth excavation, extra driveways, 154 cubic yards at 30 cents; total,	46 20
Drain, 2,000 lineal feet, at 15 cents; total,	300 00
Drain, extra, 1,129 lineal feet, at 15 cents; total,	169 35
	<hr/>
Total,	\$13,019 80
Supervisor's salary,	324 00
Engineering expenses,	292 21

TWELFTH ANNUAL REPORT.

Extras, paid by county—	
Putting in pipe culverts,	\$47 55
Guard railing on fills,	240 34
	<hr/>
Total cost of road,	\$13,923 90
	<hr/>
Lump sum, contract price,	\$12,275 74
Total allowed by the State,	13,019 80
One-third of above, amount paid by the State,	4,339 93
	<hr/>
Maximum grade before,	8.5 per cent.
Maximum grade after,	4.0 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 R. J. DOUGHERTY,
Engineer.
 JOHN TREEN,
Supervisor.

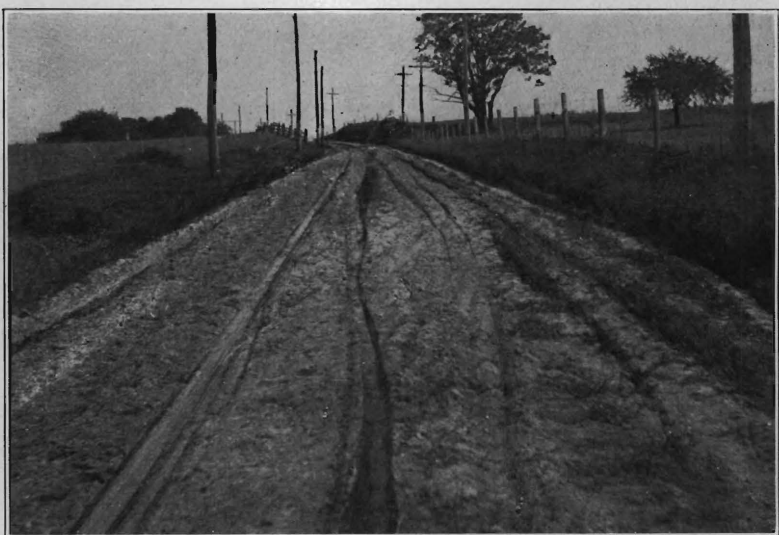
NEW BRUNSWICK, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Cranbury Neck road, township of Cranbury, county of Middlesex, State of New Jersey. Total length, 7,720 feet, or 1.46 miles.

Width of stone-bed, 14 feet.
 Length of stone-bed, 7,720 feet.
 Depth of stone-bed, 8 inches.

Macadam, 12,089.6 square yards, at 75 cents; total,	\$9,067 20
Earth excavation, 6,695.4 cubic yards, at 24.9843 cents; total,	1,672 80
Earth excavation, extra, 1,128 cubic yards, at 25 cents; total,	282 00
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Total,	\$11,022 00
Supervisor's salary,	270 00
Engineering expenses,	122 00
	<hr/>
Total cost of road,	\$11,414 00
	<hr/>
Lump sum, contract price,	\$10,740 00
Total allowed by the State,	11,022 00
One-third of above, amount paid by the State,	3,674 00
	<hr/>
Maximum grade before,	4.0 per cent.
Maximum grade after,	1.23 per cent.



**Dayton and Monmouth Junction Road, Middlesex County,
Before Improvement.**



**Dayton and Monmouth Junction Road, Middlesex County,
After Improvement.**

COMMISSIONER OF PUBLIC ROADS.

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We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,

R. J. DOUGHERTY,
Engineer.

H. N. SCOTT,
Supervisor.

NEW BRUNSWICK, N. J., October 30th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Dayton and Monmouth Junction road, township of South Brunswick, county of Middlesex, State of New Jersey. Total length, 7,700 feet, or 1.46 miles.

Width of stone-bed, 12 feet.
Length of stone-bed, 7,700 feet.
Depth of stone-bed, 8 inches.

Macadam, including spurs, 10,347.2 square yards, at 70 cents;	
total,	\$7,243 04
Earth excavation, 5,456.5 cubic yards, at 21.9914 cents; total,	1,199 96
Drain, 600 lineal feet, at 20 cents; total,	120 00
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Total,	\$8,563 00
	<hr/>
Supervisor's salary,	\$258 00
Engineering expenses,	161 26
	<hr/>
Total cost of road,	\$8,982 26
	<hr/>
Lump sum, contract price,	8,443 00
Total allowed by the State,	8,563 00
One-third of above, amount paid by the State,	2,854 33
Maximum grade before,	5.00 per cent.
Maximum grade after,	1.70 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,

R. J. DOUGHERTY,
Engineer.

JOS. R. REYNOLDS,
Supervisor.

NEW BRUNSWICK, N. J., November 28th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Franklin Park road, townships of North Brunswick and Franklin, counties

TWELFTH ANNUAL REPORT.

of Middlesex and Somerset, State of New Jersey. Total length, 17,000 feet, or 3.21 miles.

Width of stone-bed, 12 feet.
 Length of stone-bed, 17,000 feet.
 Depth of stone-bed, 8 inches.

Macadam, 19,521.5 square yards, at 69 cents; total,	\$13,469 84
Macadam, extra driveways, 76 square yards, at 34½ cents; total,	26 22
Macadam, extra road, 32 square yards, at 69 cents; total,	22 08
Telford, 3,067 square yards, at 69 cents; total,	2,116 23
Earth excavation, 3,200 cubic yards, at 30 cents; total,	960 00
Earth excavation, extra road, 2,022.2 cubic yards, at 30 cents; total,	606 66
Earth excavation, extra driveways, 37.5 cubic yards, at 30 cents; total,	11 25
Drain, 6,450 lineal feet, at 12 cents; total,	774 00
<hr/>	
Total,	\$17,986 28
Supervisor's salary,	561 00
Engineering expenses,	813 50
Extras, paid by county, for laying 7 lengths (84') C. I. pipe,	90 00
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Total cost of road,	\$19,450 78
<hr/>	
Lump sum, contract price,	\$17,291 23
Total allowed by the State,	17,986 28
One-third of above, amount paid by the State,	5,995 43
Maximum grade before,	7.00 per cent.
Maximum grade after,	2.44 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,

R. J. DOUGHERTY,
Engineer, Middlesex.
 JOSHUA DOUGHTY, JR.,
Engineer, Somerset.
 ERNEST C. TAGGART,
Supervisor.

LONG BRANCH, N. J. July 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Corliss avenue, second section, township of Neptune, county of Monmouth, State of New Jersey. Total length, 11,779 feet, or 2.23 miles.

