13truction, 17. This re wen Construction 20 view ree wide on road built and leading from 1 8 inches this IOL the purpose thick. Des Moines to Camp Dodge miles in length g the excessive The poin very hic This pavement The contract militan holly t is of monolithic brick was let in September, ary and civilian traffic usly connected with a olly inadequate to carry



State of Iowa 1917

REPORT OF THE

State Highway Commission

FOR THE

Year Ended December 1, 1917

ISSUED BY THE STATE HIGHWAY COMMISSION

AMES, IOWA

H. C. BEARD, ChairmanJ. W. HOLDEN,S. W. BEYER,State Highway Commissioners.

THOS. H. MACDONALD, Chief Engineer.

Published by THE STATE OF IOWA Des Moines

LETTER OF TRANSMITTAL

Hon. W. L. Harding, Governor:

Pursuant to the provisions of the Iowa Road Law, the State Highway Commission presents this, its Fourth Annual Report, for the year December 1, 1916, to December 1, 1917.

> H. C. Beard, Chairman, J. W. Holden, S. W. Beyer, Commissioners.

Ames, Iowa, December 30, 1917.

ROBERT HENDERSON, STATE PRINTER J. M. JAMIESON, STATE BINDER JANUARY, 1919

PART I work of the State Highway Commission 1917

STATE HIGHWAY COMMISSION FOURTH ANNUAL REPORT

Chapter I—Summary of Work for 1917

This Fourth Annual Report of the State Highway Commission is divided into two parts.

Part One contains a resume of the chief activities of the Commission for the year ended December 1, 1917.

Part Two will contain a summary of the annual reports of the ninety-nine county engineers for the year ending December 31, 1917.

The Year of 1917.

The year of 1917, which marked the entrance of the United States into the world war which had been raging since 1914, was one of increasing difficulties for the road builder. Advancing prices, the diverting of transportation facilities and the withdrawal of labor served to hinder the work, but in spite of these handicaps the amount of work accomplished was very nearly normal.

Upon the whole, the weather conditions encountered were favorable to road and bridge construction and no floods were experienced which were of sufficient extent to do any great damage to roads or bridges.

1917 Prices.

At the beginning of 1917, prices of all kinds of material used in road and bridge construction had advanced very materially, but during the season of 1917 prices of materials and labor continued to advance as the demands of the Federal Government and its allies increased.

Many counties were fortunate enough to make contracts early in the season for their season's needs, thus securing prices much below those prevailing in mid-season and later. Since January 1, 1915, the price of structural steel has advanced 250 per cent.

SUMMARY OF WORK

10WA STATE HIGHWAY COMMISSION

Prior to the beginning of 1917, the advance in the cost of grading and drainage work had not been great and a number of contracts were let in February and March before the advance in the cost of this class of work began. During the season, however, the cost of grading work advanced as the price of labor and commodities advanced.

The average price of grading for which contracts were approved in 1916 was 22.109 cents per cubic yard, while the average for 1917 was 26.61 cents per cubic yard.

The Year 1918.

Conditions prevailing not only limit the amount of construction work that can be done during 1918, but with a given amount of revenue available for road and bridge work, far less can be accomplished than formerly on account of the high prices prevailing.

Bridge Plans.

Detailed plans were prepared for 343 bridges in 72 counties, estimated to cost \$1,441,000.00. Designs were checked and approved for 113 bridges submitted from 30 counties, the estimated cost of which was \$413,500.00. Detailed shop drawings were checked for 154 structures from 56 counties, the estimated cost of which was \$355,000.00.

Bridge and Material Contracts.

During the year the Commission approved 197 bridge contracts totalling \$2,179,000.00, which were submitted from 76 counties, and 50 material contracts from 30 counties.

Railroad Crossings.

Thirty-eight crossing projects were listed during 1917, bringing the total listed for improvement, since the Highway Commission became engaged in the improvement and elimination of crossings, up to 275. Eleven projects were surveyed, plans and estimates were prepared for 30, conferences were held on 36, and 27 projects were satisfactorily adjusted.

Crossing projects were completed during the year to the number of 28, and five were eliminated by grade separation, while four were entirely eliminated.

The estimated cost of crossing improvements satisfactorily adjusted was \$50,172.00; the estimated amount appropriated by railroad companies for such improvements was \$29,947.00; and the estimated amount appropriated from public funds was \$20,674.00.

Roads.

During the year profiles for 899.5 miles of road, involving the moving of 4,806,668 cubic yards of earth, were checked and approved and 36 road contracts for work amounting to \$725,485.00 were approved. The average of the prices contained in these contracts was 26.61 cents per cubic yard.

Federal Aid for Rural Highways.

The Federal Aid which Iowa will receive has been apportioned among the counties on the basis of area as provided by Chapter 249, Acts of the 37th General Assembly, and funds to meet the federal allotment have been provided from the automobile license fees.

Twenty-one county projects have been outlined, twelve have been submitted to the Federal Department for approval and four have been approved. Surveys have been completed for seven projects involving 134 miles of road.

Roads at State Institutions.

The engineers of the Highway Commission made surveys and plans, and superintended construction on several miles of road at various state institutions under the direction of the Board of Control of State Institutions.

Changes in County Road System.

The Commission was requested to approve 50 applications from 29 Boards of Supervisors for changes to the County Road System. Forty-two of these were approved, adding 167.65 miles to the county system and removing 19.76 miles.

Road Complaints.

Road complaints numbering 126 were received during 1917. Of these, 105 were on the township road system. The records show that 64 per cent of the roads concerned were repaired or improved satisfactorily. Fewer complaints were received than in 1915 or 1916.

Standard Specifications.

During the year the standard specifications on Highway

Bridge and Culvert Construction were revised for publication and use in 1918.

District Engineers.

The five district engineers spent 1,169 days in the various counties, assisting in the county and township work. They attended 44 road lettings, 139 bridge lettings and 80 material lettings. The estimated cost of the work and material involved in these lettings was approximately \$4,000,000.00.

Testing Materials.

During the year, 122 samples of materials were tested and reported. Most of these samples were from county and city officials.

Road Meetings and County Inspections.

The Commissioners and engineers from the general office attended a number of road meetings and made numerous trips of inspection involving a total of 255 days on such assignments.

Organization of Commission.

The present organization of the Commission (December 1, 1917) by Departments is as follows:

COMMISSIONERS.

H. C. Beard, Chairman, Mt. Ayr.

- J. W. Holden, Scranton.
- S. W. Beyer, Ames.

ADMINISTRATIVE DI	EPARTMENT.
T. H. MacDonald Ch	ief Engineer
F. W. ParrottAu	ditor
J. W. EichingerBu	lletin Editor
Mrs. D. C. Elder Cle	erk
Thora Tallman Ste	enographer
Velda Rowland Ste	enographer
May VanderlindenSte	enographer

ROAD DEPARTMENT.

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SUMMARY OF WORK

L. L. KaserAssistant	Engineer
C. A. ZackAssistant	Engineer
eRoy BrownAssistant	Engineer
Crnest NelsonRodman	
). M. Briley Inspector	
Anne Vanderlinden Stenograp	her

BRIDGE DEPARTMENT.

	H. Ames	Bridge En	gineer	
Ċ.,	F. Kelley	Assistant	Bridge 1	Engineer
Ċ.,	W. Blumenschein	Structural	Engine	er
	E. Kirkham	Consulting	, Bridge	Engineer
A.	rs. J. A. Paulsen .	Stenograp	her	

DRAFTING DEPARTMENT.

J. A. Paulsen	Chief Draftsman
S. J. Bell	. Designer
W. N. Adams	. Draftsman
W. A. Reeves	. Draftsman
V. Enslow	Draftsman
Hans Hanson	Clerk

DRAINAGE DEPARTMENT.

R. W. ClydeDrainage Engineer

DISTRICT ENGINEERS.

C. Coykendall1st	District	Engineer
W. H. Root2nd	District	Engineer
W. F. Beard 3rd	District	Engineer
L. M. Martin4th	District	Engineer
J. S. Morrison5th	District	Engineer

Chapter II.—New and Recommended Legislation, Legislation Enacted by the 37th G. A.

Federal Aid Road Law.

The most important act of the 37th General Assembly relating to road improvement was the act known as the Federal Aid Road Law (Chapter 249, Acts of the 37th G. A.). This Act accepted for the State of Iowa the provisions of the Act of Congress in reference to Federal Aid and provided funds from the automobile license fees to meet the State's allotment from the Federal appropriation. The Act further provided for the selection of a comprehensive system of highways reaching all the counties in the State, said system to contain not less than 2,000 nor more than 6,000 miles.

The State Highway Commission is therein authorized and directed to enter into and complete negotiations with the Secretary of Agriculture to secure the full apportionment from the Federal Aid fund for and in behalf of the State of Iowa, to make surveys and plans, to supervise and direct the work of construction, to supervise the expenditures of all funds and to do all other things necessary to carry out the provisions of the Federal Aid Road Act.

Road Patrol Law.

Another act of the 37th General Assembly was that known as the Road Patrol Law. The provisions of this law can best be understood by referring to the complete text which follows:

Section I. Boards of Supervisors shall cause all of the highways in their jurisdiction to be patroled as hereinafter provided, and to carry out the provisions of this act, they are hereby empowered and required to appoint patrolmen for the county road system, and fix their compensation, who shall be known as county road patrolmen and who shall hold their office during the pleasure of the board appointing them.

Sec. II. The road patrolmen shall give their entire time to road work from the beginning of the road working season in the spring until its close in the fall of the year and such additional time as the board of supervisors may direct. Sec. III. Boards of supervisors shall assign, allot or parcel out to the county patrolmen such sections of road or roads as they can patrol and properly care for, and it shall be the duty of the county patrolmen to go over all the roads in their respective sections at least once each week, and said patrolmen shall make extra visits to such roads or bridges as may be reported in need of attention.

Sec. IV. It shall be the duty of the patrolmen herein provided, to drag or cause to be dragged, after each rain and at such other times as may be necessary, all the county roads that lie within their respective sections, and to remove all trash, debris or other impediments from the entrance to sluices, culverts and bridges and keep the same and their outlets open and free from obstructions. They shall keep the side ditches along the grade open and provide said ditches with ample outlets. They shall remove loose stones and other impediments from the beaten track of the highway, fill depressions and keep the roads free from ruts, water pockets and mud holes, and shall repair approaches to bridges and culverts and keep the said approaches smooth and free from bumps, and shall perform such other duties and comply with such rules and regulations as may be provided by the board of supervisors.

Sec. V. Boards of supervisors shall provide patrolmen with such tools and equipment as are necessary to carry out the provisions of this act and said patrolmen shall receipt to the board of supervisors therefor. Said patrolmen shall give bonds for the faithful performance of their duties and for the care of tools and equipment in such sum as the board of supervisors may direct, which bond shall be approved by the board.

Recommended Legislation.

As the next General Assembly of Iowa will not convene until the Highway Commission has had an opportunity to present its 1918 Annual Report, no definite recommendations are here given. In general, there are a number of confusing statutes relative to highways which should be clarified and several laws relative to township administration which are based upon practice long out of date, and which should be repealed or amended. There is a need for constructive legislation relating to financing of permanent improvements, and more generally equalizing the burden of taxation.

Chapter III.—Administrative Department.

General Organization.

The personnel of the Commission for the past year consisted of J. W. Holden of Scranton, Chairman until July 1, 1917, H. C. Beard of Mt. Ayr, Chairman from July 1 to December 1, 1917, A. Marston, Dean of Engineering of Iowa State College until October 16, 1917, and S. W. Beyer, who succeeded A. Marston. The two Commissioners first named held their office through appointment by the Governor of the State; the term of appointment being for four years, and J. W. Holden having been reappointed for a term beginning July 1, 1917, by Governor W. L. Harding. Dean Marston of the Iowa State College was commissioned a Major of Iowa Engineers by Governor W. L. Harding, and was succeeded as Dean of Engineering by Dr. S. W. Beyer, who, by virtue of his appointment as Dean, became the ex-officio member of the Commission.

The general duties of the State Highway Commission are fixed by statute as follows: Furnish standard plans and specifications to the counties; disseminate information and instructions; keep a record of operations and report annually to the Governor; appoint necessary assistants and fix their salaries; investigate and report conditions in any county; have general supervision of county and township officers; make surveys and plans for elimination of danger at railroad crossings; assist in defense of bridge patent suits; and administer the Federal Aid Road act. The Commission acting in the capacity of a governing Board, outlines the general policy and activities of the Department, hires and develops into a working organization, a staff of engineers and assistants, and in general, performs such functions as fall naturally to a governing board of any large business organization. During the year ending December 1, 1917, the Commission held thirty meetings at its office in Ames, Iowa. The force employed by the Commission is at present organized into four general Departments: The Administrative, The Bridge, The Road and The Drainage Investigation.

Departments.

The Administrative Department is directed by the Chief Engineer appointed by the Commission, and handles all the general organization duties, the issuing of publications, accounting, tests and experimental work, and patent investigations. All of the general office work is directed by this Department.

The Road Department, under the direction of the Road Engineer, handles all the road contracts, plans, profiles, complaints, changes in county road systems, roads at state institutions and Federal Aid road projects. The district engineers report all road matters to this Department.

The Bridge Department handles all bridge designs and contracts, all bridge complaints, and all railroad crossing projects. The district engineers report all bridge matters to this Department.

The Department of Drainage Investigation, under the direction of the Drainage Engineer, is engaged in making measurements of stream flows for determining the necessary sizes of bridges and culverts and tile for drainage in road improvements. It is also working in conjunction with the U. S. Geological Survey in establishing gaging stations on a number of the principal streams in the State, and collecting other data for use as above stated.

The Drafting Department works under the direction of both the Road and Bridge Departments in preparing and checking plans for road and bridge construction.

District Engineers.

The State is divided into five districts, each in charge of a district engineer. Each district contains approximately 20 counties and the entire time of each district engineer is spent in consultation with county engineers, boards of supervisors, and township trustees in the counties under his jurisdiction. It is the policy to have the district engineer present at each road, bridge or material letting, and to have a complete report of the schedule of bids received and the contracts awarded, filed with the Commission. The district men are scheduled by the general office, and are required to file detailed reports as to their activities and their observations as to the conditions in the counties they visit. The district engineers find time to inspect a great deal of road and

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bridge work, while same is in actual construction, and are able to disseminate a great deal of instruction and advice to the local road officials.

Through the district engineers and the detailed reports filed in the general office, the Commission is able to keep in touch with conditions in the various counties, is able to determine the current prices for materials and construction work, and to disseminate this information to the various county officials.

Road School.

Since the organization of the Commission under the present road law, it has been the practice to hold an annual road school for the instruction of county engineers and other road officials, at the Commission office in Ames, during the winter season. On February 27-28 and March 1, 1917, the Commission held its Fourth Annual Road School and County Engineers' Convention and it was quite generally stated that this was the best meeting of its kind which has so far been held. On account of the wide interest being shown by county supervisors in topics usually discussed in meetings of this character, an invitation was extended to all members of boards of supervisors in the State to attend this meeting. Nearly all of the county engineers in the State were in attendance and a number of assistant engineers as well as supervisors were present. Lectures were given by J. C. Wonders, District Engineer for the U. S. Office of Public Roads, district headquarters at Omaha, Neb.; B. H. Piepmier, Maintenance Engineer of the Illinois State Highway Commission; F. M. Balsey, Division Engineer of the Wisconsin State Highway Commission; Honorable J. G. Weaver of Des Moines, Iowa; A. Marston, member of the Iowa State Highway Commission and Dean of Engineering of the Iowa State College; T. R. Agg, Professor of Highway Engineering, Iowa State College; R. W. Crum, Associate Professor of Civil Engineering, Iowa State College; J. D. Buser, President of the State Association of County Supervisors, of Muscatine, Iowa, and members of the engineering staff of the Commission. A complete program of the meeting follows:

TUESDAY, FEBRUARY 27.

- 8:00 to 10:00 A. M. Registration. Room 105, Office of State Highway Commission.
- 10:00 A. M. Meeting called in Room 209, second floor, Engineering Hall.

Noon:

1:30 P. M. Engineering Assembly.

Iowa's Record for Road Work in 1916, F. R. White, Road Engineer. Permanent Road Grading, Preparation and Approval of Plans.

Discussion: Led by E. W. Dunn, County Engineer, Hardin County; W. E. Jones, Assistant Engineer; W. H. Root, District Engineer.

- Estimating, Securing Competition, Awarding Contracts, Inspection, Settling with Contractors for Road Work.
- Discussion: Led by J. F. Chapman, County Engineer, Cherokee County; C. Coykendall, District Engineer.

Closing the Season's Grading Work. Is Late Work Profitable?

Discussion: Led by H. B. Fishel, County Engineer, Crawford County. Iowa's Call to the Roadbuilder, Hon. J. G. Weaver, Des Moines.

Oiled Roads, B. H. Piepmier, Maintenance Engineer, Illinois State Highway Commission.

Discussion: Led by G. Halbfass, County Engineer, Muscatine County, Evening Program: Engineering Assembly.

7:30 P. M. The Federal Aid Road Act as Applied to Iowa, J. C. Wonders, District Engineer for U. S. Office of Public Roads, District Headquarters, Omaha, Nebraska.

Discussion Led by Commissioner A. Marston.

- Gravel Road Construction, Division Engineer Balsey of the Wisconsin Highway Commission.
- Discussion: Led by W. D. Maxwell, County Engineer, Sac County; Walter Barber, County Engineer, Clay County.

Is Winter Gravelling Practicable and Profitable? Discussion:

WEDNESDAY, FEBRUARY 28.

9:00 A. M. Engineering Assembly.

- Results of the Investigations of the Physical Properties of Iowa Gravel, Professor T. R. Agg.
- The Colormetric Tests for Impurities in Gravel, Professor R. W. Crum.

The Patrol System of Maintenance for Earth and Gravel Roads.

Discussion: Led by N. B. Barber, County Engineer, Black Hawk County; E. B. Tourtellot, County Engineer, Clayton County; Don L. Teal, County Engineer, Jefferson County.

The Tractor in Road Work, Owning versus Hiring.

Discussion: Led by Paul Graham, County Engineer, Butler County; J. S. Dodds, Assistant Engineer; H. M. Howard, County Engineer, Pottawattamie County.

1:30 P. M. Iowa's Progress in Bridge Work for 1916, and the Present Material Situation, J. H. Ames, Bridge Engineer.

Changes in the Standard Bridge Specification, E. F. Kelley, Assistant Bridge Engineer.

Discussion:

Official Relationship of County Engineers and County Auditors, J. M. Albertson, Auditor, Harrison County.

Farm Entrance Culverts.

- Discussion: Led by W. E. McClure, County Engineer, Calhoun County.
- Securing Proper Field Inspection of Bridge Construction.
 - Discussion: Led by W. O. Price, County Engineer, Marion County: Henry Hanssen, County Engineer, Linn County.
 - Special Forms of Culverts-Catch Basis, and Tile Drains versus Surface Culverts.
- Discussion: Led by L. M. Martin, District Engineer.
- Evening Program: Annual Dinner. Sheldon-Munn Hotel.
 - A special program has been arranged for this evening.

THURSDAY, MARCH 1.

Room 209, Engineering Hall.

- 8:30 A. M. The Necessary Information for Intelligent Bridge Design. Discussion: Led by M. F. McFarland, County Engineer, Lee County:
 - J. A. Paulsen.
 - Foundation Piling as a Protection to Important Structures During Severe Flood Conditions.
 - Discussion: Led by E. J. Vaughan, County Engineer, Chickasaw County: G. A. Blunt, County Engineer, Fayette County.
- 1:30 P. M. The Manufacture and Use of Concrete Pipe for Roadway Culverts.
 - Discussion: Led by J. C. McLean, County Engineer, Woodbury County: E. W. Bennison, County Engineer, Adams County.

Highway Drainage Districts.

Discussion: Led by Sam Steigerwalt. County Engineer, Story County.

The Motor Truck in Road Work and the Economy of Its Use.

Discussion: Led by George K. McCollough, County Engineer, Buena Vista County; F. R. Lyford, County Engineer, Worth County.

County Engineers.

An unusual number of changes in the office of county engineer have taken place during the past year on account of the number of engineers entering military service. Prior to December 1, 1917, twelve county engineers had enlisted or had been called into military service, and it is known that a number of others have filed papers for enlistment in various branches of the service. A complete list of those who have entered service or been commissioned prior to December 1, 1917, is given in this Chapter under "Military Service."

After careful consideration of the engineering work in Adams, Fremont, Lee, Ida and Dubuque Counties, the Boards of Supervisors of said counties were requested to make other arrangements for carrying on their engineering work in the future. The Commission approved and concurred in the action of the Board of Supervisors of Linn County in making a change in the office of County Engineer in that county.

Official Communications.

As occasion arose, official communications and circular letters were sent to the county engineers, auditors, supervisors and township clerks. Information of a general nature is, in this way, disseminated to the officials affected thereby.

Contract Approval.

All contracts for road and bridge construction or for materials, after being checked by the road or bridge engineer, are referred to the Chief Engineer and to the Commission for approval, and when finally approved, are entered on the Minutes of the Commission.

Accounting.

Complete records are kept in the office of the Commission relative to all expenditures from the maintenance fund of the Commission, and for all expenditures on account of work which the Commission directs or is interested in. The accounting work for the Commission is divided as follows:

(a) Salaries and expenses of the Highway Commission proper.

(b) Engineering expense in preparing plans and specifications for Federal Aid road projects.

(c) Construction of Federal Aid projects.

(d) Construction and maintenance of roads at various state institutions.

All bills of the first class are checked and approved by the Commission and then passed to the State Board of Audit. After the bills are approved by the State Board of Audit, they are filed with the Auditor of State, who issues warrants in payment thereof. Bills of the second class are checked and approved by the Commission and filed with the Auditor of State, who issues warrants in payment thereof. Bills of the third class are checked and approved by the engineer in charge of construction, by the district engineer, the board of supervisors of the county in which the work is being done, and then by the Highway Commission. After which they are filed with the Auditor of State or County Auditor for payment. Bills of the fourth class for the construction and maintenance of roads to various state institutions are ap-

proved by the engineer in charge of the work, then by the Supervisor of State Roads, who is Chief Engineer of the Commission, and then forwarded to the Board of Control of State Institutions. After being approved by the Board of Control and State Board of Audit, they are filed with the Auditor of State, who issues warrants in payment thereof.

Warrants issued by the Auditor of State in payment of any of the above named bills are sent to the Commission for distribution.

Records showing the classification of all bills audited as above described are kept in the office of the Commission. A detailed cost accounting system has been installed for recording all expenditures on account of Federal Aid projects and on account of work at state institutions.

General Correspondence.

Each year marks a large increase in the volume of correspondence handled by the Commission. New duties have devolved upon the Commission by reason of legislation, and the Commission is consulted more and more as the local road officials and the general public become acquainted with its activities. The administration of the Federal Aid road act alone creates quite a large volume of correspondence. Various public service commissions, organized to assist in the administration of military affairs, have made frequent calls on this Department for information. It has been the policy of the Commission during the past year to assist in every way possible in compiling or disseminating information requested by the War Department, or any of the various bodies organized to assist said Department. Much of the correspondence, and nearly all inquiries involve the compilation of a great deal of statistical information.

Contracts and Purchase of Materials.

The Commission provides standard specifications to govern the quality of all materials which are used in any considerable quantity in road or bridge work. It also provides a standard Form of Tender for use in taking bids for road or bridge construction. When bids are received, they are based upon these standard requirements, and are directly comparable. In general, all awards are made to the company submitting the lowest bid, although in some cases, if previous experience on the part of the county has shown the low bidder to be unreliable in his dealings, the contract is awarded to some other bidder, though usually on the basis of the low bid submitted. Experience has proven that low prices should not govern the awarding of contracts, if there is any reason to question either the reliability of the company or the service which is to be rendered. The use of single standards for materials, and for road and bridge construction, reaching every county in the State, has had a marked influence in improving the quality of materials shipped into Iowa, and the quality of road and bridge construction. County engineers and county supervisors are becoming convinced that detailed inspection and close adherence to the specifications are necessary in securing first-class construction.

The Iowa Highway Commission standards have been quite widely adopted in other states and even by the manufacturers themselves. The Commission has, at all times, emphasized the principle of competitive bidding, which conserves to the public all the advantages arising from competition on the part of the manufacturers and allows the counties to organize their buying in such a manner that large contracts can be placed, thus securing the lowest possible price. The law provides that all culvert and bridge construction, grading, tile and tiling, and repair work or materials therefor, of which the engineer's estimate of cost shall exceed \$1,000.00, shall be advertised and open to bids, and that any proposed contract which shall exceed the sum of \$2,000.00 for any one bridge or culvert, or repairs thereon, shall be first approved by the State Highway Commission before the same shall be effective. It has become customary, however, with many counties to send practically all of their contracts to the commission for their approval, whether such an approval is required or not. The approval of such contracts by the commission includes the checking of prices to see if they are in accord with the prevailing prices for the quality and quantity of material at the time the contract is awarded, as well as an examination of the contract and bond. A detailed record of all contracts submitted for approval is entered upon the records of the commission.

Changes in County Road Systems.

As conditions arise, which were unforeseen when the county road systems were laid out, it occasionally becomes necessary,

ADMINISTRATIVE DEPARTMENT

in serving the best interests of the public, to make certain changes or additions to the various county road systems. The law outlines the manner in which revisions may be made. The chief reasons for altering the county road systems are: To shorten the traveled distance between market towns, to eliminate dangerous crossings, to eliminate dangerous curves, a decrease in the cost of improving a road, a decrease in the cost of maintaining the road. A detailed report of changes approved by the highway commission during the past year appears under schedule 9, chapter VI.

State Fair Exhibit.

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In 1917 the commission again exhibited examples of standard road and bridge construction at the state fair held in Des Moines. Two years ago a somewhat extensive exhibit of such models was constructed and as these models were of a permanent character, they have remained to be used at each annual exhibition, and an added feature with the 1917 exhibit was an example of monolithic brick paving, as this type of construction is becoming quite popular in the middle west. A large assortment of large photographs and drawings was also displayed. One or more attendants were constantly in attendance at the exhibit, to disseminate information to many people who showed an interest in the models and other exhibits displayed.

Publications.

Monthly Service Bulletin. The January, February, March, 1917, numbers of the service bulletin were combined in a single issue. Aside from this, an addition to the bulletin was issued each month during the year. Comments from the state press, from local road officials and from highway departments, colleges, and libraries throughout the United States, confirms the thought that the monthly service bulletin is a highly desirable means of disseminating information relative to road and bridge construction to the general public. Frequent requests are received from the newspapers of the state for permission to use cuts which have been reproduced in the service bulletin. These requests are gladly complied with, though it is often necessary for some publishers to wait their turn in securing the use of the cuts. In addition to the ten issues of the service bulletin, there have been issued during the year the following publications: Standard Specifications for Highway Bridge Construction,

Standard Specifications for Earth and Gravel Road Construction, Procedure by Counties to Secure Federal Aid.

Military Service.

The call of the United States government for men to help prosecute the war has made a strong appeal to the men in the civil engineering profession. The nature of the services to be performed in many instances requires men technically trained in this profession, and the call for men of this class has been emphasized from the beginning of the war.

The response to this demand has been most hearty as evidenced by the voluntary enlistment of many men holding responsible positions both in public and private life. A number of men on the staff of the highway commission and a number of county engineers have felt it their duty to offer their services to the government.

Almost as soon as war was declared, A. Marston, dean of engineering, Iowa State College, and ex-officio member of the highway commission, offered his services, although he had been actively engaged for some time in giving military training to the students at Iowa State College, and was commissioned a major of Iowa engineers by Governor W. L. Harding, of Iowa.

L. S. Gates, an employee of the commission since 1913, applied for and received a commission as second lieutenant, engineering corps, U. S. reserves, and after a period of training at Camp Leavenworth, Kansas, was assigned to active service.

L. M. Martin, district engineer, with headquarters at Atlantic, Iowa, was commissioned a captain, engineering corps, U. S. reserves, and is awaiting the call to service.

C. H. Cook, employed as draftsman by the commission for the past year, entered the aviation service and was sent to a training camp.

J. C. Nichols and M. G. Spangler, draftsmen, enlisted in the twenty-third regiment of highway engineers and were assigned to Camp Mead for training.

Several other employees of the commission have filed enlistment papers for various branches of service and doubtless will be called at an early date.

ADMINISTRATIVE DEPARTMENT

The following named county engineers have entered military service prior to December 1, 1917:

Geo. K. McCullough, of Buena Vista County, Captain, Engineering Corps, U. S. A.

H. M. Howard, of Pottawattamie County, Captain, Company B, N. G.

C. D. Forsbeck, of Montgomery County, Captain, U. S. Reserves.

E. W. Bennison, of Adams County, First Lieutenant, U. S. Reserves.

H. H. Johnson, of Lucas County, Private, National Army.

F. G. Mallette, of Decatur County, First Lieutenant, U. S. Reserves.

R. C. Craig, of Wayne County, Corporal, National Army.

C. A. Cool, of Bremer County.

E. J. Vaughan, of Chickasaw County.

Frank D. Pearce, of Franklin County.

W. F. MacFarland, of Lee County.

J. H. Malloy, of Scott County.

Federal Aid.

Chapter 239, Acts of the Thirty-seventh General Assembly, commonly referred to as the federal-aid act, and more particularly described under chapter II of this report, authorizes and instructs the commission to do all things necessary in carrying out the provisions of said act. Since July 4, 1917, when said act became effective, the commission has prepared and submitted to the office of Public Roads Department of Agriculture twelve project statements, eight of which have been approved. Field surveys have been made for six projects and it is planned to have plans completed for a number of projects when the construction season opens in 1918.

This work has nearly all been done with the regular organization of the commission, though it will be necessary to enlarge the road department considerably when construction work begins in 1918.

Inter-County Road System.

The above-mentioned act of the Thirty-seventh General Assembly accepting federal aid, provides that the board of supervisors of each county, with the approval of the commission, shall designate a system of inter-county highways. A number of counties have reported to the commission the roads they recommend for a part of this system.

The commission has not made definite selection of these intercounty highways, except those portions on which federal-aid projects are located. The law provides that this system of highways shall embrace not less than 2,000 miles and not more than 6,000 miles.

Federal Aid Project No. 1.

Federal-Aid Project No. 1 in Iowa is located in Cerro Gordo County on the road connecting Mason City and Clear Lake, and is slightly over four miles in length. The improvement consists of type A concrete surface, 16 feet wide, and with gravel shoulders.

A contract for the construction of this project was let to the Bryant Paving Company, of Waterloo, on September 4, 1917, and was about one-half completed when cold weather necessitated the closing of work for the season.

Camp Dodge Road.

When the National Army cantonment was located north of Des Moines in Polk County, it was agreed by the commercial club of the city of Des Moines that a surfaced highway be provided from Des Moines to the camp. The board of supervisors of Polk County was called upon to construct such a road from the city limits to the camp.

The road first selected for improvement is what is known as the Beaver Avenue Road, and the highway commission was asked to make a survey and prepare plans and specification for the improvement of this road. As the season for construction work was then well advanced, the plans were rushed to completion and the work advertised. Alternate bids were taken on the monolithic brick and concrete surfacing.

Meantime, the cantonment was under construction and a premium had been placed on labor of all classes, making it difficult for contractors to figure on construction projects of any considerable size. The prices submitted at the advertised letting were so high that all were rejected and the work readvertised.

Finally the board of supervisors decided to improve a shorter route to the cantonment, known as the Forty-eighth Street Road. This necessitated another survey and the preparation of new plans and specifications. A contract was finally awarded on September 15, 1917, on the last-named road, to Aiken & Flutter, of Corning, Iowa, for 4.5 miles of monolithic brick surfacing 20 feet wide.

A portion of this road was completed and opened for traffic November 24, 1917, and cold weather forced the closing of the work for the season, December 8, 1917.

ADMINISTRATIVE DEPARTMENT

IOWA STATE HIGHWAY COMMISSION

The total estimated cost of this improvement is \$200,000.00 and when it is completed in the spring of 1918, Polk County will be able to boast of the finest piece of paved county road in the state. The plan for financing the project is to issue warrants on the county-road fund and for the banks of Des Moines to carry same until the work is completed, when the warrants will be taken up by an issue of funding bonds.

Bridge Data on Inter-State Highways.

When it became apparent that military importance might be attached to certain inter-state highways, the commission undertook through its district engineers to gather and compile data relative to the bridges and culverts on through highways crossing the state from east to west and from north to south.

The highways selected were the Lincoln Highway, the White Pole Road, Hawkeye Highway, North Iowa Pike, River to River Road, and the Blue Grass Road running east and west, and the Jefferson Highway and the Red Ball Route, running north and south.

This information recorded shows the exact location and description of each bridge or culvert and its present state of repair and whether or not it is capable of carrying a 15-ton loading.

Appointments of Commissioners.

Commissioner Beard, during the year ending December 1, 1917, attended 26 commission meetings, four conferences relative to the improvement of dangerous railroad crossings, gave twelve days to conferences with other state officials, attended three road conferences and conventions, made four extended inspection trips over roads within the state, met with the boards of supervisors and inspected the roads of nineteen counties, attended two conferences with the State Council of National Defense, devoted one day to the preparation of the annual report, and two days to a conference with a representative of the Federal Trade Commission, regarding patent litigation.

Commissioner Holden, during the past year, attended twenty commission meetings, conferred with the boards of supervisors and inspected the county roads of twenty-one counties, spent six days conferring with other state officials, attended four road conferences and conventions, and made two extended trips of inspection of county roads. Besides attending eighteen meetings of the commission, Commissioner Marston spent fifteen days attending road conferences, conferring with state and county officials, and inspecting roads and bridges.

Commissioner Beyer, who took office in October, 1917, has attended five commission meetings and given six days to inspection of the capitol-grounds improvements, inter-county road systems, and federal-aid projects.

The chief engineer and other employees spent a total of 194 days on special assignments from the office.

Chief Engineer MacDonald spent seventeen days attending road conferences and conventions, four days conferring with attorneys and the Federal Trade Commission regarding patent litigation, two days inspecting lakes to be improved, five days attending conferences regarding railroad-crossing improvements, seventeen days conferring with boards of supervisors and inspecting county roads, thirteen days on general inspection trips, thirty-one days arranging for the improvement and supervising the construction of the road from Des Moines to Camp Dodge, three days developing plans for roads at state institutions, nine days consulting with the executive council and supervising the improvement of the state capitol grounds, and six days conferring with representatives of the United States Forest Reserve and the U. S. Geological Survey and on general assignments.

At the request of the county accounting department of the state auditor's office, a representative was sent to Keokuk County to assist in making an examination of the records of said county with reference to expenditures for road and bridge improvement. This investigation was incident to removal procedures brought against a member of the board of supervisors of Keokuk County at the instigation of citizens and taxpayers of said county. The representative who assisted in this investigation spent five days in court when the action against the said board of supervisors was brought to trial.

The editor of the service bulletin made seventeen trips visiting eleven counties in the collection of material for the monthly service bulletin.

Registration of Highway Routes.

During the past year sixteen highway routes have been registered under the provisions of section 1527-s22, supplement to

the code, 1913, which provides that organizations promoting marked highway routes may protect their routes and markings by registering same with the highway commission.

A complete list of registered highways is given below. Numbers 19 to 34, inclusive, were registered during the past year:

Number	Name of Route	Date Registered
1	Great White Way	July 30, 1914
2	Green Crescent	July 30, 1914
3	Center Point Motor Club	Sentember, 1914
4	Red Ball Route	Jap. 2, 1915
5	King's Highway	June 28 1915
6	Southwest Prails	June 28, 1915
7	Waubonsia Trail	April 3 1916
8	Chariton & Leon Short Line	April 3 1016
ö	John D. Parmalas Trail	April 3 1916
10	Capitol Highway	June 9 1016
11	Red Line	June 9 1916
12	Farmars Highway	June 9 1016
13	Black Hawk Trail	Sant 25 1016
14	Jafarson Highway	Sept. 25, 1010
15	Hamin Short Douts	Sout 25, 1016
16	Hambore Cut Off	Sept. 25, 1815
17	Black Dismond Trell	Sept. 25, 1910
18	Lincoln Highway (Lowa Division)	Dea 9 1015
10	Dariol Boona Trail	Dec. 2, 1910
20	Daniel Doube Hall	Dec. 22, 1910
91	Diamond (Paul)	Dec. 22, 1910
00	Pad V Pouta	Dec. 22, 1916
00	Act A Rolle	Dec. 22, 1916
24	Coder Papide Ottomme & McCrease Ibell	Mar. 23, 1917
05	Townet Then a McGregor Trail	Mar. 23, 1917
20	Grand Lina	Mar. 23, 1917
07	Washington Highway	Mar. 23, 1917
00	Timerille Indianole Chost Time	Mar. 23, 1917
20	Dine T Highway	Mar. 23, 1917
20	Hawbara Highway	Mar. 23, 1917
31	Stor Doute	June 29, 1917
20	Burlington Way	Dec. 1, 1917
29	Town Plus Orace Pouts	Dec. 1, 1917
24	Deploop Plour Olds Cost Old	Dec. 1, 1917
0.	Demson-Sloux City Cut-OIL	Dec. 1, 1917

Chapter IV.—Bridge Department. December 1, 1916—December 1, 1917.

During the period of one year as covered by this report, the bridge department prepared detailed plans for 343 bridges for seventy-two counties, estimated to cost \$1,441,000; approved 113 designs submitted from thirty counties, the estimated cost of which was \$413,500; checked and approved 154 detailed shop drawings for steel structures from fifty-six counties on work estimated at \$355,000; checked for approval 197 bridge contracts totaling \$2,179,000, from seventy-six counties; approved fifty material contracts from thirty counties; developed eighteen new standard designs for bridges; made sixty-eight special inspection trips to thirty-four counties; adjusted thirty complaints on bridge work.

The district engineers representing the bridge department have attended 120 bridge lettings in seventy-five counties on advertised work, totaling \$2,631,000; attended eighty material lettings in sixty-one counties; spent eighty-five days in examining bridge sites; spent 202 days in supervising and inspecting bridge work, and thirteen days in certifying to emergency work.

In addition to the above, this department has handled all of the field and office work on the preparation and checking of plans and estimates for railroad crossing improvements, and attended a number of conferences on this work. A detailed statement of the crossing work appears in chapter V. The tabulation given below shows the summary and comparative statements of the detailed work of this department during 1915, 1916 and 1917, exclusive of the work done on crossing improvements. SUMMARY AND COMPARATIVE STATMENT OF THE DETAILED WORK OF THE BRIDGE DEPARTMENT ON BRIDGES AND CULVERTS, 1915, 1926, 1917

		1915	1916	3917
Bridge designs	No. of designs	459	472	30
tion of Lablas share	Est. value	\$ 1,183,000	\$ 1,511,000	\$ 1,441,00
App. of proge passa	No. of counties	47	1288	111
App. of shop drawings	No. approved	9 306,000 180	* 182,099 176	\$ \$11,50
	Est. value of steel work		54	R
App. of bridge contracts	No. approved	* 241,000 172	9 324,909 206	8 355,500
	No. of counties Total amount approved	\$ 1,237,009	\$ 1.041,355	\$ 7.13.00
App. of material contracts	No. of counties	49 21	68	0
Bridge lettings.	No. of lettings	140	139	. 25
	Est. amount bridge work included	1.679.000	3 2.202 100	4 A 201 cm
No. of material lettings at-	and the second s		a alternation	e
No. of inspection trips		84 73	87 79	8

Since the law went into effect in April, 1913, the engineers of the bridge department have designed, checked, or approved 3,756 detailed individual plans for specific bridges, with a total estimated cost above \$9,200,000; checked and reported for approval 751 bridge contracts, with a total contract price of \$6, 624,000; prepared detailed railroad crossing plans on work estimated at \$103,650.00; approved 156 material contracts; attended 399 bridge lettings on advertised bridge work estimated above \$6,630,000, and attended 243 material lettings.

Bridge Designs for Specific Locations.

The commission, through the bridge department, offers technical designing service on important structures to all the counties of the state, without cost. Most of the important bridges requiring special designs are now sent to the commission, where the designs are prepared by the department and the detailed drawings furnished to the counties. An accompanying chart shows the relative amounts of the various types designed during 1915, 1916 and 1917.

Since the road law was enacted in 1913 the bridge department has prepared 2,103 designs for specific locations, which have an estimated cost of \$5,871,000. The average estimated cost of each structure designed during 1916 was \$3,200 and in 1917 the average estimated cost of each structure designed increased to \$4,200.

BRIDGE DEPARTMENT

During the past year the commission has been requested to prepare a number of designs for important bridge structures. Among the more important designs prepared during the past year were the alternate designs for a bridge over the Des Moines River at Algona in Kossuth County consisting of two 65 ft. and one 70 ft. spandrel filled concrete arches estimated to cost \$23, 000 and two 100 ft. high rivited steel trusses estimated to cost \$22,000. Designs have been completed for two 70 ft. spandrel filled arches at Dyersville in Dubuque County estimated to cost \$33,000.00. A concrete deck girder bridge consisting of six 45 ft spans and located over the Raccoon River in Carroll County was designed by the commission and constructed by contract during the past year at a total cost of \$15,922.

Under Schedule Number One is given a detailed statement of the bridge designs prepared for specific locations in 1917. (Refer to Schedule Number One.)

Approval and Analysis of Designs Submitted.

The amount of work necessary to check and approve a design submited for analysis depends very largely upon the importance of the structure, the completeness of the design, and the type of structure. On the less important types of structure which follow closely the standards of the commission, the detailed work of checking the design is accomplished with a comparatively small amount of work. On important structures and particularly bridges of the arch type the mathematical analysis and field inspections necessary require considerable time before final approval can be made. In some cases during the past year it has been necessary to completely redesign the structure in order to secure a more economical design than the one submitted.

On steel structures the detailed plans for the steel work are forwarded to the commission by the fabricating company, where they are checked and approved before the work is fabricated in the bridge shop.

Since April, 1913, the bridge department has checked 1,195 designs submitted, which were estimated at \$2,033,500. In addition to the above, during the same period of time, a total of 458 shop drawings were checked on work estimated at \$1,310,000. Under a schedule, not printed, is given a detailed statement of the designs and shop drawings submitted for approval during 1917.

Standard Plans.

During the current year a total of eighteen new standard designs have been completed and three revised designs have been prepared to replace two old designs.

A complete new set of concrete abutment standards has been prepared consisting of five designs of two sheets each, a total of ten sheets. These are classed as new designs although, to a certain extent, they constitute a revision of the former standards.

Eight designs for trusses of the Y series have been made, completing the series and making a total of twenty designs.

Three designs for trusses of the T series have been made, completing the series and making a total of fourteen designs.

Two designs for standard overhead bridges for railroad crossings have been completed. Several more designs for this type of construction are contemplated.

Design V-2 for beam spans on piling has been revised.

Design G-2 for pile abutments for short-span pony trusses has been replaced by design sheets G-2 and G-2a.

The complete list of bridge standards in use at the present time is as follows:

Series C-Concrete box culverts for spans from 2 ft. to 12 ft. 22 sheets of designs and one estimate sheet, C1 to C23 inclusive. Dated 1916.

- Series J—Concrete slab bridges for spans from 14 ft. to 24 ft. inclusive. One design sheet, J1, dated November, 1915.
- Series H—Concrete deck girder bridges for spans from 24 ft. to 40 ft. inclusive. Two design sheets, H1, dated November, 1915. Series C, J and H are published together in booklet form.

Series X-Riveted pony trusses, with concrete floors and without joists. for spans from 35 ft. to 100 ft. inclusive and for both 16 ft. and 18 ft. roadways. Twenty-eight designs, XI to X28 inclusive.

Series V-I-beam spans. Four sheets of designs.

- V-1. Beam spans with concrete floor and angle railing. Dated January 1, 1915.
- V-2. Beam spans with wood floor and pile abutments. Dated January 15, 1917. Supersedes and renders void design V-2, dated September 1, 1915, and printed in booklet of designs for beam spans and X series pony trusses.
- V-3. Beam spans with concrete floor and concrete railing. Dated September 15, 1915.
- V-4. Beam spans with concrete floor and gas-pipe railing. Dated September 15, 1915. Series X and V are published together in booklet form.





View of overhead highway bridge constructed over the C., R. I. & P. R. R. Company's tracks on the country road between Sections 28 and 29, Allen township, Polk county. The estimated cost of the improvement of railroad crossing project No. 26, of which this is a part, was \$9,000. The railroad company paid 60 per cent and the county 40 per cent of the total cost. This is popularly known as the Avon crossing. It is approximately five miles southeast of Des Moines.



Woodbine bridge over the Boyer Drainage Ditch in Harrison county near the town of Woodbine. This bridge which consists of a 50-ft. reinforced concrete cantilever main span and 2-30-ft, concrete girder approach spans was built in 1916 at a cost of \$10,000. This type of construction is particularly well adapted for use on deep drainage ditches and streams subject to widening.



In connection with the federal aid work, traffic counts were taken during 1917 at forty-seven different stations in seventeen counties. At four of these stations, the Good Boads Experiment Station of Iowa State College, co-operating with the Highway Commission, established scales and weighed each vehicle passing the station. The results show an average daily traffic of 356 vehicles passing each station, weighing an average of 2,636 pounds per vehicle or a total weight of approximately one million pounds of traffic daily. These vehicles carried an average of 1,045 passengers per day, or approximately three passengers per vehicle. The view shows the type of scales used and the method of installment.



Bridge over the Iowa river one mile south of the city of Tama in Tama county. This bridge consists of 3-95x18 ft. low riveted truss spans on concrete foundations. An unusual feature in connection with the bridge is the 3-in, monolithic brick wearing surface on the trusses. The bridge was constructed in 1917 at a total cost of \$15,900.



Harmon Street bridge in City of Waverly, Bremer county. This bridge consists of 3-120'x18' high riveted truss spans on concrete foundations. The bridge carries a concrete floor and is provided with a six-foot sidewalk. The bridge was completed in 1917 at a total cost of \$25,000.

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Views of an 80x20-ft, through steel plate girder bridge with concrete floor and abutments constructed one-half mile north of Dedham in Carroll county. This bridge is provided with a 20-ft, roadway and a 5-ft, sidewalk. The bridge was completed in 1915 at a total cost of \$7,470. A type of permanent construction not frequently used, but offering maximum waterway clearance for the span length.

- Series M-Concrete bridge piers. One design sheet, M1, dated July, 1916.
- Series D—Circular concrete culverts from 18 in. to 42 in. in diameter. Four sheets of designs and four sheets of estimates, D-1 to D-8 inclusive. Dated 1914.

Series E-Metal culverts. One sheet, E1, dated 1914.