Width of gravel-bed, 16 feet.
 Length of gravel-bed, 11,779 feet.
 Depth of gravel-bed, 6 inches.

COMMISSIONER OF PUBLIC ROADS.

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Gravel, 3,600 cubic yards,	
Earth excavation, 5,102 cubic yards,	\$7,230 28
Supervisor's salary,	294 00
Engineering expenses,	289 21
	<hr/>
Total,	\$7,813 49
	<hr/>
Lump sum, contract price, \$6,983.24; extra work, \$247.04; total, ..	\$7,230 28
Total allowed by the State,	7,230 28
One-third of above, amount paid by the State,	2,410 09
Maximum grade before,	7.40 per cent.
Maximum grade after,	3.50 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 6 inches, which must be and was ascertained by plugging not less than every five hundred feet and measuring from the surface of the earth foundation to a line stretched across the road from the top of the grade stakes.

Respectfully yours,

W. H. DE NYSE,
Engineer.
JOHN G. WHITE,
Supervisor.

FREEHOLD, N. J., December 6th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Freehold and Colt's Neck road, first section, townships of Freehold and Atlantic, county of Monmouth, State of New Jersey. Total length, 16,400 feet, or 3.10 miles.

Width of stone-bed, 14 feet.
Length of stone-bed, 16,400 feet.
Depth of stone-bed, 8 inches.

Macadam, 25,511 square yards, at 73 cents; total,	\$18,623 03
Earth excavation, 22,500 cubic yards, at 17 cents; total,	3,825 00
Extra excavation, 433¾ cubic yards, at 17 cents; total,	73 74
Drain, stone, 2,500 lineal feet, at 17 cents; total,	425 00
	<hr/>
Total,	\$22,946 77
Supervisor's salary,	363 00
Engineering expenses,	457 48
	<hr/>
Total cost of road,	\$23,767 25

Lump sum, contract price,	\$22,874 00
Total allowed by the State,	22,946 77
One-third of above, amount paid by the State,	7,648 92
Maximum grade before,	4.08 per cent.
Maximum grade after,	2.50 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,
 PETER FORMAN,
Engineer.
 ISAAC B. DAVISON,
Supervisor.

October 3d, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Old Bridge road, township of Matawan, county of Monmouth, State of New Jersey. Total length, 3,335 feet, or .63 mile.

- Width of stone-bed, 16 feet.
- Length of stone-bed, 3,335 feet.
- Depth of stone-bed, 6 inches.
- Width of gravel-bed, 8 to 14 feet, including both wings.
- Length of gravel-bed, 3,335 feet.
- Depth of gravel-bed, 6 inches.

Macadam, 5,986 square yards, at 70 cents; total,	\$4,190 20
Gravel, 774 cubic yards, at \$2.00; total,	1,548 00
Earth excavation, 7,537 cubic yards, at 15 cents; total,	1,130 55
Overhaul, 239 cubic yards, at 25 cents; total,	59 75
Drain, 1,300 lineal feet, at 8 cents; total,	104 00

Total,	\$7,032 50
Supervisor's salary,	222 00
Engineering expenses,	211 00

Total cost of road, \$7,465 50

Lump sum, contract price,	\$6,408 00
Total allowed by the State,	7,033 10
One-third of above, amount paid by the State,	2,344 37

Maximum grade before,	9.00 per cent.
Maximum grade after,	4.00 per cent.

COMMISSIONER OF PUBLIC ROADS. 81

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 6 inches.

Respectfully yours,
 FRANK OSBORN,
Engineer.
 LEVI S. EMMONS,
Supervisor.

LONG BRANCH, N. J., July 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Oceanic and Sea Bright road, township of Shrewsbury, county of Monmouth, State of New Jersey. Total length, 7,975 feet, or 1.51 miles.

Width of stone-bed, 16 feet; extra width at corners.
 Length of stone-bed, 7,965 feet.
 Depth of stone-bed, 6 and 12 inches.

Macadam, 12,570 square yards,	
Telford, 1,778 square yards,	
Earth Excavation, 4,860 cubic yards,	
Drain, 3,200 lineal feet,	
18-inch pipe culvert and 6-brick catch basins, complete,.....	\$10,949 30
Supervisor's salary,	375 00
Engineering expenses,	328 48
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Total,	\$11,652 78

Lump sum, contract price, \$10,200; extra work, \$749.30; total,....	\$10,949 30
Total allowed by the State,	10,200 00
One-third of above, amount paid by the State,	3,400 00

Maximum grade before,	4.00 per cent.
Maximum grade after,	2.10 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 6 and 12 inches, which must be and was ascertained by plugging not less than every five hundred feet and measuring from the surface of the earth foundation to a line stretched across the road from the top of the grade stakes.

Respectfully yours,
 W. M. DE NYSE,
Engineer.
 B. F. KING,
Supervisor.

TWELFTH ANNUAL REPORT.

MORRISTOWN, N. J., November 14th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Green Village and Madison road, township of Chatham, county of Morris, State of New Jersey. Total length, 8,050 feet, or 1.52 miles.

- Width of stone-bed, 14 feet.
- Length of stone-bed, 8,050 feet.
- Depth of stone-bed, not less than 6 inches.

Macadam, 12,522 square yards, at 67 cents; total,	\$8,389 74
Earth excavation, 4,300 cubic yards, at 25 cents; total,	1,075 00
Drain pipe, iron, 10-inch, 6 lineal feet, at \$1.00; total,	6 00
Drain pipe, iron, 12-inch, 12 lineal feet, at \$1.25; total,	15 00
Drain pipe, iron, 10-inch, relaid, 24 lineal feet, at 25 cents; total,	6 00
Drain pipe, iron, 12-inch, relaid, 24 lineal feet, at 25 cents; total,	6 00
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Total,	\$9,497 74
Supervisor's salary,	156 00
Engineering expenses,	206 40
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Total cost of road,	\$9,860 14
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Lump sum, contract price,	\$9,497 74
Total allowed by the State,	9,464 74
One-third of above, amount paid by the State,	3,154 91
Maximum grade before,	8.00 per cent.
Maximum grade after,	5.25 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was not less than 6 inches.

Respectfully yours,
 WM. E. KING,
County Engineer.
 NATHANIEL CLARK,
Supervisor.

MORRISTOWN, N. J., November 14th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Morris Plains and Parsippany road, township of Hanover, county of Morris, State of New Jersey. Total length, 10,910 feet, or 2.07 miles.

- Width of stone-bed, 14 feet.
- Length of stone-bed, 10,910 feet.
- Depth of stone-bed, not less than 6 inches.

COMMISSIONER OF PUBLIC ROADS. 83

Macadam, 16,971 square yards, at 62 cents; total,	\$10,522 02
Earth excavation, 8,080 cubic yards, at 28 cents; total,	2,262 40
Drain pipe, iron, 12-inch, 90 lineal feet, at \$1.25; total,	112 50
Drain pipe, iron, 24-inch, 30 lineal feet, at \$3.00; total,	90 00
Dry masonry, 19 cubic yards, no price, .....	.....

Total, \$12,986 92

Supervisor's salary,	\$231 00
Engineering expenses,	240 05

Total cost of road, \$13,457 97

Lump sum, contract price,	\$13,044 92
Total allowed by the State,	12,784 42
One-third of above, amount paid by the State,	4,261 47

Maximum grade before, 7 per cent.
Maximum grade after, 2 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of the finished pavement was not less than 6 inches.

Respectfully yours,
WM. E. KING,
County Engineer.
RICHARD VANDERHOFF,
Supervisor.

CEDAR RUN, N. J., September 20th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Stafford Township road, second section, township of Stafford, county of Ocean, State of New Jersey. Total length, 14,051.5 feet, or 2.66 miles.

Width of gravel-bed, 24 feet.
Length of gravel-bed, 14,051.5 feet.
Depth of gravel-bed, 9 and 3 inches.

Preparation of road-bed (cost),	\$30 38
Gravel, 6,244.5 cubic yards, at 75 cents; total,	\$4,683 37
Earth excavation, 9,777 cubic yards, at 20 cents; total,	1,955 40
Supervisor's salary,	306 00
Engineering expenses,	333 46

Total, \$7,308 61

Lump sum, contract price,	\$6,669 15
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Total allowed by the State,	\$6,669 15
One-third of above, amount paid by the State,	\$2,223 05

Maximum grade before, 2.50 per cent.
 Maximum grade after, .88 per cent.

We hereby certify the above statement to be correct, and that the pavement strictly according to the specifications, and that the depth of finished pavement was 9 and 3 inches, which must be and was ascertained by plugging not less than every five hundred feet and measuring from the surface of the earth foundation to a line stretched across the road from the top of the grade stakes.

Respectfully yours,

I. H. CRAMER,

Engineer.

SAMUEL L. JOHNSON,

Supervisor.

August 29th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Lacey Township Main Shore road, in the township of Lacey, county of Ocean and State of New Jersey. Total length, 23,753 feet, or 4.50 miles.

Width of gravel-bed, 24 feet.
 Length of gravel-bed, 23,753 feet.
 Depth of gravel, 9 and 3 inches.

31,783 cubic yards of excavation at 20 cents,	\$6,356 60
11,401 cubic yards compacted gravel at 87 cents,	9,918 87
2,685 square yards turf at 20 cents,	537 00
82 feet terra-cotta pipe at 80 cents,	65 60
72 feet terra-cotta pipe at 90 cents,	64 80
950 feet surface drain at 20 cents,	190 00
2.83 A. grubbing at \$15,	42 45

Total,	\$17,175 32
Supervisor's salary,	366 00
Engineering expenses,	858 76

Total, \$18,400 08

Contract price,	\$17,132 87
Total allowed by State,	17,175 32
One-third of said amount allowed by State,	5,725 11

Maximum grade before, 5.40 per cent.
 Maximum grade after, 1.77 per cent.

COMMISSIONER OF PUBLIC ROADS. 85

We certify the above statement to be correct, and that the pavement was constructed according to the specifications, and that the depth of finished pavement was 9 and 3 inches.

Respectfully yours,

WM. SEGOINE,
Engineer.
JOSEPH PARKER,
Supervisor.

PATERSON, N. J., Dec. 4th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of East Twenty-seventh street, city of Paterson, county of Passaic, State of New Jersey. Total length, 2,287 feet, or .44 miles.

Width of stone-bed, 28 feet.
Length of stone-bed, 2,287 feet.
Depth of stone-bed, 4 inches.

Macadam, 7,136.4 square yards, at 35 cents; total,	\$2,497.74
Earth excavation, 883 cubic yards, at 35 cents; total,	309.05
Cobble stone gutter, 134 square yards, at 60 cents; total,	80.40
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Total,	\$2,887.19
Supervisor's salary,	90.00
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Total,	\$2,977.19
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Total allowed by the State,	\$2,887.19
One-third of above, amount paid by the State,	962.40
Grades not changed.	

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 4 inches.

Respectfully yours,

WILLIAM L. WHITMORE,
Engineer.

PATERSON, N. J., November 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Randolph avenue, township of Acquackanonk and city of Passaic, county of Passaic, State of New Jersey. Total length, 5,078 feet, or .96 miles.

Width of stone-bed, 28 feet.
 Length of stone-bed, 5,078 feet.
 Depth of stone-bed, 4 inches.