Series F-Concrete pipe culverts. One sheet, F1, dated 1914.

- Series I-Concrete through girder bridges for spans from 24 ft. to 40 ft. inclusive. Nine sheets.
- Series Y-Riveted pony trusses, with concrete floors on steel joists for spans from 40 ft. to 85 ft. inclusive and for both 16 ft. and 18 ft. roadways. Twenty designs, Y1 to Y20 inclusive.
- Series T-Riveted high trusses, with concrete floors on steel joists, for spans from 90 ft. to 150 ft. inclusive and for both 16 ft. and 18 ft. roadways. Fourteen designs, T1 to T14 inclusive.
- Series G-Timber and timber and steel construction.
 - Three sheets of designs.
 - G-1. Pile trestle, dated 1914.
 - G-2. Pile abutments for short pony truss spans, 16 ft. roadway.
 - G-2a. Pile abutments for short pony truss spans, 18 ft. roadway.

Sheets G-2 and G-2a are dated January 1, 1917, and supersede sheet G-2 dated March, 1915.

- Series K—Concrete bridge abutments. Five designs of two sheets each, dated November, 1917, and superseding sheets K-1, K-2 and K-3 dated November, 1913.
 - K-1. Abutments for steel truss spans. Heights 10 ft. to 19 ft. inclusive.
 - K-2. Abutments for steel truss spans. Heights 20 ft. to 30 ft. inclusive.
 - K-3. Abutments for I-beam bridges. Heights 10 ft. to 24 ft. inclusive.
 - K-4. Abutments for slab bridges. Heights 10 ft. to 19 ft. inclusive.
 - K-5. Abutments for deck girder bridges. Heights 12 ft. to 24 ft. inclusive.

Series R-Standard overhead bridges for railroad crossings.

- R-1. Overhead bridge with wood floor and sub-structure and wood or steel joists.
- R-2. Overhead bridge with 'concrete slab superstructure and sub structure of concrete bents and abutments.

Standard Specifications.

The commission has in the past issued standard specifications covering the following bridge or culvert construction:

Highway bridge and culvert construction. Reinforcing steel. Bridge lumber and piling.

Corrugated culverts.

During 1917 the standard specifications on highway bridge and culvert construction were completely revised and will be

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BRIDGE DEPARTMENT

issued soon after January 1, 1918, to cover all bridge and culvert work constructed in the state during the coming year.

Trips by Members of Bridge Department.

The department has made a number of inspection trips during the year at the requests of the counties. These inspections were made in a number of cases to determine the advisability of placing creosote wood block floors on light steel spans carrying heavy traffic. Field inspections were made during the year, of the general construction work secured on several of the larger steel and concrete spans erected in the state. These inspections are made by members of the department during the time important parts of the bridge are under construction. The total number of inspections made during the past three years are as follows: 1915, 73; 1916, 79, and 1917, 68.

Bridge Complaints.

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A number of complaints on bridge and culvert work were referred to the commission during the past year. In each case an investigation of the complaint was made. In many cases it was necessary to secure a report on the field conditions from the district engineer of the commission. These reports are all filed and made a part of the records of the commission. In every case where it was found that the complaint was justified steps were taken to remedy the conditions complained of. A total of thirty specific complaints were investigated during 1917.

Approval of Contracts on Bridge Work.

The approval of contracts on bridge work is one of the most important duties of this department. During 1917 a total of 197 bridge contracts were submitted for approval. The total contract price of these contracts is \$2,128,238.53. The tabulation below gives a summary and comparative statement of the bridge contract approval from April, 1913, to December 1, 1917.

Date of Report	Number Submitted	Average Contract Amount	Total Amt. Approved
Apr. 1, 1913-Dec. 1, 1913 Dec. 1, 1913-Nov. 1, 1914 Nov. 1, 1914-Dec. 1, 1914 Dec. 1, 1915-Dec. 1, 1916 Dec. 1, 1916-Dec. 1, 1917	53 121 172 208 197	\$ 7.774.00 7,830.00 9,950.00 10,803.00	\$ 344,162.24 731,205.58 1,337,069.15 2,043,393.47 2,128,238.53
	751		\$ 6,584,068.97

The above table shows the number of contracts approved each year since April, 1913, as well as the increase in the total amount of contracts submitted.

The commission has issued a standard blank form approved by the attorney general's office for use in making out all bridge contracts. Copies of these forms are supplied to each county and all bridge contracts are filled out on these standard forms. By using a standard contract form the time required to make an intelligent approval by the commission has been greatly reduced. During the past year the average time required for the approval of bridge contracts has been slightly over six days. This includes all time required to secure additional or incomplete information on contracts submitted for approval. When the contract is properly executed and the award made in accordance with the commission's recommendation the time of approval is rarely greater than two days.

The average contract price has increased each year since 1913, as shown by the table above. Since April, 1913, a total of 751 contracts have been submitted to the commission for approval with a total contract price of \$6,584,068.97.

Schedule Number Two shows in detail the contracts which were submitted for approval for the period from December 1, 1916, to December 1, 1917. (Refer to Schedule Two.)

Approval of Contracts for Materials.

During 1917 a marked improvement has been noted in the general form of the material contracts submitted for approval. In the past the commission has experienced considerable difficulty in securing sufficient and uniform information on the material contract forms before they were sent in to this office. The commission issued a standard form of contract for materials which has greatly aided in facilitating the approval of material contracts submitted during 1917. This year practically all of the contracts were on the standard form and contained sufficient information to enable their being considered for approval without the necessity of securing additional information from the counties. The insistence of the commission that all contracts shall contain definite clauses relating to the amount and character of material to be purchased, and the furnishing of standard forms for contracts to the counties, have both operated to greatly improve the general nature of the contracts covering

BRIDGE DEPARTMENT

the purchase of material. During 1917 thirty counties submitted a total of fifty material contracts for approval.

Schedule Number Three gives a detailed statement of the material contracts submitted for approval in 1917. (Refer to Schedule Number Three.)

Blanks for Annual and Special Reports.

This department has assisted the administrative department in the revision of the county engineers' annual report blanks and in addition has prepared several special blank forms for securing specific information regarding special subjects.

General Field Work in Connection with Bridge Department.

A large part of the detailed field work of this department is handled by the district engineers. This field work consists of . assistance given at the request of the counties for determining the type and character of drainage structures, certification of emergency bridge work, inspection of work under construction, adjustments of differences arising between the contractors and counties, interpretation of the specifications, and general advice pertaining to bridge and culvert construction and repairs.

During 1917 the district engineers of the commission spent a total of eighty-five days in examining bridge sites, 101 days in attending bridge lettings, sixty-seven days in attending material lettings, 202 days in supervision and inspection of bridge work, and thirteen days on examination and certification of emergency work. The following tabulated statement shows in summary and comparative form the work of the district engineers on bridge work during 1915, 1916 and 1917.

	Total 1915	Number 1916	of Days 1917	
Examination of bridge sitesAttending bridge lettings	146 155	84 138	85 101	
Attending material lettings Supervision and inspection, bridge work	• 84 341	79 163	67 202	
Emergency bridge work	33	12	13	
Total	759	476	468	

Bridge and Material Lettings.

The estimated amount of bridge work included in lettings attended during 1917 was \$2,631,000, or an increase of \$309,000 over 1916. Complete reports of the estimates of each of the 2,359 structures advertised, including bids received and awards made for both bridge and material lettings attended, is on file in this office. The total number of bridge lettings attended during 1917 was 120, and the total material lettings attended was eighty.

Practically all of the counties advertised for their material requirements for 1917, and many of the counties held two or three lettings throughout the year to cover their requirements.

increased Cost of Construction.

The year of 1917 was marked by the remarkable increase in the price of construction material. War conditions occasioned a shortage of construction materials and labor which operated to greatly increase the cost of bridge and culvert construction. The delay in deliveries of materials of construction due to lack of railroad facilities and mill congestion was a serious handicap to the counties and contractors.

Some idea of the phenominal increase in cost of construction material may be illustrated by the diagram shown below, which shows the advance in price of structural steel over a period of four years. This curve is platted to show the base price of structural steel for each month in the years of 1914, 1915, 1916 and 1917. Steel reached the remarkably low base price of \$1.07 per cwt. in December, 1914. On December 30, 1915, this base price reached the high price level of \$1.80.

In 1916 prices advanced rapidly and on December 30th the base price of steel was \$3.25. This was considered extremely high, although it was followed by still higher prices during the current year. During the summer of 1917 the base price of structural steel advanced to \$4.50 and remained at this amount for several months, or until the price of \$3.00 was fixed by government regulation. Since January 1, 1915, the price of structural steel advanced over 250%.

SCHEDULE ONE.

BRIDGE DESIGNS FOR SPECIFIC LOCATIONS.

County	Number of Designs	Estimated Cost of Structures Designed	Cost of Designing
Appanoose Audubon Benton Black Hawk Bromer	5 3 1 1 4 1	\$ 21,712.00 14,128.00 10,235.00 6,063.00 17,318.00 4,938.00	\$ 46.96 23.31 125.80 72.54 52.20 11.63

SCHEDULE ONE-Continued.

County	Number of Designs.	Estimated Cost of Structures Designed	Cost of Designing
to the second seco	1	2010 ments	17.05
uchanan Visto		1910 WOLK 99 789 00	264.06
uena vista	6	22,185.00	89.57
alboup	ĩ	15 050 00	17.08
arroll	5	47 686 00	116.62
855	11	34,010,00	111.53
edar	3	4,743.00	17.15
erro Gordo	3	30,155.00	88.56
herokee	8	35,729.00	74.51
hickasaw	1	5,960.00	8.10
ay	24	53,496.00	7 002 04
layton	2	22,843.00	1,203.94
anic	5	14,417.00	29 06
avis	5	10,752.00	28.60
abuque	9	20 273 00	245.55
avette	ĩ	4 728 00	6.15
loyd	2	7,003.00	41.71
ranklin	9	25,492.00	\$8.47
remont	1	5,045.00	40.74
reene	7	36,952.00	117.13
rundy	1	3,641.00	13.78
uthrie	12	55,272.00	211.38
amilton	1	3,381.00	29.22
ancock	6	13,416.00	42.00
areison	0 17	18,891.00	164 02
oward		99,029.00	32.20
umboldt	3	13 756 00	18.02
a	4	13, 186, 00	22.32
ackson	17	61,937,00	112.74
asper	2	6,772.00	16.04
efferson	. 1	4,936.00	15.62
ohnson	2	4,113.00	66.52
ossuth	7	57,765.00	511.43
inn	4	15,556.00	22.00
oniga	1	4,920.00	43 58
neas	ő	91 722 00	119.69
von	ĭ	21,102.00	4,10
ahaska	Ĝ	48,353,00	67.56
arshall	14	65,606,00	141.43
ills	1	5,872.00	24.47
itchell	2	5,391.00	-12.83
onona	3	12,760.00	89.57
onroe	3	17,722.00	20.80
uscoting	. 2	8,511.00	87.95
Brian	2	5,987.00	22.00
sceola	0	14,023.00	20.00
820	9	40 498 00	357 38
alo Alto	9	29 585 00	95.79
lymouth	7	37,155,00	62.43
ocahontas	14	\$6,306,00	158.66
olk	10	19,858.00	314.52
ottawattamie			2.13
oweshiek	13	40,311.00	184.36
oux	4	11,180.00	20.42
ory	4	21,666.00	69.29
nion	13	32,175.00	90,37
an Buren	2	11,804.00	13.13
arren	2	5 458 00	20.40
ayne	2	13 177 00	21.14
ebster	5	21 520 00	+ 60.97
innebago	5	13,287.00	\$3.88
orth	7	12,430.00	57.77
FIGht	. 4	17 561 00	725 49
AIgutanananananan		11,001,00	700.20

BRIDGE DEPARTMENT

SCHEDULE TWO.

BRIDGE CONTRACTS SUBMITTED FOR APPROVAL. DECEMBER 1, 1916-DECEMBER 1, 1917.

County	Contractor	Date of Approval	Amount
Appapoose	Ottumwa Supply & Const. Co.	Feb. 8, 1917	\$ 16,835.00
Appanoose	I. W. Manson	Feb. 16, 1917	4,041.00
and the second	Morrison Construction Co.	Feb. 16, 1917	6,336.00
Audubon	Des Moines Bridge & Iron Works	Feb. 10, 1917	6,156.00
	Pickus Engineering & Const. Co	Feb. 10, 1917	12,277.00
	J. P. Riddle	Aug. 28, 1917	20,838.00
	Jensen Const. Co	Aug. 28, 1917	9,775.00
Benton	Waterloo Construction Co		1,743.00
International Andrews	Waterloo Construction Co	Mar. 17, 1917	17 941 00
Black Hawk	Iowa Bridge Company	Apr. 10, 1917	6 503 00
Press	Waterloo Construction Co	Apr. 10, 1917	10,619,00
Boone	Iowa Bridge Company	Apr. 10, 1911	3,170,00
	N. E. Marsh	Toly 9 1017	1,995,00
	N. E. Marsh	July 31 1917	6,278.00
Buchanan	E E Dainhold	June 22, 1917	2,900.00
Buena Vista	F. F. Reinfold	Jan. 20, 1917	5,300.00
Butler	Hav Kaplar Construction Co		3,652.00
Suticipation	S Verne Maxson	June 8, 1917	4,723.00
	M G Waugh	June 18, 1917	8,640.00
	Waterloo Construction Co	June 19, 1917	4,490.00
	Clipton Bridge Works	July 2, 1917	1,200.00
	M. G. Waugh	Oct. 15, 1917	3,225.00
	M. G. Waugh	Oct. 25, 1917	2,004.10
Calhoun	Iowa Bridge Company	Feb. 24, 1917	18,929.00
	Monarch Engineering Co	Feb. 24, 1917	14 919 00
and the second se	Monarch Engineering Co	Feb. 24, 1917	15 922.00
Carroll	Omaha Structural Steel Bridge Co.	Apr. 5, 1917	10,948,00
0	Pickus Engineering & Const. Co	Nor 6 1917	18,322.00
Cass	Des Moines Structural Steel WKS	MBL. 0, 1917	1,972.00
	Standard Bridge Company	July 5, 1917	
Codar	Lana Construction Co	Ang. 23, 1917	5,210.00
Condition	B. W. Hogen	Aug. 23, 1917	11,942.00
Cerro Gordo	Hinkel & Brown	Dec. 30, 1916	3,400.00
TANKA MANAGARA	Hinkel & Brown	Mar. 3, 1917	18,500.00
	Hey-Keeler Const. Co.	Apr. 24, 1917	6,141.00
	Hey-Keeler Const. Co	Sept. 20, 1917	2,010,00
	Des Moines Bridge and Iron Works		17,897.00
Cherokee	Western Bridge & Const. Co	Mar. 9, 1917	43, 535,00
	R. E. Shackleton	Mar. 10, 1917	11,622.00
1	Stratton & Humphrey	Mar. 10, 1917	20,732.00
	Leslie G. Haywood	Mar. 10, 1917	13,552.00
	Pickus Engineering & Const. Co	Mar. 10, 1917	9,925.00
	Ward & Weighton	Apr 94, 1917	13, 332.00
	Ward & Weighton	Apr. 24, 1917	2,957.00
	Biologe Engineering & Const. Co.	Apr. 24, 1917	3,180.00
	A Phelps & Sons	Apr. 24, 1917	19,442.00
Chickasaw	Alfred Olson	- June 9, 1917	20 800 00
Clay	Hey-Keeler Construction Co	_ Mar. 29, 1917	3 317 00
	Hey-Keeler Construction Co	- Nov. 30, 1917	5 182.00
Clayton	Alfred Olson	- Apr. 14, 1917	14 100.00
	Waterloo Construction Co	- Apr. 14, 1917	5,056,00
	C. H. Williamson	- Apr. 14, 1917	3,539.00
	Alfred Olson	- Aug. 20, 1917	2,223.00
	A. P. Schweikert	- Aug. 26, 1911	45,940.00
Clinton	John R. Kane	Inly 16 1917	17,400.00
Constand	John R. Kane	Mar 17, 1917	9,000.00
Crawlord	- Elkhart Bridge & Iron Co	Mar. 17, 1917	5,694.00
	Ward & Weighton	July 16, 1917	19,690.00
Dallas	Des Mones bridge and from was.	July 16, 1917	- 3,350.00
Dey Moines	Milwankoa Bridge Co		- 389.00
· · · · · · · · · · · · · · · · ·	Clipton Bridge Works	Apr. 20, 1917	1,390.00
Dickinson	Harry V. Brown	Feb. 7, 1917	- 01 491 00
	J. J. Merryman	Mar. 3, 1917	15 548 00
	Des Moines Bridge and Iron Wks.	- Mar. 3, 1917	12 997 00
Dubuque	J. J. Leonard	- Aug. 11, 1917	3,650,00
	Jas. F. Lee Paving Co	- Rob 10 1017	16,250.00
Franklin	- N. M. Stark & Co	Anr 16 1017	10,359.00
	N. M. Stark & Co.	I mpr. 10, aval	

SCHEDULE TWO-Continued.

County	Contractor	Date of Approval	Amount
Grandy	F. Fuller & Son	Mar. 9, 1917	4,039.30
or undy	Iowa Bridge Co	June 19, 1917	8,188.00
Guthrle	Des Moines Bridge & Iron Works	Apr. 18, 1917	55,646.00
A STUDIAL DESCRIPTION OF ST	Wilson Concrete Co	Apr. 24, 1917	13,200.00
	Giles & Christenson	Apr. 23, 1917	6,894.00
	Des Moines Bridge & fron Works	Sept. 29, 1917	12,900,00
	Cilias & Christenson	Nov 3, 1917	3,520.00
Hamilton	I A Dunkel	Sept. 6, 1917	3,300.00
Hammon	Albert Swanson	Sept. 14, 1917	5,190.00
	A. H. Austin	Sept. 14, 1917	14,738.00
Hancock	G. D. McNabb	July 10, 1917	
	Lewis Kalvig	Aug. 20, 1917	2,100.00
and the second se	G. D. McNabb	Sept. 22, 1917	7 808 00
Hardin	F. X. White	Apr. 14, 1914	7.177.00
	N. M. Stark & Co.	Apr. 25, 1917	14,114,00
	Weiden Construction Co.	June 19, 1917	3,095.00
	N M Stark & Co	Aug. 28, 1917	5,400.00
Marrison	Pickus Engineering & Const. Co	Mar. 17, 1917	7,684.00
Harrison	Red Oak Bridge & Iron Works	Mar. 17, 1917	19,745.00
	Omaha Structural Steel Works	Mar. 23, 1917	8,320.00
	Pickus Engineering & Const. Co	July 28, 1917	4,922.00
Heory	Whitney & Bergdahl	Apr. 28, 1917	41,940.00
Humboldt	N. M. Stark & Co	Apr. 5, 1917	1,420,00
	Koob & Locke	Aug. 23, 1917	5 468.00
	Humboldt Cement. Prod Mig. Co.	Aug. 23, 1917	392.50
·	U. A. Miller	Rob 7 1917	18,789.00
10wa	M O Burnott	Mar. 9, 1917	22,207.00
	M O Burnett	and the second second	568.00
	M O Burnett		35,000.00
	M. O. Burnett	Oct. 17, 1917	3,363.19
Jackson	Ben Donovan	Mar. 10, 1917	3,544.00
buckrounderen	Jno. Anderson & Son	Aug. 7, 1917	18,790.00
	J. J. Leonard	Aug. 28, 1917	2,005.00
	Waterloo Construction Co	Aug. 28, 1917	04 149 00
Jasper	Des Moines Structural Steel Wks	Deg 4 1916	19,999,00
Jefferson	Ottumwa Supply & Const. Co	Lune 95 1017	2,598.05
Johnson	International Steel & Iron Co	July 28 1017	3,029.00
	Towa Bridge Company	July 28, 1917	4,125.00
Tonas	V L. Hanssen	Feb. 10, 1917	17,957.00
Kosenth	F. E. Marsh & Co.	May 24, 1917	7,094.40
Lee	Clinton Bridge Works	May 17, 1917	1,310.00
Linn	A. P. Munson	Apr. 26, 1917	3,799.00
	Waterloo Construction Co	Apr. 26, 1917	4,000,00
	Perry Jayne	Apr. 26, 1917	1,200,00
Louisa	United a Construction Co	Luno 18 1017	6,580,00
*	Ottomwa Supply & Const Co	Feb 16 1917	15,429.00
Lucas	Des Moines Bridge & Iron Works	Apr. 18, 1917	14,015.00
Mohaska	H. E. Whitlatch	Sept. 6, 1917	6,293.00
Manaska	Ottumwa Supply & Const. Co	. Oet. 23, 1917	17,701.00
	Clinton Bridge Works	Oct. 23, 1917	24,014,00
Marion.	International Steel & Iron Co	. Feb. 7, 1917	49,973.00
Marshall	Cole Bros.	_ Mar. 29, 1917	21, 920,00
	M. O. Burnett	Mar. 29, 191/	20 410.00
	T. J. Wagner	Mur. 20, 1017	28,409.33
	How Feeler Construction Co	May 7 1917	5,230.00
Million .	Red Oak Bridge & Iron Works	July 2, 1917	9,799.00
MILLS	Red Oak Bridge & Iron Works	Oct. 16, 1917	10,640.00
	Red Oak Bridge & Iron Works	Nov. 7, 1917	1,760.00
Monona	Omaha Structural Steel Bridge Co	. Mar. 21, 1917	3,502.00
and the second s	Standard Bridge Co	_ Mar. 23, 1917	5,000.0
	Iowa Bridge Company	_ Mar. 23, 1917	- 2,821.0
	Illinois Steel Bridge Co	- Apr. 5, 1917	- 10,000.0
	Illinois Steel Bridge Co	- July 2, 1017	6 JSt 0
	Pickus Engineering & Const. Co.	- July 2, 1917	12,310.0
Monroe	Happingson Const. Co	Aug. 23, 1917	12,965.0
Montgomery	Standard Bridge Counsay	Aug. 23, 1917	2,748.5
	Standard Bridge Company	Aug. 23, 1917	- 5,997.7
Museetine	L. R. Gabriel.	_ May 17, 1917	- 9,900.0
ALCIECH CILIC	L. R. Gabriel	_ June 11, 1917	6,807.0

BRIDGE DEPARTMENT

SCHEDULE TWO-Continued.

County	Contractor	Date of Approval	Amount
O'Brien	Lewis Mead	Mar. 23, 1917	6,003.00 14,311.05
Page	Standard Bridge Company	Mar. 24, 1917 Apr. 26, 1917 Apr. 30, 1917	2,835.00 23,230.00 4,756.00
Palo Alto	lowa Bridge Company Des Moines Bridge & Iron Works	Apr. 30, 1917 Apr. 10, 1917	10,270.00 16,200.00
	Des Moines Bridge & Iron Works Iowa Bridge Company	July 14, 1917 Oct. 10, 1917	6,167.17 8,900.00 3,300.00
Plymouth	Western Bridge & Const. Co Pickus Engineering & Const. Co	July 28, 1917 July 28, 1917	4,776.00 4,879.00 3,970.00
Pocahontas	Western Bridge & Const. Co Western Bridge & Const. Co Iowa Bridge Co	Oct. 6, 1917 May 24, 1917	5,643.00 14,611.00
	Pickus Engineering & Const. Co Iown Bridge Co Federal Bridge Co	May 24, 1917 Aug. 28, 1917 Sept. 18, 1917	4,461.00 2,974.00 11,647.00
Polk	N. M. Stark & Co N. M. Stark & Co N. M. Stark & Co	June 19, 1917 Sept. 22, 1917 Oct. 27, 1917	36,500.00 29,049.00 9,228,00
Pottawattamie	Wickham Bridge & Pipe Co Illinois Steel Bridge Co Red Oak Bridge & Iron Works	Apr. 5, 1917 Apr. 5, 1917 Nov. 12, 1917	8,100.00 4,570.00 5,541.00
Seett	Jno. Anderson & Son Lana Construction Co	Mar. 17, 1917 May 17, 1917	6,820.00 18,281.00
Sac	Des Moines Bridge & Iron Works	Jan. 19, 1917 Jan. 23, 1917 Feb. 8, 1917	10,974.00 10,470.00 15,370.00
Sloux	Omahn Structural Steel Works Geo. Gardner	Feb. 8, 1917 Apr. 17, 1917	12,007.00 4,906.00
Tama	A. P. Munson C. A. Tackman	Mar. 8, 1917	2,480.00 27,864.00 5,870.00
Union	A. P. Munson	Sept. 25, 1917 Sept. 25, 1917 Sept. 25, 1917	14,306.00 9,000.00 4,399.00
Wapello	Ottumwa Supply & Const. Co R G. Waugh Ottumwa Supply & Const. Co.	Mar. 8, 1917 Mar. 21, 1917	9,000.00 35,206.00
Webster	N. M. Stark & Co	Mar. 6, 1917 Apr. 5, 1917	17,550.00 11,800.00 2,567.00
Winnebago	Iowa Bridge Company	Aug. 23, 1917 Mar. 10, 1917	9,199.00 11,470.00 28,875.00
Woodbury Worth Wright	Western Bridge & Const. Co R. M. Weblemoe Iowa Bridge Company	Mar. 6, 1917 Mar. 3, 1917 May 17, 1917	39,684.00 7,700.00

SCHEDULE THREE.

MATERIAL CONTRACTS SUBMITTED FOR APPROVAL. DECEMBER 1, 1916-DECEMBER 1, 1917.

County	Contractor	Material	Date Approved	
Audubon	Standard Bridge Company Elk Horn Kimballton Lbr. Co.	Lumber.	Feb. 8, 1917	
Black Hawk	Iowa Pure Iron Culvert Co Waterloo Construction Co Independence Corr. Cul. Co	Corrugated pipe Reinforcing steel Corrugated pipe	Feb. 10, 1917 Feb. 10, 1917 Dec. 30, 1916 Feb. 7, 1917	
Carroll	Standard Bridge Company	Reinforcing steel	Mch. 5, 1917	
Cherokee	Wheeler Lbr. Bridge & Sup. Co Fort Dodge Culvert Co	Lumber Corrugated pipe	Mch. 8, 1917 Mch. 8, 1917	

SCHEDULE THREE-Continued.

County	Contractor	Material	Date Approved
Clayton	Iowa Culvert & Sheet Matel Co	Compareted size	Ann 00 1017
Davis	Wilson Concrete Co	Corrugated pipe	Apr. 26, 1917
Delaware	Klauer Manufacturing Co	Concrete curvert pipe	Apr. 20, 1917
Decatur	E O Haymond & Co	Lumber	Fab. 10 1017
Des Moines	Midland Matal Mfg Co.	Comparted pine	reo. 10, 1917
ous momenture	Wilson Concrete Co	Congrete pipe	Jula 0 1017
Dickinson	Klauer Manufacturing Co	Corrugated pipe	Mab 2 1017
Dickingourter	Sibley Cement Tile Co	Coment nine	Mch. 3, 1917
	J. I. Merryman	Coment pipe	Mch. 29, 1917
Dubuque	Klauer Mfg Co	Corrugated pipe	Aug. 16, 1017
Emmet	Des Moines Bridge & Iron Whe	Reinforcing steel	Aug. 10, 1314
Franklin	Midland Metal Mfg Co	Corrugated nine	Ten 10 1017
Contraction and a conclusion	Waterloo Construction Co	Reinforcing steel	Jan 10 1017
Fremont.	Standard Bridge Co	Lumber	Fab. 16, 1917
	Branden Bros	Piling	Feb. 16, 1017
Grundy	Klauer Manufacturing Co	Corrugated nine	200. 10, 1011
Hamilton	A. Swanson	Craceoted wood file	
		creosored wood in i	Nov 2 1017
Harrison	Hunn Sand Company	Congrete pipe	Meb 17 1017
Jasper.	Des Moines Bridge & Iron Whe	Rainforming stacl	Feb 7 1917
Jefferson	Snaulding & Kearns	Camont	100. 1, 1011
	Midland Metal Mfg Co	Corrugated ning	Feb 10 1017
1.1.1	Ottumwa Supply & Const Co	Reinforeing steel	Mch 9 1017
Keokuk.	A M Ness & Son	Lumber	Men. D, 1011
Kossuth	Klauer Manufacturing Co	Corrugated pipe	Apr 17 1017
Lee	Wheeler Lhr Bridge & Sun Oo	Lumbor	Jan 16 1017
	Clinton Bridge Works	Reinforeing steel	Meb 8 1917
	S. & J. C. Atlee Inc.	Comont	aco. 0, 1011
Louisa	Klauer Manufacturing Co	Corrugated pipe	
Lyon	Des Moines Bridge & Iron Wks	Reinforeing steal	
Mahaska	Greenman Lumber Co	Tumber	Dec 30 1916
	Wilson Concrete Company	Congrete pipe	Dec. 00, 1010
	Kalbach Lumber Co	Lumber	Nov 11 1917
Monona	Iowa Pure Iron Culvert Co	Corrugated pipe	July 2, 1917
Montgomery	Nebraska Bridge Sun & Lbr Co	Piling and lumber	Feb. 7, 1917
	Red Oak Bridge & Iron Wks.	Lumber	Feb. 7, 1917
	Wilson Concrete Company	Concrete pipe	
Muscatine	Fuller Hiller Hardware Co.	Reinforcing steel	Mch. 17, 1917
allow the second second	Klauer Manufacturing Co	Corrugated pipe	Mch. 17, 1917
	Western Boiler Pipe Co.	Cast iron and boiler	
		nipe	Meh 24 1917
	Nebraska Bridge Sup. & Lbr. Co.	Lumber	Apr. 10, 1917
O'Brien	Clinton Bridge Works	Reinforcing steel	Mch. 27, 1917
	Wheeler Lbr. Bridge & Sup. Co	Lumber	Mch. 27, 1917
Palo Altd	Des Moines Steel Company	Reinforcing steel	Feb. 24, 1917
	Royal Lumber Co.	Lumber	
	Emmetsburg Coal & Supply Co	Reinforcing steel	
	Ft. Dodge Culvert Co.	Corrugated culverts	
	Ft. Dodge Culvert Co.	Reinforcing steel	
Scott	Wheeling Corrugating Co	Corrugated pipe	
and the states of the states of the	Des Moines Steel Company	Reinforcing steel	Mch. 17, 1917
	Sieffert Lumber Co.	Cement	Mch. 17, 1917
	Wheeler Lbr. Bridge & Sup. Co	Lumber	Mch. 17, 1917
ac	John H. Fox	Corrugated pipe	Feb. 10, 1917
	Standard Bridge Company	Reinforcing steel	Feb. 10, 1917
Shelby	Standard Bridge Co	Lumber	Mch. 27, 1917
	R. A. Wickham & Co	Lumber	
	Iowa Pure Iron Co	Corrugated pipe	
Pama	U. S. Cast Iron Pipe & Fdy. Co	Pipe culverts.	
	American Casting Co.	Pipe culverts	
and the second se	Charles and Third a second second second	Lumber	Nov. 17, 1917
Warren	Standard Bridge Company	A A CARLES AND A COMPANY AND AN	
Warren Washington	Iowa Culvert & Sheet Metal Co	Corrugated pipe	
Warren Washington Wayne	Iowa Culvert & Sheet Metal Co Hayes Lumber Co	Corrugated pipe Lumber	
Warren Washington Wayne Webster	Iowa Culvert & Sheet Metal Co Hayes Lumber Co Ft. Dodge Culvert Co	Corrugated pipe Lumber Corrugated pipe	
Warren Washington Wayne Webster Winneshiek	tandard Bridge Company Iowa Culvert & Sheet Metal Co Hayes Lumber Co Ft. Dodge Culvert Co Ingvolstad Co	Corrugated pipe Lumber Corrugated pipe Lumber	Mcb. 24, 1917

RAILROAD CROSSING IMPROVEMENT

RAILROAD CROSSING IMPROVEMENT Chapter V—January 1, 1917—January 1, 1918

During the past four years the commission has taken an active part in the campaign for the elimination of dangers at railroad crossings. With the rapidly increasing use of fast-moving motor vehicles the importance of eliminating and improving a large number of the existing railroad crossings became imperative. The commission has made no attempt to secure an accurate record of the accidents or deaths resulting from crossing accidents, but a list compiled from newspaper clippings alone shows a total of sixty-two deaths in this state resulting from crossing accidents during 1917. In addition to the accidents resulting in deaths there is undoubtedly a large number which result in serious injury or which cause the destruction of valuable property.

The commission believes that the number of deaths and accidents may be materially reduced by a campaign of education for safe driving of motor vehicles and by the elimination of dangers at railroad crossings. The press of the state can render a distinct service in this connection by continually emphasizing the necessity for caution on the part of the driver when approaching a railroad crossing. The commission is seeking in every way possible to eliminate the danger at existing railroad crossings by eliminating the crossing whenever feasible or to secure the separation of the highway and railway grades by the construction of an overhead or undergrade roadway. In many cases where the above-mentioned methods of improvement are impractical it is possible to greatly improve the view of approaching trains and vehicles by the removal of obstructions adjacent to the highway or railroad track. It is evident that this phase of highway improvement must receive greater attention in the future than in the past. Below is given in tabulated form the summary and comparative results accomplished on railroad crossing improvements during the past four years.

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COMPARATIVE STATEMENT OF WORK ACCOMPLISHED—RAIL-ROAD CROSSING IMPROVEMENTS TO JANUARY 1, 1918.

and the second states	During 1916	During 1917	Grand Total to Jan. 1, 1918
Crossing projects listed	43	38	275
listed	60	41	848
Projects surveyed Projects for which plans and estimates were pre-	25	ii	132
pared	82	-30	134
Sumber of conferences held	28	36	101
Number of projects satisfactorily adjusted	23	27	91
Projects completed during the year	22	28	77
number of projects listed which have been ap-			
pealed to K. K. Commission	9	1	18
Projects adjusted by K. K. Commission	4		10
Trada proceings aliminated by grade separation	1.0	4	20
crossings improved	94	17	20
crossing projects temporarily abandoned	34	40	74
Estimated cost of crossing improvements satisfac-	1.000	57	1.
torily adjusted	\$110,259	\$ 50,172	\$267,755
Estimated cost of improvements on Commission			
plan	350,087	103,650	665,137
companies for crossing improvements	68 341	99,947	167,410
'otal estimated amount appropriated from public	- ANAL	"no ivai	2011010
funds for crossing improvements	41,918	20,674	100,794

Method of Handling Crossing Complaints.

The commission receives many complaints from highway officials and individual parties throughout the state asking our assistance in securing the elimination of danger at crossings. Each complaint is investigated and if found meritorious a crossing project number is assigned and correspondence taken up to secure the necessary improvements. In many cases a complete topographical survey is necessary from which detailed plans and estimates can be prepared and submitted to the interested parties for consideration. Unless the work required to put the crossing in satisfactory condition for safe travel is small and the matter adjusted by correspondence a conference is called, usually at the site of the proposed improvement. Representatives of the county, railroad company and commission meet to discuss the proposed plan of improvement and to agree if possible upon an equitable distribution of cost. Many important crossing projects are satisfactorily adjusted each year at these conferences. In the event that no agreement can be reached as to the method of improvement or as to the distribution of cost an appeal is taken to the Board of Railroad Commissioners as provided by statute. Out of a total of 275 crossing projects

listed it has been found necessary to appeal only eighteen projects or approximately 6.5% to the Board of Railroad Commissioners for adjustment. A total of 91 crossing projects have been satisfactorily adjusted, of which number ten or approximately 9% have been adjusted by the order of the railroad commission. Owing to the dissimilarity of the projects it has been found impractical to recommend a uniform method for the distribution of cost of the improvements. Each project is taken up separately and adjusted in so far as practical on the basis of the benefits to be derived by the individual contributing parties.

Distribution of Dangerous Crossings.

The activities of the commission in connection with railroadcrossing improvement have been directed largely towards the elimination of dangers at existing grade crossings. However, many of the complaints received refer to dangerous conditions existing on overhead and undergrade crossings. The following tabulation shows the distribution of crossings classified according to number of individual crossings listed for improvement and according to type.

DISTRIBUTION AND PERCENTAGE OF CROSSINGS LISTED FOR IMPROVEMENT OR IMPROVED TO JANUARY 1, 1918.

				Di	stribution gs as listed	of Origina by the Co	al Cross- mmission	
Type of Cro	Type of Crossing			steu	Number	Per	centage	
Trade Overhead Jodergrade New crossings Total			31 6 5 0		274 27 38 5		80 8 11 1	
Total			42		344		100%	
Type of Crossing	Distribu	ition of o or Re	Crossing I scommendi	mprover ations o roved	nents Accord f the Comm	ding to th nission Separation	e Plans	
	No.	Percent	No.	Percen	t No.	Percent	number	
Grade Overhead Undergrade New crossings	58 2 5	28 9 16	$ \begin{array}{c} 102 \\ 20 \\ 26 \end{array} $	48 91 84	50	24	210 22 31 0	
Total number	65		148		50		263	
1 Andrews and the second		14.00			and the second second	10		

	Distribution of Crossing Improvements Satisfactorily Adjusted to Date						orily
Type of Crossing	Elim	Eliminated Imp		roved	Grade Separation		Total
	No.	Percent	No.	Percent	No.	Percent	number
Grade Overhead Undergrade New crossings	22 1 2	20 8 9	$ \begin{array}{c} 67 \\ 12 \\ 20 \end{array} $	61 92 91	21	19	110 13 22
Total number	25		99		21		145
Percentage of total		17		68		15	

Methods of Improvement of Crossings.

The following outline suggests the possible methods of improvement which may be utilized in securing the elimination of dangers at railroad crossings. Each crossing project if important is inspected in the field by a representative of the commission and whenever practical plans are prepared or recommendations made for the improvement of the crossing. In general the recommendations for improvement are made in accordance with the most practical and feasible means of eliminating or minimizing the danger about in the order as listed below.

Grade Crossings.

- 1. Elimination by relocation of highway.
- 2. Separation of railroad and highway grades.
- 3. Relocation of highway to divert major portion of traffic from the crossing.
- 4. Removal of obstructions interfering with clear view of approaching trains and vehicles.
- 5. Installation of crossing gates or adequate protection to the traveling public on crossings which cannot be made reasonably safe by one or more of the methods mentioned above.

Overhead Crossings.

- 1. Elimination of crossing by relocation of highway.
- 2. Construction of substantial overhead bridges capable of carrying the standard loadings and provided with roadways adequate to accommodate the traffic.
- Reduction of steep-approach grades to facilitate the hauling of heavy loads and to obtain better view of approaching vehicles on the highway.
- 4. Elimination of short turns and obstructed views at the approaches of overhead crossings.
- 5. Relocation of highway to divert traffic from overhead crossing which cannot be put in a safe condition for travel by one or more of the methods of improvement suggested above.

Undergrade Crossings.

- 1. Elimination of crossing by relocation of highway.
- 2. Provision for an adequate horizontal and vertical clearance where the highway passes under the railroad.
- 3. Removal of obstructions interfering with a clear view of approaching vehicles on the highway.
- 4. Improvement of drainage so that roadway beneath the tracks will be properly drained at all times of the year.
- 5. Relocation of highway to divert the traffic on the event that the dangerous condition cannot be satisfactorily remedied by one of the

methods indicated above.

Recommendations for Crossing Improvements.

The minimum requirements as adopted by the commission for the different type of crossings are given in detailed form below.

Grade Crossings.

Location of crossing signs at all grade crossings a minimum distance of 300 ft. from the crossing.

Maximum approach grade to the crossing of 6%.

Level approach grade on either side of the tracks of 25 ft.

- Minimum width of planking measured at right angles to the center line of the highway of 24 ft. on the county road system and 20 ft. on the
 - township road system.

Clear view which allows a person in a vehicle 200 ft. from the crossing to observe an approaching train an equal distance from the crossing.

Undergrade Crossings.

Minimum vertical clearance of 13 ft. with a recommended clearance of at least 14 ft. wherever practical.

Minimum horizontal clearance for temporary construction of 18 ft.

Minimum horizontal clearance for permanent construction of 24 ft. for crossings on the county road system and 20 ft. for crossings on the

township road system.

Clear view which will permit one vehicle on the highway to observe another vehicle approaching a minimum distance of 200 ft.

Overhead Crossings.

Minimum vertical distance from top of rail to low steel of 22 ft. A bridge structure capable of safely carrying the Commission's standard-

ized loadings.

Minimum width of roadway for temporary construction of 20 ft. Minimum width of roadway for permanent construction on the county road system of 24 ft. and for the township road system of 20 ft.

Changes in grade on the bridge structure not to exceed 2% between bents.

Clear view which will permit one vehicle on the highway to observe another vehicle approaching for a minimum distance of 200 ft.

Distribution of Crossing Improvements.

The distribution of crossing improvements according to the number of crossings on the county and township road system and the mileage of track in the various railroad systems is given in tabulated form below. It will be noted that the distribution of crossings listed for improvement is almost in direct ratio to the mileage in each of the railroad systems. Attention is also called to the large number of crossings existing on the highways in the state.

DISTRIBUTION OF CROSSINGS AND PROJECTS LISTED.

Railroads	No. of crossings on county road system	No. of crossings on township road system	Total No. of crossings	No. of projects listed by Com- mission for improvement	Total mileage of track in the state
C., R. I. & P O., M. & St. P C., B. & Q. C. & N. W. C. & N. W. C. & N. W. C. & N. W. C. & W. M. & St. L. I. O. Wabash Great Northern C., St. P., M. & O. Mise. R. R. and Int.	349 251 272 208 123 111 95 41 9 11 63	${ \begin{array}{c} 1,526\\ 1,277\\ 915\\ 1,183\\ 633\\ 582\\ 442\\ 142\\ 142\\ 56\\ 60\\ 327\\ \end{array} }$	${ \begin{array}{c} 1,875\\ 1,528\\ 1,187\\ 1,391\\ 756\\ 693\\ 537\\ 183\\ 65\\ 71\\ 399 \end{array} }$	55 39 62 39 25 16 14 10 4 3 18	$\begin{array}{c} 2,959\\ 2,663\\ 2,020\\ 2,539\\ 1,066\\ 1,053\\ 928\\ 237\\ 103\\ 139\\ 481\end{array}$
Total	1,533	7,143	8,676	284	14,188

Plans for Future Work.

The surveys have been made and in many cases the plans and estimates completed for a number of crossing projects which will be taken up when labor and material conditions again become normal. The necessity for the curtailment of all expenditures not absolutely essential and for the conservation of labor and material has necessitated the temporary abandonment of many meritorious crossing projects for the period of the war. The order of the president of the United States announcing the assumption of control of the railroad systems of this country to become effective December 28, 1917, has just been announced and the future work of the commission in crossing improvements will be in full accord with the future government rulings or orders. Just to what extent the federal control of railroads will have upon the improvement of crossings is not apparent at this time.

SCHEDULE IV.

Detailed Statement of Work Accomplished on Individual Crossing Projects Listed.

No. 2, Pottawattamie County.

One-half mile north of the town of Macedonia, Section 14, Macedonia Township.

Chicago, Burlington and Quincy Railroad.

Correspondence was taken up with the board of supervisors and the railroad company concerning the adjustment of this proposition. The railroad company, through their division superintendent, filed with the commission a definite proposition for the distribution of expense on this improvement. This proposition was submitted to the board of supervisors, but no action was taken by them of which we have been advised. The railroad company agreed to dedicate a portion of their right of way to the county for highway purposes and upon the completion of the crossing improvement in accordance with the commission's plans to pay to Pottawattamie county the sum of \$125.00. They also ask that the county vacate a portion of their right of way which is now used for highway purposes.

No. 9, Linn County.

Section 33, Monroe Township.

Illinois Central Railroad and

Waterloo, Cedar Falls and Northern Railroad.

On April 24th an inspection of this crossing was made by the county engineer, members of the board of supervisors and district engineer of the commission. An informal discussion of the proposed method of improvement was had. The plans as prepared by the commission for an overhead crossing in this location were discussed. The question of a satisfactory adjustment of the distribution of expense on this improvement is to be taken up at a later date.

No. 10, Polk County.

Section 18, Webster Township, 34 mile north of Des Moines.

Des Moines Inter-Urban Railroad.

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Detailed plans for an overhead bridge to be constructed on this project were prepared by the commission and furinshed to the railroad company. Owing to the prevailing high prices of construction and the scarcity of labor and in view of the fact that Polk county is constructing a paved road which is parallel to the road upon which this project is located, it was considered advisable to defer the construction of this crossing improvement for the present time.

No. 18, Page County.

Sections 29 and 30, Lincoln Township, near Coin. Wabash Railroad.

The Wabash Railroad Company on June 23d in correspondence with the commission agreed to expend \$1,005 on the improvement of this crossing in accordance with the commission's plans as their portion of the expense of this improvement, this amount being approximately 60% of the commission's estimated cost of the improvement. This proposition was transmitted to the board of supervisors, but was never accepted by them. The matter of adjusting the distribution of expense of this improvement will be taken up further by correspondence.

No. 19, Union County.

Center line of Section 20, Jones Township, near Afton Junction. Chicago, Burlington and Quincy Railroad.

A petition signed by fifty-nine citizens residing in the vicinity of this crossing was filed with the commission. This petition was referred to Commissioner Beard, who took the matter up with the several interested parties by correspondence. Owing to the prevailing high prices at this time it was not considered advisable to attempt the construction of the undergrade crossing as proposed. When conditions become normal this matter will be taken up again.

No. 24, Clarke County.

In Singler's Addition, town of Woodburn.

Chicago, Burlington and Quincy Railroad.

A formal application for a hearing before the railroad commission on the matter of the improvement of this crossing was forwarded to the railroad commission on April 2, 1917.

No. 26, Polk County.

Sections 28 and 29, Allen Township.

Chicago, Rock Island and Pacific Railroad.

This crossing was constructed during 1917 in accordance with the agreement reached at a conference held on February 27, 1916. The construction has been formally accepted by the board of supervisors and the crossing improvement satisfactorily adjusted.

No. 34, Poweshiek County.

Sections 32 and 33, Chester Township, 11/2 miles north of Grinnell. Minneapolis and St. Louis Railroad.

A conference was held on October 4th between members of the board of supervisors, county engineer, district engineer of the commission and chief engineer of the M. & St. L. R. R., regarding the improvement of the under drainage of the highway adjacent to the undergrade crossing at this point. An informal discussion of the matter was taken up, but no agreement reached as to what method of improvement would

be used or the distribution of the expense between the railroad company and the county. Further correspondence will be taken up with the railroad company.

No. 37, Woodbury County,

Sections 4 and 9, Woodbury Township, 1/4 mile southeast of Sioux City. Chicago, Milwaukee and St. Paul Railroad.