Macadam, 15,610 square yards, at 33 cents; total,	\$5,151 30
Earth excavation, 12,322 cubic yards, at 35 cents; total,	4,312 70
Rock excavation, 11.2 cubic yards, at \$1.75; total,	19.60
Drain, 22 in. x 29 in. cement oval, 12 lineal feet, at \$2.00; total, ..	24 00
44 ft. 18 in. steel pipe at \$2.25; total,	108 00
Cobble stone gutter, 233 square yards, at 60 cents; total,	139 80
Rubble masonry, 3½ square yards, at \$2.50; total,	8 75
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Total,	\$9,764 15
Supervisor's salary,	378 00
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Total cost of road,	\$10,142 15
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Total allowed by the State,	\$9,623 40
One-third of above, amount paid by the State,	3,207 80
Maximum grade before, 3.90 per cent.	
Maximum grade after, 3.90 per cent.	

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 4 inches.

Respectfully yours,

WILLIAM L. WHITMORE,
Engineer.
 AUGUST KIRCHNER,
Supervisor.

PATERSON, N. J., November 1, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Oldham road, township of Wayne, county of Passaic, State of New Jersey. Total length, 5,572 feet, or 1.06 miles.

Width of stone-bed, 16 feet.
 Length of stone-bed, 5,572 feet.
 Depth of stone-bed, 4 inches.

Macadam, 10,398 square yards, at 18 cents; total,	\$1,871 64
Earth Excavation, 6,459 cubic yards, at 25 cents; total,	1,614 75
Rock excavation, 4,324 cubic yards, at \$1.60; total,	6,918 40
Drain, 12-in. steel pipe, 160 lineal feet, at \$2.25; total,	360 00
Drain, 18-in. steel pipe, 60 lineal feet, at \$2.50; total,	150 00
Rubble masonry, 19.2 cubic yards, at \$3.50; total,	67 20
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Total,	\$10,981 99

COMMISSIONER OF PUBLIC ROADS. 87

Supervisor's salary,	\$852 00
Total cost of road,	<u>\$11,833 99</u>
Total allowed by the State,	\$10,404 79
One-third of above, amount paid by State,	3,468 26
Maximum grade before, 14.84 per cent.	
Maximum grade after, 5 per cent.	

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 4 inches.

Respectfully yours,
 WILLIAM L. WHITMORE,
Engineer.
 AARON GRIMSHAW,
Supervisor

PATERSON. N. J., December 4, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Paterson and Hamburg turnpike road, township of West Milford, county of Passaic, State of New Jersey. Total length, 15,415 feet, or 2.92 miles.

- Width of stone-bed, 14 feet.
- Length of stone-bed, 15,415 feet.
- Depth of stone-bed, 4 inches.

Macadam, 23,979 square yards, at 18 cents; total,	\$4,316 22
Telford, 1,173 square yards, at 25 cents; total,	293 25
Extra earth fill, 440 cubic yards, at 40 cents; total,	176 00
Dry wall, 1,410.8 cubic yards, at \$2.00; total,	2,821 60
Trees, 190, at \$4.00,	760 00
Earth excavation, 29,628 cubic yards, at 16.5 cents; total,.....	4,888 62
Rock excavation, 2,147.6 cubic yards, at \$1.00; total,	2,147 60
Drain, 8-in. vitrified, 49 lineal feet, at 50 cents; total,	24 50
Drain, 15-in. vitrified, 329.5 lineal feet, at \$1.10; total,.....	362 45
Drain, 10-in. vitrified, 45.7 lineal feet, at 65 cents; total,.....	29 71
Drain, 18-in. vitrified, 172.5 lineal feet, at \$1.25; total,.....	215 63
Cobble stone gutter, 1,803.67 square yards, at 40 cents; total,....	721 47
Riprap, 341 square yards, at 25 cents,	85 25
Five basins, at \$10.00; total,	<u>50 00</u>
Total,	\$16,892 30

Supervisor's salary,	1,788 00
Total cost of road,	<u>\$18,680 30</u>
Total allowed by the State,	\$13,303 16
One-third of above, amount paid by State,	4,434 39
Maximum grade before, 12.60 per cent.	
Maximum grade after, 8.00 per cent.	

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 4 inches.

Respectfully yours,

WILLIAM L. WHITMORE,
Engineer.

EDWARD G. COURSEN,
Supervisor.

December 1st, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of the Wagner's Corner road, township of Bridgewater, county of Somerset, State of New Jersey. Total length, 5,700 feet, or 1.08 miles.

Width of stone-bed, 12 feet.

Length of stone-bed, 5,700 feet.

Depth of stone-bed, 8 inches.

Macadam, 7,600 square yards, at 58 cents; total,	\$4,408 00
Earth excavation, 3,483 cubic yards, at 28 cents; total,	<u>975 24</u>
Total,	\$5,383 24
Supervisor's salary,	105 00
Engineering expenses,	<u>223 55</u>
Total cost of road,	<u>\$5,711 79</u>
Lump sum, contract price,	\$5,683 24
Total allowed by the State,	5,383 24
One-third of above, amount paid by State,	1,794 41

Maximum grade before, 6.32 per cent.

Maximum grade after, 3 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 8 inches.

Respectfully yours,

JOSHUA DOUGHTY, JR.,
Engineer.

HIRAM ROCKAFELER,
Supervisor.

COMMISSIONER OF PUBLIC ROADS.

Sussex, N. J., October 27th, 1905.

Mr. E. C. Hutchinson, State Commissioner of Public Roads, Trenton, N. J.

DEAR SIR—Below find an exact detailed statement of the cost of Hamburg avenue, Mill street, Bank street, Clove avenue and part of Main street, borough of Sussex, county of Sussex, State of New Jersey. Total length, 5,192 feet, or .98 miles.

Width of stone-bed, 16 feet.
 Length of stone-bed, 5,192 feet.
 Depth of stone-bed, 6 and 8 inches.

Macadam, 9,662 square yards, at 59 cents; total,.....	\$5,700 58
Earth excavation, 5,710 cubic yards, at 30 cents; total,.....	1,713 00
Rock excavation, 876 cubic yards, at 85 cents; total,.....	744 60
Rock excavation, 215 cubic yards, at \$1.25; total,.....	268 75
Rock excavation, hauling, cubic yards,	244 70
Drain, 132 lineal feet, at 55 cents; total,	72 60
Drain, 1,069 lineal feet, at 30 cents; total,	320 70
Drain, gravel and stone for drains,	26 80
Drain, extra drainage,	181 50
Cobble stone gutter, 306 square yards, at 40 cents; total,.....	122 40
<hr/>	
Total,	\$9,395 63
Supervisor's salary,	647 70
Engineering expenses,	286 65
<hr/>	
Total cost of road,	\$10,329 98
Lump sum, contract price,	8,012 75
Total allowed by the State,	9,395 63
One-third of above, amount paid by the State,	3,131 88

Maximum grade before, 20 per cent.
 Maximum grade after, 5 per cent.

We hereby certify the above statement to be correct, and that the pavement was constructed strictly according to the specifications, and that the depth of finished pavement was 6 and 8 inches.

Respectfully yours,

E. N. MILLEN,
Engineer.

B. P. WALLING,
Supervisor.

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.....and
 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 plans, profile and cross-sections, which form part of these specifications.

3. Any variation of location, profile, size and dimensions from that shown on the plans, 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 plans 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 center 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;

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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.

WIDTH AND DEPTH.

13. The construction to be.....inches deep and..... feet wide, as shown on plans 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 isinches 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 aton.....roller. No stone larger than two and one-half (2½) 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

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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 contractor with.....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.

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 centres 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.

UNDER-DRAINS.

32. Under-drains, 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 sub-grade, 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 ($3\frac{1}{2}$) 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.

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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, etc., are intended for the use of the engineer in making estimate to the Board of Chosen Freeholders of work done. No bids 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.

(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 under-drains, 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) Under-drains,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 (\$1,000) dollars, 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 under-drains 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

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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 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.

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.

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. They may employ other parties to complete the work in such manner as they 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 them. 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 27, 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.

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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 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 them 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 careless-

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ness 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.....

.....
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.

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- (3) Macadam driveways, price per square yard.
- (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 under-drains, 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 (\$1,000) dollars, 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 ofa 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 cer-

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tificates 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....., their 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.....
.....
.....
.....

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....., their 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

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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 expressd.

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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TWELFTH ANNUAL REPORT.

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.

.....

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 AND.....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 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 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 plans, profile and cross-sections, which form part of these specifications.

3. Any variation of location, profile, size and dimensions from that shown on the plans, 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 plans 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 incumbrances, 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 center to sides, must be as shown on plans.

7. The earth taken away 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.

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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.

MATERIAL.

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

17. The road committee, in conjunction with 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 beinches 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.

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 decisions shall be final.

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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 (3½) 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 drainlineal feet.
- (4) Compacted gravel,cubic yards.
- Total estimated cost of the road, \$.....

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 (\$1,000.00) dollars, 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 under-drains 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.

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.

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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 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. They may employ other parties to complete the work in such manner as they 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 them. 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 27, 1905, but they shall co-operate as far as practicable.

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.

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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 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 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 them 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....., 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.....

.....
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 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 roadper 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.....

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Accompanying this proposal is a certified check for the sum of one thousand (\$1,000) dollars, 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 ofbeginning at.....and extending to.....in the township ofa 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....., their 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

TWELFTH ANNUAL REPORT.

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.....

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....., their 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.....of.....A. D. 190..

.....
Director.
.....
.....
.....

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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 expressd.

.....

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.

.....

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.

.....

Appendix B.

CHAPTER 58.

An Act to provide for the permanent improvement of public roads in this state (Revision of 1905).

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

Improvements
of roads by
freeholders.

Selection
of roads.

Township
assistance.

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

Survey
made.

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. 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.

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 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

Approval by
board and
commissioner.

Limit of
State ex-
penditure.

Proposals
invited.

Bidder's
guarantee.

COMMISSIONER OF PUBLIC ROADS.

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is awarded to him he will enter into a contract with said board for the same. 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. 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. 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 year from the completion of the work and acceptance thereof in writing by the commissioner of public roads.

Contract.

Approved
by com-
missioner.May reject
contract.

Proviso.

As to pay-
ment under
contract.Limit to
county ex-
penditures.

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 one half 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.

Copies of
plans, etc.,
filed with
commissioner.

5. A true copy of the survey, contract, plans, cross sections and specifications for road improvements, cer-

tified 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. 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 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.

Per diem.

Oath.

May be summarily dismissed.

Certificate of partial payments.

Final statement on completion of contract.

State appropriation.

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 commis-

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sioner of public roads shall, between December fifteenth and thirty-first of each year, certify 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.

Payment 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 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.

Notice to county board of assessors.

Assessment and collection of road moneys.

If deficiency.

If surplus.

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

Bonds instead of tax.

Amount, rate, time.

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 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.

Amount
annually
raised.

Improved
roads to be
county roads.

Maintenance.

Payment
withheld
upon failure
to maintain
roads.

10. Any road constructed under the provisions of this act or of any previous act bearing the same title 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. 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.

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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 suitable 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. 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.

County supervision of roads.

Term.

Bond.

Subject to dismissal.

Moneys for maintenance and repairs.

Cost of repairs paid by county collector.

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

Acquire lands for road purposes.

By purchase.

By con-
demnation.

moneys applicable 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.

Improvement
of road by
abutting
owners.

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, and upon acquiring, without expense to the county, the land necessary for such change. The county supervisor shall be

Such road to
be a county
road.

Change of
location of
road.

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paid the sum of twenty-five dollars for supervising said work, to be paid by said owners.

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.

Improve approaches to dwellings.

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.

Improvement of roads bordering on State property.

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.

Boundary line roads.

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 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

Act not to apply to cities.

Right of municipalities to improve roads.

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.

Control thereof.

Exception.

As to roads in cities.

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.

Repealer.

Proviso.

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.

20. This act shall take effect immediately.

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CHAPTER 239.

A 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. 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 the 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 bills 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 pro-

Joint improvement of roads.

Specifications and proposals.

Awarding contract.