A formal petition for the adjustment of this crossing improvement was filed with the board of railroad commissioners in April, 1915. On January 1, 1917, the railroad commission rendered a decision in this case. recommending that further investigation of the possibility of a relocation of the township road be made so as to avoid the heavy expense required to construct an undergrade crossing on the highway in its present location.

No. 44. Hamilton County.

Section 17, Cass Township, 4 miles north of Webster City,

Chicago and North Western Railroad.

A district engineer of the commission took up with the board of supervisors and county engineer of Hamilton County the question of whether or not a survey should be made of this crossing improvement. The board requested that the commission make a survey and prepare plans and estimates for the improvement of this crossing. As soon as labor and material conditions become normal and the construction of a permanent crossing improvement made possible, a survey of this crossing will be made and plans prepared for the improvement.

No. 52, Marshall County.

Section 2, Jefferson Township, 21/2 miles east of Haverhill.

Chicago, Milwaukee and St. Paul Railroad.

Was reported temporarily repaired in 1914. In 1917 further consideration was given by the board of supervisors to this improvement and upon their failure to reach an agreement with the railroad company concerning the character of the improvement which should be made and the distribution of expense between the railroad company and the county, a request was made to the commission for further assistance. A conference was held on June 1st between representatives of the commission, the Marshall County board and the railroad company at which time the county offered to bear 50% of the cost of the proposed work to be done. No agreement was reached with the railroad company on this proposed distribution of cost and on a later date an appeal was taken to the board of railroad commissioners requesting a formal hearing and an adjustment of the matter. Our records do not show that the matter has been finally adjusted by the railroad commissioners.

No. 53, Crawford County.

Sections 24 and 25, Boyer Township, 5 miles southwest of Dows City. Chicago and North Western Railroad.

Further notes were secured from the county engineer which enabled the completion of the plans for this crossing improvement. The proposition was satisfactorily adjusted by the county and railroad company.

Section 25, Wapello Township, 11/2 miles west of Elrick Station. Minneapolis and St. Louis Railroad.

Further correspondence was taken up with the railroad company regarding this improvement, but no satisfactory adjustment was secured. The matter having previously been referred to the board of railroad commissioners it was decided that further negotiations for the adjustment of this matter should be left to that board.

No. 63, Monroe County.

Section 31, Bluff Township, and Section 36, Union Township. Chicago, Burlington and Quincy Railroad, and Wabash Railroad. (See report on project No. 64.)

No. 64. Monroe County.

Section 23, Monroe Township, hear Lovilla. Chicago, Burlington and Quincy Railroad, and

Wabash Railroad.

On April 17th a conference was held on crossing projects No. 63 and No. 64, at which time the board of supervisors, county engineer, Wabash Railroad and commission were represented. An informal discussion of the proposed improvement was held and it was agreed that a later conference would be held on May 8th, at which time both railroad companies were to be represented. This conference was held and on account of the high cost of construction at this time it was decided to postpone further negotiations toward the improvement of this crossing for the period of the war.

No. 66, Marion County.

Section 2, Knoxville Township, 2 miles west of Knoxville. Chicago, Burlington and Quincy Railroad.

A new survey and a complete revision of the plans for the elimination of two grade crossings involved in this project was made in 1917. The revised plans and estimates were furnished to the board of supervisors and the railroad company. The commission was requested to arrange a conference for a discussion of the proposed improvement and to adjust the distribution of expense between the interested parties.

No. 69, Woodbury County.

Sections 28 and 33, Banner Township, near Lawton.

Chicago and North Western Railroad.

On February 7th a cenference was held at which time the board of supervisors, county engineer, representatives of the railroad company and the commission met at the site of the crossing and discussed the plans and estimates of cost as prepared by the commission for this improvement. The plans of the commission were accepted by the county and railroad company and an agreement was reached to proceed with the construction of the undergrade crossing on this project. The rail-

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road company agreed to construct the undergrade crossing and to pay for the same, and the county was to furnish suitable material sufficient to gravel the highway immediately under the tracks of the railroad company and highway adjacent thereto. The railroad company was to haul this material to the site of the crossing. The work was carried out as agreed and the new crossing is in use at this time.

No. 74, Lee County.

Sections 3 and 4, West Point Township, near West Point.

Chicago, Burlington and Quincy Railroad.

On January 4th a conference was held between the board of supervisors, a representative of the railroad company and commission regarding the proposed improvement of the several crossings involved in this project. A proposition was made to the railroad company by the county in which the county agreed to pay 20% of the total estimated cost of the improvement based on the plans of the commission, the railroad company to pay the remaining 80%. This proposition was rejected by the representatives of the railroad company who submitted an amended proposition in which the railroad company was to pay 40% and the county 60% of the cost of the proposed improvement. This proposition was rejected by the county, who later agreed to pay 40% of the cost of the improvement and asked the railroad company to pay the remaining 60%. It was agreed that the representative of the railroad company should submit this proposition to the management for their consideration. The commission was not advised of any formal acceptance having been made on the proposition which was submitted to the management of the railroad company. A later conference was held on this crossing project on April 2d, at which time the interested parties were represented. A statement was made at this conference by the chairman of the county board that subscriptions had been made to a private fund to carry out this improvement which aggregated about \$2,000. It was agreed that further investigation should be made to determine the amount in this fund which was being raised by private parties and that the railroad company and others interested in the improvement should be further advised. No further report was received concerning the progress made in the adjustment of this matter.

No. 80, Lucas County.

Sections 1 and 2, Benton Township, 1 mile west of Russell.

Chicago, Burlington and Quincy Railroad.

A conference was held on January 16th, at which time the board of supervisors, railroad company and commission were represented. The plans for this improvement contemplated the construction of an undergrade crossing on a township road at its intersection with the main line of the Chicago, Burlington and Quincy Railroad. The estimated cost of the improvement was \$10,000. Owing to the fact that the county was unable to contribute a substantial amount toward this improvement it is considered advisable to defer further action on the adjustment of this crossing project until the county is in a position to assist the railroad company in making the improvement.

No. 81, Lucas County.

Section 19, Union Township.

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Chicago, Burlington and Quincy Railroad.

On January 16th a conference was held, at which time the board of supervisors and commission were represented. The railroad company's representative was unavoidably prevented from attending the conference. A discussion of the proposed improvement was made and the plans of the commission accepted. It was agreed that the commission should take up correspondence with the railroad company seeking to adjust the distribution of expense for making this improvement as outlined in a formal discussion which was had at the conference above mentioned. Later it was decided to defer further negotiations toward securing an agreement between the interested parties in carrying out this improvement owing to the prevailing high cost of construction and the scarcity of labor and material.

No. 85, Sioux County.

Sections 31 and 32, Holland Township.

Chicago and North Western Railroad.

Plans and estimates of cost for the improvement of this crossing were forwarded to the county engineer with a request that he take up with the board of supervisors of Sioux County, and the township trustees of Holland Township, the plans as prepared and further advise the commission as to whether or not it is their desire to have a conference arranged to consider the distribution of cost of the improvement between the interested parties.

No. 86, Sioux County.

Sections 6 and 7, and 7 and 8, Lincoln Township. Great Northern Railroad.

A conference was held on April 17th and representatives of the county, railroad company and commission were present. It was agreed at this conference that an undergrade crossing was to be constructed in accordance with the plans as prepared by the commission. The railroad company agreed to pay \$2,500 towards the improvement and the county is to pay the balance of the estimated cost of the improvement. The total estimated cost based on the plans as prepared by the commission was \$3,800. The construction of this undergrade crossing and the road leading to it was carried out in 1917 and the grade crossing was closed.

No. 87, Sioux County.

Sections 20 and 21, West Branch Township.

Great Northern Railroad.

At a conference held on April 11th to consider the plans and estimated cost as prepared by the commission for this improvement it was agreed between the board of supervisors, the railroad company and commission that it would be desirable to defer the construction of this crossing project until labor and material conditions were greatly improved. The scarcity of available labor to do the road grading work required to carry out this improvement rendered it almost impossible to consider

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going ahead with the improvement at this time. Further negotiations for the improvement of this crossing will be taken up as soon as conditions become normal.

No. 89, Lyon County.

Sections 35 and 36, Doon Township, 1 mile south of Doon. Great Northern Railroad.

Great Northern Railroad.

Plans and estimates of cost for the improvement of the grade crossing included in this project were prepared by the commission and furnished to the county and railroad company. Correspondence was taken up with the railroad company seeking to improve the crossing, but the commission has not been advised of a satisfactory adjustment having been secured.

No. 92, Wayne County.

Between Promise City and Corydon.

Chicago, Burlington and Quincy Railroad.

Correspondence was taken up with the railroad company and board of supervisors to secure the improvement of the crossings involved in this project. No definite action was secured and the improvement of these crossings was temporarily abandoned.

No. 94, Wright County.

Northwest corner of Section 27, Blaine Township.

Chicago, Rock Island and Pacific Railroad.

A complaint was received by the commission concerning the improvement of this crossing and investigation was made by representatives of the commission on May 14th. At the time this inspection was made it was agreed that the county engineer would make the necessary survey and that notes would be sent to this office and plans would be prepared by the commission for an overhead crossing to eliminate the grade crossing which now exists. The notes which were to have been secured by the county engineer were not received by the commission, but arrangements are being made for getting the necessary information to prepare the plans for this improvement.

No. 95, Taylor County.

Adams and Taylor County line, Lennox crossing.

Chicago, Burlington and Quincy Railroad.

Correspondence was taken up in an effort to secure the improvement of this crossing. The project has been temporarily abandoned for the period of the war.

No. 97, Dallas County.

South corporation limits of town of Woodward.

Des Moines, Perry Inter-Urban Railroad.

An appeal was made to the railroad commission by citizens interested in this improvement who sought to have an order issued requiring the railroad company to construct an undergrade crossing at this point in accordance with the plans as prepared by the commission. A formal hearing was had before the railroad commission at their office in Des Moines on October 17th regarding this improvement. The commission has not yet been advised of the action taken by the board of railroad commissioners at this hearing.

No. 98, Butler County.

Sections 28 and 33, Albion Township, 2½ miles south of Parkersburg. Chicago and North Western Railroad.

Plans and estimates of cost were prepared by the commission for the construction of an overhead crossing to eliminate a grade crossing on the Hawkeye Highway. A conference was held on May 25th, at which conference the board of supervisors, the railroad company and the commission were represented. The board of supervisors agreed at this conference to pay 35% of the total estimated cost of \$13,000 for the construction of a concrete overhead bridge on this project. They requested the railroad company to bear the additional expense in making the improvement. The representative of the railroad company agreed to submit this proposition to the management. Owing to the prevailing high prices of labor and construction further action on this project was deferred for the period of the war.

No. 99, Floyd County.

Section 14, Rockford Township.

Chicago, Rock Island and Pacific Railroad.

A revision of the plans and estimates for this improvement were made in 1917 by the commission and the new plans forwarded to the railroad company and county. A conference was held on April 10th, at which time representatives of the county, railroad company and commission met to consider the alternate methods of improvement proposed and to distribute the cost of making the improvements in the event that it was considered desirable to undertake the construction of the project this year. An agreement was finally reached to improve the grade crossing in its present location by beveling the earth banks which obstructed the view of approaching trains. The county was to do the work on the outside of the railroad company's right of way and the railroad company to do the work within the company's right of way lines. The portion of the work to be done by the county has been completed, but the work within the right of way limits which was to be undertaken by the railroad company has not been completed at this time.

No. 108, Wayne County.

Sections 15 and 16, Jackson Township, in the town of Harvard. Chicago, Rock Island and Pacific Railroad.

An appeal was made to the board of railroad commissioners for a formal order requiring the improvement of this crossing. Some correspondence was taken up with the railroad company and county seeking to secure an agreement between them concerning the distribution of cost of the improvement. The railroad company finally agreed to construct the overhead project and to pay four-sevenths of the cost of grading outside of the right of way line. The grading work inside of the right of way lines to be done by the railroad company at their expense. This crossing project was satisfactorily adjusted.

No. 112, Iowa County.

Section 30, Filmore Township, near North English.

Chicago, Milwaukee and St. Paul Railroad.

Plans for the improvement of this crossing were prepared by the commission and furnished to the railroad company and the county. An appeal was made to the board of railroad commissioners asking for an order requiring the railroad company to put in an overhead crossing to take the place of the grade crossing which was considered dangerous. An order was issued by the railroad commission requiring the improvement of the crossing in a manner which is not in accordance with the recommendations of the commission. The new crossing has been completed.

No. 125, Story County.

Sections 3 and 10, Nevada Township, 3 miles east of Nevada.

Chicago and North Western Railroad, and

Chicago, Rock Island and Pacific Railroad.

Construction on the subway crossing under the main line tracks of the Chicago and North Western Railroad was completed during 1917. Work is in progress on this improvement at the time this report is being made. Negotiations were taken up with the Chicago, Rock Island and Pacific Railroad Company regarding the overhead bridge over their tracks which is a part of this crossing improvement. The commission prepared plans for a reinforced concrete structure estimated to cost \$26,000. Negotiations are in progress to secure an agreement concerning the distribution of cost on the plan prepared by the commission for the overhead bridge over the Rock Island tracks.

No. 126, Scott County.

Section 35, Princeton Township.

Davenport, Rock Island and North Western Railroad.

On December 30, 1916, the board of railroad commissioners issued a formal opinion regarding the improvement of this crossing. The railroad commission ordered that on or before September 1, 1917, the railroad company should construct an undergrade crossing in accordance with the plans as prepared by the highway commission. One-half of the cost of the construction of the subway was to be paid by the railroad company and one-half by Scott County. The county through its board of supervisors and county attorney objected to the distribution of cost and asked for a rehearing which was held at Princeton on July 20th. The decision on the petition for rehearing was given by the board of railroad commissioners on September 22d, in which they granted permission for a continuance of the date of completion of the improvement until September 1, 1918. Work has not been started on this crossing owing to the prevailing high prices of material and construction and the scarcity of labor.

No. 127, Greene County.

Between Sections 9 and 10, Jackson Township.

Chicago and North Western Railroad.

Upon a request of the railroad company the improvement of this crossing was deferred for the period of the war, owing to the scarcity of labor for carrying on such work.

No. 128, Greene County.

Sections 3 and 4, Scranton Township, 1 mile west of Scranton. Chicago and North Western Railroad.

The construction of this crossing project, which was satisfactorily adjusted in 1916, was temporarily deferred, owing to the objections raised by property owners living near the crossing. Before proceeding with the improvement of the crossing it appeared advisable to explain the proposed method of improvement more in detail to those interested. The matter will be taken up with the board of supervisors at an early. date.

No. 142, Adair County.

Sections 8 and 9, Summit Township.

Chicago, Rock Island and Pacific Railroad.

Alternate plans of improvement were prepared for this crossing proposition, which were forwarded to the county under date of April 19th. The board of supervisors was requested to designate the method of improvement which was the most satisfactory to them and to furnish this information to the commission. Negotiations would then be taken up with the railroad company to secure their consent to proceed with the improvement and to distribute the cost between the interested parties. No advice has been received from the board of supervisors to date concerning the method of improvement which they desire.

No. 150, Hardin County.

Section 34. Hardin Township.

Chicago, Rock Island and Pacific Railroad, and Illinois Central Railroad.

Survey was made for the improvement of these crossings. Plans will be prepared by the commission at an early date.

No. 164, Keokuk County.

Section 23, Richland Township, 1½ miles northeast of Richland. Chicago, Milwaukee and St. Paul Railroad.

Plans and estimates of cost were prepared for the improvement of this crossing. Correspondence was taken up with the railroad company and on May 3d the railroad company agreed to adopt the plan as proposed by the commission to contribute toward the expense of making the improvement one-half of the cost not to exceed \$600. This proposition was transmitted to the board of supervisors, but no advice was received from them concerning its acceptance.

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No. 175, Calhoun County.

Sections 27 and 28, Greenfield Township,

Chicago, Rock Island and Pacific Railroad.

At a conference held on July 9th at the site of the crossing between the board of supervisors of Calhoun County, representatives of the railroad company and commission, it was agreed that the plans and estimates of cost of the improvement as prepared by the commission with slight modifications should be accepted. An agreement was reached with the railroad company concerning the method of improvement and the distribution of cost, the railroad company assuming all of the cost relating to the improvement of their existing undergrade crossing and the board of supervisors agreeing to take care of the expense involved in providing drainage and the improvement of the highway adjacent to the crossing. Upon a later request of the railroad company the improvement of this crossing was deferred for the period of the war.

No. 180, Webster County.

Sections 11 and 14, Dayton Township.

Minneapolis and St. Louis Railroad.

Plans were completed for the improvement of this crossing in 1917 and furnished to the railroad company and board of supervisors. The project was temporarily abandoned on account of the extensive expenditure which would be necessary to make the improvement.

No. 181, Webster County.

North line of Section 1, Fulton Township.

Minneapolis and St. Louis Railroad.

At a conference held on January 10th between the board of supervisors, the railroad company and the commission a formal proposition was made to the railroad company in which the board of supervisors agreed to pay 20% of the cost of the construction of the improvement in accordance with the commission's plans, the township trustees of Fulton Township to pay 20% and the Minneapolis and St. Louis Railroad the remaining 60%. This proposition was accepted by the Minneapolis and St. Louis Railroad and work is proceeding in accordance with the detailed plans as prepared by the commission.

No. 190, Decatur County.

Sections 14 and 23, Long Creek Township.

Chicago, Burlington and Quincy Railroad.

This crossing was improved in 1917 in accordance with an agreement reached in 1916. Project satisfactorily adjusted and completed. (See 1916 report.)

No. 191, Wapello County.

Section 25, Green Township.

Wabash Railroad.

A survey was made and plans and estimates of cost were prepared for the improvement of this crossing. On the request of the railroad company the adjustment of the proposition was deferred until after the war, owing to the labor and material situation.

No. 199, Washington County.

In the city limits of Washington, west end of Seventh Street.

Chicago, Rock Island and Pacific Railroad, and

Chicago, Milwaukee and St. Paul Railroad.

At a conference held in Washington County late in December, 1916, between the board of supervisors, the city council of Washington and representatives of the railroad company, a proposition was made to the railroad companies that the county and city would complete the improvement of the crossing in accordance with the plans upon the payment of \$1,700 by the railroad company. The crossing improvement was made in accordance with this understanding.

No. 201, Wayne County.

Sections 8 and 17, Howard Township.

Chicago, Milwaukee and St. Paul Railroad.

The expense of improving the obstructed view to this grade crossing being small, it was not considered necessary to prepare a detail plan for the improvement. The commission took up correspondence with the railroad company and secured their consent to contribute \$300 towards the cost of removing the obstructions to the view and making the grade crossing safer. This amount being satisfactory to the county the proposition was satisfactorily adjusted.

No. 205, Bremer County.

Sections 6 and 7, Polk Township.

Illinois Central Railroad.

At a conference held on March 28th, regarding the improvement of this crossing project, the board of supervisors, representatives of the railroad company and commission agreed to the following basis of settlement—the county to do all of the necessary work to complete the project and to pay 25% of the cost of the improvement, the railroad company to pay the remaining 75%. This proposition was accepted by the railroad company and the crossing project completed.

No. 206, Adair County.

Section 6, Walnut Township, Section 1, Summit Township, Chicago, Rock Island and Pacific Railroad.

Plans and estimates of cost were prepared for the improvement of this grade crossing. The board of supervisors requested that further action be deferred on this crossing improvement until a more favorable time. The project has therefore been temporarily abandoned.

No. 212, Jefferson County.

Sections 31, 32 and 33, Lockridge Township, near Glendale. Chicago, Burlington and Quincy Railroad.

A revised copy of the plans for this improvement, together with a formal proposition for the distribution of the expense of improving this crossing in accordance with the plans, were forwarded to the railroad company in 1917. No acceptance of the proposition as submitted has been received to date.

No. 213, Taylor County.

Section 28, Washington Township.

Chicago, Burlington and Quincy Railroad.

The adjustment of this crossing proposition was referred to the railroad commission in 1916 by interested citizens in Taylor County. No adjustment having been secured by the railroad commission, a further appeal was made by the highway commission for assistance in securing relief from the conditions complained of. The commission took this matter up by correspondence with the railroad company and board of supervisors, but was unable to reach a satisfactory agreement. Owing to the difficulty in securing labor to do the necessary work, it was considered advisable to defer further action in the matter for the period of the war.

No. 215, Muscatine County.

Section 21, Bloomington Township.

Chicago, Rock Island and Pacific Railroad.

The Chicago, Rock Island and Pacific Railroad Company accepted the proposition made by Muscatine County for the improvement of a grade crossing in accordance with the plans as prepared by the commission. The railroad company agreed to remove the dirt on their right of way and to install the proposed pipe culverts on each side of the tracks. The county is to remove the dirt on the outside of the right of way and to secure the necessary right of way to complete the improvement. The commission's estimated cost on the basis of the plans as prepared was \$2,990. The proposition has been satisfactorily adjusted and construction work completed.

No. 216, Muscatine County.

Sections 21, 22 and 23, Montpelier Township.

Chicago, Rock Island and Pacific Railroad.

At a conference held in Muscatine County between the board of supervisors and the railroad company, it was agreed that Muscatine County should submit a proposition to the railroad company for acceptance based on the acceptance of the plans as prepared by the commission for the elimination of three grade crossings by the relocation of two miles of the present county road paralleling the Mississippi River. A proposition was formulated and submitted to the railroad company by the county engineer, but no agreement was reached concerning the distribution of cost. Later the railroad company requested that the construction of the improvement be deferred on account of war conditions.

No. 217, Union County.

Southwest corner Section 4, Jones Township.

Chicago Great Western Railroad.

It was decided that the improvement of this crossing proposition should be temporarily deferred for the period of the war. No. 219, Bremer County.

Section 28, Lafayette Township.

Illinois Central Railroad.

At a conference held in Waverly on March 28th an agreement was reached with the railroad company which insures the construction of the improved grade crossing in accordance with the plans as prepared by the commission. The railroad company agreed to do all of the work and to place 1,600 yards of dirt on the highway in accordance with the county engineer's instructions. The county is to purchase the right of way necessary to complete the improvement and the actual cost of construction is to be divided equally between the railroad company and the county. The proposition is satisfactorily adjusted and completed.

No. 220, Sac County.

Between Sections 10 and 11, Boyer Valley Township.

Chicago and North Western Railroad.

A conference was held at Early on this crossing project, at which time representatives of the railroad company, the board of supervisors and commission were present. The improvement consists of the construction of an undergrade crossing to replace an existing grade crossing. The total estimated cost of the improvement was 6,720. The county made a proposition to the representative of the railroad company which would distribute the cost as follows—railroad company 80%. township and county 20%. The representatives of the railroad company agreed to submit this proposition to the management for consideration. No acceptance of the proposition has been reported to date.

No. 221, Jackson County.

Sections 19 and 20, Bellevue Township.

Chicago, Milwaukee and St. Paul Railroad.

Plans and estimates of cost were prepared by the commission in 1917 and furnished to the county and railroad company. The improvement as proposed consists of the vacation of a portion of the existing county road and the construction of a new road which will eliminate two other dangerous grade crossings. The estimated cost of the improvement is \$4,300. At a conference held on February 8th, which was attended by representatives of the board of supervisors, the railroad company and commission, the county made a proposition to the railroad company in which they agreed to bear 35% of the total cost of the improvement, the railroad company to assume the remainder of the expense of making the improvement. The representative of the railroad company agreed to submit a proposition based on an equal distribution of cost between the railroad company and the county. No agreement was reached on the improvement at this conference. Later the county agreed to the proposition as submitted by the railroad company at the conference above mentioned, but the railroad company through their legal department refused to contribute toward the construction of the proposed crossing improvement. No adjustment has been secured on this proposition to date.

No. 224, Wayne County.

Section 14, Jackson Township.

Chicago, Rock Island and Pacific Railroad.

Plans and estimates of cost were prepared by the commission for this improvement and furnished to the county and railroad company. The improvement of the existing grade crossings requires the removal of obstructions to the view of approaching trains and is estimated to cost \$1,200. No advice has been received from the county as to whether they desire the matter taken up at this time.

No. 225, Wayne County.

Northeast corner Section 25, Corydon Township.

Chicago, Burlington and Quincy Railroad.

Plans and estimates of cost for the improvement of grade crossing on the Corydon-Promise City road were prepared by the commission and furnished to the railroad company and county. The estimated cost of improving this grade crossing in accordance with the commission's plans is \$2,000. A conference was held on this crossing improvement on April 6th, at which time representatives of the county, railroad company and commission were present. An agreement was reached at this conference to accept the plans of improvement as prepared by the commission and to divide the cost of making the improvement equally between the county and railroad company. Project satisfactorily adjusted and work completed.

No. 226, Decatur County.

Section 26, Long Creek Township.

Chicago, Burlington and Quincy Railroad.

Plans and estimates of cost for the improvement of the grade crossing were prepared by the commission and furnished to the railroad company and county. The improvement of this crossing was temporarily abandoned.

No. 229, Jasper County.

Section 8, Palo Alto Township, 3 miles west of Newton.

Chicago, Rock Island and Pacific Railroad.

The plans for this improvement were completed, but upon a request of the railroad company action in the matter was temporarily deferred.

No. 231, Madison County.

Sections 9 and 10, Ohio Township.

Chicago, Burlington and Quincy Railroad.

Plans were completed for the improvement of this crossing and were furnished to the railroad company and county. No request having been received from the county to secure a conference on this proposition, the matter was temporarily deferred. No. 232, Madison County.

Section 4, Madison Township.

Chicago, Rock Island and Pacific Railroad.

The plans and estimates of cost were completed on this improvement in 1917 and furnished to the railroad company and county. No further action has been taken. Negotiations for the construction of this improvement have been temporarily deferred.

No. 233, Madison County.

Section 2, Township 77 North, Range 29 West, 1 mile west of Earlham. Chicago, Rock Island and Pacific Railroad.

Plans and estimates of cost on this improvement were completed in 1917. Upon request of the railroad company that the construction be deferred for the period of the war the project was temporarily abandoned.

No. 234, Lyon County.

Sections 17 and 20, Richland Township.

Chicago, Milwaukee and St. Paul Railroad.

Plans and estimates of cost were completed for the improvement of this grade crossing. Copies of these plans were furnished to the railroad company and county. The grading work contemplated by the plans has been completed and the crossing now is constructed in accordace with the plans.

No. 235, Keokuk County.

Section 36, Jackson Township.

Chicago, Milwaukee and St. Paul Railroad.

The improvement of this grade crossing by the installation of culverts under the highway required for drainage and grading work adjacent to the crossing was completed in 1917. The project was satisfactorily adjusted and the improvement has been completed.

No. 238, Muscatine County.

In the town of Moscow.

Chicago, Rock Island and Pacific Railroad.

On January 5th the board of supervisors passed a resolution requesting the commission to prepare plans for the improvement or elimination of two crossings of the River to River Road and Chicago, Rock Island and Pacific Railroad in the town of Moscow. Surveys were made and plans and estimates were prepared and furnished the railroad company and county for this improvement. The plans contemplate a relocation of the present road so as to avoid the two existing crossings. The estimated cost of the improvement based on the plans as prepared is \$1,759. Owing to the necessity for conserving labor and material it was considered advisable to defer further action on this crossing project at this time.

RAILROAD CROSSING IMPROVEMENT

No. 239, Montgomery County.

Section 20, Garfield Township.

Chicago, Burlington and Quincy Railroad.

Plans were prepared by the railroad company which contemplated the relocation of a portion of the county road to eliminate a grade crossing on the main line of the Chicago, Burlington and Quincy Railroad. This matter was taken up with the board of supervisors and it was considered advisable to defer further negotiations regarding the adjustment of this matter until the plans for the federal aid project in this county were completed. The improvement of this crossing will be taken up at a later date.

* No. 240, Cherokee County.

Section 11, Willow Township.

Illinois Central Railroad.

Plans for the elimination of two grade crossings on the Quimby-Washta road at their intersection with the Illinois Central Railroad were worked up from notes furnished by the county engineer of Cherokee County. The proposed improvement contemplated the construction of a short piece of highway which would eliminate the two crossings, the estimated cost being \$1,710. At a conference held on April 3d in regard to this improvement the board of supervisors, railroad company and commission agreed to accept the plans as prepared by the commission. The railroad company is to pay one-fourth of the cost of the improvement and the county is to bear the balance of the expense. The project has been completed.

No. 241, Cherokee County.

Sections 21 and 28, Willow Township.

Illinois Central Railroad.

Plans were prepared by the commission for the improvement of this crossing and at a conference held on April 3d an agreement was reached with the railroad company to construct the improvement in accordance with the plans. The railroad company to bear one-fourth of the expense and the county the remaining three-fourths. Project satisfactorily adjusted.

No. 242, Madison County.

Section 11, South Township, 2 miles north of St. Charles. Chicago Great Western Railroad.

A complaint was received by the commission concerning the drainage conditions on this undergrade crossing. Relief from these conditions was secured by correspondence with the railroad company. The complaint has been satisfactorily adjusted.

No. 243, Jefferson County.

In the town of Batavia.

Chicago, Burlington and Quincy Railroad. Listed for survey.

No. 244, Benton County.

Sections 23 and 24, Cedar Township, ½ mile southeast of Mt. Auburn. Chicago, Rock Island and Pacific Railroad.

A survey was made and plans and estimates prepared for this crossing improvement, which consists of grading work adjacent to the crossing to secure a better approach. The estimated cost of the improvement was \$525. Plans and estimates of cost were filed with the railroad company and county. No report has been received concerning an adjustment of this project.

No. 245, Story County.

Sections 16 and 17, Washington Township.

Fort Dodge, Des Moines and Southern Railroad.

A survey was made for the improvement of a grade crossing near Zumwalt.

No. 246, Johnson County.

Section 27, Scott Township.

Chicago, Rock Island and Pacific Railroad.

Plans were prepared for the improvement of the existing overhead crossing from notes secured by the county engineer. Copies of these plans were sent to the railroad company and county. No further information has been received as to wether or not the crossing improvement has been made.

No. 247, Jones County.

Sections 13 and 14, Cass Township. Chicago, Milwaukee and St. Paul Railroad. Projected list for survey in 1917.

No. 248, Carroll County.

Section 9, Jasper Township, in the town of Lanesboro.

Chicago Great Western Railroad.

A complaint was received regarding the grade crossing in the town of Lanesboro and an inspection was made by a representative of the commission and the matter taken up with the railroad company by correspondence. Satisfactory repairs were made to the crossing in accordance with recommendations of the commission. The project has been satisfactorily adjusted.

No. 249, Marshall County.

Section 28, Linn Township.

Minneapolis and St. Louis Railroad.

On request of the board of supervisors an inspection of this grade crossing was made by a representative of the commission and an estimate was prepared for the cost of constructing an undergrade crossing in this location. The estimated cost being \$12,000, the board of supervisors considered it advisable to defer action on this crossing improvement.

RAILROAD CROSSING IMPROVEMENT

No. 250, Monona County.

Section 14, Maple Township. Chicago, Milwaukee and St. Paul Railroad. Listed for survey.

No. 251, Johnson County.

Sections 9 and 16, Lucas Township.

Chicago, Rock Island and Pacific Railroad.

Plans were prepared for the improvement of the overhead crossing upon notes secured by the county engineer. A request was filed with the railroad company to rebuild their existing overhead structure in accordance with the plans as prepared. No advice has been received as to whether or not the improvement has been carried out.

No. 252, Johnson County.

Section 4, Scott Township, and Section 33, Graham Township.

Chicago, Rock Island and Pacific Railroad.

Survey was made and plans and estimates of cost were furnished the railroad company and county. The improvement of the project has been temporarily deferred.

No. 253, Harrison County.

Section 3, Cincinnati Township. Chicago and North Western Railroad. Project listed for survey.

No. 254, Johnson County.

Section 27, Madison Township.

Cedar Rapids, Iowa City Railroad.

Survey was made and plans were prepared for improvement of this crossing. The work required to put the crossing in satisfactory condition consists of the removal of buildings which obstruct the view of approaching trains. The matter can be satisfactorily adjusted without the necessity of a conference.

No. 255, Marshall County.

Section 29, Linn Township.

Minneapolis and St. Louis Railroad.

Survey was made and plans and estimates of cost were prepared for the elimination of two grade crossings on the Minneapolis and St. Louis Railroad and the Marshalltown-Marietta County Road by a slight relocation of the highway, the estimated cost of the improvement being \$3,200. At a conference held on June 14th attended by the members of the board of supervisors, representatives of the railroad company and commission, an agreement was reached whereby the crossing is to be improved in accordance with the plans and the railroad company is to contribute \$1,130 or approximately 35% of the cost of the improvement. The county is to pay the additional cost. The crossing project was satisfactorily adjusted and construction work has been completed.
10WA STATE HIGHWAY COMMISSION

No. 256, Mahaska County.

Sections 8 and 9, White Oak Township, 1 mile west of Rose Hill. Chicago, Rock Island and Pacific Railroad.

Survey was made by the county engineer for the improvement of this crossing and plans were submitted to the railroad company. A conference was held on October 17th, at which time the board of supervisors, township trustees, railroad company and the commission were represented. No agreement was reached at this conference regarding the distribution of the cost of the improvement. The matter is under adjustment at this time.

No. 257. Winneshiek County.

Section 23, Decorah Township, 1/2 mile east of Decorah.

Chicago, Rock Island and Pacific Railroad.

Survey has been made for this improvement and plans are in the course of preparation at this time.

No. 258, Sioux County.

Sections 10 and 11, Sherman Township.

Chicago and North Western Railroad.

An inspection of this crossing improvement was made on May 23d by a representative of the commission. The conditions complained of consist of unsatisfactory drainage and insufficient clearance on the undergrade crossing. On account of the large expenditure which would be necessary to remedy these conditions at this time owing to the fact that the crossing is located on an unimportant township road, it was considered advisable to defer action in the matter for the period of the war.

No. 259, Crawford County.

Sections 8 and 9, Stockholm Township, 3 miles west of Boyer.

Chicago and North Western Railroad.

A plan for the improvement of an overhead crossing was submitted to the commission for approval. A conference was held with the township trustees, board of supervisors, railroad company and commission and it was agreed that with slight modifications the plan would be approved. The detailed plans for the new crossing were approved by the commission on August 22d.

No. 260, Keokuk County.

Sections 12 and 13, Van Buren Township.

Chicago, Milwaukee and St. Paul Railroad.

A complaint was received by the commission concerning an undergrade crossing. An inspection of the crossing was made on April 27th by a representative of the commission. Correspondence was taken up with the railroad company to remedy the conditions complained of. The railroad company finally agreed to bear 50% of the cost of making a grade crossing near the site of the present undergrade crossing, but no acceptance of this proposition was received from the county. This improvement is under adjustment at this time.

RAILROAD CROSSING IMPROVEMENT

No. 261, Webster County.

Sections 14 and 15, Dayton Township, 1 mile west of Dayton.

Chicago and North Western Railroad.

A complaint was received by the commission concerning the under drainage to this undergrade crossing. An inspection of the crossing was made on August 31st by a representative of the commission and correspondence taken up with the railroad company to remedy the conditions complained of. No satisfactory adjustment having been made a further conference was arranged on September 28th, at which time representatives of the railroad company, township and commission met at the site of the crossing. An agreement was reached whereby the conditions complained of were to be remedied by the railroad company. This crossing complaint was satisfactorily adjusted.

No. 262, Ida County.

Sections 33 and 34, Maple Township, 1 mile west of Battle Creek.

Chicago and North Western Railroad.

Upon a request of the railroad company an inspection was made of an improvement which they contemplated constructing in this location. At the conference which was held on July 16th it was agreed that the improvement should be made in accordance with the plans of the railroad company. The work has been done and the project satisfactorily adjusted.

No. 263, Jasper County.

Section 6, Des Moines Township, 1 mile east of Prairie City.

Chicago, Rock Island and Pacific Railroad.

A petition signed by a large number of property owners complaining regarding the condition of this crossing was received by the commission on September 3d. On September 8th an inspection of the crossing was made by a representative of the commission who reports that temporary repairs will be made to the crossing by the railroad company which will satisfactorily adjust the complaint.

No. 264, Wapello County.

Sections 23 and 24. Columbia Township. Chicago, Rock Island and Pacific Railroad. Listed for survey.

No. 265, Cerro Gordo County.

Section 13, Lincoln Township, and Section 18, Lime Creek Township. Chicago, Milwaukee and St. Paul Railroad.

A complaint was received concerning the condition of this grade crossing and correspondence taken up with the railroad company to secure its improvement. Temporary repairs were made to this crossing upon request of the commission which satisfactorily adjusted the complaint.

No. 266, Dickinson County.

Sections 33 and 34, Superior Township.

Chicago, Rock Island and Pacific Railroad.

A complaint was received regarding the condition of this grade crossing. A representative of the commission made an inspection of this crossing on September 11th and reported it to be in a dangerous condition on account of the obstructed view to approaching trains. Owing to the expenditure which would be necessary to satisfactorily remedy conditions it was considered advisable to defer further action to secure the improvement of this crossing for the period of the war.

No. 267, Ringgold County.

Section 2, Monroe Township.

Chicago, Burlington and Quincy Railroad.

A complaint regarding the improvement of this crossing was satisfactorily adjusted by correspondence with the railroad company.

No. 268, Sac County.

Sections 35 and 36, Viola Township.

Chicago and North Western Railroad.

An appeal was made to the commission for assistance in adjusting a controversy over the location of a project adjacent to this crossing. An inspection of the conditions was made by a representative of the commission on September 25th. The matter was satisfactorily adjusted through correspondence.

No. 269, Benton County.

Section 23, Iowa Township.

Chicago and North Western Railroad.

A complaint was received by the commission on June 22d concerning the condition of the undergrade crossing in the above location. On request of the commission the railroad company furnished material for repairing the road adjacent to the crossing and the complaint was satisfactorily adjusted in this manner.

No. 270, Union County.

Sections 5 and 6, Platt Township, 11/2 miles north of Kent.

Chicago, Burlington and Quincy Railroad.

The commission received a complaint regarding a plan of improvement proposed by the railroad company concerning a crossing improvement in the above location. An investigation of the complaint was made by a representative of the commission on October 10th. It was finally determined that no work would be done on the proposed improvement for some time and further investigation of the complaint was temporarily abandoned.

No. 271, Polk County.

Sections 22 and 23, Jefferson Township, near the town of Herrold. Des Moines Inter-Urban Railroad.

A complaint was received from the war department regarding the condition of a grade crossing within the cantonment at Camp Dodge. This matter was taken up by correspondence with the railroad company and they promptly agreed to remedy the conditions complained of in the manner as suggested by the commission.

No. 272, Wright County.

Section 33, Iowa Township.

Chicago Great Western Railroad.

A complaint was received by the commission on October 19th concerning the condition of an overhead crossing in the above location. The petition which was filed with the commission was signed by a large number of property owners living adjacent to the crossing. The matter was taken up with the board of supervisors who were anxious to have the necessary improvements made to this crossing to put it in satisfactory condition for travel. Correspondence was taken up with the railroad company, who agreed to make an early inspection of the crossing and to remedy the conditions complained of.

No. 273, Wright County.

Section 31, Iowa Township, ½ mile east of Solberg. Chicago Great Western Railroad. (See report on No. 272.)

No. 274, Wright County.

Sections 33 and 34, Grant Township, 3 miles east of Clarlon. Chicago Great Western Railroad. (See report on No. 272.)

No. 275, Iowa County.

Sections 11 and 12, Hartford Township, 1 mile west of Ladora.

Chicago, Rock Island and Pacific Railroad.

A complaint was received concerning the condition of this crossing. This complaint will be investigated at an early date.

Note: Each crossing project is assigned a number when listed for the attention of the commission. Those crossing projects listed but not reported above remain in the same status as previously reported. A total of 275 individual crossing improvements have been listed to date.

ROAD DEPARTMENT.

ROAD DEPARTMENT.

Chapter VI.—December 1, 1916—December 1, 1917.

During the period covered by this report, engineers of the road department have checked and approved profiles for the improvement of 899.5 miles of road, involving the moving of 4,806,668 cubic yards of earth; approved thirty-six contracts for road work amounting to \$725,485; investigated and undertook the adjustment of one hundred twenty-five complaints; investigated and passed upon fifty requests for changes in county roads; supervised state road work involving the grading of six miles, graveling of five miles, building of twenty-three concrete culverts, laying of 1500 square yards of paving, and laying of annual county and township highway reports; prepared three special sets of road specifications, including specifications for both concrete and brick pavement; prepared a bulletin outlining the procedure by counties to secure federal aid; issued instructions governing the preparation of federal aid surveys and plans; prepared and submitted to the federal authorities project statements for twelve federal aid projects, and collected data for nine federal aid projects for which the project statements have not been submitted.

District engineers representing the road department have made field examination of 899.5 miles for which profiles were approved; attended forty-four road lettings for road work costing \$1,080,195.00 and involving the moving of 2,867,533 cubic yards of earth; made field examination of all the proposed changes in the county road systems concerning which there could be any question, and made reconnaisance surveys and estimates of the cost of twenty-one proposed federal aid projects involving 352 miles of road.

One thousand seven hundred sixty-eight days have been spent in the field on road work; 1,174 days by engineers of the road department and 594 days by the district engineers. Five hundred seven days were spent on federal aid road work, the remaining 1,261 days having been spent on regular county work.

Road Profiles Approved.

Profiles for the improvement of 899.5 miles of road have been checked and approved. This required the handling and checking of 1,010 separate profile drawings. Since the commission was organized in 1913, profiles for 2,802.5 miles of road have been checked and approved. (Refer to Schedule No. 5.)

The development of the road work is well illustrated in the increase of road profiles approved each year, as follows:

Year	Profiles	Approved
1913	29	miles
.1914	445	
1915	549	"
1916	880	" .
1917	899.5	**

A comparison of the maximum grades, rise and fall, and quantity of earthwork for the profiles approved in 1915, 1916, and 1917 follows:

Av. max. grade before improvement	5.929	% 5.77%	5.55%
Av. max. grade after improvement	3.739	% 3.61%	3.55%
Reduction in av. max. grade	2.199	% 2.16%	2.00%
Av, rise and fall per mile before improvemen	t 52.9 ft.	50.0 ft.	48.1 ft.
Av. rise and fall per mile after improvement	41.4 ft.	40.1 ft.	37.9 ft.
Reduction in av. rise and fall	11.5 ft.	9.9 ft.	10.2 ft.
Earthwork required by profiles approved, cubic yards	2,898,720 4	1,739,485	4,806,668
Av. quantity earthwork per mile of road, cubic yards	5,280	5,655	5,418

Specifications-Bulletins.

Special specifications have been prepared for the paving of the Sageville Road in Dubuque County, the Camp Dodge Road in Polk County, and the Clear Lake Road in Cerro Gordo County. The latter specifications are for Federal Aid Project No. 1.

No new standard road specifications have been issued.

A bulletin, "Procedure by Counties to Secure Federal Aid," has been issued, outlining to the county boards the steps to be taken in getting their county in line to receive federal aid. In-

1915 1916 1917

ROAD DEPARTMENT.

IOWA STATE HIGHWAY COMMISSION

structions have been issued for making federal aid road surveys and preparing federal aid road plans.

Road Lettings Attended. (Refer to Schedule No. 6.)

Forty-five lettings for the improvement of 646.66 miles of road have been attended. The total contract price was \$1,165,465.89. The earth excavation included in these lettings amounted to 2,885,233 cubic yards, which cost \$712,333.33, or an average of 24.69 cents per cubic yard.

Road Contracts Approved.

The only road contracts which the law requires the counties to send to the commission for approval are the contracts for more than one thousand dollars' worth of grading, let privately after bids have been received at a public letting and rejected. Many counties voluntarily sent in their contracts for the commission to pass upon, even though they were not required to do so. (Refer to Schedule No. 7.)

Thirty-six contracts for the improvement of 315.37 miles of road have been approved. The total amount of these contracts is \$725,485.00, of which \$386,319.28 is for earth excavation. These contracts provide for the moving of 1,451,602 cubic yards of earth, at an average price of 26.61 cents per cubic yard. Three contracts for the improvement of 42 miles of road, costing \$39,906.85, have been rejected.

Road Complaints. (Refer to Schedule No. 8.)

One hundred twenty-six complaints were received during 1917. One hundred five of these were on the township roads. Twenty-one were on the county roads. The division of the complaints with reference to county and township roads is almost identical with the relative mileage of those systems.

The records show that sixty-four per cent of the roads concerning which complaints were made have been repaired or improved satisfactorily. Since April, 1913, there have been filed with the commission six hundred forty-one road complaints, as follows:

1913	28	complaints
1914	83	"
1915	254	
1916	151	
1917	126	"

Inspection and Supervision of Road Work.

Seventy-five per cent of the cost of road construction work is for earth and gravel road work. Eighty-three days were spent on the inspection and supervision of this class of work. The other twenty-five per cent of the road expenditures is for pavement construction, and special engineers have been assigned to supervise this work. (Refer to Special Assignments.)

Changes in the County Road System. (Refer to Schedule No. 9.)

The commission has taken action on proposed additions or alterations in the county road systems in twenty-nine counties, involving fifty separate requests by the board of supervisors. Forty-two of these requests were approved. These involved the addition of 167.65 miles to the county road system and the removal of 19.76 miles from the county system. The net increase in the mileage of the county road system was 147.89 miles.

Special Assignments.

Engineers from the road department have been assigned to special work, as follows:

Dubuque Post Road,	62 (lays.	
Sageville Road, Dubuque County,	169		
State Road Work.	79	**	
Camp Dodge Road, Polk County,	366	"	
Total	676	**	

The work of the Dubuque Post Road consisted of maintaining an engineer on this work part of the season to assist the engineer assigned by the office of public roads to have charge of the contract. By the middle of August the work on this contract had progressed to such a point that it was not necessary for our engineer to continue longer thereon. The road is not yet finished. About four miles remain to be surfaced with a top coat of gravel and the guard rail is yet to be constructed.

The work on the Sageville Road consisted of supplying an engineer and one inspector to supervise the grading and draining of three and three-tenths miles of road and the construction thereon of a monolithic brick pavement eighteen feet wide. The grading and draining has been completed and about one and onehalf miles of pavement has been laid.

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ROAD DEPARTMENT.

IOWA STATE HIGHWAY COMMISSION

The special assignments on state road work consisted of assigning an engineer from the road department to supervise the road construction and maintenance work in progress at the various state institutions.

The work on the Camp Dodge Road consisted of making detailed surveys for the improvement of both Beaver Avenue and Fifty-eighth Street from the Des Moines city limits to the cantonment, a distance of about five miles, and later supervising the construction work. The earthwork on this road has not been completed, two miles of monolithic brick pavement twenty feet wide has been laid and the gravel shoulders on one mile have been constructed.