Apportion cost.	portion of the cost 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
Advertising.	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; <i>provided, however,</i> 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.
Proceedings.	
State aid.	
Proviso.	
Meeting cost.	2. If in the opinion of either of such boards, to place in 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 account of the bonds issued shall fall due in one year 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 issue bonds.	
When payable.	

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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.

Interest and principal.

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.

Paving public roads.

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

Cause portions of road to conform to altered grade.

which this is a supplement, and 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.

Proceedings.

Municipalities may improve road.

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.

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.

CHAPTRE 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*:

1. The board of chosen freeholders of any of the several counties of this state shall have the power and 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 expenses 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.

Change and
improve
roads.

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

Presentation
by owners.

Map and
specifications.

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 changed location shall be deemed and taken as vacated as a part of said county or public road or highway.

Power of freeholders.

Repealer.

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 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.

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

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 of this state, has been or shall

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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.

Becomes a county road.

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

Petition may include.

3. This act shall take effect immediately.

Approved March 28, 1904.

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:

Property-owners to contribute whole expense of improvement.

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, 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

Owner to
have control
of expendi-
tures.

Old road
vacated.

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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.

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:*

I. 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, be amended so as to read as follows:

Section be amended.

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

I. 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 authorized to raise and bonds issued.

Proviso.

Proviso.

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.

2. The second section of said act be amended so as to read as follows:

Board not to use money raised except to grade, etc.

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.

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.

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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:*

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.

Repair of
roads damaged
by freshets.

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:*

Acquirement
of turnpike
road for free
public use.

I. 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 roads 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 director of the said board or boards of chosen

Appointment
of commis-
sioners by
governor.

Hearing.

COMMISSIONER OF PUBLIC ROADS.

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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.

Report to
state com-
missioner
of roads.

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

One-third
paid from
state appro-
priation.

Proviso.

Proviso. 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.

Duty of county board of assessors. 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.

Loan to meet deficiency.

When turnpike in two or more counties.

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 had separately and independently in each of the said counties.

Maintenance.

5. Any road so acquired shall forever thereafter be a 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 so acquired and improved by petition as aforesaid the board of chosen freeholders shall apply to the circuit court

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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.

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.

Manner of
assessment.

Report
a lien.

Approved March 22, 1901.

 VACATION OF TURNPIKE.

SUPPLEMENT.

Approved February 13, 1884.

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

Deed of ces-
sion and
transfer of
turnpike road,
how executed
and filed.

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.

Proviso.

Company released from control, etc., of part of road ceded when deed is filed in office of secretary of state.

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, 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.

An Act authorizing turnpike companies to vacate or dispose of a portion of its road and property.

Approved April 20, 1885.

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.

When turnpike company may vacate or dispose of portion of road.

An Act to authorize turnpike companies to abandon a portion of their roads and property.

Passed June 1, 1886.

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

Turnpike companies may abandon portion of road.

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.

BROAD TIRES.

CHAPTER 76.

An Act to amend an act entitled "An act to enable township committees to encourage the use of broad tires on wagons and carts by a rebatement of taxes."

I. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That section one of an act entitled "An act to enable township committees to encourage the use of broad tires on wagons and carts by a rebatement of taxes," approved March sixteenth, one thousand eight hundred and ninety-three, which reads as follows:

I. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That township committees be and they are hereby authorized, when in their judgment it is for the public good, to pass an ordinance allowing a rebate of taxes for township or road purposes to all owners or possessors of wagons and carts used in said township for transportation of goods, wares, merchandise, produce, passengers, and for general farm, freight and express purposes, having tires of not less than four inches in width; *provided*, the said rebate shall not exceed fifty cents for each wheel in use in any one year," be and the same is hereby amended so as to read as follows:

I. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That township committees be and they are hereby authorized, when in

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their judgment it is for the public good, to pass an ordinance allowing a rebate of taxes for township or road purposes to all owners or possessors of wagons and carts used in said township for transportation of goods, wares, merchandise, produce, passengers, and for general farm, freight and express purposes, having tires of not less than four inches in width; *provided*, the said rebate shall not exceed one dollar for each wheel in use in any one year.

2. That this act shall take effect immediately.

Passed March 24, 1896.

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 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.

Settlement when road not accepted.

3. This act shall take effect immediately.

Approved March 20, 1900.

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 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 appointment 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.

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 condemnation, 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 any wise affect the provisions of law under which such road, including the bridges thereof, are or shall be constructed, renewed, repaired or maintained.

Acquirement
of lands.

3. This act shall take effect immediately.

Approved March 28, 1904.

CHAPTER 98.

Further Supplement to an act entitled "An act concerning roads," approved April sixteenth, eighteen hundred and forty-six.

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

Highway must be kept clear of weeds, etc.

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.

2. This act shall take effect immediately.

Approved March 23, 1900.

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, etc., 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 mov-

ing 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.

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.

Broken stone of dimension one inch or more placed on highways to be covered.

3. This act shall take effect immediately.

Approved May 12, 1896.

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 deem 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.

LAYING OUT, VACATING OR ALTERING PUBLIC ROADS BY
SURVEYORS OF HIGHWAYS: (Revised Statutes,
page 2828-119, Sec. I.)

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

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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*.)

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 inter-

sected 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.

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 location 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,

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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	" "	" " "
"	8	" " 8	" "	" " "
"	8	" " 10	" "	" " "
"	8	" " 12	" "	" " "
"	9	" " 4	" "	" " "
"	9	" " 6	" "	" " "
"	9	" " 8	" "	" " "
"	9	" " 10	" "	" " "
"	9	" " 12	" "	" " "

TWELFTH ANNUAL REPORT.

A road 10 feet wide and 4 inches deep will require 1,093 $\frac{3}{4}$ tons of stone per mile.