State Road Work.

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Surveys have been made for the improvement of five and onehalf miles of road at the state institutions at Knoxville, Ames, and Davenport. Plans have been prepared for three and onehalf miles.

At Cherokee, Independence, Ames, Fort Madison and Mount Pleasant, six miles have been built to finished grade. At Independence; Cherokee, Fort Madison, Mount Pleasant, and Marshalltown, twenty-three concrete culverts were constructed. At Marshalltown 1,500 square yards of concrete pavement was laid. At Woodward and Ames five miles have been graveled. Four thousand four hundred feet of tile has been placed. An engineer from the road department has supervised all the surveys, preparation of plans, construction and repair work on the state institution roads. This work has required seventy-nine days in the field besides the necessary office work.

Annual Report Blanks.

In co-operation with the administrative department the blanks for the annual reports of township trustees, clerks, and road superintendents, and the road division of the county engineers' annual reports have been revised and copies sent out to the various officers.

Surveys for Federal Aid Projects.

A total of 325 days have been spent on federal aid road surveys, and surveys have been completed for 138 miles of road.

Engineers from the road department have assisted the county engineers in making surveys for federal aid projects, as follows:

Project	No. 2,	Woodbury County,	76	days.
Project	No. 3.	Jefferson County,	46	
Project	No. 4,	Delaware County,	31	**
Project	No. 5.	Buchanan County,	22	**
Project	No. 6.	Ringgold County,	12	44
Project	No. 7.	Marion County,	104	**
Project	No. 11,	Warren County,	44	
	Total		335	u

On Projects Nos. 2, 4, 5, and 6, the commission furnished one engineer and supplied instruments, etc. The county furnished the remainder of the party, transportation, etc. On Projects Nos. 3, 7, and 11, the commission furnished one engineer and one assistant, the county furnishing the remainder of the party, transportation, etc.

The surveys on Projects Nos. 2, 4, 5, 7, and 11, aggregating 118 miles, have been completed. About ten miles on each of Projects Nos. 3 and 6 have been completed.

Field Work of Road Department.

The total amount of time spent in the field on road work by the district engineers and engineers of the road department was 1,768 days. In general, the field work of the road department in dealing with county and township officials is carried on by the district engineers, 594 days having been spent by them on such work in 1917. In addition, engineers of the road department have spent 1,174 days in the field. Three hundred sixty-eight days were spent by engineers of the road department on federal aid road work, the remaining 806 days having been spent on the regular work. A statement showing the distribution of the time spent by district engineers will be found in part one, chapter eight. The time spent in the field by engineers of the road department follows:

Special Assignments	676	days.
Investigation of complaints.	18	**
Investigation of road profiles.	34	. 11
Inspection of road promotion of road w	ork, 63	
Investigation and supervision of fond	335	
Federal and road surveys,	33	
Investigation of federal and projection	15	
Unclassified,	1104	
Total	1104	

SCHEDULE FIVE.

ROAD PROFILES APPROVED.

County		County	
Adair	4	Jefferson	0
Adams	0	Johnson	9
Allamakee	. 2	Jones	2
Appapoose	5	Keokuk	0
uduhan	7	Kossuth	16
Inton	ò	Los	0
Real Howle	0	Linn	
Black Hawk	0	Louise	
soone	1	Louisa	-
sremer	-0	Lucas	0
Suchanan	5	Lyon	2
Buena Vista	123	Madison	0
utler	7	Mahaska	12
alhoun	31	Marion	0.
arroll	15	Marshall	19
855	2	Mills	0
erro Gordo	15	Mitchell	0
barokaa	11	Monona	.11
And or	11	Monroe	0
Coar and an and a second second second	2	Montgomery	ő
nickasaw	10	Musesting	30
larke	1	Muscaune	12
lay	69	O'Brien	32
layton	1	Osceola	15
linton	4	Page	2
rawford	36	Palo Alto	. 39
allas	34	Plymouth	0
avis	0	Pocahontas	42
eestur	ő	Polk	17
olawara	ő	Pottawattamie	0
Moines	7	Poweshiek	0
lokingon	10	Ringgold	0
CKIISOII	40	Nac	90
unuque	8	Sact	00
mmet	- 34	Shellow	9
ayette	0	Slowy	0
loyd	14	Sloux	0
ranklin	27	Story	36
remont	2	Tama	2
reene	10	Taylor	0
rundy	1	Union	0
uthrie	1	Van Buren	0
amilton	95	Wapello	0
ancock	6	Warren	0
ardin	96	Washington	0
errison	00	Wayne	4
anry	2	Webster	10
compared	4	Winenhago	20
oward and an and a second seco	4	Winneshiak	20
umoolat	16	Woodburn	10
18	0	Wonth	12
owa	1	Worth	0
ackson	3	wright	0
aspor			-
	*	Total	1,010

Total length 4,749,743 ft. or 899.5 miles.

ROAD DEPARTMENT.

		W	lies of Ro	pr		মৃ			ete	
County	No. of sgnittsi	Finished grade	[9781Ð	талотота	IstoT	Еатіћ wor сп. уd.	Kind U	of Work and nit Prices	mizorqqA	18101
	-	0.7			0.7	5,000	Earth,	320	-	1,600.00
Allamakee		0.4			4.0	23,100	Earth,	300		7.615.20
Audubon		0.7.0			72.5	280,000	Earth,	23.7c	8	8,178.50
Buena Vista.		0.0			5.0	11,700	Earth.	24.956	. 63	11.629.0
outline Oathoun Arrolf		8.7		0.1	8.7	127,000	Earth,	18.9e. 28.2e; Concrete	23	4,302.40
Oerro Gordo	-	11.0				79 000	Parth.	m't \$2.23.	201	2,042.95
Cherokee.		11.0			0.5	000'9	Earth.	29.956		1,647.25
Cedar		63.0	0.00		123.0	225,000	Gravel	730	14	5,865.25
(a)		85.4			35.4	456,392	Earth,	19.1c	30	7,553.89
Crawford		1.5			1.5	20. 202	Earth,	41.3c		8,200.00
Des Moines	~ **	23.5	2.5		26.0	96,159	Earth,	23.7e	61	5.735.50
DICKIDSON	1	3.3		3.3	3.3	17,700	Earth.	45c; rock, 81; rock 90c; hrick		
Dubuque							pave	ment \$2.045; sub-	a	5.270.00
		1 00			29.4	136,258	Earth,	05.280	00	476.84
Emmet		10			3.5	27,000	Earth.	25.60	-	6,367.92
Familton		14.0	3.5		17.5	65,900	Earth.	35c	61	5.775.40
Hardin		6.75			6.75	23,961	Earth.	326		7,780.84
Humboldt		9.4			4.6	24,282	Earth.	24.10		6,563.75
Lyon	10	2.1			0.7	45,054	Earth	. 33.4c		15,040.03
Mahaska	2	15.5	2.5		15.5	110,781	Earth	35.4c		2,832,00
Mills		2.0			2.0	15,600	Earth	24.50		3,839.70

SCHEDULE SIX. ROAD LETTINGS ATTENDED.

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SCHEDULE SIX-Continued. ROAD LETTINGS ATTENDED.

		N	diles of Ro	ad		24		3
County	No. of lettings	Finished grade	Gravel	Pavement	Total	Earth wor cu. yd.	Kind of Work and Unit Prices	Approxima total
Muscatipe O'Brien Palo Alto Pocehontas Polk	. 1 2 1 2	$10.13 \\ 10.32 \\ 41.76 \\ 40.0 \\ 16.3$		4.8	$10.13 \\ 10.32 \\ 41.76 \\ 40.0 \\ 16.3$	$53,036 \\ 48,647 \\ 152,381 \\ 103,700 \\ 96,720$	Earth, 34.6c. Earth, 24.1c. Earth, 22.1c. Earth, 29.5c. Earth, 43.8c; briek pavem't \$2.73 sq. yd. Gravel shoulders \$2.25	$18,713,35 \\ 11,724,70 \\ 33,627,91 \\ 21,058,15$
Sac Story Tama Wapello Washington Winnebago	1 1 1 1 1	36.0 33.75 5.5 1.0 0.75 15.75			36.0 33.75 5.5 1.0 0.75 15.75	$144,000 \\ 65,000 \\ 44,500 \\ 4,500 \\ 12,354 \\ 101,000$	per cu. yd Earth, 22.5c. Earth, 24.8c. Earth, 29.95c. Earth, 25.0c. Earth, 25.0c. Earth, 23.85c.	$\begin{array}{c} 222,200.45\\ 32,400.00\\ 16,120.00\\ 13,635.25\\ 1,125.00\\ 3,088.50\\ 24,088.50\end{array}$
Totals	45	628.16	73.5	12.1	646.66	2,889,455		\$1,165,465.89

.*

Total earth excavation, 2,885,233 eu. yds, Total cost earth excavation, \$712,333.33. Average cost earth excavation, 24.69 cents per cu. yd.

SCHEDULE SEVEN. ROAD CONTRACTS APPROVED.

County	Contractor	Date Approved	No. of miles	Kind of Work	Unit Price	Quantity	Total amount
Audubon. Calhoun. Calhoun. Calhoun. Carroll. Cerro Gordo. Cherokee. Clay Clinton. Crawford. Des Moines. Dickinson. Dickinson. Dubuque.	P. J. Ryan E. W. Beeman E. W. Beeman J. Carstens Bryant Asph. Co Leach Bros Edw. Peterson Co Thos. Carey & Son Carl Howe John Grimm Lamoreaux Bros J. E. Kughn & Son C. B. MeNamara Co	$\begin{array}{c} 4-6-17\\ 3-10-17\\ 3-31-17\\ 8-417\\ 9-20-17\\ 9-2-17\\ 9-2-17\\ 4-17-17\\ 2-8-17\\ 1-11-17\\ \hline 3-17-17\\ 7-29-17\\ \hline 3-5-17\\ 9-6-17\\ 5-2-17\\ \hline 5-2-17\\ \end{array}$	$\begin{array}{c} \textbf{4.0}\\ \textbf{21.0}\\ \textbf{0.5}\\ \textbf{0.75}\\ \textbf{1.5}\\ \textbf{4.00}\\ \textbf{11.0}\\ \textbf{63.0}\\ \textbf{2.0}\\ \textbf{13.2}\\ \textbf{0.4}\\ \textbf{2.0}\\ \textbf{12.0}\\ \textbf{11.5}\\ \textbf{3.3}\\ \end{array}$	Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Concrete pavement Earth excavating Earth excavating	\$0.30 per c. y. 0.2495 per c. y. 0.30 per c. y. 0.30 per c. y. 0.50 per c. y. 0.50 per c. y. 0.55 per c. y. 0.2595 per c. y. 0.2595 per c. y. 0.25 per c. y. 0.25 per c. y. 0.250 per c. y. 0.250 per c. y. 0.250 per c. y. 0.30 per c. y. 0.50 per c. y. 0.384 per c. y. 0.245 per c. y. 0.245 per c. y. 0.259 per c. y. 0.259 per c. y. 0.259 per c. y. 0.455 per c. y. 0.455 per c. y. 0.455 per c. y. 0.455 per c. y. 0.50 per c	$\begin{array}{c} 23,100 \ c. \ y.\\ 82,683 \ c. \ y.\\ 7,108 \ c. \ y.\\ 4,500 \ c. \ y.\\ 15,000 \ c. \ y.\\ 10,049 \ c. \ y.\\ 20,049 \ c. \ y.\\ 225,000 \ c. \ y.\\ 225,000 \ c. \ y.\\ 5,440 \ c. \ y.\\ 1,871 \ c. \ y.\\ 187,445 \ c. \ y.\\ 222 \ c. \ y.\\ 15,000 \ c. \ y.\\ 222 \ c. \ y.\\ 15,000 \ c. \ y.\\ 144,700 \ c. \ y.\\ 1,650 \ c. \ y.\ y.\ y.\ y.\ y.\ y.\ y.\ y.\ y.\ $	$\begin{array}{c} \$ & 6,030.00\\ 20,629.41\\ 2,159.40\\ 1,350.00\\ 4,500.00\\ 5,024.50\\ 67,259.56\\ 29,211.00\\ 51,750.00\\ 1,360.00\\ 4,447.00\\ 39,712.32\\ 2,500.00\\ 2,722.00\\ 5,760.00\\ 2,722.00\\ 5,760.00\\ 10,951.50\\ 11,784.00\\ 6,390.00\\ \end{array}$
Emmet. Franklin. Grundy. Guthrie. Humboldt. Jackson. Louisa. Mahaska. Mahaska. Monona. Museo tine.	Wisely & Son Rieko Snater S. Cox Morrison Con. Co C. A. Miller Lewis Said M. F. Wallace Jno. Montgomery J. Herbert & Son Russell Condon Fuller Bros.	$\begin{array}{c} 7-30-17\\ 4-19-17\\ 7-30-17\\ \text{Rejected}\\ -\\ 7-13-17\\ 4-27-17\\ 11-15-17\\ 10-24-17\\ 10-24-17\\ 7-5-17\\ 5-17-17\\ \end{array}$	29.4 3.5 2.0 0.5 2.0 1.0 3.0 2.0 2.0 8.75	Solid rock Preparing subgrade Brick pavement Guard rail Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Solid rock Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating Earth excavating	1.00 per c. y. 0.07 per c. y. 0.07 per s. y. 2.041½ per s. y. 0.2528 per t. f. 0.2528 per c. y. 0.75 per c. y. 0.27 per c. y. 0.311½ per c. y. 0.321 per c. y. 0.331 per c. y. 0.341 per c. y. 0.345 per c. y. 0.325 per c. y. 0.326 per c. y. 0.325 per c. y.	2,000 c. y. 2,000 c. y. 58,000 s. y. 2,500 l. f. 126,258 c. y. 2,200 c. y. 10,000 c. y. 16,455 c. y. 1,645 c. y. 1,645 c. y. 1,645 c. y. 1,645 c. y. 1,645 c. y. 1,640 c. y. 12,000 c. y. 12,000 c. y. 15,669 c. y.	$\begin{array}{c} 85,270,00\\ 34,476,84\\ 1,650,00\\ 2,700,00\\ 4,401,79\\ 1,600,50\\ 3,465,00\\ 5,533,25\\ 2,250,00\\ 6,293,15\\ 4,140,00\\ 3,836,70\\ 13,858,50\end{array}$

ROAD DEPARTMENT.

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\$1

SCHEDULE SEVEN-Continued.

ROAD CONTRACTS APPROVED.

County	Contractor	Date Approved	. No. of miles	Kind of Work	Unit Price	Quantity	Total
Muscatine. O'Brien Osceola. Palo Alto Polk Pocahontas Polk.	J. G. Grimm. P. Richardson Edw. Peterson Co Barnes Bros. Edw. Peterson Clint Maddy Akin & Flutter.	5-17-17 3-27-17 6-4-17 8-16-17 Rejected. 9-1-17 9-19-17	$0.70 \\ 10.32 \\ 14.0 \\ 6.0 \\ 40.0 \\ 18.25 \\ 4.8 \\ \end{cases}$	Earth excavating Earth excavating Earth excavating Earth excavating Hauling and placing gravel. Earth excavating Guard rail Shaping subgrade Brick pavement Cravel eboulders	0.349 per c. y. 0.241 per c. y. 0.27 per c. y. 0.29 per c. y. 0.295 per c. y. 0.295 per c. y. 0.50 per c. y. 0.50 per c. y. 0.55 per 1. f. 0.10 per s. y. 2.53 per s. y. 9 25 per a y.	5,350 c. y. 48,647 c. y. 49,000 c. y. 21,853 c. y. 16,700 c. y. 16,000 c. y. 42,720 c. y. 3,250 l. f. 89,511 s. y. 55,945 s. y.	1,867.15 11,724.70 13,230.00 6,172.07 31,058.15 18,315.00
Polk Sac Seott Seott Seott	Thos. Carey & Son Phelan & Shirley Aug. Korneman Wm. Rathlef Fuller Bros.	$\begin{array}{c} 11- \ 5-17\\ 2- \ 2-17\\ 3-24-17\\ 3-24-17\\ 3-24-17\\ 3-24-17\end{array}$	$ \begin{array}{r} 11.5 \\ 36.0 \\ 2.0 \\ 2.5 \\ 2.5 \end{array} $	Earth excavating Earth excavating Earth excavating Laying 6-inch tile Earth excavating Loose rock	0.389 per c. y. 0.225 per c. y. 0.28 per c. y. 0.11 per l. f. 0.36 per c. y. 0.72 per c. y.	54,074 c. y. 54,074 c. y. 144,000 c. y. 9,550 c. y. 3,000 l. f. 5,000 c. y. 1,360 c. y.	21,068,60 32,400,90 2,702,00 330,60
Woodbury	R. C. Ward	4-19-17	7.0	Earth excavating	0.266 per c. y.	43,897 c. y.	11,691.94
Totals			357.37				\$765,392.19

Total number contracts submitted for approval, 39. Total earth excavated in contracts approved, 1,451,602 cu. yds. Total cost of earth excavated in contracts, \$386,319.28. Average unit cost of earth excavated in contracts approved, \$0.2661 per cu. yd.

Como	Flict	Adjusted	County	Filed	Adjusted
A vita in	0				
Adams			Jones		
Allamakee			Keokuk		
Appanoose	10 0	10 0	Too Too	5 m	5 × 4
Benton	****	144	Linn		
Black Hawk			Louisa		
Bremer	-		Lucas		
Buehanan		-	Madison	50	5.0
Buena Vista	1		Mahaska	- 50	- 14
Calhoun	1		Marshall	-	
Carroll	1	1	Mills	1	1
Cerro Gordo	57	0	Monona	10	
Cadar Cadar			Montenmere	60	1
Chiekasaw		-	Muscatine	10	1
Clay			Osceola	1	
Clayton			Page		
Crawford	co o		Plymouth	10 0	
Dallas	21		Poenhontas		
Decatur	**	63 Q	Pottawattamie	10.0	10 61
Delaware		1	Poweshiek	(15)	101
Diekinson	1		Sae Sae	+	
Dubuque	1		Scott		
Favette			Sloux	1	-
Franklin			Story		
Floyd	0 01	0 60	Tama	2	15
Greene			Union	60	
Grundy			Wanello		-
Hamilton	1.	1	Warren	100	
Hancock			Wayne	0 1	41
Harrison	61.9		Webster	101	201
Henry Howard			Winneshiek	1	
Humboldt			Woodbury	10	10
lowa	1		Wright	1	
Jackson	1	1	Thetal		s. .
Jefferson	t	1.4	A VINE ADDRESSON	are.	to

ROAD DEPARTMENT.

SCHEDULE EIGHT.

ROAD COMPLAINTS FILED AND ADJUSTED

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SCHEDULE NINE.

COUNTY ROAD CHANGES UPON WHICH OFFICIAL ACTION HAS BEEN TAKEN.

County	Date filed with Commission	Date of action by Comm'n	Was board's action	Miles to be added to county system	Miles to be deducted from county system
Benton	6-9-17	6-99-17	Yes	3.5	
Benton	6-9-17	6-29-17	No	1.5	
Black Hawk	8-13-17	9-24-17	Yes	35.0	
Boone	12-15-16	12-22-16	Yes	1.0	1,5
Charokao	0-19-17	11-5-17	Ves	3.5	
Chickasaw	9-23-17	10-19-17	Yes	1.0	
Dickinson	9-24-17	9-29-17	Yes	8.5	
Dickinson	10-5-17	11-5-17	Yes	0.50	0.65
Dubuque	6-30-17	11-5-17	Yes	3.25	
Franklin	10-12-17	7_21_17	Ves	0.5	
Fremont	5-11-17	5-24-17	Yes	4.0	
Fremont	9-21-16	4-30-17	Yes	3.62	
Grundy	3-8-17	4-20-17	No	10.0	
Grundy	4-14-17	4-30-17	NO	7.0	
Hamilton	10-10-17	10-10-17	Ves	1.5	1.5
Hardin	4-16-17	5-24-17	Yes	4.0	3.5
Jaekson	5-2-16	5-24-17	Yes	5.5	4.0
Jackson	11 - 3 - 17	11- 5-17	Yes	0.5	
Jasper	5-26-17	6-4-17	Yes	0.75	0.30
Jefferson	5-19-17	5 94 17	Veg	2.0	5.0
Jones	11- 1-17	11- 6-17	Yes	4.5	
Louisa	5-10-17	11- 5-17	No	1.0	
Louisa	5-19-17	11- 5-17	Yes	4.0	
Lucas	10-23-16	3-23-17	Yes	11.0	
Marion	10-23-10	3-23-17	Vos	0.75	0.75
Monroe	7-18-17	7-24-17	Yes	7.0	
Monroe	5-21-17	6-11-17	No	6.5	
Monroe	2-26-17	3-23-17	Yes	3.5	
Monroe	4-26-17	6-29-17	Yes	9.0	
Muscatine	11-2-17	7 91 17	Yes	3.0	0.50
Palo Alto	12-13-16	12-22-16	Yes	0.62	0.00
Palo Alto	12-4-16	12-4-16	Yes	0.75	
Palo Alto	12- 4-16	12-13-16	Yes	0.5	
Polk	8-27-17	9-1-17	Yes	3.75	
Polk	4-19-17	6- 4-17	Yes	2.0	
Van Buren	9-18-17	10-19-17	Yes	1.0	0.75
Wapello	4-27-17	6-29-17	Yes	9.0	
Washington	2-6-17	3-23-17	Yes	11.5	
Washington	2-6-17	3-23-17	Yes	1.25	1.25
Washington	2-0-17	3-23-17	Ves	2.0	
Washington	2- 6-17	3-23-17	Yes	0.5	
Washington	2-6-17	3-23-17	Yes	1.5	
Total miles approved				167.65	19.75
Total miles rejected				41.00	0.00
matel segurate but Decel of					
Supervisors				208.65	19.76
Net increase in mileage of county roads				147.89	

ROAD DEPARTMENT.

SCHEDULE TEN.

SHOWING DAYS SPENT IN EACH COUNTY BY DISTRICT ENGINEERS.

County	Days	County	Days
Adata			
Adams	10	Johnson	14
ADDINS	10	Jones	6
Allamakee	11	Keokuk	15
Appanoose	12	Kossuth	9
Dentoa		Lee	14
Augubon	13	Linn	10
Disch Hawk	14	Louisa	39
DIBCK HBWK	10	Lucas	8
Dreiner	10	Lyon	13
Buenanan	9	Madison	7
Buena Vista	9	Mahaska	23
Butler	20	Marion	7
Calloun	16	Marshall	14
Carroll	17	Mills	16
Cass	21	Mitchell	9
Cerro Gordo	23	Monona	15
Cherokee	13	Monroe	23
Cedar	5	Montgomery	19
Chickasaw	15	Muscatine	12
Clark	10	O'Brien	6
Clay	11	Osceola	2
Clayton	11	Page	18
Clinton	12	Palo Alto	13
Crawford	10	Plymouth	14
Dallas	14	Pocabontes	19
Davis	10	Polk	17
Decatur	10	Pottewattamie	-99
Delaware	13	Poweshiek	6
Des Moines	14	Ringgold	4
Dickinson	11	Sac	6
Dubuque	17	Scott	8
Emmet	6	Shelby	11
Favette	6	Sioux	11
Floyd	13	Story	ò
Franklin	16	Tama	15
Fremont	9	Taylor	5
Greene	7	Union	0
Orundy	-	Van Buren	1
Cathrin	01	Wanello	-01
Hamilton	21	Worren	10
Hencock	10	Washington	14
Hardin	19	Wayno	11
Harrison	10	Wahstar	10
Hanry	15	Winnehago	10
Howard	10	Winneshtek	13
Humboldt	10	Woodbury	10
Identification and and and and and and and and and an	12	Worth	12
Your and the second sec	o o	Weight	2.
IOWA	5	Hangint	12
JBCKSON	12		
Jasper	7	Total	1,100
Jefferson	20	rotar	1,10

FEDERAL AID. Chapter VII.

The federal aid funds which Iowa will receive from the government have been apportioned among the various counties of the state on the basis of area. State funds from the automobile license fees have been provided to meet the state's share of the cost of federal aid road work. Twenty-one federal aid projects involving the improvement of 352 miles of road, have been outlined and data collected ready to submit to the federal authorities. Twelve of these projects have been submitted to the government and four have been approved by the government. Detailed surveys have been completed for seven projects, involving 134 miles. Surveys are in progress on four other projects. Plans and specifications for one project have been completed, submitted to the federal authorities, approved by them, and about onehalf of the project constructed.

State Law Accepting Federal Aid.

The Thirty-seventh General Assembly passed an act (chapter 249, Laws of the 37th G. A.) accepting the provisions of the iederal aid road law, appropriating funds to meet the state's share of the cost of road construction under the federal aid act, providing for the selection of a "comprehensive system" of highways reaching each county in the state, and authorizing the State Highway Commission to do the things necessary to comply with the federal aid act, and to secure the federal aid funds apportioned to the state of Iowa. This law provides that the federal aid funds apportioned to Iowa shall be divided among the various counties according to the relation which the area of each county bears to the area of the whole state, and that the county board of supervisors of each county shall make application to the State Highway Commission for that county's apportionment. Should any county board fail to make application on or before July 1, 1920, for its apportionment of federal aid funds, such county is presumed to have waived its right to such fund, and the amount previously apportioned to such county will be re-apportioned to some other county for use on federal aid projects.

Inter-County Road System.

The "comprehensive system" of highways provided for in the state law accepting federal aid, shall consist of not less than 2,000 miles and not more than 6,000 miles and shall include a part of the roads in each county of the state. This system has been named the "Inter-County Road System." The commission requested the co-operation of the county boards in selecting this inter-county road system and outlined the principles governing such selection, as follows:

(1) The system selected shall be comprehensive in that it shall serve to carry by the most direct routes the largest possible percentage of the traffic within the state.

(2) Each board should recommend a mileage of roads approximately equal to one-third the mileage of the present county road system in that county.

(3) Only the most important highways which will fit into the state wide system shall be selected.

(4) Special attention shall be given to the connections between county seats and with the roads selected by adjacent counties. At the state lines, connection should be made with the primary road systems of neighboring states.

Replies, designating the roads which in their judgment should form the inter-county roads, have been received from eightythree county boards. (Refer to Schedule Eleven.)

Since the law makes no provision for changing the intercounty road system after it has been approved, the commission has adopted the policy of not making final approval for any county until the proposed federal aid project for that county has been approved and the final plans prepared. Final approval has been made of the inter-county road system in Cerro Gordo County, and contests regarding connections between Jackson and Dubuque, Black Hawk and Grundy, Monroe and Wapello Counties have been investigated and settled.

Application for Federal Aid.

After having designated the inter-county road system, the board of supervisors shall, if they wish to secure federal aid,

make application to the commission for their county's allotment of such funds and designate the portion of the inter-county road system which they wish to improve, and the general character of the improvement proposed. Such applications have been received from fifty-nine counties. (Refer to Schedule Eleven.)

Funds Available.

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Under the federal aid road law the government appropriated \$75,000,000 in allotments covering a period of five years; \$5,-000,000 to become available the first year, \$10,000,000 the second year, \$15,000,000 the third year, \$20,000,000 the fourth year, and \$25,000,000 the fifth year. These funds are to be apportioned among the various states on the triple basis of area, population, and mileage of rural post road.

Iowa's allotment for the first year was \$146,175.60, and for the second year \$292,351.20, a total of \$438,526.80 for the first two years. This sum of federal money was available for Iowa when on July 4, 1917, the state law accepting federal aid became effective. The state treasurer, according to the provisions of the state law, set aside an equal amount (\$438,526.80) from the automobile license fees to meet the state's portion of the cost of federal aid road improvements. This state and federal fund amounting to \$877,053.60 now available is sufficient for allotments to nineteen counties. These nineteen projects have been outlined as hereinafter set forth.

The apportionment of federal aid funds for the third year; i. e., the fiscal year 1918-1919, has been certified by the secretary of agriculture. Iowa's share is \$434,653.61. This fund will become available July 1, 1918. It will be noted that the federal money appropriated for the third year (\$15,000,000) is the same as the sum of the appropriations for the first two years. Iowa's share for the third year is \$3,873.19 less than for the first two years. This difference is due to a falling off in Iowa's percentage of rural post roads.

Distribution of Federal Aid Funds Among the Counties.

The state law accepting federal aid provides that the funds allotted to Iowa by the federal government must be divided among the various counties of the state on the basis of area. Based on the first two years' allotments, Iowa's allotment for the five year period was estimated at \$2,192,540.35. This fund was apportioned to the counties as shown in Schedule No. 12. The allotment is approximate only, as any variation in the funds which Iowa receives from the government will cause a corresponding variation in the allotments to the counties.

Projects. (Refer to Schedule Thirteen.)

Preliminary examinations have been made, estimates prepared, traffic census taken, and other data collected, for twenty-one projects located in as many different counties. For the first nineteen projects the funds are now available and construction work will be started in 1918. For the other two projects, funds will become available July 1, 1918, and construction work will be started in the spring of 1919. Formal projects for twelve projects have been submitted to the federal authorities, four of which have been approved. Detailed surveys for seven projects, consisting of 134 miles, have been completed. Detailed plans and specifications for one project, 4.07 miles in length, have been completed, approved by the government, and the construction work about half finished. Detailed plans for two other projects, 30 miles in length, are nearly completed.

The total length of the twenty-one projects is 358.72 miles. The improvements proposed contemplate building to finished grade without hard surfacing, 241.1 miles; building to finished grade and graveling, 82.05 miles; building to finished grade and paving, 3.07 miles; re-shaping old grades and graveling, 29.40 miles; and re-shaping and paving, 3.10 miles. A detailed statement of each project follows:

Project No. 1, Cerro Gordo County. Length 4.07 miles. Located on the Mason City-Clear Lake Road. The improvement proposed consists of reshaping two miles that have been constructed to finished grade, constructing 2.07 miles to finished grade, and surfacing the entire length, 4.07 miles, with concrete pavement 16 ft. wide. The project statement was submitted to the federal authorities on July 17, 1917, and approved by them on August 2, 1917. The detailed survey was made by the county engineer, who also prepared the working plans. The letting was held on September 4, 1917, the total amount of the contract being \$90,-492.56. About one and one-half miles of the road has been completed.

Project No. 2, Woodbury County. Length 54.75 miles. Located on the Hawkeye Highway Cutoff and the Sioux City-Denison Cutoff. The project statement was submitted to the federal authorities on August 7th. The improvement consists of constructing 54.75 miles to finished grade, and surfacing one of these miles with a concrete pavement 16

ft. wide. Surveys were completed November 7th by co-operation of the county engineer and the commission.

Project No. 3, Jefferson County. Length 20.5 miles. Located on the Blue Grass Route. The project statement was submitted to the federal authorities on October 19th and approved by them November 17, 1917. Surveys are now under way, the county engineer and the highway commission co-operating. The project contemplates constructing 20.5 miles to finished grade. About two miles of this road will be relocated so as to avoid four crossings of the main line, double-track, C., B. & Q. Railroad.

Project No. 4, Delaware County. Length 15 miles. Located on the Hawkeye Highway from Manchester to Dyersville. The project statement was submitted to the federal authorities on November 30, 1917. The improvement proposed consists of grading and graveling the entire fifteen miles. One mile will be relocated so as to avoid a grade crossing of the main line Illinois Central Railroad. Surveys have been completed by co-operation of county engineer and commission.

Project No. 5, Buchanan County. Length 15.5 miles. Located on the Hawkeye Highway from Jesup to Winthrop. The project statement was submitted to the federal authorities on October 19, and approved by them on November 5, 1917. The project contemplates the grading and graveling of the entire 15.5 miles. About one mile will be relocated so as to avoid two crossings on the main line of the Illinois Central Railroad. Surveys have been completed by co-operation of the county engineer and commission.

Project No. 6, Ringgold County. Length 12 miles. Located on the Ayr Line Road and Waubonsie Trail, radiating out from Mount Ayr. The project statement was submitted to the federal authorities on September 25th and approved by them November 20, 1917. The improvement proposed consists of constructing the entire twelve miles to finished grade. Surveys are now in progress.

Project No. 7, Marion County. Length 18 miles. Radiating out in four directions from Knoxville. The project statement was submitted to the federal authorities on October 19th. The project contemplates constructing the eighteen miles to finished grade. Surveys have been completed by co-operation of the county engineer and the commission.

Project No. 8, Decatur County. Length 10.4 miles. Located on the Jefferson Highway from Lamoni east. The project statement was submitted to the federal authorities on October 31st. The improvement proposed consists of constructing the 10.4 miles to finished grade and eliminating one grade crossing on the C., B. & Q. Railroad.

Project No. 9, Johnson County. Length 11.1 miles. Located on the Red Ball Route and the River to River Road out of Iowa City. The project statement was submitted to the federal authorities on November 5th. The project contemplates constructing 10 miles of the Red Ball Route to finished-grade, and re-shaping and paving 1.1 mile of the Red Ball Route between Iowa City and Coralville. The surveys were completed by the county engineer. Project No. 10, Calhoun County. Length 18.4 miles. Located on the Rockwell City-Pomeroy Road and the Rockwell City-Lake City Road. The project statement has not yet been submitted to the federal authorities. The project contemplates the re-shaping and graveling of 18 miles.

Project No. 11, Warren County. Length 15.5 miles. Located on the Jefferson Highway. The project statement was submitted to the federal authorities on November 27th. The project contemplates constructing 15.5 miles to finished grade. Surveys were completed November 25th by co-operation of county engineer and commission.

Project No. 12, Dallas County. Length 16.25 miles. Located on the Perry-Adel Road. The project statement was submitted to the federal authorities on November 27th. The project contemplates grading and graveling the entire 16.25 miles. The survey is now in progress.

Project No. 13, Webster County. Length 16 miles. Located on the Hawkeye Highway and the Daniel Boone Trail radiating out from Fort Dodge. The project statement was submitted to the federal authorities on November 27th. The project contemplates constructing 5 miles to finished grade, re-shaping 11 miles that were built to finished grade by the county, and graveling the entire 16 miles. The survey is now in progress.

Project No. 14, Harrison County. Length 18.2 miles. Located on the Lincoln Highway between Missouri Valley and Woodbine. The project statement has not been submitted to the federal authorities. The project contemplates grading the entire 18.2 miles to finished grade and making numerous relocations to improve the grades and alignment.

Project No. 15, Mills County. Length 13 miles. Located between Glenwood and Hastings. The project statement has not yet been submitted to the federal authorities. The project contemplates constructing the entire 13 miles to finished grade.

Project No. 16, Montgomery County. Length 16 miles. Extends east from Red Oak to the county line. The project statement has not yet been submitted to the federal authorities. The improvement proposed consists of constructing the road to finished grade.

Project No. 17, Dubuque County. Length 12 miles. Located on the Military Road extending from Cascade toward Dubuque. The project statement has not yet been submitted to the federal authorities. The Improvement proposed consists of grading and graveling the entire 12 miles and eliminating one railroad grade crossing.

Project No. 18, Clinton County. Length 18.3 miles. Located on the Lincoln Highway. The project statement has not yet been submitted to the federal authorities. The improvement proposed consists of grading and graveling the entire 18.3 miles.

Project No. 19, Grundy County. Length 28.75 miles. Located on the Grundy Center-Eldora Road and on the Grundy Center-Dike-Cedar Falls

Road. The project statement has not yet been submitted to the federal authorities. The improvement proposed contemplates the grading of the entire project to finished grade.

Project No. 20, Monroe County. Length 9 miles. Located on the Airline Road from Albia east to the county line. The project statement has not yet been submitted to the federal authorities. The improvement proposed consists of making numerous relocations to improve the grade and alignment, and constructing the road to finished grade. Funds for this project will not be available until July 1, 1918.

Project No. 21, Jackson County. Length 11 miles. Located on the Maquoketa-Zwingle Road. Project statement has not yet been submitted to the federal authorities. The improvement proposed consists of making a number of relocations and building the road to finished grade. Funds for this project will not be available until July 1, 1918.

Traffic Census. (Refer to Schedule Fourteen.)

In connection with the preparation of data for the submission of federal aid projects to the government, a count was made of the traffic on each proposed project. An average of three traffic counting stations per project were established. The counts were taken at each station for a period of seven days, and from seven o'clock in the morning until nine o'clock in the evening. The traffic was classified according to motive power, as "motor driven," and "horse drawn," and was also classified according to its origin or object, as "farm," "interurban," "tourist," and "town."

"Motor driven" traffic includes all automobiles, motorcycles, motor trucks, tractors, steam engines, and all other vehicles propelled by their own power.

"Horse drawn" traffic includes all traffic by horses, and all other traffic not propelled by its own power and not included under "motor driven" traffic.

"Farm" traffic includes all farm to market and return traffic. This class is intended to cover all traffic between the farm and town.

"Interurban" traffic includes all traffic from one town to another; i. e., town to town travel. This traffic originates within one town and terminates in another. These towns may be neighboring or may be a considerable distance apart so long as they are located in this state.

"Tourist" traffic includes traffic which originates outside of the state or which originates within the state and is bound for points outside the state.

"Town" traffic is traffic which originates within a town, goes into the country, and then returns to the town whence it came.

The summaries of the traffic counts at forty-seven stations located in seventeen different counties show that on the average, 28.6% of the traffic is farm traffic, 46.9% is inter-urban traffic, 6.5% is tourist traffic, and 18.0% is town traffic. The data indicates that there was considerable variation in the classifications by the different enumerators, which resulted in wide variation in the data from individual stations. This variation would, however, be compensating to some extent, so that the average result should give a fairly accurate classification.

These traffic counts were taken on roads included in the intercounty system, nearly all of which is on the county road system. Two-thirds of this traffic originates in the towns and has nothing to do with farm-to-market travel. Less than one-third is farm-to-market travel. On the other hand the taxes for the construction and maintenance of these roads are raised principally from farm property. County road tax on farm property varies from two to four mills. County road taxes on town and city property vary from one-half mill to one and one-half mills. County road taxes on farm property are from one and threetenths to six times as great as on city and town property. Yet the town and city traffic, as shown by traffic counts made up to this time, on the main county roads is much greater than the farm traffic.

Other interesting data obtained from the traffic census is the high percentage of motor driven traffic and the great number of people traveling the roads. The averages for forty-seven stations show that eighty-six per cent of the traffic is motor driven traffic. The average traffic per day was 339 vehicles and 996 passengers.

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IOWA STATE HIGHWAY COMMISSION

SCHEDULE ELEVEN.

SHOWING COUNTIES THAT HAVE DESIGNATED THEIR INTER-COUNTY ROADS OR MADE APPLICATION FOR FEDERAL AID.

AdairAdaus	Inter-col roads design	Appliesti for fed sid	County	Inter-count roads designate	Application for feder aid
Adams Adams Adams Adams Adams Allamakee Allamakee Audubon Benton Benton Bremer Buchanan Buchanan Buchanan Carroll Cars Cerro Gordo Cherokee Cedar Chekasaw Clark Clary Clary Clary Clary Chayton Crawford Clinton Davie	Vor	Vor	Lafforson	Ves	Yes
Allamakee	Ves	Ver	Johnson	Ves	Yes
Appanoose Andubon Black Hawk Boone Bremer Buena Vista Butler Calhoun Carroll Carroll Cerro Gordo Cherokee Cedar Chekasaw Clark Clay Crawford Crawford	Ves	No	Lones	No	No
Aldobon	Yes	No	Keokuk	Yes	Yes
Benton Black Hawk Boone Bremer Buchanan Butler Calhoun Carroll Carrol Gordo Cass Cerro Gordo Cherokee Cedar Chekasaw Clayk Clayk Crawford Crawford	Ves	No	Kossuth	Yes	No
Black Hawk Boone Bremer Buchanan Buchanan Butler Calhoun Carroll Carroll Coss Cerro Gordo Cherokee Cedar Cherokee Cedar Clark Clay Clay Clay Clay Clay Corwford Claw Crawford Claw Corwford Claw	Ves	Vor	Tan	Ves	No
Boone	Vos	No	Linn	Ves	Yes
Bremer	Ves	No	Louisa	Yes	No -
Buchanan Buena Vista Calhoun Carroll Carso Cerro Gordo Cherokee Cedar Chickasaw Clark Clark Clay Clayton Crawford Crawford Clarkon Davis	Ves	Vos	Lucas	Yes	Yes
Buena Vista Butler Calhoun Carroll Cass Cerro Gordo Cherokee Cedar Chickasaw Clark Clark Clay Clayton Crawford Crawford Clanton Davis	Yes	Ves	Lyon	Yes	Yes
Butler	Yes	Ves	Madison	No	No
Calhoun Carroll Cass Cerro Gordo Cherokee Cedar Chickasaw Clark Clark Clay Clayton Crawford Crawford Crawford Clinton Davis	No	No	Mahaska	Yes	No
Carroll Carso Gordo Cherokee Cherokee Clark Clark Clay Clay ton Crawford Crawford Charton	Yes	Ves	Marion	Yes	Yes
Cass Cerro Gordo Cherokee Cedar Clakkasaw Clayk Clay Clayton Crawford Crawford Clanton	No	No	Marshall	Yes	No
Cerro Gordo Cherokee Cedar Chiekasaw Clark Clay Clayton Crawford Crawford Clatton Davis	Ves	No	Mitchell	Yes	Yes
Cherokee Cedar Chickasaw Clark Clay Clayton Crawford Crawford Clinton Dawls	Ves	Ves	Mills	Yes	Yes
Cedar Chicknsaw Clark Clay Clay Clayton Crawford Crawford Clinton Davis	Yes	No	Monona	Yes	Yes
Chickasaw Clark Clayton Crawford Crawford Davis	No	No	Monroe	Yes	Yes
Clark Clay Clayton Crawford Clinton Davis	Vog	Veg	Montgomery	Yes	Yes
Clay Clayton Crawford Clinton	Ves	Ves	Muscatine	Yes	Yes
Clayton Crawford Clinton	Yes	No	O'Brien	Yes	No
Crawford	Yes	Yes	Osceola	Yes	No
Clinton	No	No	Page	No	No
Davis	Yes	Yes	Palo Alto	Yes	Yes
LAND A CONTRACTOR	Yes	No	Plymouth	Yes	Yes
Dallas	Yes	Yes	Pocahontas	Yes	No
Decatur	Yes	Yes	Polk	No	No
Delaware	Yes	Yes	Pottawattamie	No	No
Des Moines	Yes	Yes	Poweshiek	Yes	No
Diekinson	Yes	Yes	Ringgold	Yes	Yes
Dubuque	Yes	Yes	Sac	Yes	No
Emmet	Yes	Yes	Scott	Yes	Yes
Fayette	Yes	Yes	Shelby	No	Yes
Floyd	Yes	Yes	Sioux	Yes	Yes
Franklin	Yes	Yes	Story	No	No
Fremont	Yes	No	Tama	No	NO
Greene	No	No	Taylor	NO	res
Grundy	Yes	Yes	Union	NO	NO
Guthrie	Yes	Yes	Van Buren	Yes	Yes
Hamilton	No	No	Wapello	Yes	NO
Hancock	Yes	Yes	Warren	Yes	Yes
Hardin	Yes	No	Washington	Yes	NO
Harrison	Yes	Yes	wayne	Yes	Yes
Henry	Yes	Yes	Webster	res	Tes
Howard	Yes	Yes	Winnebago	Yes	res
Humboldt	Yes	NO	Winnesmek	Yes	Yan
In	Yes	Yes	Woodbury	Les	Yes
lowa	Yes	NO	Worth	Yes	Yes
JACKSON	Yes	Yes	weight	1.68	1.68

FEDERAL AID

SCHEDULE TWELVE.

SHOWING APPROXIMATE ALLOTMENTS OF FUNDS TO EACH COUNTY.

		Approxima	te Allotment
County	Area in Sq. Miles	Federal Aid Fund	Federal-County Co operative Road Fund
Adair	579	Q 00 075 65	\$ 44 751 80
Adams	497	16 674 95	32 348 70
Allamakee	671	06 000 55	59 405 10
DDanoose	619	20,202.00	40 065 20
Audubon	442	17 800 15	24 505 50
Benton	710	97 802 00	55 607 90
Black Hawk	5/6/1	22 102 30	44 204 60
Boone	578	22,570,90	45,141,80
Bremer	434	16,947,70	23, 895, 40
Buchanan	567	22,141.35	44,282,70
Buena Vista	580	22,649.00	45,298.00
Butler	577	22,531.85	45,063.70
Calhoun	571	22,297.55	44,595,10
Carroll	572	22,336.60	44,673.20
Cass	564	22,024.20	44,048.40
Jedar	578	22,570.90	45,141.80
Jerro Gordo	575	22,453.75	44,907.50
Cherokee	573	22,875.65	44,751.30
DICKASAW	497	19,407.85	38,815.70
Clarke	428	16,713.40	33,426.80
Clay	573	22,375.65	44,751.30
Jayton	790	30,849.50	61,699.00
Cunton	709	27,686.45	55,372.90
Grawford	715	27,920.75	55,841.50
Jallas	592	23,117.60	46,235.20
Davis	502	19,603.10	39,206.20
Jecatur	533	20,813.65	41,627.30
Dog Moines	571	22,297.50	44,000,10
Dickinson	9.20	10, (02.40	22,000,10
Dubuqua	616	24 054 90	48 100 00
Fmmot	417	18 009 05	20 607 70
Favette	794	05 979 90	58 544 40
Floyd	405	10 290 75	28 659 50
Franklin	578	22 570 90	45 141 80
Fremont	522	20, 384, 10	40.768.20
Freene	576	22,492,80	44,985,60
Grundy	501	19,564,05	39,128,10
Juthrie	597	23,312.85	46,625,70
Hamilton	570	22,258.50	44,517,00
Hancock	573	22,375.65	44,751.30
Henry	427	16,674.35	33,348.70
Harrison	712	27,803.60	55,607.20
Hardin	569	22,219.45	44,438.90
Iumboldt	434	16,947.70	33,895.40
Howard	468	18,275.40	36,550.80
08	430	16,791.50	33,583.00
lookaan	583	22,766.15	45,532.30
ACKSOII	649	25,843.45	50,686.90
laffareon	180	16 000.50	57,013.00
lohnson	401	02 SEO FE	33,001.10
Ionas	611	20,809.00	44,199,00
Keekuk	579	99 570 00	45 141 90
Cosenth	074	28 084 70	76 069 40
Loa	545	01 000 05	49 584 50
Linn	717	27,998,35	55 997 70
Louisa	426	16,635,30	33,270,60
Lucas	432	16,869,60	33,739,20
Lyon	582	22,727.10	45,451,20
Madison	563	21,965.15	43,970,30
Mahaska	575	22,453.75	44,907.50
Marion	577	22,531.85	45,063.70
Marshall	572	22,336.60	44,673.20
Mills	447	17,455.35	34,910.70
Mitchell	463	18,080.15	36,160.30
Monona	708	27,647.40	55,294.80
Monroe	433	16,908.65	33,817.30
Montgomary	424	16,557.20	33,114,40

10WA STATE HIGHWAY COMMISSION

SCHEDULE TWELVE-Continued.