"	10	"	"	6	"	"	1,640 $\frac{5}{8}$	"	"	"
"	10	"	"	8	"	"	2,187 $\frac{1}{2}$	"	"	"
"	10	"	"	10	"	"	2,734 $\frac{3}{8}$	"	"	"
"	10	"	"	12	"	"	3,281 $\frac{1}{4}$	"	"	"
"	11	"	"	4	"	"	1,203 $\frac{1}{8}$	"	"	"
"	11	"	"	6	"	"	1,804 $\frac{11}{10}$	"	"	"
"	11	"	"	8	"	"	2,406 $\frac{1}{4}$	"	"	"
"	11	"	"	10	"	"	3,007 $\frac{13}{10}$	"	"	"
"	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 $\frac{13}{10}$	"	"	"
"	13	"	"	8	"	"	2,843 $\frac{3}{4}$	"	"	"
"	13	"	"	10	"	"	3,554 $\frac{11}{10}$	"	"	"
"	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 $\frac{3}{8}$	"	"	"
"	14	"	"	12	"	"	4,593 $\frac{3}{4}$	"	"	"
"	15	"	"	4	"	"	1,640 $\frac{5}{8}$	"	"	"
"	15	"	"	6	"	"	2,460 $\frac{13}{10}$	"	"	"
"	15	"	"	8	"	"	3,281 $\frac{1}{4}$	"	"	"
"	15	"	"	10	"	"	4,101 $\frac{9}{10}$	"	"	"
"	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	"	"	2,780 $\frac{1}{10}$	"	"	"
"	17	"	"	8	"	"	3,718 $\frac{3}{4}$	"	"	"
"	17	"	"	10	"	"	4,648 $\frac{7}{10}$	"	"	"
"	17	"	"	12	"	"	5,578 $\frac{1}{8}$	"	"	"

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A road 18 feet wide and 4 inches deep will require 1,968 $\frac{3}{4}$ tons of stone per mile.

"	18	"	"	6	"	"	2,953 $\frac{1}{8}$	"	"	"
"	18	"	"	8	"	"	3,937 $\frac{1}{2}$	"	"	"
"	18	"	"	10	"	"	4,921 $\frac{1}{8}$	"	"	"
"	18	"	"	12	"	"	5,906 $\frac{1}{4}$	"	"	"
"	19	"	"	4	"	"	2,078 $\frac{1}{8}$	"	"	"
"	19	"	"	6	"	"	3,117 $\frac{8}{16}$	"	"	"
"	19	"	"	8	"	"	4,156 $\frac{1}{4}$	"	"	"
"	19	"	"	10	"	"	5,195 $\frac{5}{16}$	"	"	"
"	19	"	"	12	"	"	6,234 $\frac{3}{8}$	"	"	"
"	20	"	"	4	"	"	2,187 $\frac{1}{2}$	"	"	"
"	20	"	"	6	"	"	3,281 $\frac{1}{4}$	"	"	"
"	20	"	"	8	"	"	4,375	"	"	"
"	20	"	"	10	"	"	5,468 $\frac{3}{4}$	"	"	"
"	20	"	"	12	"	"	6,562 $\frac{1}{2}$	"	"	"

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 $\frac{1}{3}$ square yards.
10	"	5,866 $\frac{2}{3}$ "
12	"	7,040 "
14	"	8,213 $\frac{1}{3}$ "
16	"	9,386 $\frac{2}{3}$ "
18	"	10,560 "

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	8 feet wide, or	4,693 $\frac{1}{3}$	square yards, at	25c. per yard,	\$1,173 33 $\frac{1}{3}$
10	"	5,866 $\frac{2}{3}$	"	25c.	"	1,466 66 $\frac{2}{3}$
12	"	7,040	"	25c.	"	1,760 00
14	"	8,213 $\frac{1}{3}$	"	25c.	"	2,053 33 $\frac{1}{3}$
16	"	9,386 $\frac{2}{3}$	"	25c.	"	2,346 66 $\frac{2}{3}$
18	"	10,560	"	25c.	"	2,640 00
8	"	4,693 $\frac{1}{3}$	"	30c.	"	1,408 00
10	"	5,866 $\frac{2}{3}$	"	30c.	"	1,760 00
12	"	7,040	"	30c.	"	2,112 00
14	"	8,213 $\frac{1}{3}$	"	30c.	"	2,464 00
16	"	9,386 $\frac{2}{3}$	"	30c.	"	2,816 00
18	"	10,560	"	30c.	"	3,168 00
8	"	4,693 $\frac{1}{3}$	"	35c.	"	1,642 66 $\frac{2}{3}$
10	"	5,866 $\frac{2}{3}$	"	35c.	"	2,053 33 $\frac{1}{3}$
12	"	7,040	"	35c.	"	2,464 00
14	"	8,213 $\frac{1}{3}$	"	35c.	"	2,874 66 $\frac{2}{3}$
16	"	9,386 $\frac{2}{3}$	"	35c.	"	3,285 33 $\frac{1}{3}$
18	"	10,560	"	35c.	"	3,696 00
8	"	4,693 $\frac{1}{3}$	"	40c.	"	1,877 33 $\frac{1}{3}$
10	"	5,866 $\frac{2}{3}$	"	40c.	"	2,346 66 $\frac{2}{3}$
12	"	7,040	"	40c.	"	2,816 00
14	"	8,213 $\frac{1}{3}$	"	40c.	"	3,285 33 $\frac{1}{3}$
16	"	9,386 $\frac{2}{3}$	"	40c.	"	3,754 66 $\frac{2}{3}$
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 $\frac{2}{3}$
10	"	5,866 $\frac{2}{3}$	"	50c.	"	2,933 33 $\frac{1}{3}$
12	"	7,040	"	50c.	"	3,520 00
14	"	8,213 $\frac{1}{3}$	"	50c.	"	4,106 66 $\frac{2}{3}$
16	"	9,386 $\frac{2}{3}$	"	50c.	"	4,693 33 $\frac{1}{3}$
18	"	10,560	"	50c.	"	5,280 00
8	"	4,693 $\frac{1}{3}$	"	55c.	"	2,581 33 $\frac{1}{3}$
10	"	5,866 $\frac{2}{3}$	"	55c.	"	3,226 66 $\frac{2}{3}$
12	"	7,040	"	55c.	"	3,872 00
14	"	8,213 $\frac{1}{3}$	"	55c.	"	4,517 33 $\frac{1}{3}$
16	"	9,386 $\frac{2}{3}$	"	55c.	"	5,162 66 $\frac{2}{3}$
18	"	10,560	"	55c.	"	5,808 00