SHOWING APPROXIMATE ALLOTMENTS OF FUNDS TO EACH COUNTY.

		Approxima	te Allotment
County	Area in Sq. Miles	Federal Aid Fund	Federal-County Co- operative Road Fund
Muscatine	455 369 305 572 861 590 596 596 580 580 580 580 580 580 580 580 576 470 780 567 780 567 589 720 534 427 490 438 571 559 524 379 686 878 379 8878	$\begin{array}{c} 17, 767.75\\ 22, 219.45\\ 15, 424.75\\ 20, 735.35\\ 22, 336.60\\ 33, 622.06\\ 22, 649.00\\ 23, 273.80\\ 37, 409.90\\ 22, 649.00\\ 21, 687.00\\ 22, 492.80\\ 33, 550\\ 22, 649.00\\ 21, 687.00\\ 22, 492.80\\ 33, 550\\ 22, 678.00\\ 22, 141.35\\ 23, 000.45\\ 28, 116.00\\ 20, 852.70\\ 16, 674.25\\ 19, 134.50\\ 17, 103.90\\ 22, 927.55\\ 21, 828.95\\ 21, 828.95\\ 20, 462.20\\ 28, 233.15\\ 15, 580.95\\ 26, 788.30\\ 34, 285.90\\ 15, 580.95\\ 26, 788.30\\ 34, 285.90\\ 15, 580.95\\ 29, 570.90\\ \end{array}$	$\begin{array}{c} 35, 535, 50\\ 44, 438, 90\\ 30, 849, 50\\ 44, 471, 10\\ 44, 673, 20\\ 67, 244, 10\\ 45, 208, 00\\ 46, 547, 60\\ 7, 244, 10\\ 45, 208, 00\\ 46, 547, 60\\ 74, 819, 80\\ 45, 208, 00\\ 44, 2174, 60\\ 44, 295, 60\\ 36, 707, 00\\ 59, 356, 60\\ 36, 707, 00\\ 59, 356, 00\\ 44, 282, 70\\ 44, 985, 60\\ 36, 707, 00\\ 59, 356, 00\\ 44, 282, 70\\ 44, 282, 70\\ 44, 282, 70\\ 45, 356, 10\\ 44, 505, 10\\ 43, 348, 70\\ 38, 209, 00\\ 33, 348, 70\\ 38, 209, 00\\ 34, 207, 80\\ 44, 505, 10\\ 45, 505, 10\\ 40, 924, 40\\ 56, 406, 39\\ 31, 161, 90\\ 53, 576, 60\\ 68, 571, 80\\ 31, 161, 90\\ 31, 161, 90\\ 45, 141, 80\\ \end{array}$
Wright	56.147	\$ 2,192,540.35	\$ 4,385,080.70



A completed section of the concrete pavement on the Mason City-Clear Lake Road. This pavement is sixteen feet wide and is reinforced. Note the smooth uniform appearance of the surface, produced by the roller and belt method of finishing. The earth shoulders have not been built up even with the pavement slab, nor have the side ditches been properly shaped and finished. The mixer is shown in the distance.



Construction view of concrete pavement construction on Federal Ald Project No. 1. located between Mason City and Clear Lake, Cerro Gordo county. View shows finishing concrete by the roller method. After the concrete has been struck off to grade and cross-section, a light roller about six feet in length is moved back and forth across the pavement, smoothing up the surface and working out the excess water. Immediately following the rolling, the surface of the pavement is floated with an ordinary belt, about ten inches wide and extending across the full width of the pavement. The belt is worked back and forth across the pavement by two workmen in a manner similar to the use of a cross cut saw. At each crosswise motion, the belt is worked ahead slightly.



View of finished section of the road to Camp Dodge. On each side of the 20-foot brick pavement, there is provided a six-foot gravel shoulder, thus providing opportunity to avoid blockading the high speed traffic on the pavement by slow moving vehicles and disabled cars.



Providing safety for traffic on high fills is one of the necessary features of careful road building. The view shows standard wooden guard rails. The posts are set 3½ feet into the ground. No posts less than six inches in diameter are used. Such safety provisions have been greatly neglected, but must receive more attention in the future. Plans and specifications for all federal aid work require guard rails on all fills, six feet in height or more, and at all other points where it is necessary to safeguard traffic.



Gravel road construction No. 1: Gravel has been dumped on the road, but has not yet been spread, harrowed or reshaped. It has too often been without having been properly spread. This method inevitably results in a wavy, rough and unsatisfactory road. Gravel dumped and left on the should always be indicated by red lights. A road should be built to finished grade before any gravel is placed. The crown should be removed from the smooth and free from ruts or other depressions.



Gravel road construction No. 2: Spreading the gravel with a blade grader gives a uniform thickness and distribution of material.



Gravel road construction No. 3: After the gravel has been spread to uniform thickness, it should be thoroughly mixed by harrowing. The view shows a spring tooth harrow in use which has been found very satisfactory for this work. This harrowing locates and brings to the surface any large stones, which are then easily removed from the roadway. The harrow should be of such weight and the teeth of such length as to reach entirely through and stir all parts of the layer of gravel. This operation also mixes with the gravel, earth from the roadbed, providing binder and hastening the compacting of the gravel.



Gravel road construction No. 4: Reshaping the grave. with blade grader after the harrowing has been completed. This produces a smooth surface and a uniform thickness of the gravel. View shows a roller drawing the blade grader, thus accomplishing a double purpose of providing power for the grader and of alding the compacting of the gravel. An ordinary tractor with the lugs removed is a good machine for this work. After a gravel road has progressed to the point shown, it should be very carefully maintained by patrol maintenance in order to prevent the formation of ruts and holes. This maintenance is exceedingly vital for the first several months and should never at any time, be entirely dispensed with.

FEDERAL AID

		Project	Statement			Type of D	mprovement	
County	Project No.	Submitted Fed. Gov.	Approved Fed. Gov.	dfyngl fengff sollni	Finished Frade- Finished	9qnds-9M	Gravel— miles	Parement- Balim
Cerro Gordo	01	21-17-7	8-2-17	4.07	2.0	2.0		4.07
belavare Delavare Buchanan Rungeold	0 4 10 Q I	11-91-01 11-30-17 10-19-17 10-19-17	11-16-17	99999 8999	20.5 15.0 12.0		15.0	
Detatut Detatur Johann	- 00 00 g	10-21-17		10.40	10.40	1.1		1.1
Warron Warron Dullas - Webter - Harrison	80282	21-25-11 21-25-11 21-25-11		1975 1975 1975 1975 1975 1975 1975 1975	16.5 16.25 5.0 18.25	11.0	16.25 16.05	
Mults Andread	82228			0.000 0.0000 0.0000 0.0000 0.000000	0000120 0999880 0999880		15.3	
Jaekson	21			16.0	16.0			
Total	(Articleson a			518-55 51	329.15	32.1	111.45	6.17

SCHEDULE THIRTEEN.

SCHEDULE FOURTEEN.

PROJECTS.
AIL
FEDERAL
NO
DATA
TRAFFIC
OF
SUMMARY

		3	Total	Average	Class	Leation	Accord	IN SH				Accordi	ng to			1
	3	ai) a	Per 8	Tation	Motor	Driven	Horse	Drawn	Far	m	Interu	rban	TuoT	ist	TONT	0.0
County	Project No.	Xo. of cours	No. of rehicles	No. of pass'g'rs	No. of vehicles	Per cent	To'.oV selitiev	Per cent	Vo. of vehicles	Per cent	No. of vehicles	Per cent	Yo. of vehicles	Per cent	No. of vehicles	Per cent
Cerro Gordo	- 31 6 3 6 3 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4 6 9 4	* + + + + + + + + + + + + + + + + + + +	201 201 201 201 201 201 201 201 201 201	3,687 668 668 1,480 1,480 857 857 857 857 857 857 856 726 1,068 1,068 1,068 1,068 1,068 7726 7726 7726	061 1187 1187 1187 1187 203 203 203 205 216 216 216 216 216 216 216 216 216 216	88888888888888888888888888888888888888	12882838282828283244 128888383828282833244	160 160 160 160 160 160 160 160 160 160	88588585858585838888888888888888888888	3.9 37.0 39.0 39.0 39.0 45.9 44.5 54.8 54.8 54.8 54.8 54.5 54.5 31.9 31.9 31.9	902 47 1100 1100 111 111 113 8 8 8 8 8 8 113 113 113 113	85.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5 8.5	814698988 889885 88985 89998 80998 8009 8009 8009 8009 8009 8009 8009 8000 8009 80000 80000 80000 80000 80000 80000 8000000	25.2 25.2 25.7 25.7 25.7 25.7 25.7 25.7	88888888888888888888888888888888888888	13.0 7.3 7.3 7.3 7.3 7.3 7.3 7.3 7.3 7.3 7.3
Average per day		·	339	906	292	86.1	47	13.9	16	28.6	159	46.9	81	6.5	19	18.0
Total No. of stations		14	-										-			

IOWA STATE HIGHWAY COMMISSION

WORK OF THE DISTRICT ENGINEERS Chapter VIII

The five district engineers have spent 1,169 days in the various counties assisting in the county and township work. They have attended forty-four lettings for the improvement of 643.36 miles of road costing \$1,080,395.89; one hundred thirty-nine lettings for the construction of 2,359 bridges costing \$2,630,938.00, and eighty lettings for bridge and road material. The profile for 899.5 miles of road have been examined in the field to determine the reasonableness of the improvement contemplated. Twenty-one federal aid road projects, involving 352 miles of road, have been investigated. Sixty-three complaints regarding the condition of the highways have been investigated, and a number of meetings have been held for the purpose of explaining the annual report blanks to the county engineers.

The number of days spent in the field are classified as follows:

	1915	1916	1917
Examination of bridge sites	146	84	85
Attending bridge lettings	155	138	101
Attending material lettings	67	79	67
Inspection and supervision of bridge work	341	163	203
Examination of emergency work	88	19	13
Spocial assignments	200	8	
Attending road lattings	09	44	90
Accelering road lettings	190	100	105
Approval of grade lines	100	100	120
inspection and supervision of road work	250	307	00
Inspection proposed changes in county roads	15	37	51
Investigation of complaints	120	77	63
Explanation of yearly report blanks	43	.93	56
Railroad crossings			35
Federal Aid road work		1000	139
Unclassified	86	182	111
Total	1.641	1.177	1,169
Deduct time of engineers road department	304		
(Refer to Schedule Number Ten)	1,337	1,177	1,169

The classification given for 1915 includes not only the field work of the five district engineers, but also the field work of the

engineers of the road department. The classification given for 1916 and 1917 includes only the work of the district engineers. The number of days reported for 1915 (1,337) includes thirteen months' time. The average per month was 102.85 days. The number of days reported for 1916 and 1917 includes twelve months each. The average per month was 98.09 days for 1916, and 97.42 days for 1917.

In the thirteen months included in the 1915 report, the five district engineers traveled by rail 108,344 miles, or 8,334 miles per month. In the twelve months included in the 1916 report they traveled 100,374 miles, or 8,365 miles per month. In the twelve months included in the 1917 report they traveled 108,044 miles, or 9,004 miles per month. The average travel for each day spent in the field was eighty-one miles in 1915, eighty-five miles in 1916, and ninety-two miles in 1917.

Summary of Field Work for Each District Engineer.

First District: Engineer C. Coykendall has attended sixteen material lettings, thirty bridge lettings for 618 structures costing \$799,618.00; twelve road lettings for 153.9 miles of road costing \$445,179.22; investigated five federal aid projects; investigated nine complaints; spent thirty-two days in taking field measurements for bridges; twenty-one days on field examination of road profiles, forty-two days in the supervision and inspection of bridges and road work. A total of 222 days has been spent in the field, requiring travel amounting to 24,042 miles.

Second District: Engineer W. H. Root has attended seventeen material lettings, twenty-four bridge lettings for 291 structures costing \$325,797.00; six road lettings for 37.95 miles of road costing \$138,365.06; investigated four federal aid projects; investigated five complaints; spent twenty-seven days taking field measurements for bridges; twenty-one days on field examination of road profiles, and sixty-seven days in the supervision and inspection of bridge and road work. A total of 248 days has been spent in the field, requiring travel amounting to 21,959 miles.

Third District: Engineer W. F. Beard has attended thirteen material lettings, twenty-five bridge lettings for 928 structures costing \$720,421.00; seventeen road lettings for 426.23 miles of road costing \$440,662.00; investigated three federal aid projects; investigated six complaints; spent eleven days taking field measurements for bridges; forty-one days in field examination of road profiles, and forty-four days in the inspection and supervision of bridge and road work. A total of 215 days has been spent in the field, requiring travel amounting to 22,590 miles.

Fourth District: Engineer L. M. Martin has attended twentyone material lettings, twenty-one bridge lettings for 210 structures costing \$412,253.00; two road lettings for four miles of road costing \$9,762.00; investigated five federal aid projects; investigated seventeen complaints; spent five days taking field measurements for bridges; ten days on field inspection of road profiles, and seventy days in the supervision and inspection of road and bridge work. A total of 231 days has been spent in the field, requiring travel amounting to 22,195 miles.

Fifth District: Engineer J. S. Morrison has attended thirteen material lettings, twenty bridge lettings for 312 structures costing \$372,850.00; seven road lettings for 21.28 miles costing \$46,-226.00; investigated four federal aid projects; investigated twenty-six complaints; spent ten days in taking field measurements for bridges; thirty-two days in field examination of road profiles, and sixty-two days in the supervision and inspection of road and bridge work. A total of 253 days has been spent in the field, requiring travel amounting to 17,259 miles.

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ROADS AT STATE INSTITUTIONS.

Chapter IX.

In 1914 the board of control, acting under the authority vested in them by the 34th General Assembly, commenced on a plan of improvement of roads at the various state institutions; a plan involving permanent grading and where possible, graveling and paving.

The work started in 1914, has been extended from year to year and it is now anticipated that during the next two or three years, the roads at each and every institution will have received attention.

Iowa State College, Ames.

During the month of June, a heavy flood destroyed nearly 150 feet of heavy fill on the North Campus Road which was repaired by day labor at a cost of approximately \$500.00.

During the period covered by this report, the following work has been done:

Grading one-half (1/2) mile of road.

1,626	cubic	yards	at	25c	 	 	 	 	 	 .\$406.50
Overh	aul .				 	 	 	 	 	 . 36.24

\$442.74

Later, this same one-half mile was graveled by the patrolman who cares for the roads at the institution.

All the roads at this institution, except one-quarter mile, have been brought to a permanent grade and the greater part of the same has been graveled.

State Hospital, Cherokee.

A contract for grading the south mile was let to Geo. W. Condon, approximately 30,000 cu. yds. at 25.4c per cu. yd. All work was completed but moving about 5,000 cubic yards which will be finished the coming season.

The improvement of this road which commences at the city limits and runs west one mile, not only straightens out a bad, dangerous curve, but reduces the grade from 12% to 6%.

In addition to this, one-quarter $(\frac{1}{4})$ mile on the north was graded by the county in conjunction with some other county grading. On this one-quarter mile, 1,868 cubic yards were moved at a cost of 25c per cu. yd. or a total cost of \$747.25. When the work now under way is completed, the entire system of three and one-half $(3\frac{1}{2})$ miles will have been brought to a permanent grade.

Three (3) culverts were built by day labor at a total cost of \$918.55, and at a unit cost of about \$17.00 per cu. yd.

Colony for Epileptics, Woodward.

The road system at this institution comprises about five and one-half $(51/_2)$ miles, all of which has been brought to permanent grade during previous years.

Graveling continued this season until all but three-fourths of a mile has been covered with the first course of gravel; 3,600 cu. yds. of gravel were placed by the men and teams from the farm. These men were convicts from the prison at Ft. Madison and in this work of graveling, produced very satisfactory results. The gravel was obtained from a pit located on the state farm and was placed and rolled at a cost of \$3,163.15, or at a cost of about 88c per cubic yard. The roads at this institution are cared for by a patrolman who devotes his entire time to this work.

State Hospital, Mt. Pleasant.

The work on the roads at this institution has been done entirely by day labor under the supervision of Ralph Hueligs, steward of the institution, and results produced have been very satisfactory.

Four (4) concrete culverts, totaling 60 cubic yards, were built at a total cost of \$980.43 or a unit cost of \$16.36 per cu. yd. which was under the engineer's estimate. Only a small amount of grading was done, owing to the late start but this will be com-

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IOWA STATE HIGHWAY COMMISSION

pleted in the coming season. In all, \$453.24 was spent in day labor, grading.

State Penitentiary, Ft. Madison.

At this institution by the consent of the board of control, an arrangement was made with the warden whereby the improvements planned were made by the inmates of the institution for a sum equal to the engineer's estimate. This work involved moving approximately 5,000 cubic yards of earth and building one (1) 7x9 cattle pass and one (1) 4 ft. x 4 ft. hog pass, in all approximately 80 cubic yards of concrete. At the present time, only the concrete structures have been completed.

The sum appropriated for this work was \$2,700.00 of which amount \$769.88 has been paid.

State Hospital, Independence.

A contract for grading two (2) miles of road was let to Jack Brown, a contractor. Nine thousand six hundred and ninetythree cubic yards were moved at a cost of 29c per cubic yard, at a total cost of\$2,811.27.

A contract for building thirteen (13) concrete culverts was let to Frank Rheinhold.

155.9 cu. yds	s. of	concrete :	at \$16.5	0 per	cubic	yard	\$ 2572.35
Engineering	and	Miscella	neous .				 208.73
							 anoshi ana

Total amount spent\$5592.35

lowa Soldiers' Home, Marshalltown.

At this institution, the state legislature appropriated the following sums for improvements:

For building 10 ft.x 14 ft. concrete dam and culvert\$3,500.00 For paving and sewer assessment, Summit Street 4,000.00

A contract for the former was let to the Ingersoll-Staufer Engineering Company, of Marshalltown, and a contract for the latter let to the Western Construction Company, of Sioux City, who at that time were under contract with the city of Marshalltown to pave a portion of the city streets.

Distribution of Cost of Paving.

1012 lin. feet of	curb at 45c		455.40
1538.33 sq. yds.	paving at \$	1.57	2,399.48

ROADS AT STATE INSTITUTIONS

122 ft. special curb at 60c	73.20
294.41 sq. yd. paving inside ground \$1.57	462.22
Reinforcing steel	143.52
Sewer Assessment	426.71
Engineering paid city of Marshalltown	9.47

\$4,000.00

Distribution of Cost of Dam and Culvert.

Contra	et prie	e on	dam	and	cul	vert		 	 	 • •	 	 	 \$3,250.00
cubi	c yards	s extra	a con	crete	at	\$20.0	0	 	 	 • •	 	 	 60.00
Back :	filling							 	 	 	 	 	 190.00

\$3,500.00

In addition to the above, the sum of \$525.85 was spent for grading purposes and for raising dam one foot, \$59.62.

Summary of Expenditures.

Dam an	nd cu	ilvert	 	 		a.	1.5			 		 -				 				 \$3,500.00
Paving	and	sewer	 • •	 	 							 		 				 		 4,000.00
Grading			 	 							• •				•					525.85
Raising	dam		 	 	 							 		 		 	4	 		 59.62

\$8,085.47

Boys' Reformatory, Eldora.

At this institution the roads are graded and maintained in excellent condition, under the direct supervision of Mr. Illif, who with the abundance of help available, has kept the roads in a condition worthy of considerable comment.

This season the main road in front of the institution grounds, as well as part of the inner drives, was given a coat of oil which cost, together with the engineering expense, the sum of \$652.48.

Small amounts have been spent from the general maintenance fund at various institutions for dragging and repairs, but ordinarily the roads are maintained by the institutions themselves without charge. At Iowa State College and the colony for epileptics at Woodward, the roads are cared for by patrolmen who devote their entire time to this work with the result that the roads are kept in excellent condition. It is the intention that as fast as the roads at other institutions are brought to permanent grade and where the mileage is large enough to warrant, this same patrol system will be adopted.

EXPERIMENTS, TESTS AND TECHNICAL IN-VESTIGATIONS.

Chapter X.

The testing work for the highway commission is done in the laboratories of the Iowa State College largely by members of the experiment station staff. No charge is made by the experiment station for this work. Samples of materials for use on county road and bridge work sent to the commission for examination are tested and a report made as to the compliance with commission specifications and the requirements of standard practice. The following schedule shows the number of tests of various kinds of material made for the commission during the year:

Paints	
Steel reinforcing15	
Cement 9	
Road oils	
Culvert metals 5	
Stone 7	
Gravel	
Sand 6	
Concrete paving 1	
Asphalt cement10	
Tars	
Creosote oil 5	
Brick 3	

Experimental Work.

Treatment was continued on several stretches of graveled and oiled roads on which work had been done previously. An examination was made of several pieces of road constructed by various counties.

Experimental Road at Spirit Lake.

The gravel road in Dickinson County connecting Spirit Lake and Arnold's Park, and completed in 1916, was treated to two applications of No. 2 Mexican road oil about September 1, 1917. An engineer from the highway commission was in charge of the work and the cost was borne jointly by Dickinson County and the experiment station of the Iowa State College. Before applying the oil, all loose gravel was pushed off the road with a light blade grader. The oil was applied at the rate of $\frac{1}{2}$ gallon per square yard in two applications of $\frac{1}{4}$ gallon each and at a temperature of about 90 degrees centigrade. An effort was made to keep traffic off the road until the oil could be covered with gravel. The oil was distributed with a pressure distributor with a heater attachment belonging to the Experiment Station of the Iowa State College.

The gravel surface, before application of the oil, had become worn and rutted to such an extent as to indicate that the traffic over this road is too heavy for a gravel surface.

The analysis of a sample from the car of Mexican Road Oil used on the experimental road at Spirit Lake is as follows:

Specific gravity at 77 degrees F	960
Loss on heating 5 hrs. at 163 degrees C	11.17%
Character of above residueVo	ery sticky
Fixed carbon	7.77
Ash	Nil
Bitumen ins. in naphtha	15.03
Flash point (open cup)101 (legrees C.
Fire point (open cup)115 (legrees C.

Road Oiling.

About twenty counties and a large number of cities and small towns oiled a considerable mileage of earth roads during 1917. Benton County oiled nearly seventy miles of earth road; Cedar County, 40 miles; Clinton County, 17 miles; Jones County, 26 miles; Lee County, 12 miles; Louisa County, 18 miles; Muscatine County, 5 miles; Poweshiek County, 8 miles; Scott County, 17 miles; and other counties smaller stretches.

The cost of this work as reported, ranges from about two hundred to six hundred dollars per mile, the cost varying with the length of road oiled, and the width of surface treated, the length of haul, and the method of application.

FINANCIAL REPORT

FINANCIAL REPORT. Chapter XI.—Fiscal Year July 1, 1916, to June 30, 1917.

The total expenditures for maintenance of the State Highway Commission for the fiscal year beginning July 1, 1916, and ending June 30, 1917, was \$89,786.84. This is \$1,034.50 less than the amount expended for like purpose during the previous fiscal year.

Schedule No. 28 gives detailed comparison of expenditures for the years ending June 30, 1915, June 30, 1916, and June 30, 1917. An examination of this schedule shows a noticeable increase in the cost of maintaining the department between the years ending June 30, 1915, and June 30, 1916, largely on account of legislative acts placing new duties on the department, as for instance, the defense of bridge patent suits, making surveys and plans for dangerous railroad crossings and making survey and report on Iowa lakes. The activities of the Commission during the last fiscal year ended June 30, 1917, were in general the same as they were during the previous fiscal year and it will be noted that there was very little difference in the cost of maintaining and operating the department during said two years.

It is probable that another marked change will be noted in the year ending June 30, 1918, as the 37th General Assembly under provisions of Chapter 249 of its acts, placed additional duties upon the Highway Commission in the matter of administering the Federal Aid law, but the fact that the Commission and its staff is now quite well organized will make it possible to keep the cost of engineering in connection with construction of Federal Aid projects at the minimum.

Auditing Claims.

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Under an act of the 36th General Assembly all bills for salaries and expenses of the State Highway Commission are audited by the State Board of Audit in the same manner as bills of other state departments. All bills filed against the State Highway Commission are audited in the office of said Commission, after which the vouchers in triplicate are prepared covering said bills and same are submitted to the Commission for approval. After approval by the Commission, two copies of the vouchers and the original claims or expense books are forwarded to the State Board of Audit. When approved by the Board of Audit the original voucher is filed with the Auditor of State for payment. All funds appropriated for the maintenance of the State Highway Commission are deposited with the Treasurer of State and disbursed on warrants drawn by the Auditor of State.

Practically all supplies and equipment purchased for the use of the Commission are ordered through the Purchasing Department of the Iowa State College, the Secretary of the Executive Council or after securing competitive bids from responsible parties.

Under the instructions of the state document editor, only a summary of the Commission's expenditures is published in this report, as a full, detailed and itemized account appears in the published report of the Executive Council.

SALARIES AND EXPENSES.

SCHEDULE FIFTEEN. SUMMARY OF EXPENDITURES.

	Salar Per l	ry or Diem	Ехре	enses	Total
Commissioners Administrative Department Administrative Department Bridge Department Bridge Department Briting Department Pirst District engineer Second District engineer Fourth District engineer Fourth District engineer Tests and experimental work State institution roads Railroad crossing surveys and plans. Lake bed survey and report. Drainage Department Equipment and supplies, all departments	\$ 1, 11, 10, 8, 12, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2	930.00 3 969.06 232.50 513.27 553.06 000.00 000.00 000.00 000.00 900.00 900.00 900.00 900.00 900.00 800.00 800.00 814.19 .833.36	\$ 1. 1.	909.63 510.72 907.39 625.75 52.19 710.26 871.41 020.37 032.60 751.87 461.14 32.37 276.58 48.95	\$ $\begin{array}{c} 2,839.63\\ 12,479.78\\ 11,139.89\\ 9,139.02\\ 12,633.25\\ 2,710.26\\ 2,851.41\\ 3,020.37\\ 3,632.60\\ 2,751.87\\ 3,886.58\\ 2,032.37\\ 2,076.58\\ 4,814.19\\ 882.31\\ 13,476.73\end{array}$
Total	\$ 68,	098.88	\$ 8,	211.23	\$ 89,786.84

IOWA STATE HIGHWAY COMMISSION

SCHEDULE SIXTEEN.

COMMISSIONERS.

		F	Per Diem		Expenses	1	Fotal
J.	W. Holden, Chairman	\$	1,020.00*	10	373.72* 128.25	8	1,393.72
H.	C. Beard		910.00		397.56		1,307.56
	Total	8	1,930.00	\$	909.63	\$	2,839.63

•Of this amount \$220.00 for per dlem and \$82.67 for expenses was earned prior to July 1, 1916 or during previous fiscal year.

SCHEDULE SEVENTEEN.

ADMINISTRATIVE DEPARTMENT.

	Employment	Salary	Expense	Total
Thos. H. MacDonald F. W. Parrott. L. A. Wilkinson, Sr J. W. Eichinger. Annie Laurie Bowen Thora Taliman Maude Spence Anna S. Holden A. S. Miller. Extra help Extra help. Extra help.	Chief engineer Chief clerk Accountant, 3 mo Bulletin editor Clerk (11 mos.). Stenographer Stenographer Stenographer (extra) Stenographer (extra) Asst. engineer, 2½ mo Stenographie Mailing bulletin Miscellaneous	\$ 3,600.00 499.98 2,000.00 825.00 840.00 840.00 520.00 277.55 250.00 86.23 164.66 65.64	\$ 273.00 71.84 161.62 2.48 1.78	\$ 3,873.00 2,071.84 499.98 2,161.02 825.00 842.48 840.00 520.00 277.55 251.78 86.23 164.66 65.64
Total		\$ 11,969.06	\$ 510.72	\$ 12,479.78

SCHEDULE EIGHTEEN.

ROAD DEPARTMENT.

	Employment	Salary	Expense	Total
F. R. White J. S. Dodds W. E. Jones L. S. Gates A. S. Miller O. W. Crowley H. S. Leicht S. A. Schackle Anne Vanderlinden	Road engineer. Asst. road engineer. Asst. road engineer. Asst. engineer, 11% mo. Asst. engineer, 1 mo. Asst. engineer. Asst. engineer. Asst. engineer. Stenographer	\$ 3,000.00 2,100.00 1,900.00 1,458.33 100.00 550.00 104.17 1,020.00	\$ 444.16 288.78 120.78 14.64 39.03	\$ 3,444.15 2,388.78 2,020.78 1,472.97 100.00 39.03 550.00 104.17 1,020.00
Total		\$ 10,232.50	\$ 907.39	\$ 11,139.89

FINANCIAL REPORT

SCHEDULE NINETEEN.

BRIDGE DEPARTMENT.

	Employment		Salary	3	Expense		Total
J. H. Ames E. F. Kelley J. E. Kirkham E. W. Blumenschein Mrs. J. A. Paulsen A. S. Miller Otto Sjolander	Bridge engineer Asst. bridge engineer Cons. bridge engineer Structural engineer Stenographer Inspector (2 mo.) Inspector (per diem)	17	2,400,00 2,300,00 500,00 2,100,00 936,77 200,00 76,50	\$	249.03 203.81 55.49 114.90 2.52	17-	2,649.03 2,503.81 500.00 2,155.49 936.77 314.90 79.02
Total		-	8,513.27	8	625.75	\$	9,139.02

SCHEDULE TWENTY.

DRAFTING DEPARTMENT.

	Employment	Salary	Expense	Total
J. A. Paulsen. L. H. Doughty. W. N. Adams. W. A. Reeves. Theo. Ohmann. V. Enslow. J. C. Nichols. A. S. Miller. M. G. Spangler. G. W. Garland. Hans Hanson. E. H. Irwin. R. J. Freshour. Otto Sjolander. B. E. Brevik. H. W. Thornburg. W. M. MacGibbon. Coleman H. Cook.	Chief draftsman Designer Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Clerk Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman Draftsman	\$ 1,900.00 1,279.97 1,500.00 1,320.00 930.00 1,200.00 900.00 100.00 121.28 765.00 1,140.00 283.40 948.65 251.61 34.90 13.75 500.00 32,50	\$ 44.65 7.54	$\begin{array}{c} \$ & 1,944.65\\ 1,279.97\\ 1,500.00\\ 1,327.54\\ 2300.00\\ 1,2200.00\\ 9600.00\\ 100.00\\ 100.00\\ 121.22\\ 765.00\\ 100.00\\ 121.40\\ 283.40\\ 948.65\\ 251.63\\ 34.90\\ 13.75\\ 500.60\\ 32.50\\ 32.$
Total		\$ 12,581.06	\$ 52.19	\$ 12,633.25

SCHEDULE TWENTY-ONE:

DISTRICT ENGINEERS.

	Employment	Salary			Expense		Total
C. Coykendall W. H. Root W. F. Beard. L. M. Martin J. S. Morrison	First district Second district Third district Fourth district Fifth district	*	2,000.00 2,000.00 2,000.00 2,000.00 2,000.00 2,000.00	\$	$710.26 \\ 871.41 \\ 1.020.37 \\ 1.632.60 \\ 751.87$	80	2,710.26 2,871.41 3,020.37 3,032.60 2,751.87
Total		\$	10,000.00	\$	4,386.51	8	14,386.51

IOWA STATE HIGHWAY COMMISSION

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SCHEDULE TWENTY-TWO. TESTS AND EXPERIMENTAL WORK.

	Employment	Salary	Expense	Total
C. B. McCullough C. D. Curtiss A. S. Miller Velda Rowland T. R. Agg J. H. Buchanan J. S. Coye Bert Myers	Asst. Ch. Eng., 2 mo Asst. engineer. Stenographer Asst. Engineer. Chemist Chemist Asst. engineer.	\$ 416.66 1,471.61 305.50 840.00 325.00 66.67	\$ 61.30 305.44 14.11 8.13 42.83 - 29.33	\$ 477.96 1,777.05 319.61 848.13 42.83 325.00 29.36 66.67
Total		\$ 3,425.44	\$ 461.14	\$ 3,886.58

SCHEDULE TWENTY-THREE. STATE INSTITUTION ROADS.

		Employment	Salary	I	xpense	Total
F.	H. Mann	Asst. engineer	\$ 2,000.00	\$	32.37	\$ 3,032.37
	Total		\$ 2,000.00	\$	32.37	\$ 2,032.37

SCHEDULE TWENTY-FOUR. RAILROAD CROSSING SURVEYS AND PLANS.

		Employment		Salary	1	Expense		Total
Е.	Williams	Asst. engineer	8	1,800.00	\$	276.58	-	2,076.58
	Total		\$	1,800.00	\$	276.58	\$	2,076.58

SCHEDULE TWENTY-FIVE. LAKE BED SURVEY AND REPORT.

	Employment	Salary	Expense**	Total
R. W. Clyde	Drainage engineer	1,266.64		1,206.04
S. A. Schackle. W. M. MacGibbon	Asst. engineer	700.00 416.12		700.00 416.12
Lyle Turner Earnest Nelson	Rodman	269.58 303.39		269.68 303.39
R. S. Barston	Rodman	53.66 220,00		53.66 220.00
A. H. Frost	Rodman	113.33 90.00		113.33 90.00
Judd Weed	Rodman	10.00 162.17 190.00		10.00 162.17
R. M. Dewey	Rodman	89.83 80.50		130.26 89.83
H. W. Ouren Theo, Bruhn	Rodman	32.66		32.66
A. F. Schultz. Wm. O. Byington.	Rodman	8.00		8.00
Nate Crowell. Walter Anderson	Rodman	50.00 16.94		50.00 16.94
Hurley Yarns B. L. Hubbard	Rodman	33.37 15.81		33.37 15.81
Total		4,814.19		4,814.19

**Expenses paid from General State fund.

FINANCIAL REPORT

SCHEDULE TWENTY-SIX.

DRAINAGE DEPARTMENT.

	Employment		Salary	Ē	xpense		Total
R. W. Clyde	Drainage engineer Asst. engineer	-	633.36 200.00	\$	48.95	44	682.31 200.00
Total		*	833.36	\$	48.95	\$	882.31

SCHEDULE TWENTY-SEVEN.

EQUIPMENT AND SUPPLIES-ALL DEPARTMENTS.

Freight and drayage	$\begin{array}{c} 142.24\\ 198.20\\ 608.86\\ 146.75\\ 809.02\\ 1,614.23\\ 4,149.66\\ 4,250\\ 165.00\\ 573.54\\ 2,377.82\\ 1,194.84\\ 562.06\\ 43.50\\ 39.66\\ 54.83\\ 166.05\\ 557.96\end{array}$
Total	8 13,476.73

SCHEDULE TWENTY-EIGHT.

COMPARISON OF EXPENDITURES FOR 1914-15, 1915-16 AND 1916-17.

	1914-15	1915-16	1916-17
Commissioners	\$ 3,407.65 14,834.87 10,308.33 16,064.47 13,053.59 4,622.42	\$ 2,593.22 12,137.98 11,186.35 7,944.33 10,309.20 13,711.09 5,300.07 1,855.90 3,225.54 2,031.30 5,535.00	\$ 2,839.03 12,479.78 11,139.89 9,139.02 12,633.25 14,386.65 3,886.68 2,032.37 2,076.58 4,814.19 882.31 19,462.79
Total	\$ 80,935.18	\$ 90,821.34	\$ 89,786.84

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STATE OF IOWA

Part II OF REPORT OF THE State Highway Commission For the year January 1, 1917 to January 1, 1918

ISSUED BY STATE HIGHWAY COMMISSION

> H. C. BEARD J. W. HOLDEN S. W. BEYER Commissioners

AMES, IOWA, JANUARY 1, 1918

SUMMARY OF ANNUAL REPORTS OF COUNTY ENGINEERS

This summary is prepared from the annual reports of the county engineers of the ninety-nine counties of Iowa, and is prepared and submitted in accordance with the provisions of Section 1527-s2, SS 1915.

The county engineers' reports include detailed statements of all county expenditures for road and bridge work. Efforts were made through the county engineers to secure detailed reports of township expenditures. Out of 1613 townships, reports were secured from 1521 up to date when this report was tabulated.

Statements of expenditures are based on warrants issued by the county auditors for the period covered by this report. The county engineers are dependent upon the following sources for information contained in their reports:

(a) Total expenditures from County Bridge, County Motor Vehicle Road, and County Road Cash funds; County Auditor's warrant register; detailed classification of these expenditures must be made by the county engineer.

(b) Financial statement of the receipts and disbursements in above named funds, County Treasurer's Cash Book.

(c) Statement of county's indebtedness, records of county auditor and county treasurer combined.

(d) Statement of Classified expenditures from all township funds, and financial statement of receipts and disbursements in said funds, annual reports of township clerks.

This report includes a general summary of the activities of the ninety-nine counties, paragraph summaries of the road and bridge expenditures of the individual counties, and twenty-seven summary tables showing in detail the expenditures for road and bridge work from all funds and the present financial condition of the several counties,

SUMMARY OF FINANCIAL STATEMENT FOR ENTIRE STATE.

From January 1, 1917 to January 1, 1918, the counties and townships spent \$15,165,475.76 for road and bridge work on the 104,000 miles of road constituting the county and township road systems. This is an average expenditure of \$145.82 per mile, which includes both road and bridge work. The expenditures are classified as follows:

Spent for bridge work on both county and township

road	is .		7,466,796.69
Spent	for	township road work	3,558,338.51
Spent	for	county road work	4,140,340.56

Total\$15,165,475.76

On January 1, 1918, there were cash balances on hand in the county and township road and bridge funds amounting to \$1,132,058.89, as follows:

County bridge fund\$	21,220.33
County road cash fund	162,573.93
County motor vehicle road fund	304,820.88
Total County balance\$	488,615.14
Township road, drag and drainage funds	643,443.75
Total	1,132,058.89

There were outstanding bonds amounting to \$7,295,687.14, as follows:

Bridge bonds outstanding	\$	6,308,041.35
Road bonds outstanding	••••••	1,054,645.79

Total \$ 7,362,687.14

It should be noted that only 14.3% of the outstanding bonds are for road work. The remaining 85.7% are bonds for bridge work. The total indebtedness of the counties, which includes outstanding bills, warrants and bonds was \$11,191,001.02, on January 1, 1918 as compared with \$8,034,968.00 on Jan. 1, 1917. This indebtedness is classified and compared for the past two years, as follows:

COUNTY BRIDGE FUND.

		Jan. 1, 1917	Jan. 1, 1918
Outstanding	bills\$	216,253.00	\$ 152,426.34
Outstanding	warrants	2,556,460.00	2,414,748.15
Outstanding	bonds	3,872,817.00	6,308,041.35

Total bridge indebtedness......\$6,645,530.00 \$8,875,215.84

COUNTY ROAD FUNDS.

		Jan. 1, 1917	Jan. 1, 1918
Outstanding	bills	\$ 125,475.00.	\$ 86,709.12
Outstanding	warrants	. 809,506.00	1,174,430.27
Outstanding	bonds	. 454,457.00	1,054,645.79
Total	road indebtedness	\$1,389,438.00	\$2,315,785.18
Total	indebtedness	\$8,034,968.09	\$11,191,001.02

20.6% of the total indebtedness is for road work. The remaining 79.4% is for bridge work.

In addition to the large percentage of outstanding indebtedness which is for bridge work and the correspondingly small percentage of indebtedness which is for road work, it should be stated that the road funds are annually depleted in making payments for bridge and culvert work. The law provides that permanent culverts may be paid for from the county motor vehicle road fund, and that filling bridges and culverts, making stream changes, etc., can be paid for from the county road cash fund. During 1915, \$670,000.00 was thus diverted from the road funds for bridge and culvert work; in 1916 \$972,338.00, and in 1917, \$872,324.45 was so diverted. Of the road funds used for bridge and culvert work in 1916, \$550,166.00, and in 1917, \$512,234.63 came from the motor vehicle road fund; and in 1916, \$422,172.00, and in 1917, \$360,089.82 came from the county road cash fund.

Tables Nos. 1, 23, 24, 25, 26 and 27 show the expenditures and financial statements for each county.

SUMMARY OF BRIDGE WORK AND EXPENDITURES FOR ENTIRE STATE.

A summary of the county engineers' annual reports for 1917 shows a total expenditure for bridge work in the state of \$7,466,796.69. A comparison of the classified expenditures for 1914, 1915, 1916 and 1917 are given in the table below.

	1914	1915	1916	1917
Bridge and culvert construction Repair work.	\$3,100,000.00 1,160,000.00	\$5,170,000.00 1,212,000.00	\$5,248,000.00	\$5,552,825.06 1,039,391.95
Bridge equipment and unused material	310,000.00	247,000.00	318,000.00	356,255.98
Miscellaneous, right of way, etc.	357,000.00		192,000.00	156,004.43
Total	\$5,027,000.00	\$6,629,000.00	\$7,172,000.00	\$7,466,796.69

In making a comparison of the total expenditures for 1915, 1916 and 1917 it should be noted that the item of filling bridges and culverts is not included in the total for 1915. During 1917, a total of \$362,319.27 was spent on filling bridges and culverts, which deducted from the total given above leaves the amount of \$7,104,477.42 as the total expenditure for bridges and culverts during 1917. This amount indicates an increased expenditure of \$319,477.42 or 4.5% over 1916. The increased cost of construction due to the advance in the price of construction materials would readily account for this increased expenditure.

In the table given below, a summary and comparative statement, is given on the classified expenditure for the past four years.

		1914		1915		
Classification	No,	Amount	%	No.	Amount	50
Permanent bridges and cul- verts	6,587 4,858 11,445	\$2,655,000.00, 418,000.00 1,160,000.00 794,000.00 5,027,000.00	53.0 8.3 23.1 15.6 100.0	7,131 34,233 41,364	\$4,079,000.00 1,091,000.00 1,212,000.00 247,000.00 6,629,000.00 249,000.00	61.6 16.5 18.3 3.6 100.0
Total	******	\$5,027,000.00			\$6,878,000.00	

		1916		1917		
Classification	No.	Amount	%	No.	Amount	%
Permanent bridges and cul- verts	11,116	\$4,026,000.00	59.3	7,166	\$4,485,781.23	63.1
verts	33,500	1,222,000.00	18.1	*8,572	1,067,043.83	15.0
Miscellaneous	******	510,000.00	7.5	*******	512,260.41	7.2
Total bridge work proper	44,616	6,785,000.00	100.0		7,104,477.42	100.0
Filing bridges and culverts.		387,000.00	******	******	362,319.27	
Total		\$7,172,000.00			\$7,466,796.69	

*This number does not include the culvert material furnished townships at a cost of \$463,553.59.

The amounts given above were spent on work classified as shown. Permanent bridges and culverts include only structures composed entirely of masonry or steel construction. If a part of the work is of a temporary nature, the structure is classified order the heading of temporary construction. Temporary bridges and culverts include all structures not mentioned above. Pipe culverts not provided with masonry bulkheads are classified as temporary construction. The item of filling bridges and culverts is not included in the totals for the year 1914.

During 1917 there was a slight increase in the amount spent and in the percentage of permanent bridges and culverts constructed as compared with 1916. The total expenditure for permanent construction increased \$459,781.23.

The expenditure for temporary bridges and culverts, which included culvert material furnished townships, decreased in amount \$154,956.17.

During 1917 the expenditure for repair work was increased the amount of \$12,391.95 over the amount reported for 1916. The Miscellaneous item which includes an amount of \$356,256.00 for equipment and unused material purchased has been slightly increased during 1917.

A detailed statement of the amounts spent for the various types of construction for 1915, 1916 and 1917 are given in the table below:

		1915		1916	4	2161
Type.	No.	Cost -	No.	Cost	No.	Cost
Concrete box culvert.	4,886	\$1,675,889.00	5,136	\$1,883,066.00	4,330	\$1,982,831.14
Circular concrete culverts	708	68,155,00	880	105,754.00	782	96,223.43
Concrete pipe culverts	2,531	129,835.00	2,768	89,614.00	1,816*	209,154.28
Corrugated pipe culverts	27.768	537,464.00	. 30,486	721,335.00	5,330*	540, 498, 95
Masonry arch culverts	3	803.00	56	2,007.00	2	777.90
Boiler pipe culverts	1,859	98,018.00	1.566	77,925.00	524*	45,001.31
Cast iron pipe culverts	255	21,085.00	478	41,089.00	188*	17,532.12
Masonry box culverts	23	5,421.00	30	5,563.00	24	14,257,28
Head walls on culvert	594	62,384.00	1,085	82,250.00	208	23,340.37
Concrete siab bridges	138	173,034.00	128	165,556.00	115	230,271.61
Concrete alcal Ulidges	19	199,354.00	48	15,348.00	10	00.925 15
Concrete thru wirder.	8 %	35,668,00	26	45 143 00	22	50,986,18
Concrete deck girders.	15	167.273.00	12	187.567.00	64	179,016.34
Retaining walls	41	14,085.00	24	12,839.00	13	7,423.09
Masonry abutments	9	2,940.00	+	3,434,00	50	5,501.76
I-beam spans on piling abutments	110	53,533.00	129	65,171.00	69	49,172.49
I-beam spans on concrete abutments	404	44,479.00	411	619,114.00	456	684,115.55
Steel girders-concrete concrete abutments	1	21.200.00	4	13,447.00	1	1,580.14
Pony trusses on piling-wood floor	62	46,002.00	89	86,340.00	35	41,955.07
Pony truss with concrete abutments	214	566,449.00	- 185	545,556.00	201	727,498,19
High steel trusses-concrete abutments	23	82,309.00	23	133.982.00	27	168,313.27
Deck trusses-concrete abutments			1	4,422.00	9	43,352.84
Wood pile bridges	834	210,305.00	773	180,462.00	811*	274,484.28
Miscellaneous bridges and culverts	£	186,788.00		54,834.00	•009	27,745.18
	41.364	\$4,886,888.00	44.616	\$5.248.332.00	15.738	\$5.552.825.06

--Total number does not include pipe culverts furnished to township

ROAD AND BRIDGE EXPENDITURES

SUMMARY OF ROAD WORK AND EXPENDITURES FOR ENTIRE STATE.

County Road Expenditures.

During the period covered by this report, the total expenditure for road work on the county system was \$4,140,340.56. This sum includes all expenditures for construction, maintenance, repairs, and miscellaneous work on the county system, all expenditures for road equipment and unused material, new right of way, gravel pits, railway crossing improvements, drainage assessments, and all other expenditures by the counties for road purposes. It does not include the expenditures from the county motor vehicle road fund for permanent culverts amounting to \$512,234.63, nor the expenditures from the county road cash fund for filling bridges and culverts amounting to \$360,-089.82. These expenditures are listed under the bridge work.

Of the above county road expenditure of \$4,140,340.56, \$2,028,625 or 49% was spent for permanent work; \$477,616.13 or 11.5% was spent for temporary work; \$562,245.39 or 13.6% was spent for repairs; \$525,805.19 or 12.7% was spent for maintenance; \$264,192.98 or 6.4% was spent for equipment and unused material and \$281,855.79 or 6.8% was spent for miscellaneous work.

A Comparison of the road expenditures for 1917 with the expenditures for 1914, 1915, and 1916 follows:

TOTALS.

	1914	1915	1916	1917
Permanent work Repairs and maintenance	\$895,000.00 969,000.00	\$1,159,764.00 1,143,382.00	\$1,309,884.00 932,142.00	\$2,028.625.08 1,088.050.58
(a) Tractor grading	101,000.00	359,205.00	513,600.00	426,552.17 51,063.96
Machinery and unused material. Miscellaneous	182,000.00 1,292,000.00	249,016.00 227,920.00 257,078.00	242,962.00 249,435.00	264,192.98 281,855.79
Total	\$3,403,000.00	\$3,396,365.00	\$3,276,026.00	\$4,140,340.56

	1914	1915	1916	1917
Permanent work	25.3% 28.6%	34.1% 33.7%	40.0% 28.5%	49.0% 26.3%
(a) Tractor grading (b) Oiling roads	2.9%	10.6%	15.7% 0.8%	10.3% 1.2%
Machinery and unused material. Miscellaneous	5.3% 37.9%	7.3% 6.7% 7.6%	7.4% 7.6%	6.4% 6.8%

PERCENTAGES.

"Permanent Work" includes constructing roads to the permanent grade lines established by the county engineer and to standard sections; constructing roads to temporary grade lines and standard sections, that is widening cuts and fills to standard widths and working toward a permanent grade line; tile drainage; and surfacing roads with gravel, macadam, sand-clay or some form of paying.

It should be noted that the percentage of county road expenditure which went for permanent work in 1917 increased 9% over that of 1916. Likewise the repairs and maintenance decreased 2.3%.

During 1917 repairs and maintenance cost \$67.64 per mile, against \$59.75 per mile for this work in 1916.

"Temporary Work" includes "oiling roads," and "Tractor grading." No tractor grading is included in this classification unless the cost was in excess of sixty dollars per mile. Such work costing less than \$60.00 per mile is classified as repair work.

"Filling bridges and culverts" which was classified with the road work in 1915, has been classified under bridge work in 1916 and 1917 reports.

During 1917 there were 879.97 miles of road built to permanent grades at a cost of \$1,238,977.94 or an average of \$1,407.97 per mile. There were 40.60 miles built to temporary grade at a cost of \$70,347.30, or an average of \$1,732.69 per mile. 2490.66 miles of roads were constructed to natural grade at a cost of \$384,622.91 or an average cost of \$154.42 per mile. 411.54 miles were hard surfaced at a cost of \$548,159.70. Of this amount \$138,605.50 or 25% was spent on 5.35 miles as follows: \$27,-763.93 was spent on 1.4 miles of the 4.07 miles of Iowa Federal Aid project No. 1, between Mason City and Clear Lake. This was surfaced with concrete. \$42,650.85 was spent on 1.95 miles of the Sageville road out of Dubuque. This was surfaced with briek. \$68,190.72 was spent on 2 miles of the 4.8 miles of monolithic brick pavement extending from the city limits of Des Moines towards Camp Dodge. The remaining amount, \$309,554.20 or 75% was spent for surfacing. The greater amount was for gravel, there being 406.19 miles surfaced with gravel at an average cost of \$762.09 per mile. Nearly all the surfacing work was single course gravel conforming to Class B, standard cross-section, which requires 880 cubic yards of gravel per mile.

15,724 miles of the county road system were regularly dragged at an average total cost of \$24.04 per mile. The average number of times dragged was 27.98. The average cost per mile for dragging for one round trip was \$0.774. The total county road expenditure in 1916 averaged \$207.80 per mile. In 1917 the total expenditures averaged \$251.12 per mile.

A comparison of the construction work accomplished during 1917 with that accomplished during 1914, 1915, and 1916, follows:

	1914	1915	1916	1917
Built to permanent grade Built to temporary grade Tractor grading	418 mi. 416 mi. 1210 mi. 75.6 mi.	462.7 mi. 355.9 mi. 2358.8 mi. 182.0 mi.	625.2 mi. 107.83 mi. 3680.9 mi. 277.0 mi.	858.44 mi. 213.11 mi. 2467.58 mi. 424.58 mi.

Since April, 1913, surveys have been made on 5,663.18 miles or about 35.2% of the county road system. 7,972.40 miles or 49.5% of the county road system has been built to natural grade. 1,728.01 miles have been built to permanent grade and 869.69 miles have been surfaced.

Detailed comparisons of the road work and expenditures on the various county road systems are shown in tables Nos. 9 to 13 inclusive. Table No. 21 shows the number and value of gravel pits owned by the counties.

Township Road Expenditures.

Reports from 1521 of the 1613 townships were received in time to be included in this report. This is all but 92 of the townships reporting.

The 1521 townships reporting show a total road expenditure of \$3,558,338.51, from which the total expenditure for 1613 townships have been estimated at \$3,860,738.00. These expenditures are distributed as follows:

TOTALS.

1010

1917

	1311
Permanent work	478,771.10
Temporary work	496,751.41
Repairs	1,096,751.81
Maintenance	731,969.47
Equipment and unused material	345,326.56
Filling bridges and culverts and placing temporary	
culverts	338,143.80
Miscellaneous	373,333.85
Tetel	
Total	3.860.738.00

PERCENTAGES.

.....

manual work	12.4 %
Temporary work	12.9%
Repairs	28.4%
Maintenance	19.0%
Equipment and unused material	8.9%
Filling bridges and culverts and placing temporary cul-	
verts	8.7%
Miscellaneous	9.7%
Totala	
Totals	100.0%

The above percentages show that 70% of the township money went for repairs, maintenance, temporary and miscellaneous work. This is as it should be. It is surprising to note that any of the township money went for permanent work. There are approximately 88,300 miles of township road, so that the average expenditure per mile is \$46.00, which is only about two-thirds of the average county road expenditure for repairs and maintenance alone.

The township expenditures are shown more in detail in tables Nos. 14, 15, 16, 17 and 18.

The following is a summary of the road and bridge expenditures by counties:

ADAIR COUNTY.

The total county road expenditure was \$19,370.91 of which \$684.45 or 3.5% was spent for permanent work, \$5,070.94 or 26.2% was spent for repairs, \$7,748.70 or 40.0% was spent for maintenance, \$5,113.51 or 26.4% was spent for road equipment and unused material and \$753.31 or 3.9% was spent for special cases.

ROAD AND BRIDGE EXPENDITURES

There were no roads built to permanent grade. 0.20 miles were built to temporary grade at a cost of \$514.82. No roads were surfaced, built to natural grade or oiled.

The county road system was dragged an average of 23.33 times at an average cost of \$16.32 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$74.53 per mile of county road. The total average expenditure per mile of county road was \$112.62.

There are 172 miles included in the county road system. Of this mileage 00 miles are now surfaced; 1.50 miles are built to permanent grade; 2.50 miles are constructed to temporary grade; 164.50 miles are built to natural grade, and on 3.5 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 18 of the 18 townships was \$35,625.04.

Bridges.

The total expenditure for bridge and culvert work during 1917, was \$60,781.88 of which \$37,680.89, or 62.1% was spent for permanent bridges and culverts; \$7,412.16, or 12.2% was spent for temporary bridges and culverts; \$8,671.96, or 14.2% was spent for repairs; \$534.58, or 0.9% was spent for culvert material for townships; \$846.00, or 1.4% was spent for equipment and unused matrial; \$5,371.29, or 8.8% was spent for filling bridges and culverts and \$265.00, or 0.4% was spent for special cases.

Of the total amount \$45,093.05 was spent for new bridges and culverts; \$37.680.89, or 83.7% was for permanent work and \$7,412.16, or 16.3% was for temporary work.

The amounts last above referred to were spent on the following construction: 20 concrete box culverts, costing \$12,761.53; 1 circular concrete culverts costing \$280.55; 83 concrete pipe with headwalls, costing \$15,674.48; 5 headwalls on culverts previously constructed costing \$550.20; 2 concrete abutments costing \$534.52; 2 I-beam spans on concrete abutments, costing \$3,142.80; 1 pony truss, concrete abutments, costing \$4,-736.81; 130 concrete pipe without headwalls, costing \$6,102.14; 4 corrugated pipe without headwalls, costing \$30.17; 1 I-beam span on piling abutments \$966.69 and 1 wood pile bridge costing \$313.16.

ADAMS COUNTY.

Roads.

The total county road expenditure was \$10,003.54 of which \$3,304.02, or 33.1% was spent for temporary work; \$3,901.82, or 39.0% was spent for repairs; \$2,292.89, or 22.9% was spent for maintenance; \$474.81, or 4.7% was spent for road equipment and unused material and \$30.00, or 0.3% was spent for special cases. No permanent road work was done.

There were no roads built to permanent grade, temporary grade, surfaced or oiled. 22.25 miles were built to natural grade at a cost of \$3,304.02.

The county road system was dragged an average of 26.2 times at an average cost of \$18.34 per mile, the average cost per mile one round trip

Roads.

Permanent work

129

being \$0.70. The average cost of repairs and maintenance was \$40.98 per mile of county road. The total average expenditure per mile of county road was \$79.08.

There are 136.50 miles included in the county road system. Of this mileage 13.00 miles are constructed to temporary grade; 105.25 miles are built to natural grade and on 18.25 miles only repair and maintenance work has been done. There are no roads surfaced or built to permanent grade.

The total township road expenditure indicated by reports from 12 of the 12 townships was \$21,021.30.

Bridges.

128

The total expenditure for bridge and culvert work during 1917 was \$42,529.93, of which \$12,488.94, or 29.4% was spent for permanent bridges and culverts; \$5,881.64, or 13.8% was spent for temporary bridges and culverts; \$7,027.34, or 16.5% was spent for repairs; \$4,815.44, or 11.4% was spent for culvert material for townships; \$6,137.01, or 14.4% was spent for equipment and unused material; \$5,825.32, or 13.7% was spent for special cases.

Of the total amount \$18,370.58 spent for new bridges and culverts \$12, 488.94, or 68.0% was spent for permanent work and \$5,881.64, or 32.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 6 concrete box culverts, costing \$3,777.68; 50 concrete pipe with headwalls costing \$7,687.97; 1 corrugated pipe with headwalls costing \$141.85; 3 cast iron pipe with headwalls costing \$798.99; 2 headwalls on culverts previously constructed, costing \$82.45; 3 concrete pipe without headwalls costing \$102.81; 1 I-beam span on pile abutments costing \$830.89; 1 pony truss on piling, wood floor costing \$358.02 and 15 wood pile bridges costing \$4,589.32.

Roads.

ALLAMAKEE COUNTY.

The total county road expenditure was \$32,954.79 of which \$4,687.50 or 14.2% was spent for permanent work; \$6,329.29 or 19.3% was spent for temporary work; \$12,460.47 or 37.7% was spent for repairs; \$1,942.11 or 5.9% was spent for maintenance; \$5,619.97 or 17.1% was spent for road equipment and unusued material and \$1,915.45 or 5.8% was spent for special cases.

There were no roads built to temporary grade and none were surfaced. 2.39 miles were built to permanent grade at a cost of \$4,687.50; 18.19 miles were built to natural grade at a cost of \$5,149.06 and 2.75 miles were oiled at a cost of \$1,180.23.

The county road system was dragged an average of 18 times at an average cost of \$16.18 per mile, the average cost per mile one round trip being \$0.90. The average cost of repairs and maintenance was \$124.16 per mile of county road. The total average expenditure per mile of county road was \$284.09.

There are 116.00 miles included in the county road system. Of this mileage 24.05 miles are built to permanent grade; 18.19 miles are built to natural grade, and on 73.76 miles only repair and maintenance work has been done. There were no roads surfaced and none are built to temporary grade.

The total township road expenditure indicated by reports from 17 of the 18 townships was \$25,715.51.

Bridges.

Roads.

The total expenditure for bridge and culvert work during 1917 was \$89,150.24 of which \$62,692.54 or 70.2% was spent for permanent bridges and culverts; \$12,271.75 or 13.8% was spent for temporary bridges and culverts; \$11,652.88 or 13.1% was spent for repairs; \$1,124.45 or 1.3% was spent for culvert material for townships; \$145.51 or 0.2% was spent for equipment and unused material; \$216.60 or 0.2% was spent for filling bridges and culverts and \$1,046.51 or 1.2% was spent for special cases.

Of the total amount \$74,964.29 spent for new bridges and culverts \$62,692.54 or 83.6% was spent for permanent work and \$12,271.75 or 16.4% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 4 concrete box culverts, costing \$2,054.66; 3 concrete slab bridges costing \$2,795.55; 3 masonry abutments costing \$1,056.15; 2 I-beam spans on concrete abutments costing \$1,738.53; 5 high steel trusses, concrete abutments costing \$18,454.01; 5 deck trusses, concrete abutments \$36,593.64; 15 corrugated pipes without head walls costing \$1,268.98; 2 I-beam spans on piling abutments costing \$367.52; 2 pony trusses on piling, wood floor costing \$2,946.30 and 15 wood pile bridges costing \$7,688.95.

APPANOOSE COUNTY.

The total county road expenditure was \$13,310.84 of which \$6,604.14 or 49.6% was spent for repairs; \$4,354.20 or 32.7% was spent for maintenance; \$1,607.81 or 12.1% was spent for equipment and unused material and \$744.69 or 5.6% was spent for special cases. There was no permanent or temporary road work done.

There were no roads built to permanent, temporary or natural grade and none were surfaced or oiled.

The county road system was dragged an average of 35 times at an average cost of \$26.32 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$65.82 per mile of county road. The total average expenditure per mile of county road was \$80.00.

There are 166.50 miles included in the county road system. Of this mileage none was surfaced, permanently graded or temporarily graded. 29.00 miles are built to natural grade, and on 137.50 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 17 of the 17 townships was \$27,471.13.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$71,867.42 of which \$29,259.83 or 40.6% was spent for permanent bridges and culverts; \$2,623.10 or 3.6% was spent for temporary bridges and culverts; \$17,370.57 or 29.3% was spent for repairs; \$10,653.92 or 14.8% was spent for culvert material for townships; \$10,694.95 or 14.9% was spent for filling bridges and culverts and \$1,265.05 or 1.8% was spent for special cases.

Of the total amount \$31,882.93 spent for new bridges and culverts, \$29,259.83 or 31.8% was spent for permanent work; \$2,623.10 or 8.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 12 concrete box culverts, costing \$6,413.40; 5 I-beam spans, concrete abutments costing \$10,591.04; 3 pony trusses with concrete abutments costing \$12,255.39; 16 corrugated pipe without headwalls costing \$448.04; 42 boiler pipe culverts costing \$1,995.56 and 2 cast iron pipe without headwalls costing \$179.50.

Roads.

AUDUBON COUNTY.

The total county road expenditure was \$25,937.38 of which \$12,988.11 or 50.2% was spent for permanent work; \$972.00 or 3.7% was spent for temporary work; \$7,116.63 or 27.4% was spent for repairs; \$3,763.85 or 14.5% was spent for maintenance; \$851.29 or 3.3% was spent for road equipment and unused material and \$245.50 or 0.9% was spent for special cases.

There were no roads surfaced or oiled. 3 miles were built to permanent grade at a cost of \$11,197.81; 1 mile was built to temporary grade at a cost of \$900.00 and 9 miles were built to natural grade at a cost of \$972.00

The county road system was dragged an average of 35 times at an average cost of \$24.44 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$77.71 per mile of county road. The total average expenditure per mile of county road was \$185.26.

There are 140.00 miles included in the county road system. Of this mileage 3.50 miles are built to permanent grade; 0.50 miles are constructed to temporary grade; 130.00 miles are built to natural grade, and on 6.00 miles only repair and maintenance work has been done. There were no roads surfaced.

The total township road expenditure indicated by reports from all of the townships was \$27,337.60.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$85,581.09 of which \$42,073.99 or 49.2% was spent for permanent bridges and culverts; \$16,089.11 or 18.8% was spent for temporary bridges and culverts; \$6,569.56 or 7.7% was spent for repairs; \$7,948.09 or 9.3% was spent for culvert material for townships; \$8,327.24 or 9.7% was spent

for equipment and unused material: \$4,053.10, or 4.7% was spent for filling bridges and culverts and \$520.00 or 0.6% was spent for special cases.

Of the total amount \$58,163.10 spent for new bridges and culverts, \$42,073.99 or 72.4% was spent for permanent work; and \$16,089.11 or 27.6% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 17 concrete box culverts costing \$24,195.62; 1 concrete pipe with headwalls costing \$590.68; 1 cast iron pipe with headwalls costing \$12.03; 1 concrete slab bridge costing \$5,932.26; 1 I-beam span, concrete abutments costing \$4,603.00; 1 pony truss, concrete abutments costing \$6,740.40; 3 concrete pipe without headwalls costing \$530.42; 45 corrugated pipe with headwalls costing \$1,528.10 and 36 wood pile bridges costing \$14,030.59.

Roads.

BENTON COUNTY.

The total county road expenditure was \$41,245.00 of which \$7,346.91 or 17.8% was spent for permanent work; \$13,707.75 or 33.3% was spent for temporary work; \$8,892.33 or 21.5% was spent for repairs; \$3,776.26 or 9.2% was spent for maintenance; \$6,864.74 or 16.6% was spent for road equipment and unused material and \$657.01 or 1.6% was spent for special cases.

There were no roads built to temporary grade or surfaced. 2.50 miles were built to permanent grade at a cost of \$6,799.00; 41 miles were built to natural grade at a cost of \$4,534.02 and 68.5 miles were oiled at a cost of \$9,173.73.

The county road system was dragged an average of 12.22 times at an average cost of \$18.33 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$60.04 per mile of county road. The total average expenditure per mile of county road was \$195.47.

There are 211.00 miles included in the county road system. Of this mileage 1.00 mile is now surfaced; 8.50 miles are built to permanent grade; 27.50 miles are constructed to temporary grade; 174.00 miles are built to natural grade, and no funds were spent for repair and maintenance work.

The total township road expenditure indicated by reports from 20 of the 20 townships was \$54,823.86.

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Bridges.

The total expenditure for bridge and culvert work during 1917 was \$106,838.92 of which \$73,217.85 or 68.5% was spent for permanent bridges and culverts; \$51.80 or 0.04% was spent for temporary bridges and culverts; \$15,520.53 or 14.5% was spent for repairs; \$6,707.66 or 6.3% was spent for culvert material for townships; \$734.02 or 0.7% was spent for equipment and unused material; \$10,528.53 or 9.9% was spent for filling bridges and culverts and \$78.53 or 0.06% was spent for special cases.

Of the total amount \$73,259.65 spent for new bridges and culverts, \$73,217.85 or 99.93% was spent for permanent work and \$51.80 or .07% was spent for temporary work.

ROAD AND BRIDGE EXPENDITURES

IOWA STATE HIGHWAY COMMISSION

The amounts last above referred to were spent on the following construction: 124 concrete box culverts costing \$42,206.76; 9 circular concrete culverts costing \$556.80; 10 concrete slab bridges costing \$11,909.75; 6 concrete through girders costing \$15,804.54; 1 pony truss, concrete abutments costing \$2,740.00; 2 corrugated pipe without head walls costing \$5.00 and 1 cast iron pipe without headwalls costing \$46.80.

BLACK HAWK COUNTY.

Roads.

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The total county road expenditure was \$42,972.58 of which \$19,671.06 or 45.8% was spent for permanent work; \$7,984.37 or 18.6% was spent for temporary work; \$4,080.10 or 9.5% was spent for repairs; \$7,244.55 or 16.8% was spent for maintenance; \$3,652.28 or 8.5% was spent for road equipment and unused material and \$340.22 or 0.8% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 5.08 miles were built to permanent grade at a cost of \$2.025.04; 5.08 miles were surfaced with gravel at a cost of \$17,011.12 and 31.25 miles were built to natural grade at a cost of \$7,984.37.

The county road system was dragged an average of 31 times at an average cost of \$24.18 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$60.75 per mile of county road. The total average expenditure per mile of county road was \$230.54.

There are 186.43 miles included in the county road system. Of this mileage 13.43 miles are now surfaced; 4.59 miles are built to permanent grade; 28.00 mies are constructed to temporary grade; 138.42 miles are built to natural grade, and on 1.99 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$43,281.31.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$69,557.59 of which \$26,806.60 or 38.9% was spent for permanent bridges and culverts, \$15,984.67 or 23.0% was spent for temporary bridges and culverts; \$14,826.33 or 21.4% was spent for repairs; \$4,218.76 or 6.1% was spent for culvert material for townships; \$6,780.84, or 9.7% was spent for equipment and unused material; \$745.73 or 1.1% was spent for filling bridges and culverts and \$194.66 or 0.3% was spent for special cases.

Of the total amount \$42,791.27 spent for new bridges and culverts \$26,806.60 or 62.7% was spent for permanent work and \$15,984.67 or 37.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 89 concrete box culverts costing \$22,440.42; 3 corrugated pipe with headwalls costing \$250.69; 12 head walls on culverts previously constructed costing \$2,463.66; 1 I-beam span on concrete abutments costing \$1,651.83; 184 corrugated pipe without headwalls costing \$1,727.85; 1 boiler pipe without headwalls costing \$12.50; 3 I-beam spans on piling costing \$13,585.00; 2 wood pile bridges costing \$538.68 and 9 miscellaneous bridges and culverts costing \$120.64.

BOONE COUNTY.

Roads.

The total county road expenditure was \$40,585.18 of which \$19,687.78 or 48.5% was spent for permanent work; \$2,920.78 or 7.2% was spent for temporary work; \$1,315.96 or 3.2% was spent for repairs; \$5,897.23 or 14.5% was spent for maintenance; \$7,698.26 or 19.0% was spent for road equipment and unused material and \$3,065.17 or 7.6% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 1.50 miles were built to permanent grade at a cost of \$2,424.14; 16.0 miles were surfaced with gravel at a cost of \$16,427.31; 29.75 miles were built to natural grade at a cost of \$2,920.78.

The county road system was dragged an average of 31 times at an average cost of \$23.21 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$45.94 per mile of county road. The total average expenditure per mile of county road was \$258.50.

There are 157.00 miles included in the county road system. Of this mileage 25.50 miles are now surfaced; 9.50 miles are built to permanent grade; 4.00 miles are constructed to temporary grade; 75.00 miles are built to natural grade, and on 43.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 15 of the 17 townships was \$50,349.58.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$55,825.49 of which \$40,059.93 or 71.8% was spent for permanent bridges and culverts; \$1,081.07 or 1.9% was spent for temporary bridges and culverts; \$6,556.23 or 11.7% was spent for repairs. \$3,426.56 or 6.2% was spent for culvert material for townships; \$1,927.09 or 3.5% was spent for equipment and unused material; \$2,454.30 or 4.4% was spent for filling bridges and culverts and \$320.31 or 0.6% was spent for special cases.

Of the total amount \$41,141.00 spent for new bridges and culverts, \$40,059.93 or 97.4% was spent for permanent work and \$1,081.07 or 2.6% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 20 concrete box culverts costing \$16,672.32; 1 circular concrete culvert costing \$72.69; 2 concrete slab bridges costing \$5,989.07; 2 concrete arch bridges costing \$11,111.40; 1 concrete deck girder costing \$1,528.33; 1 I-beam span on concrete abutments costing \$1,337.00; 1 high steel truss, concrete abutments costing \$3,349.12; 23 corrugated pipe without headwalls costing \$589.03 and 16 miscellaneous bridges and culverts costing \$492.04.

IOWA STATE HIGHWAY COMMISSION

Roads.

BREMER COUNTY.

The total county road expenditure was \$21,037.47 of which \$7,044.05 or 33.4% was spent for permanent work; \$4,988.11 or 23.7% was spent for temporary work; \$1,721.03 or 8.2% was spent for repairs; \$3,349.64 or 16.0% was spent for maintenance; \$3,348.38 or 15.9% was spent for road equipment and unused material and \$586.26 or 2.8% was spent for special cases.

There were no roads built to temporary grade and none were oiled, 2.0 miles were built to permanent grade at a cost of \$2,131.95; 1.0 miles were surfaced with gravel at a cost of \$1,773.21; 47.5 miles were built to natural grade at a cost of \$4,988.11.

The county road system was dragged an average of 35 times at an average cost of \$26.06 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$40.40 per mile of county road. The total average expenditure per mile of county road was \$167.63.

There are 125.50 miles included in the county road system. Of this mileage 1.25 miles are now surfaced; 6.75 miles are built to permanent grade; 52.80 miles are built to natural grade, and on 64.7 miles only repair and maintenance work has been done. There were no roads built to permanent grade.

The total township road expenditure indicated by reports from 6 of the 14 townships was \$11,963.14.

Bridges.

Roads.

The total expenditure for bridge and culvert work during 1917 was \$46,545.79 of which \$38,036.38 or \$1.7% was spent for permanent bridges and culverts; \$593.24 or 1.3% was spent for temporary bridges and culverts; \$2,616.29 or 5.6% was spent for repairs; \$4,976.70 or 10.7% was spent for equipment and unused material; \$255.47 or 0.55% was spent for filling bridges and culverts and \$67.71 or 0.15% was spent for special cases.

Of the total amount \$38,629.62 spent for new bridges and culverts \$38,036.38 or 98.5% was spent for permanent work and \$593.24 or 1.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 24 concrete box culverts costing \$7,670.00; 11 circular concrete culverts costing \$1,286.56; 1 concrete through girder costing \$2,010.17: 2 concrete .deck girders costing \$5,682.33; 1 high steel truss, concrete abutments costing \$21,387.32 and 2 wood pile bridges costing \$593.24.

BUCHANAN COUNTY.

The total county road expenditure was \$27,618.63, of which \$5,317.64 or 19.3% was spent for permanent work; \$5,276.04 or 19.1% was spent for temporary work; \$9,359.32 or 33.9% were spent for repair; \$4,423.79

or 16% was spent for maintenance; \$189.20 or 0.7% was spent for road equipment and unused material, and \$3,052.64 or 11.0% was spent for special cases.

There were no roads built to permanent or temporary grade, and none were oiled. 4.0 miles were surfaced with gravel and clay, at a cost of \$2,494.33 and 31.25 miles were built to natural grade at a cost of \$5,276.04.

The county road system was dragged an average of 16.4 times, at an average cost of \$9.84 per mile, the average cost per mile one round trip being \$0.60. The average cost of repairs and maintenance was \$78.58 per mile of county road. The total average expenditure per mile of county road was \$157.46.

There are 175.41 miles included in the county road system. Of this mileage, 4 miles are now surfaced; 11.75 miles are built to permanent grade; 35 miles are built to natural grade, and on 122.26 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 12 of the 16 townships, was \$35,064.18.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$69,400.21, of which \$52,038.80 or 75.0% was spent for permanent bridges and culverts; \$2,612.92 or 3.7% was spent for temporary bridges and culverts; \$7,185.00 or 10.4% was spent for repairs; \$3,023.29 or 4.4% was spent for culvert material for townships; \$4,535.20 or 6.5% was spent for filling bridges and culverts.

Of the total amount, \$54,651.72 spent for new bridges and culverts, \$52,038.80 or 95.2% was spent for permanent work and \$2,612.92 or 4.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 29 concrete box culverts, costing \$7,524.23; 4 circular concrete culverts costing \$421.44; 2 corrugated pipes with headwalls costing \$411.04; 1 concrete arch bridge costing \$43,682.09 and 119 corrugated pipes without headwalls, costing \$2,612.92.

Roads.

BUENA VISTA COUNTY.

The total county road expenditure was \$156,162.46, of which \$134,574.94 or 86.4% were spent for permanent work; \$4,554.53 or 2.8% was spent for repairs; \$7,145.74 or 4.5% was spent for maintenance; \$1,373.60 or 0.9% was spent for road equipment and unused material, and \$8,513.65 or 5.4% was spent for special cases. There was no temporary road work done.

There were no roads built to temporary or natural grade and none were oiled. 75.75 miles were built to permanent grade at a cost of \$94,021.54 and 29.31 miles were surfaced with gravel at a cost of \$32,230.60.

The county road system was dragged an average of 24.3 times at an average cost of \$18.21 per mile, the average cost per mile one round trip
being \$0.75. The average cost of repairs and maintenance was \$68.72 per mile of county road. The total average expenditure per mile of county road was \$917.25.

There are 170.25 miles included in the county road system. Of this mileage, 52.5 miles are now surfaced; 117.5 miles are built to permanent grade and on .25 miles only repair and maintenance work has been done. There were no roads constructed to temporary or natural grade.

The total township expenditure indicated by reports from 17 of the 18 townships was \$51,609.94.

Bridges.

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The total expenditure for bridge and culvert work during 1917 was \$217,809.17, of which \$182,969.57 or 83.9% was spent for permanent bridges and culverts; \$24,336.17 or 11.2% was spent for temporary bridges and culverts; \$1,766.78 or 0.8% was spent for repairs; \$3,807.51 or 1.7% was spent for equipment and unused material; \$1,416.82 or 0.7% was spent for filling bridges and culverts and \$3,512.32 or 1.7% was spent for special cases.

Of the total amount \$207,305.74 spent for new bridges and culverts \$182,969.57 or 88.3% was spent for permanent work and \$24,336.17 or 11.7% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 101 concrete box culverts costing \$40,564.21; 7 headwalls on culverts previously constructed costing \$1,206.83; 106 I-beam spans on concrete abutments costing \$132,790.16; 3 pony truss spans with concrete abutment and floor costing \$8,408.37; 524 corrugated pipes without headwalls costing \$24,116.26 and 9 miscellaneous bridges and culverts costing \$219.91.

BUTLER COUNTY.

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Roads.

The total county road expenditure was \$42,489.42 of which \$5,271.74 or 12.4% was spent for permanent work; \$5,381.42 or 12.8% was spent for temporary work; \$12,298.91 or 29.3% was spent for repairs; \$10,246.71 or 24.1% was spent for maintenance; \$8,978.95 or 21.0% was spent for road equipment and unused material and \$311.69 or 0.7% was spent for special cases.

There were no roads built to temporary grade and none were surfaced or oiled. 5.0 miles were built to permanent grade at a cost of \$4,537.50 and 33.0 miles were built to natural grade at a cost of \$5,381.42.

The county road system was dragged an average of 19 times at an average cost of \$14.24 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$129.05 per mile of county road. The total average expenditure per mile of county road was \$243.21.

There are 174.70 miles included in the county road system. Of this mileage 1.50 miles are now surfaced; 8.50 miles are built to permanent grade; 145.5 miles are built to natural grade, and on 19.20 miles only repair and maintenance work has been done. There were no roads built to temporary grade.

The total township road expenditure indicated by reports from all of the townships was \$42,769.19.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$106,242.82 of which \$42,226.51 or 39.8% was spent for permanent bridges and culverts; \$20,725.91 or 19.5% was spent for temporary bridges and culverts; \$19,228.25 or 18.1% was spent for repairs; \$11,790.84 or 11.1% was spent for culvert material for towships; \$6,778.00 or 6.4% was spent for equipment and unused material; and \$5,493.31 or 5.1% was spent for filling bridges and culverts.

Of the total amount \$62,952.42 spent for new bridges and culverts \$42,226.51 or 67.1% was spent for permanent work and \$20,725.91 or 32.9% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 55 concrete box culverts costing \$18,897.28; 1 concrete abutment costing \$2,722.18; 1 concrete deck girder costing \$2,230.20; 2 pony truss spans with concrete abutment and floor costing \$8,116.85; 2 high steel truss spans with concrete abutments and floor costing \$10,260.00; 197 corrugated pipes without headwalls costing \$4,445.91 and 46 wood pile bridges costing \$16,280.00.

Roads.

CALHOUN COUNTY.

The total county road expenditure was \$75,455.91 of which \$58,588.21 or 77.6% was spent for permanent work; \$3,114.75 or 4.1% was spent for temporary work; \$1,426.18 or 1.9% was spent for repairs; \$4,888.87 or 6.5% was spent for maintenance; \$2,407.45 or 3.2% was spent for road equipment and unused material and \$5,030.45 or 6.7% was spent for special cases.

There were no roads oiled. 39.6 miles were built to permanent grade at a cost of \$32,979.24; 0.6 miles were built to temporary grade at a cost of \$628.74; 14.65 miles were surfaced with gravel at a cost of \$24,195.75 and 57.5 miles were built to natural grade at a cost of \$3,114.75.

The county road system was dragged an average of 31.7 times at an average cost of \$27.77 per mile, the average cost per mile one round trip being \$0.875. The average cost of repairs and maintenance was \$38.16 per mile of county road. The total average expenditure per mile of county road was \$434.65.

There are 173.62 miles included in the county road system. Of this mileage 27.90 miles are now surfaced; 90.62 miles are built to permanent grade; 3.00 miles are constructed to temporary grade; 50.10 miles are built to natural grade, and on 2.00 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$48,062.69.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$76,876.46 of which \$59,073.80 or 76.9% was spent for permanent bridges and culverts; \$4,170.99 or 5.4% was spent for temporary bridges and cul-

verts; \$1,835.79 or 2.4% was spent for repairs; \$3,418.74 or 4.4% was spent for culvert material for townships; \$2,590.99 or 3.4% was spent for equipment and unused material; \$2,635.25 or 3.4% was spent for filling bridges and culverts and \$3,150.90 or 4.1% was spent for special cases.

Of the total amount \$63,244.79 spent for new bridges and culverts \$59,073.80 or 93.4% was spent for permanent work; and \$4,170.99 or 6.6% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 17 concrete box culverts costing \$10,049.30; 57 circular concrete culverts costing \$6,727.40; 1 concrete pipe culvert with headwall costing \$82.50; 1 concrete slab bridge costing \$2,745.50; 3 concrete abutments costing \$4,143.48; 1 concrete deck girder costing \$3,698.60; 2 I-beam spans on concrete abutments costing \$4,344.55; 7 pony truss spans with concrete abutments and floor costing \$2,282.47; 1 high steel truss with concrete abutments costing \$5,000.00; 5 concrete pipes without headwalls costing \$113.79; 79 corrugated pipes without headwalls costing \$1,619.65; 17 boiler pipes without headwalls costing \$388.68; 1 cast iron pipe without headwalls costing \$52.50; 6 I-beam spans on piling costing \$1,275.10; 1 pony truss on piling, wood floor costing \$213.79; 3 wood pile bridges costing \$507.48.

Roads.

CARROLL COUNTY.

The total county road expenditure was \$55,569.18 of which \$39,152.70 or 70.5% was spent for permanent work; \$7,470.98 or 13.5% was spent for temporary work; \$3,663.90 or 6.6% was spent for repairs; \$2,961.62 or 5.3% was spent for maintenance; \$809.66 or 1.4% was spent for equipment and unused material and \$1,510.32 or 2.7% was spent for special cases.

13.25 miles of road were built to permanent grade at a cost of \$36,249.18; 1.0 miles were built to temporary grade at a cost of \$1,570.50; 0.5 miles were surfaced with gravel at a cost of \$688.30; 35.25 miles were built to natural grade at a cost of \$7,470.98. There were no roads oiled.

The county road system was dragged an average of 31 times at an average cost of \$17.12 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$37.86 per mile of county road. The total average expenditure per mile of county road was \$317.54.

There were no roads surfaced. There are 175.00 miles included in the county road system. Of this mileage 35.00 miles are built to permanent grade; 12.00 miles are constructed to temporary grade; 48.00 miles are built to natural grade, and on 80.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 15 of the 16 townships was \$36,917.60.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$83,106.61 of which \$48,058.60 or 57.8% was spent for permanent bridges and culverts; \$9,334.98 or 11.2% was spent for temporary bridges and

culverts; \$8,425.38 or 10.1% was spent for repairs; \$6,227.24 or 7.5% was spent for culvert material for townships; \$7,054.88 or 8.5% was spent for equipment and unused material; \$911.00 or 1.1% was spent for filling bridges and culverts and \$3,094.53 or 3.8% was spent for special cases.

Of the total amount \$57,393.58 spent for new bridges and culverts \$48,058.60 or 83.7% was spent for permanent work and \$9,334.98 or 16.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 30 concrete box culverts costing \$14,620.67; 13 circular concrete culverts costing \$2,641.52; 4 corrugated pipes with headwalls costing \$599.11; 11 cast iron pipes with headwalls costing \$491.73; 1 concrete slab bridge costing \$800.00; 3 concrete deck girders costing \$26,888.66; 1 retaining wall costing \$564.11; 1 I-beam span on concrete abutments costing \$1,452.80; 27 concrete pipes without headwalls costing \$349.53; 46 corrugated pipes without headwalls costing \$1,541.85; 5 boiler pipes without headwalls costing \$67.75; 3 cast iron pipes without headwalls costing \$129.60; 21 wood pile bridges costing \$7,117.65 and 4 miscellaneous bridges and culverts costing \$128.60.

Roads.

CASS COUNTY.

The total county road expenditure was \$17,280.02 of which \$3,336.42 or 19.3% was spent for permanent work; \$281.85 or 1.6% was spent for temporary work; \$7,329.65 or 42.4% was spent for repairs; \$5,668.82 or 32.9% was spent for maintenance; \$571.68 or 3.3% was spent for road equipment and unused material and \$91.60 or 0.5% was spent for special cases.

No roads were built to temporary or natural grade and none were surfaced or oiled. 1.75 miles were built to permanent grade at a cost of \$3,219.87.

The county road system was dragged an average of 35 times at an average cost of \$27.70 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$91.21 per mile of county road. The total average expenditure per mile of county road was \$121.26.

There are 142.50 miles included in the county road system. Of this mileage 2.25 miles are built to permanent grade; 2.75 miles are constructed to temporary grade; 121.00 miles are built to natural grade, and on 16.0 miles only repair and maintenance work has been done. There were no roads surfaced.

The total township road expenditure indicated by reports from 15 of the 18 townships was \$32,442.93.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$80,766.02 of which \$43,609.70 or 54.1% was spent for permanent bridges and culverts; \$6,096.93 or 7.5% was spent for temporary bridges and culverts; \$14,198.91 or 17.5% was spent for repairs; \$4,303.00 or 5.3% was spent for culvert material for townships; \$3,995.56 or 5.0% was spent for

equipment and unused material; \$6,957.08 or 8.6% was spent for filling bridges and culverts and \$1,604.84 or 2.0% was spent for special cases.

Of the total amount \$49,706.63 spent for new bridges and culverts \$43,609.70 or 87.8% was spent for permanent work; and \$6,096.93 or 12.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction 24 concrete box culverts costing \$23,011.96; 3 headwalls on culverts previously constructed costing \$344.00; 4 I-beam spans on concrete abutments costing \$12,741.06; 2 pony truss spans with concrete abutments costing \$7,512.68; 19 concrete pipes without headwalls costing \$1,280.70; 1 corrugated pipe without headwalls costing \$64.70; 1 boiler pipe culvert without headwalls costing \$92.00; 18 wood pile bridges costing \$4,435.08; 16 miscellaneous bridges and culverts costing \$224.45.

CEDAR COUNTY.

The total county road expenditure was \$34,347.72 of which \$11,886.37 or 34.6% was spent for permanent work; \$11,565.66 or 33.7% was spent for temporary work; \$2,686.11 or 7.8% was spent for repairs; \$6,573.82 or 19.2% was spent for maintenance; \$724.01 or 2.1% was spent for road equipment and unused material and \$911.75 or 2.6% was spent for special cases.

There were no roads built to temporary grade. 3.87 miles were built to permanent grade at a cost of \$10,292.79; 0.25 miles were surfaced with macadam at a cost of \$1,093.48; 39.49 miles were built to natural grade at a cost of \$4,424.99; and 40.85 miles were oiled at a cost of \$7,140.67.

The county road system was dragged an average of 43.6 times at an average cost of \$32.71 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$58.49 per mile of county road. The total average expenditure per mile of county road was \$216.98.

There are 158.30 miles included in the county road system. Of this mileage 1.90 miles are now surfaced; 14.40 miles are built to permanent grade; 1.33 miles are constructed to temporary grade; 79.74 miles are built to natural grade, and on 60.93 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$52,866.87.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$57,061.23 of which \$44,398.34 or 78.0% was spent for permanent bridges and culverts; \$793.72 or 1.4% was spent for temporary bridges and culverts; \$10,197.70 or 17.7% was spent for repairs; \$1,146.24 or 2.0% was spent for culvert material for townships; \$23.00 or 0.04% was spent for equipment and unused material; \$86.75 or 0.15% was spent for special cases, bridges and culverts and \$415.48 or 0.71% was spent for special cases,

Of the total amount \$45,192.06 spent for new bridges and culverts \$44,398.34 or 98.2% was spent for permanent work and \$793.72 or 1.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 129 concrete box culverts costing \$30,770.57; 7 circular concrete culverts costing \$474.12; 1 concrete slab bridge costing \$1,550.00; 1 concrete deck girder costing \$3,456.00; 4 I-beam spans on concrete abutments costing \$3,855.95; 2 pony truss spans with concrete abutments and floor costing \$4,291.70; 24 boiler pipes without headwells costing \$695.29 and 9 miscellaneous bridges and culverts costing \$98.43.

Roads.

CERRO GORDO COUNTY.

The total county road expenditure was \$98,349.94 of which \$77,092.27 or 78.5% was spent for permanent work; \$418.86 or 0.4% was spent for temporary work; \$6,533.04 or 6.6% was spent for repairs; \$6,152.56 or 6.2% was spent for maintenance; \$1,257.73 or 1.3% was spent for road equipment and unused material and \$6,895.48 or 7.0% was spent for special cases.

There were no roads oiled. 46.72 miles were built to permanent grade at a cost of \$42,640.64; 5.7 miles were surfaced with gravel at a cost of \$4,082.33; 1.4 miles were surfaced with concrete at a cost of \$27,763.93 and 3.0 miles were built to natural grade at a cost of \$418.36.

The surfacing with concrete above reported was in connection with lowa Federal Aid Project No. 1. This project provides for the paving of 4.07 miles of road between Mason City and Clear Lake at a cost of approximately \$90,000.00. The paving will be sixteen feet wide, single course, reinforced concrete. Cerro Gordo county's allotment of Federal Aid is \$22,453.75, and the State matches this with a like sum leaving about \$45,000.00 to be paid by the county.

Construction was begun on this project in September, 1917 and about 1.4 miles have been surfaced. The project will be completed in the spring of 1918 as soon as weather conditions permit. A total of \$27,763.43 has been expended on the project to date of which sum, the state paid \$18,100.62 from the Federal-County-Cooperation Road Fund. The Bryant Paving Company of Waterloo has the contract for construction of the pavement. The completion of this project will provide paved road from Mason City to Clear Lake which together with the pavement in these two cities form a link on the North Iowa Pike about ten miles in length.

The county road system was dragged an average of 28.3 times at an average cost of \$25.31 per mile, the average cost per mile one round trip being \$0.76. The average cost of repairs and maintenance was \$83.48 per mile of county road. The total average expenditure per mile of county road was \$647.25.

There are 151.95 miles included in the county road system. Of this mileage 7.70 miles are now surfaced; 68.20 miles are built to permanent grade; 35.00 miles are built to natural grade and on 41.05 miles only repair and maintenance work has been done. There were no roads built to temporary grade.

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Roads.

The total township road expenditure indicated by reports from all of the townships was \$48,857.99.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$67,178.47 of which \$54,513.04 or 81.3% was spent for permanent bridges and culverts; \$2,412.95 or 3.6% was spent for temporary bridges and culverts; \$4,126.04 or 6.1% was spent for repairs; \$1,987.02 or 2.9% was spent for culvert material for townships; \$1,831.44 or 2.7% was spent for equipment and unused material; \$1,624.42 or 2.4% was spent for filling bridges and culverts and \$683.56 or 1.0% was spent for special cases.

Of the total amount \$56,925.99 spent for new bridges and culverts. \$54,513.04 or 95.8% was spent for permanent work and \$2,412.95 or 4.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 70 concrete box culverts costing \$23,131.78; 45 circular concrete culverts costing \$5,361.81; 1 cast iron pipe with headwalls costing \$110.80; 6 headwalls on culverts previously constructed costing \$484.65; 3 concrete slab bridges costing \$3,768.60; 4 concrete deck girders costing \$3,581.23; 5 I-beam spans on concrete abutments costing \$6,155.12; 3 pony truss spans with concrete abutments and floor costing \$11,919.05 and 135 corrugated pipes without headwalls costing \$2,412.95.

CHEROKEE COUNTY.

Roads.

The total county road expenditure was \$32,633.74 of which \$21,600.04 or 66.1% was spent for permanent work; \$1,064.25 or 3.3% was spent for temporary work; \$4,007.55 or 12.3% was spent for repairs; \$2,905.30 or 8.9% was spent for maintenance; \$361.90 or 1.1% was spent for road equipment and unused material and \$2,694.70 or 8.3% was spent for special cases.

There were no roads built to temporary grade and none were surfaced or oiled. 16.25 miles were built to permanent grade at a cost of \$20,125.80; and 8.0 miles were built to natural grade at a cost of \$1.064.25.

The county road system was dragged an average of 25 times at an average cost of \$20.17 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$45.03 per mile of county road. The total average expenditure per mile of county road was \$212.53.

There are 153.50 miles included in the county road system. Of this mileage 52.50 miles are built to permanent grade; 77.00 miles are built to natural grade, and on 24.0 miles only repair and maintenance work has been done. There are no roads surfaced and none are built to temporary grade.

The total township road expenditure indicated by reports from all of the townships was \$28,756.47.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$201,310.69, of which \$153,735.06, or 76.4% was spent for permanent

bridges and culverts; \$6,882.48, or 3.4% was spent for temporary bridges and culverts; \$9,218.11, or 4.6% was spent for repairs; \$10,012.69, or 4.9% was spent for culvert material for townships; \$8,014.50, or 4.0%was spent for equipment and unused material; \$2,964.12, or 1.5% was spent for filling bridges and culverts and \$10,483.73, or 5.2% was spent for special cases.