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8 feet wide, or	4,693 $\frac{1}{3}$	square yards, at	60c. per yard,	\$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 $\frac{2}{3}$
10	"	5,866 $\frac{2}{3}$	"	65c. "	3,813 33 $\frac{1}{3}$
12	"	7,040	"	65c. "	4,576 00
14	"	8,213 $\frac{1}{3}$	"	65c. "	5,338 66 $\frac{2}{3}$
16	"	9,386 $\frac{2}{3}$	"	65c. "	6,101 33 $\frac{1}{3}$
18	"	10,560	"	65c. "	6,864 00
8	"	4,693 $\frac{1}{3}$	"	70c. "	3,285 33 $\frac{1}{3}$
10	"	5,866 $\frac{2}{3}$	"	70c. "	4,106 66 $\frac{2}{3}$
12	"	7,040	"	70c. "	4,928 00
14	"	8,213 $\frac{1}{3}$	"	70c. "	5,749 33 $\frac{1}{3}$
16	"	9,386 $\frac{2}{3}$	"	70c. "	6,570 66 $\frac{2}{3}$
18	"	10,560	"	70c. "	7,392 00
8	"	4,693 $\frac{1}{3}$	"	75c. "	3,520 00
10	"	5,866 $\frac{2}{3}$	"	75c. "	4,400 00
12	"	7,040	"	75c. "	5,280 00
14	"	8,213 $\frac{1}{3}$	"	75c. "	6,160 00
16	"	9,386 $\frac{2}{3}$	"	75c. "	7,040 00
18	"	10,560	"	75c. "	7,920 00
8	"	4,693 $\frac{1}{3}$	"	80c. "	3,754 66 $\frac{2}{3}$
10	"	5,866 $\frac{2}{3}$	"	80c. "	4,693 33 $\frac{1}{3}$
12	"	7,040	"	80c. "	5,632 00
14	"	8,213 $\frac{1}{3}$	"	80c. "	6,570 66 $\frac{2}{3}$
16	"	9,386 $\frac{2}{3}$	"	80c. "	7,509 33 $\frac{1}{3}$
18	"	10,560	"	80c. "	8,448 00
8	"	4,693 $\frac{1}{3}$	"	85c. "	3,989 33 $\frac{1}{3}$
10	"	5,866 $\frac{2}{3}$	"	85c. "	4,986 66 $\frac{2}{3}$
12	"	7,040	"	85c. "	5,984 00
14	"	8,213 $\frac{1}{3}$	"	85c. "	6,981 33 $\frac{1}{3}$
16	"	9,386 $\frac{2}{3}$	"	85c. "	7,978 66 $\frac{2}{3}$
18	"	10,560	"	85c. "	8,976 00
8	"	4,693 $\frac{1}{3}$	"	90c. "	4,224 00
10	"	5,866 $\frac{2}{3}$	"	90c. "	5,280 00
12	"	7,040	"	90c. "	6,336 00
14	"	8,213 $\frac{1}{3}$	"	90c. "	7,392 00
16	"	9,386 $\frac{2}{3}$	"	90c. "	8,448 00
18	"	10,560	"	90c. "	9,504 00

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	8 feet wide, or	4,693 $\frac{1}{3}$	square yards, at	95c. per yard,	\$4,458	66 $\frac{2}{3}$
10	"	5,866 $\frac{2}{3}$	"	95c.	"	5,573	33 $\frac{1}{3}$
12	"	7,040	"	95c.	"	6,688	00
14	"	8,213 $\frac{1}{3}$	"	95c.	"	7,802	66 $\frac{2}{3}$
16	"	9,386 $\frac{2}{3}$	"	95c.	"	8,917	33 $\frac{1}{3}$
18	"	10,560	"	95c.	"	10,032	00
8	"	4,693 $\frac{1}{3}$	"	\$1.00	"	4,693	33 $\frac{1}{3}$
10	"	5,866 $\frac{2}{3}$	"	1.00	"	5,866	66 $\frac{2}{3}$
12	"	7,040	"	1.00	"	7,040	00
14	"	8,213 $\frac{1}{3}$	"	1.00	"	8,213	33 $\frac{1}{3}$
16	"	9,386 $\frac{2}{3}$	"	1.00	"	9,386	66 $\frac{2}{3}$
18	"	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, ..	580	684	782	880	977	1,075	1,173
One mile,	7 feet wide, ..	684	798	912	1,026	1,140	1,254	1,368
One mile,	8 feet wide, ..	782	912	1,042	1,173	1,303	1,434	1,564
One mile,	9 feet wide, ..	880	1,026	1,173	1,320	1,466	1,613	1,760
One mile,	10 feet wide, ..	977	1,140	1,303	1,466	1,629	1,792	1,955
One mile,	11 feet wide, ..	1,075	1,254	1,434	1,613	1,792	1,971	2,151
One mile,	12 feet wide, ..	1,173	1,368	1,564	1,760	1,955	2,151	2,346
One mile,	13 feet wide, ..	1,271	1,482	1,694	1,906	2,118	2,330	2,542
One mile,	14 feet wide, ..	1,368	1,597	1,825	2,053	2,281	2,509	2,737
One mile,	15 feet wide, ..	1,466	1,711	1,955	2,200	2,444	2,688	2,933
One mile,	16 feet wide, ..	1,564	1,825	2,085	2,346	2,607	2,868	3,128
One mile,	17 feet wide, ..	1,662	1,919	2,216	2,493	2,770	3,047	3,324
One mile,	18 feet wide, ..	1,760	2,053	2,346	2,640	2,933	3,226	3,520
One mile,	19 feet wide, ..	1,857	2,167	2,477	2,786	3,096	3,405	3,715
One mile,	20 feet wide, ..	1,955	2,281	2,607	2,933	3,259	3,585	3,911

NEW JERSEY STATE LIBRARY

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ROAD MAP
OF
THE STATE OF
NEW JERSEY

From the original surveys of the U.S. Geological Survey
and the State Department of 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100

Scale
1 inch = 10 miles