Of the total amount \$160,617.54 spent for new bridges and culverts; \$153,735.06, or 95.7% was spent for permanent work and \$6,882.48, or 4.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction 142 concrete box culverts costing \$69,800.80; 5 circular concrete culverts costing \$548.58; 6 concrete slab bridges costing \$9,912.26; 1 concrete deck girder costing \$1,581.80; 1 concrete retaining wall costing \$226.00; 30 I-beam spans on concrete abutments costing \$55,483.89; 4 pony truss spans on concrete abutments costing \$16,181.73; 116 corrugated pipe without headwalls costing \$4,203.04; 3 I-beam spans on piling abutments costing \$1,617.02; and 34 miscellaneous bridges and culverts costing \$1,062.42.

CHICKASAW COUNTY.

Roads.

The total county road expenditure was \$23,820.11, or which \$6,514.85, or 27.4% was spent for permanent work; \$6,566.91, or 27.6% was spent for temporary work; \$5,234.05, or 22.0% was spent for repairs; \$3,509.07, or 14.7% was spent for maintenance; \$1,681.28, or 7.0% was spent for road equipment and unused material and \$313.95, or 1.3% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 6.5 miles were built to permanent grade at a cost of \$3,723.51; 5.25 miles were surfaced with clay and gravel at a cost of \$1,372.30; 36.0 miles were built to natural grade at a cost of \$6,566.91.

The county road system was dragged an average of 18 times at an average cost of \$14.40 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$55.69 per mile of county road. The total average expenditure per mile of county road was \$152.20.

There are 156.5 miles included in the county road system. Of this mileage 8.75 are now surfaced; 10.00 miles are built to permanent grade; 106.75 miles are built to natural grade, and on 31.0 miles only repair and maintenance work has been done. There are no roads built to temporary grade.

The total township road expenditure indicated by reports from all of the townships was \$35,241.07.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$43,847.49, of which \$16,592.39, or 37.8% was spent for permanent bridges and culverts; \$9,685.55, or 22.1% was spent for temporary bridges and culverts; \$6,828.65, or 15.5% was spent for repairs; \$2,389.60, or 5.5% was spent for culvert material for townships; \$6,671.67, or 15.2% was

spent for equipment and unused material; \$637.35, or 1.5% was spent for filling bridges and culverts and \$1,042.28, or 2.4% was spent for special cases.

Of the total amount \$26,277.94 spent for new bridges and culverts \$16,592.39, or 63.2% was spent for permanent work; \$9,635.55, or 36.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 18 concrete box culverts costing \$3,327.63; 1 concrete abutments costing \$298.25; 1 I-beam span on concrete abutments costing \$245.08; 4 pony truss spans with concrete abutments and floor costing \$12,721.43; 15 corrugated pipes without headwalls costing \$493.98 and 42 wood pile bridges costing \$9,191.57.

Roads.

CLARKE COUNTY.

The total county road expenditure was \$8,389.10, of which \$2,354.88, or 28.0% was spent for temporary work; \$1,199.55, or 14.3% was spent for repairs; \$2,926.36, or 34.8% was spent for maintenance; \$1,068.14, or 12.8% was spent for road equipment and unused material and \$840.17, or 10.1% was spent for special cases. There was no permanent road work done.

There were no roads built to permanent or temporary grade, and none were surfaced or oiled. 22.0 miles were built to natural grade at a cost of \$2.354.88.

The county road system was dragged an average of 36 times at an average cost of \$25.67 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$36.19 per mile of county road. The total average expenditure per mile of county road was \$73.59.

There are 114.0 miles included in the county road system. Of this mileage, 108 miles are built to natural grade and on 6.0 miles, only repair and maintenance have been done. There were no roads surfaced or built to permanent or temporary grade.

The total township road expenditure indicated by reports from 11 of the 12 townships was \$16,535.09.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$36,519.47, of which \$9,084.83, or 24.9% was spent for permanent bridges and culverts; \$3,707.42, or 10.2% was spent for temporary bridges and culverts; \$3,480.67 or 9.5% was spent for repairs; \$4,213.88, or 11.5% was spent for culvert material for townships; \$5,133.89, or 14.1% was spent for equipment and unused material; \$10,834.79, or 29.6% was spent for special cases.

Of the total amount \$12,792.25 spent for new bridges and culverts. \$9,084.83, or 71.0% was spent for permanent work and \$3,707.42, or 29.0% was spent for temporary work. The amounts last above referred to were spent on the following construction: 13 concrete box culverts, costing \$9,084.83; 62 corrugated pipe without headwalls, costing \$1,813.88 and 1 pony truss on piling, wood floor, costing \$1,893.54.

CLAY COUNTY.

Roads.

The total county road expenditure was \$142,364.89, of which \$118,167.02, of \$3.0.% was spent for permanent work; \$2,805.69, or 2.0% was spent for repairs; \$5,003.49, or 3.5% was spent for maintenance; \$1,668.20, or 1.2% was spent for road equipment and unused material, and \$14,720.49, or 10.3% was spent for special cases. There was no temporary road work done.

80.65 miles were built to permanent grade at a cost of \$87,907.71; 33.10 miles were surfaced with gravel at a cost of \$25,319.44. No roads were built to temporary or natural grade, and none were oiled.

The county road system was dragged an average of 17 times at an average cost of \$14.06 per mile, the average cost per mile one round trip being \$0.82. The average cost of repairs and maintenance was \$52.06 per mile of county road. The total average expenditure per mile of county road was \$949.10.

There are 150 miles included in the county road system. Of this mileage, 45 are now surfaced; 103.5 miles are built to permanent grade; none are built to temporary or natural grade, and on 1.50 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 6 of the 16 townships, was \$17,038.79.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$103,412.99, of which \$80,375.11, or 77.8% was spent for permanent bridges and culverts; \$9,843.27, or 9.5% was spent for temporary bridges and culverts; \$2,781.57, or 2.7% was spent for repairs; \$9,230.64, or 8.9% was spent for culvert material for townships; \$864.61, or 0.8% was spent for equipment and unused material and \$317.79, or 0.3% was spent for special cases.

Of the total amount \$90,218.38 spent for new bridges and culverts, \$80,375.11, or 89.1% was spent for permanent work and \$9,843.27, or 10.9% was spent for temporary work.

The amounts last above referred to, were spent on the following construction: 76 concrete box culverts, costing \$38,588.97; lconcrete slab bridge, costing \$411.18; 34 I-beam spans on concrete abutments, costing \$22,736.21; 7 pony trusses with concrete abutments and floor, costing \$18,638,75; 44 concrete pipe without headwalls, costing \$665.44 and 209 corrugated pipe without headwalls, costing \$9,177.83.

Roads.

CLAYTON COUNTY.

The total county road expenditure was \$28,336.56, of which \$6,741.28, or 23.8% was spent for permanent work; \$2,195.77, or 7.8% was spent 10 for repairs; \$16,031.04, or 56.5% was spent for maintenance; \$3,135.91, or 11.1% was spent for road equipment and unused material and \$232.56, or 0.8% was spent for special cases. There was no temporary road work done.

There were no roads built to permanent, temporary or natural grade, and none were surfaced or oiled.

The county road system was dragged an average of 38.5 times at an average cost of \$26.06 per mile, the average cost per mile one round trip being \$0.67. The average cost of repairs and maintenance was \$91.44 per mile of county road. The total average expenditure per mile of county road was \$142.18.

There are 199.30 miles included in the county road system. Of this mileage, 1.00 are now surfaced; 2.00 miles are built to temporary grade, and on 196.3 miles, only repair and maintenance work has been done. There were no roads built to permanent or natural grade.

The total township road expenditures indicated by reports from all of the townships, was \$44,940.94.

Bridges.

146

The total expenditure for bridge and culvert work during 1917 was \$76,780.87, of which \$66,334.75, or 86.6% was spent for permanent bridges and culverts; \$2,795.12, or 3.6% was spent for temporary bridges and culverts; \$3,185.25, or 4.1% was spent for repairs; \$2,403.69, or 3.1% was spent for culvert material for townships; \$939.31, or 1.2% was spent for equipment and unused material; \$787.00, or 1.0% was spent for filling bridges and culverts, and \$335.75, or 0.4% was spent for special cases.

Of the total amount \$69,129.87 spent for new bridges and culverts, \$66,334.75, or 96.0% was spent for permanent work and \$2,795.12, or 4.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 48 concrete box culverts costing \$20,240.43; 2 concrete arch culverts costing \$1,482.00; 1 corrugated pipe culvert with headwalls, costing \$70.00; 12 concrete slab bridges costing \$12,275.95; 2 concrete abutments costing \$1,952.28; 2 concrete thru girders costing \$779.00; 2 concrete deck girders costing \$6,426.50; 1 masonry abutment costing \$178.10; 13 I-beam spans on concrete abutments costing \$9,164.15; 4 pony trusses with concrete abutments and floor costing \$13,766.34; 37 corrugated pipe without headwalls costing \$1,150.09; 6 wood-pile bridges costing \$1,580.58; 1 miscellaneous bridge and culvert costing \$64.45.

Roads.

CLINTON COUNTY.

The total county road expenditure was 34,370.13, of which 14,104.14, or 41.0% was spent for permanent work; 7,066,21, or 20.6% was spent for temporary work; 33,680.78, or 10.7% was spent for repairs; 5,190.78, or 15.1% was spent for maintenance; 2.784.17, or 8.1% was spent for road equipment and unused material and 1,544.05; or 4.5% was spent for special cases.

5.95 miles were built to permanent grade at a cost of \$5,014.08; 0.25 miles were built to temporary grade at a cost of \$557.40; 3.92 miles were surfaced with gravel at a cost of \$7,830.24; 14.7 miles were built to natural grade at a cost of \$1,616.97 and 17.1 miles were oiled at a cost of \$5,449.24.

The county road system was dragged at average of 28.46 times at an average cost of \$21.35 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$45.37 per mile of county road. The total average expenditure per mile of county road was \$175.80.

There are 195.50 miles included in the county road system. Of this mileage, 12.19 miles are now surfaced; 15.77 miles are built to permanent grade; 7.75 miles are constructed to temporary grade; 73.7 miles are built to natural grade and on 86.09 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 20 townships, was \$48,109.55.

Bridges.

The total expenditure for bridge and culvert work during 1917 was 576,694.79, of which 63,134.08, or 82.4% was spent for permanent bridges and culverts; 2,135.82, or 2.8% was spent for temporary bridges and culverts; 1,937.30, or 2.5% was spent for repairs; 3306.29, or 0.4% was spent for culvert material for townships; 4,833.40, or 6.3% was spent for equipment and unused material; 2,245.09, or 2.9% was spent for special cases.

Of the total amount \$65,269.90 spent for new bridges and culverts, \$63,134.08, or 96.7% was spent for permanent work and \$2,135.82, or 3.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 45 concrete box culverts costing \$31,227.93; 8 I-beam spans on concrete abutments costing \$14,683.87; 4 pony trusses with concrete abutments and floor costing \$15,018.39; 1 high steel truss with concrete abutment costing \$2,203.79; 40 corrugated pipe without headwalls, costing \$1,514.47; 3 boiler pipe without headwalls costing \$21.00; 1 I-beam span on piling costing \$80.30 and 7 wood pile bridges costing \$520.05.

Roads.

CRAWFORD COUNTY.

The total county road expenditure was \$166,126.96 of which \$144,152.60, or 86.8% was spent for permanent work; \$9,989.45, or 6.0% was spent for repairs; \$5,895.52, or 3.5% was spent for maintenance; \$1,449.32, or 0.9% was spent for road equipment and unused material, and \$4,640.07, or 2.8% was spent for special cases. There was no temporary road work done.

41.52 miles were built to permanent grade at a cost of \$144,152.60. There were no roads built to temporary or natural grade, and none were surfaced or oiled.

Sec.

ROAD AND BRIDGE EXPENDITURES

The county road system was dragged an average of 37 times at an average cost of \$23.63 per mile; the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$105.54 per mile of county road. The total average expenditure per mile of county road was \$1,103.83.

There are 150.5 miles included in the county road system. Of this mileage, 96.0 miles are built to permanent grade; 1.00 mile is built to natural grade, and on 53.5 miles, only repair and maintenance work has been done. No roads were surfaced or built to temporary grade.

The total township road expenditure indicated by reports from all of the townships, was \$56,325.00.

Bridges.

148

The total expenditure for bridges and culvert work during 1917 was \$215,743.16, of which \$141,349.81, or 65.6% was spent for permanent bridges and culverts; \$7,193.89, or 3.3% was spent for temporary bridges and culverts; \$33,645.71, or 15.6% was spent for repairs; \$12,082.55, or 5.6% was spent for culvert material for townships; \$10,000.00, or 4.6% was spent for equipment and unused material; \$10,292.72, or 4.8% was spent for filling bridges and culverts and \$1,178.48, or 0.5% was spent for special cases.

Of the total amount \$148,543.70 spent for new bridges and culverts, \$141,349.81, or 95.2% was spent for permanent work and \$7,193.89, or 4.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 136 concrete box culverts costing \$88,738.07; 4 I-beam spans on concrete abutments costing \$5,703.46; 13 pony trusses with concrete abutments and floor costing \$46,908.28; 23 corrugated pipe without headwalls costing \$981.10, and 28 wood pile bridges costing \$6,212.79.

Roads.

DALLAS COUNTY.

The total county road expenditure was \$41,906.44, of which \$20,699.41, or 49.3% was spent for permanent work; \$8,264.82, or 19.8% was spent for temporary work; \$665.13, or 1.6% was spent for repairs; \$6,681.94, or 15.8% was spent for maintenance; \$1,743.67, or 4.2% was spent for road equipment and unused material; and \$3,851.47, or 9.2% was spent for special cases.

6.97 miles were built to permanent grade at a cost of \$9,861.15; 12.25 miles were surfaced with gravel at a cost of \$9,740.45; 63.5 miles were built to natural grade at a cost of \$8,264.82. No roads were oiled, or
built to temporary grade.

The county road system was dragged an average of 34 times at an average cost of \$25.45 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$42.93 per mile of county road. The total average expenditure per mile of county road was \$244.85.

There are 171.15 miles included in the county road system. Of this mileage, 23.73 miles are now surfaced; 15.74 miles are built to permanent

grade; 120.00 miles are built to natural grade, and on 11.68 miles, only repair and maintenance work has been done. No roads have been constructed to temporary grade.

The total township road expenditure indicated by reports from all of the townships, was \$46,705.30.

Bridges.

Roads.

The total expenditure for bridge and culvert work during 1917 was \$67,065.19, of which \$36,276.15, or 54.2% was spent for permanent bridges and culverts; \$3,617.52, or 5.4% was spent for temporary bridges and culverts; \$8,855.97, or 13.2% was spent for repairs; \$8,546.04, or 12.7% was spent for culvert material for townships; \$3,086.96, or 4.6% was spent for equipment and unused material; \$4,576.61, or 6.8% was spent for filling bridges and culverts, and \$2,105.94, or 3.1% was spent for special cases.

Of the total amount \$39,893.67 spent for new bridges and culverts, \$36,276.15, or 90.9% was spent for permanent work and \$3,617.52, or 9.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 24 concrete box culverts costing \$18,497.14; 3 circular concrete culverts costing \$884.01; 5 concrete slab bridges costing \$4,454.00; 2 high steel trusses with concrete abutments, costing \$12,441.00; 180 concrete pipe without headwalls costing \$1,207.45; 73 corrugated pipe without headwalls, costing \$2,213.99, and 6 miscellaneous bridges and culverts costing \$196.08.

DAVIS COUNTY.

The total county road expenditure was \$12,838.57, of which \$5,122.97, or 39.8% was spent for temporary work; \$3,871.49, or 30.1% was spent for repairs; \$2,823.52, or 22.1% was spent for maintenance; \$679.68, or 5.3% was spent for road equipment and unused material and \$340.91, or 2.7% was spent for special cases. There was no permanent road work done.

There were no roads built to permanent or temporary grade and none were surfaced or oiled. 45.0 miles were built natural grade at a cost of \$5.122.97.

The county road system was dragged an average of 18.8 times at an average cost of \$18.82 per mile, the average cost per mile one round trip being \$0.50. The average cost of repairs and maintenance was \$42.97 per mile of county road. The total average expenditure per mile of countrol road was \$82.40.

There are 155.80 miles included in the county road system. Of this mileage 110.75 miles are built to natural grade and on 45.05 miles only repair and maintenance work has been done. There are no roads surfaced and none are built to permanent or temporary grade.

The total township road expenditure indicated by reports from 7 of the 15 townships was \$21,745.56.

Bridges.

150

The total expenditure for bridgeand culvert work during 1917 was \$55,573.12, of which \$20,009.88, or 36.0% was spent for permanent bridges and culverts; \$3,667.60, or 6.4% was spent for temporary bridges and culverts; \$19,402.65, or 35.1% was spent for repairs; \$1,429.90, or 2.6% was spent for equipment and unused material; \$7,116.34, or 12.8% was spent for filling bridges and culverts and \$3,946.75, or 7.1% was spent for special cases.

Of the total amount \$23,677.48 spent for new bridges and culverts. \$20,009.88, or \$4.5% was spent for permanent work and \$3,667.60, or 19.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 10 concrete box culverts costing \$7,029.60; 6 circular concrete culverts costing \$2,581.08; 48 concrete pipe culverts with headwalls \$5,680.04; 9 headwalls on culverts previously constructed \$763.63; 1 I-beam span on concrete abutments costing \$1,529.49; 1 pony truss with concrete abutments and floor costing \$2,426.04; 3 I-beam spans on piling costing \$2,919.21, and 2 wood pile bridges costing \$748.39.

Roads.

DECATUR COUNTY.

The total county road expenditures was \$28,630.24, of which \$8,775.98, or 30.6% was spent for permanent work; \$2,167.49, or 7.6% was spent for temporary work; \$387.00, or 1.4% was spent for repairs; \$11,204.33, or 39.1% was spent for maintenance: \$2,155.72, or 7.5% was spent for road equipment and unused material and \$3,939.72, or 13.8% was spent for special cases.

No roads were built to temporary grade and none were surfaced or oiled. 8.1 miles were built to permanent grade at a cost of \$7,869.61, and 13.97 miles were built to natural grade at a cost of \$1,353.93.

The county road system was dragged an average of 39 times at an average cost of \$30.58 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$76.26 per mile of county road. The total average expenditure per mile of county road was \$188.35.

There are 152.00 miles included in the county road system. Of this mileage 10.35 miles are constructed to temporary grade; 45.00 miles are built to natural grade, and on 96.65 miles only repair and maintenance work has been done. There are no roads built to permanent grade and none are surfaced.

The total township road expenditure indicated by reports from all of the 16 townships was \$23,449.49.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$37,011.45 of which \$9.382.15, or 25.4% was spent for permanent bridges and culverts; \$1,516.44, or 4.1% was spent for temporary bridges and culverts; \$12,101.94, or 32.7% was spent for repairs; \$4,712.32, or 12.7%

was spent for culvert material for townships; \$5,302.39, or 14.3% was spent for equipment and unused material; \$2,928.48, or 7.9% was spent for filling bridges and culverts, and \$1,067.73, or 2.9% was spent for mecial cases.

Of the total amount \$10,898.59 spent for new bridges and culverts, 19.382.15, or 86.1% was spent for permanent work, and \$1,516.44, or 13.9% was spent for temporary work.

The amounts last above referred to were spent on the following construction. 17 concrete box culverts costing \$8,470.31; 1 concrete pipe culvert with headwalls costing \$84.56; 8 cast iron pipe culverts with headwalls costing \$827.28, and 58 corrugated pipes without headwalls costing \$1,516.44.

Roads.

DELAWARE COUNTY.

The total county road expenditure was \$38,282.36, of which \$18,385.27 or 48.1% was spent for permanent work; \$6,211.09 or 16.2% was spent for temporary work; \$6,326.05 or 16.5% was spent for repairs; \$4,622.37 or 12.1% was spent for maintenance; \$2,227.63 or 5.8% was spent for equipment and unused material and \$509.95 or 1.3% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 4.0 miles were built to permanent grade at a cost of \$12,407.78; 5.5 miles were surfaced with gravel at a cost of \$5,785.21 and 42.5 miles were built to natural grade at a cost of \$6,211.09.

The county road system was dragged an average of 35 times at an average cost of \$27.18 per mile, the average cost per mile one round trip being \$0.76. The average cost of repairs and maintenance was \$62.27 per mile of county road. The total expenditure per mile of county road averaged \$217.76.

There are 175.80 miles included in the county road system. Of this mileage 13.5 miles are now surfaced; 19.00 miles are built to permanent grade; 105.8 miles are built to natural grade, and on 37.5 miles only repair and maintenance work has been done. There are no roads constructed to temporary grade.

The total township road expenditure indicated by reports from all of the 16 townships was \$36,175.47.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$44,829.07 of which \$25,175.28 or 56.1% was spent for permanent bridges and culverts; \$6,752.84 or 15.1% was spent for temporary bridges and culverts; \$5,459.84 or 12.2% was spent for repairs; \$4,301.35 or 9.6% was spent for culvert material for townships; \$1,466.44 or 3.3% was spent for equipment and unused material; \$1,570.70 or 3.5% was spent for filling bridges and culverts and \$102.62 or .2% was spent for special cases.

Of the total amount \$31,928.12 spent for new bridges and culverts, \$25,175.28 or 78.8% was spent for permanent work and \$6,752.84 or 21.2% was spent for temporary work.

IOWA STATE HIGHWAY COMMISSION

The amounts last above referred to were spent on the following construction: 60 concrete box culverts costing \$19,013.91; 1 masonry box culvert costing \$107.10; 3 concrete slab bridges costing \$2,846.15; 3 I-beam spans on concrete abutments costing \$2,061.65; 2 pony trusses with concrete abutments and floor costing \$1,146.47; 35 corrugated pipes without headwalls costing \$981.08; 1 cast iron pipe without headwalls costing \$90.50; 2 I-beam spans on piling costing \$3,930.70 and 10 wood pile bridges costing \$1,750.56.

Roads.

DES MOINES COUNTY.

The total county road expenditure was \$12,463.70 of which \$2,892.27 or 23.2% was spent for permanent work; \$2,670.29 or 21.4% was spent for temporary work; \$578.39 or 4.6% was spent for repairs; \$4,070.37 or 32.7% was spent for maintenance; \$981.58 or 7.9% was spent for road equipment and unused material; and \$1,270.80 or 10.2% was spent for special cases.

0.37 miles were built to permanent grade at a cost of \$1,541.00; 0.5 miles were surfaced with gravel at a cost of \$115.73; 20.10 miles were built to natural grade at a cost of \$1,664.02, and 2.75 miles were oiled at a cost of \$1,006.27. No roads were built to temporary grade.

The county road system was dragged an average of 22.0 times at an average cost of \$28.00 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$57.04 per mile of county road. The total average expenditure per mile of county road was \$152.93.

There are \$1.50 miles included in the county road system. Of this mileage, 0.50 miles are now surfaced; 6.36 miles are built to permanent grade; 1.54 miles are constructed to temporary grade; 38.25 miles are built to natural grade, and on 34.85 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$25,862.64.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$30,807.38, of which \$14,952.20 or 48.6% was spent for permanent bridges and culverts; \$292.58 or 1.0% was spent for temporary bridges and culverts; \$1,754.47 or 5.7% was spent for repairs; \$3,357.64 or 10.9% was spent for culvert material for townships; \$3,898.53 or 12.6% was spent for equipment and unused material; \$908.65 or 2.9% was spent for filling bridges and culverts, and \$5,643.31 or 18.3% was spent for special cases.

Of the total amount \$15,244.78 spent for new bridges and culverts, \$14,952.20 or 98.1% was spent for permanent work and \$292.58 or 1.9% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 19 concrete box culverts costing \$8,098.06; 5 circular concrete culverts costing \$1,017.57; 21 concrete pipe with headwalls costing \$2,728.80: 2 I-beam spans on concrete abutments costing \$1,521.82; 1 pony truss with concrete abutments and floor, costing \$1,585.95; 10 corrugated pipe without headwalls costing \$282.08 and 2 cast iron pipe without headwalls costing \$10.50.

ROAD AND BRIDGE EXPENDITURES

DICKINSON COUNTY.

Roads.

The total county road expenditure was \$127,813.43, of which \$104,098.50 or \$1.5% was spent for permanent work; \$3,947.08 or 3.1% was spent for temporary work; \$1,108.72 or 0.9% was spent for repairs; \$9,938.59 or 7.8% was spent for maintenance; \$2,506.26 or 1.9% was spent for road equipment and unused material, and \$6,214.28 or 4.8% was spent for special cases.

40.89 miles were built to permanent grade at a cost of \$45,984.14; 38.89 miles were surfaced with gravel at a cost of \$50,380.25; 12.0 miles were built to natural grade at a cost of \$2,531.36, and 1.9 miles were oiled at a cost of \$815.87. No roads were built to a temporary grade.

The county road system was dragged an average of 60.9 times at an average cost of \$48.74 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$103.83 per mile of county road. The total average expenditure per mile of county road was \$1,201.25.

There are 106.43 miles included in the county road system. Of this mileage, 60.25 miles are now surfaced; 11.81 miles are built to permanent grade; 19.30 miles are built to natural grade, and on 15.07 miles, only repair and maintenance work has been done. No roads are constructed to temporary grade.

The total township expenditures indicated by reports from all of the townships was \$28,540.57.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$83,936.98, of which \$75,341.11 or \$9.8% was spent for permanent bridges and culverts; \$3,208.90 or 3.8% was spent for temporary bridges and culverts; \$836.28 or 1.0% was spent for repairs; \$1,090.70 or 1,3% was spent for culvert material for townships; \$1,083.06 or 1.3% was spent for equipment and unused material; \$1,357.26 or 1.6% was spent for special cases.

Of the total amount \$78,550.01 spent for new bridges and culverts, \$75,341.11 or 95.9% was spent for permanent work and \$3,208.90 or 4.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 43 concrete box culverts costing \$19,522.81; 133 circular concrete culverts costing \$14,079.97; 12 I-beam spans on concrete abutments, costing \$13,689.41; 9 pony trusses with concrete abutments and floor costing \$28,048.92; 141 concrete pipe without headwalls costing \$1,944.30; 2 I-beam spans on piling, costing \$1,001.00, and 1 miscellaneous bridge and culvert, costing \$263.60.

DUBUQUE COUNTY.

Roads.

The total county, road expenditure was \$129,775.00, of which \$93,657.21 or 72.3% was spent for permanent work; \$2,629.84 or 2.0% was spent for temporary work; \$23,981.42 or 18.4% was spent for repairs; \$2,551.00 or 2.0% was spent for maintenance; \$3,752.64 or 2.9% was spent for road equipment and unused material, and \$3,202.89 or 2.4% was spent for special cases.

There were 4.25 miles built to permanent grade at a cost of \$13,358.27; no roads were built to temporary grade. 1.95 miles were surfaced with brick at a cost of \$42,650.85; 13.0 miles were built to natural grade at a cost of \$2,629.84. No roads were oiled.

The county road system was dragged an average of 21 times at an average cost of \$16.81 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$153.23 per mile of county road. The total average expenditure per mile of county road was \$752.32.

There are 172.55 miles included in the county road system. Of this mileage 20.95 miles are now surfaced; 4.25 miles are built to permanent grade; 0.00 miles are constructed to temporary grade; 13.0 miles are built to natural grade, and on 134.35 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 16 of the 17 townships was \$32,428.36.

Bridges.

Roads.

The total expenditure for bridge and culvert work during 1917 was \$107,097.39, of which \$57,547.27 or 53.7% was spent for permanent bridges and culverts; \$1,970.34 or 1.8% was spent for temporary bridges and culverts; \$12,696.31 or 11.8% was spent for repairs; \$15,818.08 or 14.8% was spent for culvert material for townships; \$1,793.20 or 1.7% was spent for equipment and unused material; \$15,267.11 or 14.2% was spent for special cases.

Of the total amount \$59,427.61 spent for new bridges and culverts, \$57,457.27 or 96.7% was spent for permanent work, and \$1,970.34 or 3.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 91 concrete box culverts costing \$38,841.34; 1 headwall on culvert previously constructed costing \$296.00; 3 concrete abutments \$4,576.33; 4 I-beam spans on concrete abutments costing \$10,675.00; 2 pony trusses with concrete floor and abutments costing \$3,068.60; 25 concrete pipe culverts without headwalls costing \$1,741.34, and 2 miscellaneous bridges and culverts costing \$229.00.

EMMET COUNTY.

The total county road expenditure was \$49,148.48, of which \$36,566.39 or 74.4% was spent for permanent work; \$35.00 or 0.1% was spent for temporary work; \$3,849.41 or 7.8% was spent for repairs; \$3,962.19 or 8.1% was spent for maintenance; \$1,327.95 or 2.7% was spent for road equipment and unused material, and \$3,407.54 or 6.9% was spent for special cases.

There were 16.55 miles of road built to permanent grade at a cost of \$15,394.47. No roads were built to temporary grade. 20.11 miles were surfaced with gravel at a cost of \$20,369.65. 1.10 miles were built to natural grade at a cost of \$35.00. No roads were oiled.

The county road system was dragged at an average of \$13.18 per mile. The average cost of repairs and maintenance was \$75.47 per mile of county road. The total average expenditure per mile of county road was \$474.86.

There are 103.5 miles included in the county road system. Of this mileage 56.6 miles are now surfaced; 10.6 miles are built to permanent grade; 1.00 miles are constructed to temporary grade; 23.00 miles are built to natural grade, and on 12.3 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 12 townships was \$34,389.56.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$23,815.98, of which \$14,958.38 or 62.7% was spent for permanent bridges and culverts; \$2,037.94 or 8.6% was spent for temporary bridges and culverts; \$2,693.65 or 11.3% was spent for repairs; \$1.806.17 or 7.6% was spent for culvert material for townships; \$2,105.85 or 8.8% was spent for equipment and unused material; \$83.15 or 0.3% was spent for special cases.

Of the total amount \$16,996.32 spent for new bridges and culverts, \$14,958.38 or 88.0% was spent for permanent work; \$2,037.94 or 12.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 21 concrete box culverts costing \$9,257.70; 32 circular concrete culverts costing \$2,927.77; 2 concrete deck girders costing \$2,539.89; 1 retaining wall costing \$233.02; 6 wood pile bridges costing \$2,005.04, and 1 miscellaneous culvert costing \$32.90.

Roads.

FAYETTE COUNTY.

The total county road expenditure was \$35,706.07, of which \$11,785.68, or 32.9% was spent for permanent work; \$9,062.58, or 25.5% was spent for temporary work; \$2,649.84, or 7.4% was spent for repairs; \$6,207.30, or 17.4% was spent for maintenance; \$3,811.79, or 10.7% was spent for road equipment and unused material, and \$2,188.88, or 6.1% was spent for special cases.

There were 2.0 miles built to permanent grade at a cost of \$10,302.88. No roads were built to temporary grade. 1.75 miles were surfaced with gravel at a cost of \$1,070.14. 48.5 miles were built to natural grade at a cost of \$9,062.58. No roads were oiled.

The county road system was dragged an average of 26 times at an average cost of \$14.26 per mile, the average cost per mile one round

trip being \$0.60. The average cost of repairs and maintenance was \$43.84 per mile of county road. The total average expenditure per mile of county road was \$176.76.

There are 202.0 miles included in the county road system. Of this mileage 3.0 miles are now surfaced; 22.0 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 167.0 miles are built to natural grade, and on 10.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 20 townships was \$48,843.60.

Bridges.

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The total expenditure for bridge and culvert work during 1917 was \$104,411.45, of which \$81,578.76, or 77.9% was spent for permanent bridges and culverts; \$1,093.07, or 1.5% was spent for temporary bridges and culverts; \$12,083.44, or 11.5% was spent for repairs; \$6,139.94, or 5.8% was spent for culvert material for townships; \$1,152.50, or 1.1% was spent for equipment and unused material; \$472.34, or 0.4% was spent for filling bridges and culverts, and \$1,891.40, or 1.8% was spent for special cases.

Of the total amount \$82,671.83 was spent for new bridges and culverts, \$81,578.76, or 98.7% was spent for permanent work, and \$1.093.07, or 1.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 52 concrete box culverts costing \$17,956.45; 7 concrete slab bridges costing \$15,924.52; 3 concrete thru girders costing \$12,849.90; 2 concrete deck girders costing \$4,405.86; 7 I-beam spans on concrete abutments costing \$10,087.63; 9 pony trusses with concrete floor and abutments, costing \$20,354.40, and 65 corrugated pipe without headwalls, costing \$1,093.07.

Roads.

FLOYD COUNTY.

The total county road expenditure was \$34,936.64, of which \$11,533.08, or 33.0% was spent for permanent work; \$3,092.75, or 8.8% was spent for temporary work; \$8,428.97, or 24.2% was spent for repairs; \$4,836.65, or 13.8% was spent for maintenance; \$6,525.19, or 18.7% was spent for road equipment and unused material, and \$520.00, or 1.5% was spent for special cases.

There were 4.5 miles built to permanent grade at a cost of \$4,321.35. No roads were built to temporary grade. 3.5 miles were surfaced with gravel at a cost of \$4,786.86. No roads were built to natural grade and no roads were oiled.

The county road system was dragged an average of 32.93 times at an average cost of \$24.69 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$93.32 per mile of county road. The total average expenditure per mile of county road was \$245.53.

There are 142.25 miles included in the county road system. Of this

mileage 0.0 miles are now surfaced; 7.25 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 135.0 miles are built to natural grade, and on 0.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 11 of the 12 townships was \$30,939.85.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$56,071.78, of which \$30,771.35, or 54.9% was spent for permanent bridges and culverts; 0.0% was spent for temporary bridges and culverts; \$15,-390.85, or 27.5% was spent for repairs; \$1,790.47, or 3.2% was spent for culvert material for townships; \$7,194.86, or 12.8% was spent for equipment and unused material; \$924.25, or 1.6% was spent for special cases.

Of the total amount \$30,771.35 was spent for new bridges and culverts, \$30,771.35, or 100.0% was spent for permanent work.

The amounts last above referred to were spent on the following construction: \$3 concrete box culverts costing \$20,060.13; 2 circular concrete culverts costing \$305.12; 2 corrugated pipe culverts with headwalls costing \$569.18; 6 concrete slab bridges costing \$4,517.26; 1 concrete deck girder costing \$1,725.44; 2 concrete abutments costing \$873.77, and 4 I-beam spans on concrete abutments costing \$2,720.45.

Roads.

FRANKLIN COUNTY.

The total county road expenditure was \$43,489.90, of which \$17,827.24, or 41.0% was spent for permanent work; \$11,177.75, or 25.7% was spent for temporary work; \$5,567.91, or 12.8% was spent for repairs; \$4,442.66, or 10.2% was spent for maintenance; \$2,432.66, or 5.6% was spent for road equipment and unused material, and \$2,041.68, or 4.7% was spent for special cases.

There were 8.5 miles built to permanent grade at a cost of \$13,405.00. No roads were built to temporary grade. 1.5 miles were surfaced with gravel at a cost of \$2,697.35; 3.00 miles were built to natural grade at a cost of \$7,260.42. No roads were oiled.

The county road system was dragged an average of 29 times at an average cost of \$26.12 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$54.11 per mile of county road. The total average expenditure per mile of county road was \$235.08.

There are 185.0 miles included in the county road system. Of this mileage 20.5 miles are now surfaced; 7.0 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 101.75 miles are built to natural grade, and on 55.75 miles only repairs and maintenance work has been done.

The total township road expenditure indicated by reports from 15 of the 16 townships was \$53,442.46.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$67,364.73, of which \$49,267.95, or 73.2% was spent for permanent bridges and culverts; \$6,429.40, or 9.5% was spent for temporary bridges and culverts; \$6,928.01, or 10.3% was spent for repairs; \$838.32, or 1.2% was spent for culvert material for townships; \$3,697.23, or 5.5% was spent for equipment and unused material; 0.0% was spent for filling bridges and culverts, and \$203.82, or 0.3% was spent or special cases.

Of the total amount \$55,697.35 spent for new bridges and culverts; \$49,267.95, or 8.5% was spent for permanent work, and \$6,429.40, or 11.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 43 concrete box culverts costing \$23,183.87; 1 circular concrete culvert costing \$176.77; 1 concrete abutment costing \$1,170.00; 2 concrete arch culverts costing \$126.93; 1 concrete deck girder costing \$4,286.-55; 1 I-beam span on concrete abutments costing \$1,272.37; 9 pony trusses with concrete floor and abutments costing \$19,051.46; 17 corrugated pipe without headwalls costing \$6,418.90, and 1 miscellaneous culvert costing \$10.50.

Roads.

FREMONT COUNTY.

The total county road expenditure was \$32,370.83, of which \$3,017.32, or 9.3% was spent for permanent work; \$13,068.33, or 40.3% was spent for temporary work; \$3,632.84, or 17.4% was spent for repairs; \$5,108.21, or 15.8% was spent for maintenance; \$1,963.10, or 6.1% was spent for road equipment and unused material, and \$3,581.03, or 11.1% was spent for special cases.

There were 1.5 miles built to permanent grade at a cost of \$3,017.32; no roads were built to temporary grade and no roads surfaced. \$13,007.68 was spent for building roads to natural grade. No roads were oiled.

The county road system was dragged at an average cost of \$20.70 per mile. The average cost of repairs and maintenance was \$63.09 per mile of county road. The total average expenditure per mile of county road was \$209.65.

There are 154.38 miles included in the county road system. Of this mileage 0.00 miles are now surfaced; 0.00 miles are built to permanent grade; 2.00 miles are constructed to temporary grade; 30.75 miles are built to natural grade, and on 121.63 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 10 of the 13 townships was \$22,645.70.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$76,873.15, of which \$25,913.84, or 33.7% was spent for permanent bridges and culverts; \$21,310.44, or 27.7% was spent for temporary bridges and culverts; \$18,876.74, or 24.6% was spent for repairs; 0.0% was spent for culvert material for townships; \$4,015.55, or 5.2% was spent for equipment and unused material; \$2,199.12, or 2.9% was spent for filling bridges and culverts, and \$4,557.46, or 5.9% was spent for sepcial cases.

Of the total amount \$47,224.28 spent for new bridges and culverts, \$25,913.84, or 54.9% was spent for permanent work, and \$21,310.44, or 45.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: \$8,322.70 was spent for the construction of concrete box culverts; \$138.96 was spent for concrete arch culverts; \$8,229.97 was spent for concrete arch culverts with headwalls; \$163.34 was spent for masonry arch culverts; \$8,337.97 was spent for masonry box culverts; \$720.90 was spent for headwalls on culverts constructed previously; 5 concrete pipe without headwalls costing \$170.53; 17 corrugated pipe without headwalls, costing \$144.07; and 15 cast iron pipe without headwalls costing \$690.68. \$472.60 was spent for pony trusses on piling—wood floors; \$19,650.44 was spent for wood pile bridges, and \$182.12 was spent for miscellaneous bridge and culverts.

GREENE COUNTY.

Roads.

The total county road expenditure was \$37,208.71, cf which \$18,006.68, or 48.4% was spent for permanent work; \$5,357.44, or 14.4% was spent for temporary work; \$1,753.08, or 4.7% was spent for repairs; \$5,849.36, or 15.7% was spent for maintenance; \$5,682.11, or 15.3% was spent for road equipment and unused material, and \$560.04, or 1.5% was spent for special cases.

10.75 miles were built to permanent grade at a cost of \$8.292.45; no roads were built to temporary grade; 11.5 miles were surfaced with gravel at a cost of \$8,494.74; 29.0 miles were built to natural grade at a cost of \$4,409.09. No roads were oiled.

The county road system was dragged an average of 24.4 times at an average cost of \$17.07 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$57.37 per mile of county road. The total average expenditure per mile of county road was \$280.82.

There are 132.5 miles included in the county road system. Of this mileage 41.12 miles are now surfaced; 56.63 miles are built to permanent grade; 0.00 miles are constructed to temporary grade; 23.75 miles are built to natural grade, and on 11.00 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 15 townships was \$41,540.19.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$42,758.36, of which \$27,757.67, or 64.9% was spent for permanent bridges and culverts; \$826.45, or 1.9% was spent for temporary bridges and culverts; \$7,740.71, or 18.1% was spent for repairs; \$1,996.47, or 4.7% was spent for culvert material for townships; \$3,528.88, or 8.3% was spent or equipment and unused material; \$257.43, or 0.6% was spent for filling bridges and culverts, and \$650.75, or 1.5% was spent for special cases.

Of the total amount \$28,574.12 spent for new bridges and culverts; \$27,757.67, or 97.1% was spent for permanent work, and \$826.45, or 2.9% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 18 concrete box culverts costing \$8,217.92; 81 circular concrete culverts costing \$8,694.78; 4 headwalls on culverts previously constructed costing \$150.33; 3 concrete slab bridges costing \$254.85; 2 concrete abutments costing \$711.95; 7 deck girders (concrete) costing \$9,-304.04; 1 I-beam span on concrete abutments costing \$423.80; 1 concrete pipe without headwalls costing \$15.87; 3 corrugated pipe culverts without headwalls costing \$89.05; 1 cast iron pipe without headwalls costing \$21.53; 1 wood pile bridge costing \$172.67, and 6 miscellaneous bridges and culverts costing \$527.33.

GRUNDY COUNTY.

The total county road expenditure was \$32,309.43, of which \$5,820.56, or 18.0% was spent for permanent work; \$4,411.59, or 13.6% was spent for temporary work; \$14,579.32, or 45.2% was spent for repairs; \$3,011.56, or 9.3% was spent for maintenance; \$2,199.69, or 6.8% was spent for road equipment and unused material, and \$2,286.71, or 7.1% was spent for special cases.

3.0 miles were built to permanent grade at a cost of \$5,012.65. No roads were built to temporary grade and none were surfaced or oiled. 27.0 miles were built to natural grade at a cost of \$4,411.59.

The county road system was dragged an average of 25.2 times at an average cost of \$18.82 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$111.33 per mile of county road. The total average expenditure per mile of county road was \$204.48.

There are 158.00 miles included in the county road system. Of this mileage 0.0 miles are now surfaced; 4.0 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 132.0 miles are built to natural grade, and on 22.00 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 14 townships was \$36,316.63.

Bridges.

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Roads.

The total expenditure for bridge and culvert work during 1917 was \$57,128.70, of which \$43,727.82, or 76.6% was spent for permanent bridges and culvert; \$1,822.04, or 3.2% was spent or temporary bridges and culverts; \$4,877.35, or 8.5% was spent for repairs; \$3,644.08, or 6.4% was spent for culvert material or townships; \$295.12, or 0.5% was spent for equipment and unused material; \$1,935.85, or 3.4% was spent for filling bridges and culverts, and \$826.43, or 1.4% was spent on special cases.

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Of the total amount \$45,549.86 spent for new bridges and culverts, \$43,727.82, or 95.9% was spent for permanent work, and \$1,822.04, or 4.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 96 concrete box culverts, costing \$38,260.82; 1 concrete slab bridge costing, \$1,740.00; 1 concrete thru girder costing \$3,727.00, and 52 corrugated pipe without headwalls costing \$1,822.04.

GUTHRIE COUNTY.

Roads.

The total county road expenditure was \$23,966.66, of which \$509.94, or 2.1% was spent for permanent work; \$7,293.79, or 30.4% was spent for temporary work; \$7,510.03, or 31.4% was spent for repairs; \$5,391.06, or 22.5% was spent for maintenance; \$2,177.66, or 9.1% was spent for road equipment and unused material, and \$1,084.18, or 4.5% was spent for special cases.

There were no roads built to permanent grade, no roads built to temporary grade, and no roads surfaced. 25.1 miles were built to natural grade at a cost of \$2,455.46, and 1.0 mile was oiled at a cost of \$600.00

The county road system was dragged an average of 15.3 times at an average cost of \$27.78 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$65.82 per mile of county road. The total average expenditure per mile of county road was \$122.28.

There are 196.0 miles included in the county road system. Of this mileage 2.0 miles are now surfaced; 1.28 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 80.7 miles are built to natural grade, and on 112.02 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 16 of the 17 townships was \$35,463.08.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$128,969.08, of which \$91,259.70, or 70.8% was spent for permanent bridges and culverts; \$7,972.00, or 6.2% was spent for temporary bridges and culverts; \$14,027.64, or 10.9% was spent for repairs; \$7,026.74, or 5.4% was spent for culvert material for townships; \$910.92, or 0.7% was spent for equipment and unused material; \$7,127.41, or 5.5% was spent for special to the sp

Of the total amount \$99,231.70 spent for new bridges and culverts, \$91,259.70, or 92.0% was spent for permanent work, and \$7,972.00, or 8.0% Was spent for temporary work.

The amounts last above referred to were spent on the following construction: 53 concrete box culverts costing \$38,164.04; 13 concrete pipe with headwalls, costing \$3,560.14; 6 headwalls on culverts previously constructed, costing \$922.39; 3 I-beam spans on concrete abutments costing \$20,114.50; 2 high steel trusses with concrete abutments costing

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\$22,193.81; 1 concrete pipe without headwall costing \$78.50; 48 corrugated pipe costing \$2,791.55; 1 boiler pipe culvert costing \$122.25; 7 wood pile bridge costing \$4,391.34, and 33 miscellaneous bridges and culverts costing \$588.36.

Roads.

HAMILTON COUNTY.

The total county road expenditure was \$78,615.65, of which \$45,398.11, or 57.7% was spent for permanent work; \$1,556.57, or 2.0% was spent for temporary work; \$5,594.56, or 7.1% was spent for repairs; \$5,733.50, or 7.3% was spent for maintenance; \$5,767.86, or 7.3% was spent for road equipment and unused material, and \$14,565.05, or 18.6% was spent for special cases.

There were 12.75 miles built to permanent grade at a cost of \$18,810.20. No roads were built to temporary grade. 21.17 miles were surfaced with gravel at a cost of \$20,712.57; 9.13 miles were built to natural grade at a cost of \$1,556.57. No roads were oiled.

The county road system was dragged an average of 32 times at an average cost of \$35.83 per mile, the average cost per mile one round trip being \$1.00. The average cost of repairs and maintenance was \$63.85 per mile of county road. The total average expenditure per mile of county road was \$443.15.

There are 177.38 miles included in the county road system. Of this mileage 33.02 miles are now surfaced; 39.65 miles are built to permanent grade; 1.12 miles are constructed to temporary grade; 97.65 miles are built to natural grade, and on 5.94 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 16 of the 17 townships was \$35,463.08.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$78,854.48, of which \$59,731.93, or 75.7% was spent for permanent bridges and culverts; \$10,163.27, or 12.9% was spent for temporary bridges and culverts; \$3,708.98, or 4.7% was spent for repairs; \$1,957.10, or 2.5% was spent for culvert material for townships; 0.0% was spent for equipment and unused material; \$2,257.05, or 2.9% was spent for filling bridges and culverts, and \$1,036.15, or 1.3% was spent for special cases.

Of the total amount \$69,895.20 spent for new bridges and culverts; \$59,731.93, or \$5.5% was spent for permanent work, and \$10,163.27, or 14.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 51 concrete box culverts, costing \$29,094.50; 19 circular concrete culverts costing \$1,866.23; 1 concrete abutment costing \$1,799.85; 11 concrete deck girders costing \$18,875.21; 3 I-beams on concrete abutments costing \$6,516.00; 1 steel girder on concrete abutments costing \$1,580.14; 479 corrugated pipe without headwalls costing \$9,960.36, and 1 I-beam span on piling costing \$202.91.

Roads.

The total county road expenditure was \$49,277.27, of which \$23,004.65, or 46.7% was spent for permanent work; \$3,622.30, or 7.4% was spent for temporary work; \$4,449.51, or 9.0% was spent for repairs; \$9,014.50, or 18.3% was spent for maintenance; \$4,444.80, or 9.0% was spent for road equipment and unused material, and \$4,741.51, or 9.6% was spent for special cases.

HANCOCK COUNTY.

6.08 miles were built to permanent grade at a cost of \$8,338.48; 11.25 miles were surfaced with gravel at a cost of \$8,397.86; 19.25 miles were built to natural grade at a cost of \$2,825.55. No roads were built to temporary grade, and none were oiled.

The county road system was dragged an average of 35 times at an average cost of \$28.36 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$81.79 per mile of county road. The total average expenditure per mile of county road was \$299.38.

There are 164.63 miles included in the county road system. Of this mileage, 14.25 miles are now surfaced, 6.08 miles are built to permanent grade; 9.25 miles are constructed to temporary grade; 30.75 miles are built to natural grade, and on 104.3 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 12 of the 16 townships was \$36,209.53.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$43,639.91, of which \$25,181.27, or 57.6% was spent for permanent bridges and culverts; \$4,306.16, or 9.9% was spent for temporary bridges and culverts; \$3,774.83, or 8.7% was spent for repairs; \$4,091.55, or 9.4% was spent for culvert material for townships; \$4,713.07, or 10.8% was spent for equipment and unused material; \$322.00, or 0.7% was spent for filling bridges and culverts, and \$1,251.03, or 2.9% was spent for special cases.

Of the total amount \$29,487.43 spent for new bridges and culverts, \$25,-181.27, or 85.4% was spent for permanent work and \$4,306.16, or 14.6% Was spent for temporary work.

The amounts last above referred to were spent on the following construction: 32 concrete box culverts costing \$15,716.41; 1 circular concrete culvert costing \$89.29; 4 concrete slab bridges costing \$6,782.52; 1 pony truss with concrete abutments and floor costing \$2,593.05; 71 concrete pipe without headwalls, costing \$1,744.42; and 8 wood pile bridges, costing \$2,561.74.

Roads.

The total county road expenditure was \$59,210.25, of which \$43,617.63, or 73.6% was spent for permanent work; \$2,056.07 or 3.5% was spent for temporary work; \$1,105.93, or 1.9% was spent for repairs; \$5,890.81, or

HARDIN COUNTY.

9.9% was spent for maintenance; \$3,597.04, or 6.1% was spent for road equipment and unused material; and \$2,942.77, or 5.0% was spent for special cases.

21.62 miles were built to permanent grade at a cost of \$19,244.45; 0.5 miles were built to temporary grade at a cost of \$180.30; 25.82 miles were surfaced with gravel at a cost of \$23,135.57; and 26.38 miles were built to natural grade at a cost of \$2,056.07. No roads were oiled.

The county road system was dragged an average of 25 times at an average cost of \$20.85 per mile, the average cost per mile one round trip being \$0.85. The average cost of repairs and maintenance was \$40.14 per mile of county road. The total average expenditure per mile of county road was \$339.70.

There are 174.3 miles included in the county road system. Of this mileage 39.0 miles are now surfaced; 25.50 miles are built to permanent grade; 0.5 miles are constructed to temporary grade; 95.0 miles are built to natural grade, and on 14.3 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 14 of the 15 townships was \$39,367.40.

Bridges.

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The total expenditure for bridges and culvert work during 1917 was \$78,147.29, of which \$67,096.36, or 85.8% was spent for permanent bridges and culverts; \$906.18, or 1.2% was spent for temporary bridges and culverts; \$3,782.30, or 4.8% was spent for repairs; \$1,502.20, or 1.9% was spent for culvert material for townships; \$2,464.46, or 3.2% was spent for equipment and unused material; \$2,252.80, or 2.9% was spent for filling bridges and culverts; \$142.99, or 0.2% was spent for special cases.

Of the total amount \$68,002.54 spent for new bridges and culverts, \$67,096.36, or 98.7% was spent for permanent work and \$906.18, or 1.3% was spent for temporary work.

The amounts last above referred to were spent on the following named construction: 62 concrete box culverts, costing \$23,520.34; 63 circular concrete culverts costing \$6,314.86; 3 concrete slab bridges costing \$1,838.31; 1 concrete arch bridge costing \$8,381.57; 3 concrete thru girders costing \$3,107.04; 5 concrete deck girders costing \$10,490.39; 6 I-beam spans on concrete abutments costing \$9,329.20; 3 pony trusses with concrete floor and abutments costing \$4,114.65; and 45 corrugated pipe without headwalls costing \$906.18.

Roads.

HARRISON COUNTY.

The total county road expenditure was \$32,071.00, of which \$1,600.01, or 5.0% was spent for permanent work; \$13,373.87, or 41.7% was spent for temporary work; \$9,415.11, or 29.3% was spent for repairs; \$3,697.34, or 11.6% was spent for maintenance; \$920.31, or 2.9% was spent for road equipment and unused material, and \$3,064.36, or 9.5% was spent for special cases.

2.25 miles were built to permanent grade at a cost of \$1,600.01; no roads were built to temporary grade and no roads were surfaced. 24.75 miles were built to natural grade at a cost of \$13,373.87. No roads were oiled.

The county road system was dragged an average of 31 times at an average cost of \$22.14 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$78.05 per mile of county road. The total average expenditure per mile of county road was \$190.89.

There are 168.0 miles included in the county road system. Of this mileage, 0.00 miles are now surfaced, 13.0 miles are built to permanent grade; 1.5 miles are constructed to temporary grade; 69.0 miles are built to natural grade, and on 84.5 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 20 townships was \$45,913.96.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$105,411.99, of which \$61,398.31, or 58.3% was spent for permanent bridges and culverts; \$13,360.05, or 12.7% was spent for temporary bridges and culverts; \$20,192.66, or 19.1% was spent for repairs; \$1,606.86, or 1.5% was spent for culvert material for townships; \$90.00, or 0.1% was spent for equipment and unused material; \$2,152.21, or 2.0% was spent for special cases.

Of the total amount \$74,758.36 spent for new bridges and culverts, \$61,398.31, or 82.2% was spent for permanent work, and \$13,360.05,or 17.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 7 concrete box culverts costing \$7,795.43; 24 concrete pipe culverts with headwalls, costing \$6,769.40; 2 concrete abutments costing \$4,437.40; 1 corrugated pipe headwalls costing \$499.84; 3 concrete deck girders costing \$12,767.67; 7 pony trusses with concrete floor and abutments costing \$27,025.95; 1 high steel truss on concrete abutments costing \$2,102.57; 5 concrete pipe without headwalls costing \$624.75; 1 I-beam span on piling costing \$1,220.35; 5 pony trusses on piling—wood floors costing \$6,050.85; 10 wood pile bridges costing \$4,343.39; 20 miscellaneous bridges and culverts costing \$1,120.71.

Roads.

HENRY COUNTY.

The total county road expenditure was \$13,755.05, of which \$1,037.00, or 7.6% was spent for permanent work; \$813.64, or 5.9% was spent for temporary work; \$5,381.76, or 39.2% was spent for repairs; \$5,112.04, or 37.1% was spent for maintenance; \$1,157.52, or 8.4% was spent for road equipment and unused material, and \$253.09, or 1.8% was spent for special cases. 0.5 miles were built to permanent grade at a cost of \$1,037.00; no roads were built to temporary grade and no roads were surfaced. 12 miles were built to natural grade at a cost of \$1,813.64. No roads were oiled.

The county road system was dragged an average of 26 times at an average cost of \$36.53 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$73.74 per mile of county road. The total average expenditure per mile of county road was \$96.66.

There are 142.30 miles included in the county road system. Of this mileage 0.0 miles are surfaced; 1.0 mile is built to permanent grade and 0.0 are constructed to temporary grade; 100.2 miles are built to natural grade, and on 41.1 miles only repair and maintenance work has been done.

The total township road expenditure indicated by all of the 12 townships was \$25,422.60.

Bridges.

The total expenditure for bridge and culvert work during 1917 was 45,066.71, of which 35,673.76, or 79.2% was spent for permanent bridges and culverts, 3291.10, or 0.9% was spent for temporary bridges and culverts; 5,662.14, or 12.5% was spent for repairs; 0.0% was spent for culvert material for townships; 1,573.83, or 3.5% was spent for equipment and unused material; 1,765.88, or 3.9% was spent for filling bridges and culverts, and 0.0% was spent for special cases.

Of the total amount \$36,064.86 spent for new bridges and culverts, \$35,673.76, or 98.9% was spent for permanent work and \$391.10, or 1.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 58 concrete box culverts costing \$22,554.71; 1 circular concrete culverts, costing \$149.30; 4 concrete slab bridges costing \$6,913.55; 2 concrete abutments costing \$1,600.31; 3 I-beam spans on concrete abutments costing \$4,269.48; 8 corrugated pipe without headwalls, costing \$391.10; 2 cast iron pipe with headwalls, costing \$186.41.

Roads.

HOWARD COUNTY.

The total county road expenditure was \$18,333.38, of which \$9,826.69, or 53.7% was spent for permanent work; \$1,463.59, or 8.0% was spent for temporary work; \$975.53, or 5.3% was spent for repairs; \$1,782.58, or 9.7% was spent for maintenance; \$964.19, or 5.2% was spent for road equipment and unused material, and \$3,320.80, or 18.1% was spent for special cases.

3.0 miles were built to permanent grade at a cost of \$4,905.05; 0.75 miles were built to temporary grade at a cost of \$2,345.68. No roads were surfaced and no roads oiled. 12.0 miles were built to natural grade at a cost of \$1,463.59.

The county road system was dragged an average of 16.54 times at an average cost of \$14.76 per mile, the average cost per mile one round trip

being \$0.75. The average cost of repairs and maintenance was \$22.55 per mile of county road. The total average expenditure per mile of county road was \$149.90.

There are 122.30 miles included in the county road system. Of this mileage 6.25 miles are now surfaced; 12.5 miles are built to permanent grade; 3.0 miles are constructed to temporary grade; 57.25 miles are built to natural grade, and on 43.3 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 12 townships was \$18,026.44.

Bridges.

The total expenditure for bridges and culvert work during 1917 was 46,576.56, of which 25,091.34, or 54.2% was spent for permanent bridges and culverts; 5,709.60, or 12.2% was spent for temporary bridges and culverts; 7,223.12, or 15.5% was spent for repairs; 4,376.26, or 9.4% was spent for culvert material for townships; 1,794.19, or 3.8% was spent for equipment and unused material; 2,342.05, or 5.0% was spent for filling bridges and culverts, and 4,000.00, or 0.1% was spent for special cases.

Of the total amount \$30,800.94 spent for new bridges and culverts, \$25,091.34, or 81.5% was spent for permanent work and \$5,709.60, or 18.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 34 concrete box culverts costing \$14,393.92; 9 circular concrete culverts costing \$1,455.16; 1 corrugated pipe culvert with headwalls costing \$137.50; 1 I-beam span on concrete abutments costing \$4,836.46; 1 high steel truss with concrete abutments costing \$4,268.30; 8 corrugated pipe without headwalls costing \$124.80, and 25 wood pile bridges costing \$5,584.80.

Roads.

HUMBOLDT COUNTY.

The total county road expenditure was 32,480.95, of which 24,600.87, or 75.7% was spent for permanent work; 1,678.95, or 5.2% was spent for temporary work; 2,286.90, or 7.1% was spent for repairs; 3,322.35, or 10.2% was spent for maintenance; 352.88, or 1.1% was spent for road equipment and unused material, and 239.00, or 0.7% was spent for special cases.

8.5 miles were built to permanent grade at a cost of \$10,984.40. No roads were built to temporary grade. 7.0 miles were surfaced with gravel at a cost of \$8,698.86; 13.5 miles were built to natural grade at a cost of \$1,678.95. No roads were oiled.

The county road system was dragged an average of 23 times at an average cost of \$26.57 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$42.66 per mile of county road. The total average expenditure per mile of county road was \$247.00.

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There are 131.5 miles included in the county road system. Of this mileage 23.0 miles are now surfaced; 7.25 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 81.25 miles are built to natural grade, and on 20.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 12 townships was \$37,866.18.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$44,609.73, of which \$38,683.06, or 86.7% was spent for permanent bridges and culverts; \$30.28, or 0.1% was spent for temporary bridges and culverts; \$828.78, or 1.8% was spent for repairs; \$76.67, or 0.2% was spent for culvert niaterial for townships; \$870.74, or 1.9% was sent for equipment and unused material; \$2,709.01, or 6.1% was spent for filling bridges and culverts, and \$1,411.19, or 3.2 was spent for special cases.

Of the total amount \$38,713.34 spent for new bridges and culverts, \$38,683.06, or 99.9% was spent for permanent work, and \$30.28, or 0.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 30 concrete box culverts costing \$10,183.47; 3 circular concrete culverts costing \$323.50; 2 concrete slab bridges costing \$2,698.00; 1 concrete abutment costing \$2,130.78; 4 concrete thru girders costing \$7,-110.90; 1 concrete deck girders costing \$1,976.91; I I-beam span on concrete abutments costing \$2,938.08; 1 high steel truss with concrete floor and abutment costing \$1,656.85; 3 pony trusses with concrete floor and abutments costing \$9,664.59, and 1 miscellaneous culvert costing \$30.28.

Roads.

IDA COUNTY.

The total county road expenditure was \$20,187.48, of which \$649.35, or 3.2% was spent for permanent work; \$8,241.74, or 40.8% was spent for temporary work; \$5,398.92, or 26.7% was spent for repairs; \$4,132.78, or 20.5% was spent for maintenance; \$1,376.69, or 6.9% was spent for road equipment and unused material, and \$388.00, or 1.9% was spent for special cases.

There are no roads built to permanent, temporary, or natural grade. No roads were surfaced and none were oiled.

The county road system was dragged an average of 19 times at an average cost of \$19.92 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$72.21 per mile of county road. The total average expenditure per mile of county road was \$152.93.

There are 132.0 miles including in the county road system. Of this mileage 0.0 miles are now surfaced; 0.0 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 10.00 miles are built to natural grade, and on 122.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by all of the 12 townships was \$25,003.84.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$57,039.63, of which \$31,679.93, or 55.8% was spent for permanent bridges and culverts; \$5,177.08, or 9.1% was spent for temporary bridges and culverts; \$11,635.62, or 20.2% was spent for repairs; \$6,136.04, or 10.7% was spent for culvert material for townships; \$217.95, or 0.4% was spent for equipment and unused material; \$2,193.01, or 3.8% was spent for filling bridges and culverts, and 0.00% was spent for special cases.

Of the total amount \$36,857.01 spent for new bridges and culverts, \$31,679.93, or 86.0% was spent for permanent work and \$5,177.08, or 14.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 28 concrete box culverts costing \$17,905.93; 1 concrete slab bridge costing \$3,055.00; 3 I-beam spans on concrete abutments costing \$9,234.00; 2 pony trusses with concrete abutments costing \$1,485.00; 43 corrugated pipe without headwalls costing \$1,655.57; 8 wood pile bridges costing \$3,521.51.

Roads.

IOWA COUNTY.

The total county road expenditure was \$22,081.35, of which \$5,413.36, or 24.5% was spent for permanent work; \$3,387.95, or 15.3% was spent for temporary work; \$5,207.61, or 23.7% was spent for repairs; \$4,639.35, or 21.0% was spent for maintenance; \$1,025.65, or 4.6% was spent for road equipment and unused material, and \$2,407.43, or 10.9% was spent for special cases.

2.38 miles were built to permanent grade at a cost of \$4,792.16. No . roads were built to temporary grade and no roads were oiled. 0.5 miles were surfaced with clay and sand at a cost of \$484.10; 9.25 miles were built to natural grade at a cost of \$3,387.95.

The county road system was dragged an average of 53 times at an average of \$26.77 per mile, the average cost per mile round trip being \$0.80. The average cost of repairs and maintenance was \$57.58 per mile of county road. The total average expenditure per mile of county road was \$129.13.

There are 171.0 miles included in the county road system. Of this mileage 1.75 miles are now surfaced; 3.58 miles are built to permanent grade; 33.71 miles are constructed to temporary grade; 109.41 miles are built to natural grade, and on 22.55 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 18 townships was \$41,995.43.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$77,496.16, of which \$42,719.07, or 55.2% was spent for permanent bridges and culverts; \$2,459.17, or 3.2% was spent for temporary bridges and

culverts; \$11,639.05, or 15.0% was spent for repairs; \$6,741.25, or 8.7% was spent for culvert material for townships; \$10,314.03, or 13.3% was spent for equipment and unused material; \$3,512.57, or 4.5% was spent for filling bridges and culverts, and \$111.02, or 0.1% was spent for special cases.

Of the total amount \$45,178.24 spent for new bridges and culverts, \$42,719.07, or 94.6% was spent for permanent work; \$2,459.17, or 5.4% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 27 concrete box culverts costing \$18,939.70; 4 corrugated pipe culverts without headwalls costing \$314.89; 2 concrete slab bridges costing \$7,245.22; 6 I-beam spans on concrete abutments costing \$11,133.26; 1 pony truss with concrete floor and abutments costing \$5,086.00; 36 corrugated pipe culverts without headwalls costing \$1,462.20; 1 wood pile bridge costing \$339.37, and 22 miscellaneous bridges and culverts costing \$657.60.

Roads.

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JACKSON COUNTY.

The total county road expenditure was \$32,657.28, of which \$12,088.68, or 37.0% was spent for permanent work; 0.0% was spent for temporary work; \$11,615.00 or 35.6% was spent for repairs; \$4,478.86, or 13.7% was spent for maintenance; \$1,770.82, or 5.4% was spent for road equipment and unused material, and \$2,703.92, or 8.3% was spent for special cases.

There were 2.5 miles built to permanent grade at a cost of \$9,161.87. No roads are built to temporary or natural grades, and no roads were surfaced or oiled.

The county road system was dragged an average of 39 times at an average cost of \$29.85 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$102.18 per mile of county road. The total average expenditure per mile of county road was \$207.35.

There are 157.5 miles included in the county road system. Of this mileage 0.00 miles are now surfaced; 4.0 miles are built to permanent grade; 0.00 miles are constructed to temporary grade; 0.00 miles are built to natural grade, and on 153.5 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 18 townships was \$31,330.52.

Bridges.

The total expenditure for bridge and culvert work during 1917 was 107,567.67, of which 81,091.66, or 75.8% was spent for permanent bridges and culverts; 1.971.70, or 1.8% was spent for temporary bridges and culverts; 22,266.41, or 20.4% was spent for repairs; 252.26, or 0.2% was spent for culvert material for townships; 147.65, or 0.1% was spent for equipment and unused material; 1,061.65, or 1.0% was spent for special cases.

Of the total amount \$83,063.36 spent for new bridges and culverts, \$81,091.66, or 97.6% was spent for permanent work, and \$1,971.70, or 2.4% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 53 concrete box culverts costing \$31,026.18; 4 circular concrete culverts costing \$985.00; 2 corrugated pipe culverts costing \$148.45; 1 boiler pipe culvert with headwalls costing \$50.70; 3 headwalls on culverts previously constructed costing \$376.30; 2 concrete abutments costing \$8,534.00; 1 concrete thru girder costing \$4,839.43; 1 retaining wall costing \$239.00; 1 masonry abutment costing \$1,452.00; 4 I-beam spans on concrete abutments costing \$12,276.87; 4 pony trusses with concrete abutments and floor costing \$21,163.73; 5 concrete pipe without headwalls costing \$148.45; 3 cast iron pipe without headwalls costing \$1,687.70, and 1 miscellaneous bridge costing \$135.55.

Roads.

JASPER COUNTY.

The total county road expenditure was \$63,086.75, of which \$37,123.14, or 58.8% was spent for permanent work; \$6,521.52, or 10.4% was spent for temporary work; \$8,010.43, or 12.8% was spent for repairs; \$5,062.94, or 8.0% was spent for maintenance; \$2,622.41, or 4.1% was spent for road equipment and unused material; and \$3,746.32, or 5.9% was spent for special cases.

9.25 miles were built to permanent grade; at a cost of \$18,893.67; 11.0 miles were built to temporary grade at a cost of \$16,372.14; no roads were surfaced; 4.80 miles were built to natural grade at a cost of \$4,686.78; and 3.75 miles were oiled at a cost of \$1,834.74.

The county road system was dragged an average of 18 times at an average cost of \$24.70 per mile. The average cost per mile one round trip was \$0.70. The average cost of repairs and maintenance was \$63.75 per mile of county road. The total average expenditure per mile of county road was \$307.67.

There are 205.05 miles included in the county road system. Of this mileage 0.0 miles are now surfaced; 13.25 miles are built to permanent grade; 41.5 miles are constructed to temporary grade; 118.25 miles are built to natural grade; and on 32.05 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 19 townships was \$56,103.15.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$95,678.48, of which \$59,908.18, or 62.6% was spent for permanent bridges and culverts, \$2,267.66, or 2.4% was spent for temporary bridges and culverts; \$13,808.42, or 14.4% was spent for repairs; \$2,472.80, or 2.6% was spent for culvert material for townships; \$6,739.76, or 7.0% was spent for equipment and unused material; \$8,660.82, or 9.1% was spent for filling bridges and culverts, and \$1,820.84, or 1.9% was spent for special cases.

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Of the total amount \$62,175.84 spent for new bridges and culverts, \$59,908.18, or 96.4% was spent for permanent work; and \$2,267.66, or 3.6% was spent for temporary work.

The amounts last above referred to were spent on the following named construction: 51 concrete box culverts costing \$24,986.68; 1 corrugated pipe culvert with headwalls costing \$175.65; 2 boiler pipe culverts with headwalls costing \$245.85; 18 concrete slab bridges costing \$16,343.50; 2 retaining walls costing \$1,581.21; 4 pony trusses with concrete abutments and floors, costing \$13,998.50; 1 high steel truss with concrete abutments costing \$2,576.79; 51 corrugated pipe culverts without headwalls costing \$2,239.66; and 18 boiler culverts without headwalls costing \$944.90.

Roads.

JEFFERSON COUNTY.

The total county road expenditure was \$24,431.50, of which \$51.55, or 0.2% was spent for permanent work; \$3,479.46, or 14.2% was spent for temporary work; \$3,828.62, or 15.7% was spent for repairs; \$8,236.70, or 33.6% was spent for maintenance; \$2,826.94, or 11.6% was spent for road equipment and unused material, and \$6,008.23, or 24.7% was spent for special cases.

No roads were built to permanent or temporary grade, and no roads were surfaced. 23.25 miles were built to natural grade at a cost of \$2,276.46, and 3.75 miles were oiled at a cost of \$1,203.00.

The county road system was dragged an average of 20 times at an average cost of \$29.43 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$85.38 per mile of county road. The total average expenditure per mile of county road was \$172.90.

There are 141.3 miles included in the country road system. Of this mileage 0.0 miles are now surfaced; 0.6 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 87.5 miles are built to natural grade, and on 53.2 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 12 townships was \$35,681.10.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$68,803.02, of which \$42,809.52, or 62.3% was spent for permanent bridges and culverts; \$4,488.52, or 6.5% was spent for temporary bridges and culverts; \$7,018.74, or 10.3% was spent for repairs; \$5,815.34, or 8.4% was spent for culvert material for townships; \$1,051.87, or 1.5% was spent for equipment and unused material; \$7,039.32, or 10.3% was spent for filling bridges and culverts, and \$529.71, or 0.8% was spent for special cases.

Of the total amount \$47,298.04 spent for new bridges and culverts, \$42,809.52, or 90.5% was spent for permanent work and \$4,488.52, or 9.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 60 concrete box culverts costing \$22,333.51; 1 headwall on previously constructed culvert costing \$63.04; 1 I-beam span on concrete abutments costing \$462.85; 1 high steel truss on concrete abutments costing \$19,950.12; 27 corrugated pipe culverts without headwalls costing \$1,510.63; 8 cast iron pipe culverts without headwalls, costing \$971.83, and 15 wood pile bridges costing \$2,006.06.

JOHNSON COUNTY.

Roads.

The total county road expenditure was \$37,790.48, of which \$14,975.64, or 39.6% was spent for permanent work; \$7,129.57, or 18.9% was spent for temporary work; \$5,813.55, or 15.4% was spent for repairs; \$5,260.06, or 13.9% was spent for maintenance; \$2,862.06, or 7.6% was spent for road equipment and unused material, and \$1,749.60, or 4.6% was spent for special cases.

8.5 miles were built to permanent grade at a cost of \$11,976.90; 0.3 miles were built to temporary grade at a cost of \$1,004.60; 0.3 miles were surfaced with clay, sand and cinders, at a cost of \$862.20; 42.6 miles were built to natural grade at a cost of \$7,129.57. No roads were oiled.

The county road system was dragged an average of 26.3 times at an average cost of \$33.29 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$70.53 per mile of county road. The total average expenditure per mile of county road was \$240.70.

There are 157.0 miles included in the county system. Of this mileage 0.5 miles are now surfaced; 9.5 miles are built to permanent grade; 2.0 miles are constructed to temporary grade; 120.0 miles are built to natural grade, and on 25.0 miles only repair and maintenance work has been done.

The total township road expenditure as indicated by reports from all of the 21 townships was \$45,264.97.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$71.896.16, of which \$40,654.90, or 56.6% was spent for permanent bridges and culverts; \$7,898.92, or 10.9% was spent for temporary bridges and culverts; \$7,617.64, or 10.6% was spent for repairs; \$4,907.98, or 6.8% was spent for culvert material for townships; \$6,816.75, or 9.5% was spent for equipment and unused material; \$2,922.03, or 4.1% was spent for special cases.

Of the total amount \$48,553.82 spent for new bridges and culverts, \$40,654.90, or 83.8% was spent for permanent work and \$7,898.92, or 16.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 82 concrete box culverts costing \$28,105.58; 1 headwall on previously constructed culvert, costing \$114.30; 1 retaining wall costing \$202.03; 9 I-beam spans on concrete abutments costing \$10,190.30; 2 pony trusses with concrete floor and abutments costing \$2,042.69; 78 corrugated pipe culverts without headwalls costing \$3,020.27; 5 wood pile bridges costing \$639.28, and 212 miscellaneous bridges and culverts costing \$4,239.37.

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Roads.

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JONES COUNTY.

The total county road expenditure was \$36,947.26, of which \$4,532.89, or 12.3% was spent for permanent work; \$5,821.72, or 15.7% was spent for temporary work; \$18,184.95, or 49.2% was spent for repairs; \$6,139.51, or 16.6% was spent for maintenance; \$1,657.24, or 4.5% was spent for road equipment and unused material, and \$610.95, or 1.7% was spent for special cases.

1.11 miles were built to permanent grade at a cost of \$1,012.50. No roads were built to temporary grade. 1.11 miles were surfaced with gravel at a cost of \$2,865.50; 8.0 miles were built to natural grade at a cost of \$576.00, and 26.0 miles were oiled at a cost of \$5,245.72.

The county road system was dragged an average of 30 times at an average cost of \$21.67 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$131.13 per mile of county road. The total average expenditure per mile of county road was \$199.18.

There are 185.5 miles included in the county road system. Of this mileage 2.54 miles are now surfaced; 5.5 miles are built to permanent grade; 5.0 miles are built to temporary grade; 140.0 miles are built to natural grade, and on 32.46 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 16 townships was \$37,288.64.

Bridges.

Roads.

The total expenditure for bridge and culvert work during 1917 was 67,549.99, of which 28,078.86, or 41.6% was spent for permanent bridges and culverts; 6,181.41, or 9.1% was spent for temporary bridges and culverts; 30,799.18, or 45.6% was spent for repairs; 1,737.84, or 2.6% was spent for culvert material for townships; 0.0% was spent for equipment and unused material; 725.20, or 1.1% was spent for filling bridges and culverts, and 27.50, or 0.04% was spent for special cases.

Of the total amount \$34,260.27) spent for new bridges and culverts, \$28,078.86, or 82.0% was spent for permanent work, and \$6,181.41, or 18.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 15 concrete box culverts costing \$6,797.07; 3 corrugated pipe culverts with headwalls costing \$341.85; 1 masonry abutment costing \$1,000.00; 9 I-beam spans on concrete abutments costing \$15,937.58; 1 pony truss with concrete floor and abutments costing \$4,002.36; 14 corrugated pipe culverts without headwalls costing \$518.00; 1 I-beam span on pilling costing \$656.68, and 18 wood pile bridges costing \$5,006.73.

KEOKUK COUNTY.

The total county road expenditure was \$14,892.67, of which \$361.16, or 2.4% was spent for permanent work; 0.0% was spent for temporary work; \$8,898.73, or 59.7% was spent for repairs; \$3,925.90, or 26.4% was spent for maintenance; \$1,489.90, or 10.0% was spent for road equipment and unused material, and \$216.98, or 1.5% was spent for special cases.

No roads were built to permanent, temporary, or natural grade, and no roads were surfaced or oiled.

The county road system was dragged an average of 26.5 times at an average cost of \$18.58 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$76.42 per mile of county road. The total average expenditure per mile of county road was \$88.75.

There are 167.8 miles included in the county road system. Of this mileage 0.0 miles are now surfaced; 0.0 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 102.0 miles are built to natural grade, and on 65.8 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 17 townships was \$40,484.40.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$55,266.55, of which \$26,265.55, or 47.4% was spent for permanent bridges and culverts; \$1,536.83, or 2.8% was spent for temporary bridges and culverts; \$17,332.36, or 31.4% was spent for repairs; \$1,919.52, or 3.5% was spent for culvert material for townships; \$1,515.50, or 2.7% was spent for equipment and unused material; \$6,696.79, or 12.1% was spent for filling bridges and culverts, and 0.0% was spent for special cases.

Of the total amount \$27,802.38 spent for new bridges and culverts, \$26,265.55, or 94.5% was spent for permanent work; \$1,536.83, or 5.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 49 concrete box culverts costing \$21,267.13; 1 circular concrete culvert costing \$292.85; 30 concrete pipe culverts with headwalls costing \$4,705.57; 1 concrete pipe culvert with headwalls costing \$31.88, and 70 corrugated pipe culverts without headwalls costing \$1,504.95.

Roads.

KOSSUTH COUNTY.

The total county road expenditure was \$100,669.29, of which \$44,252.57, or 44.0% was spent for permanent work; \$7,186.30, or 7.1% was spent for temporary work; \$11,479.49, or 11.4% were spent for repairs; \$11,-273.54, or 11.2% was spent for maintenance; \$1,502.60, or 1.5% was spent for road equipment and unused material, and \$24,974.79, or 24.8% was spent for special cases.

16.5 miles were built to permanent grade at a cost of \$18,336.32; no roads were built to temporary grade; 17.8 miles were surfaced with gravel at a cost of \$23,315.57; 47.0 miles were built to natural grade at a cost of \$7,186.30. No roads were oiled.

The county road system was dragged an average of 33.4 times at an average cost of \$28.43 per mile, the average cost per mile one round trip being \$0.85. The average cost of repairs and maintenance was \$81.05 per mile of county road. The total average expenditure per mile of county road was \$360.17.

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There are 279.5 miles included in the county road system. Of this mileage 26.7 miles are now surfaced; 27.3 miles are built to permanent grade; 0.5 miles are constructed to temporary grade; 163.5 miles are built to natural grade, and on 61.5 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 20 of the 28 townships was \$63,117.09.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$65,580.68, of which \$23,995.13, or 36.8% was spent for permanent bridges and culverts; \$13,996.05, or 21.3% was spent for temporary bridges and culverts; \$17,886.48, or 27.2% was spent for repairs; \$6,391.43, or 9.7% was spent for culvert material for townships; \$366.63, or 0.6% was spent for equipment and unused material; \$2,003.47, or 3.0% was spent for filling bridges and culverts, and \$941.49, or 1.4% was spent for special cases.

Of the total amount \$37,991.18 spent for new bridges and culverts, \$23,-995.13, or 63.2% was spent for permanent work, and \$13,996.05, or 36.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 18 concrete box culverts costing \$11,681.39; 13 concrete pipe culverts with headwalls costing \$1,632.76; 7 concrete slab bridges costing \$5,612.70; 1 concrete abutment costing \$30.00; 6 concrete deck girders costing \$5,038.28; 200 corrugated pipe culverts without headwalls costing \$3,414.56; 22 wood pile bridges costing \$9,878.09, and 14 miscellaneous bridges and culverts costing \$703.40.

Roads.

LEE COUNTY.

The total county road expenditure was \$31,185.54 of which \$9,590.66, or 30.8% was spent for permanent work; \$8,121.97, or 26.1% was spent for temporary work; \$2,526.57, or 8.1% was spent for repairs; \$9,165.93, or 29.4% was spent for maintenance; \$1,333.66, or 4.2% was spent for road equipment and unused material and \$446.75, or 1.4% was spent for special cases.

There were no roads built to temporary grade. 0.34 miles were built to permanent grade at a cost of \$2,551.56; 13.00 miles were resurfaced with macadam at a cost of \$6,961.86; 41.0 miles were built to natural grade at a cost of \$4,300.60 and 12.5 miles were oiled at a cost of \$3,821.37.

The county road system was dragged an average of 30 times at an average cost of \$35.35 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$77.95 per mile of county road. The total average expenditure per mile of county road was \$207.90.

There are 150.0 miles included in the county road system. Of this mileage 13.5 miles are now surfaced; 0.75 miles are built to permanent

grade; 41.0 miles are built to natural grade, and on 94.75 miles only repair and maintenance work has been done. There were no roads built to temporary grade.

The total township road expenditure indicated by reports from all of the 15 townships was \$29,849.48.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$37,575.30, of which \$21,011.95, or 56.0% was spent for permanent bridges and culverts; \$10,724.81, or 28.5% was spent for repairs; \$1,975.50, or 5.2% was spent for culvert material for townships; \$3,756.29, or 10.0% was spent for equipment and unused material; \$106.75, or 0.3% was spent for filling bridges and culverts.

Of the total amount \$21,011.95 spent for new bridges and culverts, \$21,011.96, or 100.0% was spent for permanent work. There was no temporary work done.

The amounts last above referred to were spent on the following construction: 22 concrete box culverts costing \$5,755.59; 15 circular concrete culverts costing \$2,280.02; 8 headwalls on culverts previously constructed costing \$850.00; 1 I-beam span on concrete abutments costing \$7,327.62 and 1 pony truss with concrete abutments and floor costing \$4,798.72.

LINN COUNTY.

Roads.

The total county road expenditure was \$31,383.09 of which \$309.26, or 1.0% was spent for permanent work; \$594.72, or 1.9% was spent for temporary work; \$16,884.65, or 53.8% was spent for repairs; \$10,103.95, or 32.2% was spent for maintenance; \$1,165.23, or 3.7% was spent for road equipment and unused material and \$2,325.28, or 7.4% was spent for special cases.

There were no roads built to permanent, temporary or natural grade and none were surfaced. 2.0 miles were oiled at a cost of \$594.72.

The county road system was dragged an average of 32.47 times at an average cost of \$32.47 per mile, the average cost per mile one round trip being \$1.00. The average cost of repairs and maintenance was \$123.34 per mile of county road. The total average expenditure per mile of county road was \$143.43.

There are 218.80 miles included in the county road system. Of this mileage 2.00 miles are now surfaced; 5.80 miles are built to permanent grade; 3.00 are constructed to temporary grade; 34.00 miles are built to natural grade, and on 174.0 miles only repair and maintenance work has been done.

The total township read expenditure indicated by reports from all of the townships was \$50,943.40.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$82,-844.37, of which \$61,612.06, or 74.6% was spent for permanent bridges and culverts; \$1,040.53. or 1.2% was spent for temporary bridges and

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culverts; \$11,497.17, or 13.8% was spent for repairs; \$3,017.42, or 3.6% was spent for culvert material for townships; \$255.00, or 0.3% was spent for equipment and unused material; \$2,465.54, or 3.0% was spent for filling and culverts and \$2,956.65, or 3.5% was spent for special cases.

Of the total amount \$62,652.59 spent for new bridges and culverts \$61,-612.06, or 98.3% was spent for permanent work and \$1,040.53, or 1.7% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 72 concrete box culverts costing \$30,632.76; 6 I-beam spans on concrete abutments costing \$13,915.07; 6 pony trusses with concrete abutments and floor costing \$17,064.23; 16 corrugated pipes without headwalls costing \$370.39 and 4 wood pile bridges costing \$670.14.

Roads.

LOUISA COUNTY.

The total county road expenditure was \$19,337.40, of which \$3,711.31, or 19.3 per cent, was spent for permanent work; \$6,561.18, or 34.0 per cent was spent for temporary work; \$1,731.05, or 8.8 per cent was spent for repairs: \$3,242.50, or 16.8 per cent was spent for maintenance; \$2,962.73, or 15.3 per cent, was spent for road equipment and unused material; and \$1,128.63, or 5.8 per cent was spent for special cases.

There were no roads built to temporary grade and none were surfaced. 1.0 miles were built to permanent grade at a cost of \$3,168.30; 36.25 miles were built to natural grade at a cost of \$2,092.98 and 17.88 miles were oiled at a cost of \$4,468.20.

The county road system was dragged an average of 20 times at an average cost of \$29.19 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$44.40 per mile of county road. The total average expenditure per mile of county road was \$172.66.

There are 112.0 miles included in the county road system. Of this mileage 2.57 miles are now surfaced; 7.47 miles are built to permanent grade; 94.96 miles are built to natural grade, and on 7.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 12 townships was \$30,471.70.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$39,686.07 of which \$20,820.72, or 52.6% was spent for permanent bridges and culverts; \$7,677.66, or 19.3% was spent for temporary bridges and culverts; \$3,972.99, or 10.0% was spent for repairs; \$6,063.48, or 15.2% was spent for culvert material for townships; \$509.12, or 1.3% was spent for equipment and unused material; \$1.02, or .003% was spent for filling bridges and culverts and \$641.08, or 1.6% was spent for special cases.

Of the total amount \$28,498.38 spent for new bridges and culverts, \$20,-820.72, or 73.1% was spent for permanent work; and \$7,677.66, or 26.9% was spent for temporary work.

ROAD AND BRIDGE EXPENDITURES

The amounts last above referred to were spent on the following construction: 12 concrete box culverts costing \$6,280.98; 1 circular concrete culvert costing \$95.03; 1 I-beam span on concrete abutments costing \$1,365.27; 2 pony trusses with concrete abutments and floor costing \$13,-079.44; 143 corrugated pipes without headwalls costing \$2,957.72; 7 wood pile bridges costing \$3,439.55; 45 miscellaneous bridges and culverts costing \$1,280.39.

LUCAS COUNTY.

Roads.

The total county road expenditure was \$20,037.07 of which \$1,689.37, or 8.4% was spent for permanent work; \$5,945.88, or 29.7% was spent for temporary work; \$6,672.17, or 33.3% was spent for repairs; \$3,084.24, or 15.4% was spent for maintenance; \$1,379.54, or 6.9% was spent for road equipment and unused material and \$1,265.87, or 6.3% was spent for special cases.

There were no roads built to permanent grade and none were surfaced or oiled. 0.40 miles were built to temporary grade at a cost of \$1,568.00 and 45.5 miles were built to natural grade at a cost of \$4,001.88.

The county road system was dragged an average of 28 times at an average cost of \$19.52 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$66.37 per mile of county road. The total average expenditure per mile of county road was \$136.31.

There are 147.0 miles included in the county road system. Of this mileage 1.0 miles are built to permanent grade; 60.0 miles are constructed to temporary grade; 45.5 miles are built to natural grade, and on 40.5 miles only repair and maintenance work has been done. There are no roads surfaced.

The total township road expenditure indicated by reports from all of the 12 townships was \$23,108.57.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$70,790.10 of which \$48,291.44, or 68.2% was spent for bridges and culverts; \$2,565.78 or 3.6% was spent for temporary bridges and culverts; \$3,375.10, or 4.8% was spent for repairs; \$6,804.57, or 9.6% was spent for culvert material for townships; \$762.96 or 1.1% was spent for equipment and unused material; \$8,594.00, or 12.1% was spent for filling bridges and culverts and \$396.25, or 0.6% was spent for special cases.

Of the total amount \$50,857.22 spent for new bridges and culverts, \$48,291.44, or 95.0% was spent for permanent work; \$2,565.78 or 5.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 45 concrete box culverts costing \$19,811.31; 47 concrete pipes with headwalls costing \$8.370.46; 4 headwalls on culverts previously constructed costing \$335.23; 1 concrete slab bridge costing \$1,533.06; 1 retaining wall costing \$7.20; 2 I-beam spans on concrete abutments costing \$5,316.18; 2 pony trusses with concrete abutments and floor costing \$12,-\$18.00; 19 concrete pipes without headwalls costing \$1,015.68; 7 corrugated

pipes without headwalls \$272.10; 2 cast iron pipes without headwalls costing \$98.70; 6 wood pile bridges costing \$653.35; 17 miscellaneous bridges and culverts costing \$525.95.

LYON COUNTY.

Roads.

The total county road expenditure was \$50,513.27 of which \$7,307.23, or 14.5% was spent for permanent work; \$23,388.76, or 46.3% was spent for temporary work; \$12,115.05, or 24.0% was spent for repairs; \$2,280.91, or 4.5% was spent for maintenance; \$5,131.48 or 10.1% was spent for road equipment and unused material and \$289.84, or 0.6% was spent for special cases.

There were no roads built to temporary grade and none were surfaced or oiled. 2.0 miles were built to permanent grade at a cost of \$7,307.23 and 59.5 miles were built to natural grade at a cost of \$23,116.46.

The county road system was dragged an average of 14 times at an average cost of \$10.90 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$76.37 per mile of county road. The total average expenditure per mile of county road was \$267.97.

There are 188.5 miles included in the county road system. Of this mileage 11.00 miles are built to permanent grade; 2.00 miles are constructed to temporary grade; 132.5 miles are built to natural grade, and on 43.0 miles only repair and maintenance work has been done. There are no surfaced roads.

The total township road expenditure indicated by reports from 15 of the 18 townships was \$26,709.75.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$109,339.63 of which \$91,865.42, or 84.1% was spent for permanent bridges and culverts; \$10,849.51 or 9.9% was spent for temporary bridges and culverts; \$3,389.10, or 3.1% was spent for repairs; \$1,634.85, or 1.5% was spent for equipment and unused material: \$1,590.50 or 1.4% was spent for filling bridges and culverts and \$10.25, or .01% was spent for special cases.

Of the total amount \$102,714.93 spent for new bridges and culverts, \$91,865.42, or 89.5% was spent for permanent work and \$10,849.51, or 10.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 70 concrete box culverts costing \$31,683.30; 7 I-beam spans on concrete abutments costing \$14,110.24; 3 pony trusses with concrete abutments and floor costing \$20,184.49; 3 high steel trusses with concrete abutments and floor costing \$25,887.39; 220 corrugated pipes without headwalls costing \$9,182.66; 1 I-beam span on pile costing \$899.35; 2 wood pile bridges costing \$498.14 and 9 miscellaneous bridges and culverts costing \$269.36.

MADISON COUNTY.

Roads.

The total county road expenditure was \$23,832.89, of which \$11,917.94, or 50.0% was spent for temporary work; \$2,445.70, or 10.3% was spent for repairs; \$3,876.97, or 16.2% was spent for maintenance; \$4,185.15, or 17.6% was spent for road equipment and unused material and \$1,407.13, or 5.9% was spent for special cases. No permanent road work was done. done.

32.0 miles were built to natural grade at a cost of \$4,154.82. No roads were built to permanent or temporary grade, and none were surfaced or oiled.

The county road system was dragged an average of 15 times at an average cost of \$23.49 per mile, the average cost per mile one round trip bing \$0.783. The average cost of repairs and maintenance was \$39.03 per mile of county road. The total average expenditure per mile of county road was \$147.11.

There are 162.0 miles included in the county road system. Of this mileage, 1.5 miles are built to permanent grade; 0.9 miles are constructed to temporary grade; 72.5 miles are built to natural grade, and on 87.1 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships, was \$33,150.46.

Bridges.

Roads.

The total expenditure for bridge and culvert work during 1917 was \$50,338.64, of which \$12,401.73, or 24.7% was spent for permanent bridges and culverts; \$1,642.64, or 3.2% was spent for temporary bridges and culverts; \$14,752.46, or 29.4% was spent for repairs; \$10,580.56, or 21.0% was spent for culvert material for townships; \$2,737.61, or 5.4% was spent for equipment and unused material; \$7,714.34, or 15.3% was spent for filling bridges and culverts, and \$509.30, or 1.0% was spent for special cases.

Of the total amount \$14,044.37 spent for new bridges and culverts, \$12,401.73, or 88.3% was spent for permanent work and \$1,642.64 or 11.7% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 23 concrete box culverts costing \$9,395.44; 1 boiler pipe with headwalls, costing \$51.35; 1 concrete abutment costing \$916.86; 1 I-beam span on concrete abutments, costing \$2,038.08; 21 corrugated pipe without headwalls costing \$1,132.73; 2 wood pile bridges, costing \$258.91, and 1 miscellaneous bridge and culvert, costing \$251.00.

MAHASKA COUNTY.

The total county road expenditure was \$38,468.16, of which \$17,390.36, or 45.2% was spent for permanent work; \$3,808.40, or 9.9% was spent for temporary work; \$6,276.87, or 16.3% was spent for repairs; \$5,605.47, or 14.6% was spent for maintenance; \$4,975.06, or 12.9% was spent for road equipment and unused material; and \$412.00, or 1.1% was spent for special cases.

7.5 miles were built to permanent grade at a cost of \$15,764.22; 1.0 miles were built to temporary grade at a cost of \$815.00 and 34.38 miles were built to natural grade at a cost of \$3,808.40. No roads were surfaced or oiled.

The county road system was dragged an average of 23 times at an average cost of \$36.88 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$77.01 per mile of county road. The total average expenditure per mile of county road was \$249.30.

There are 154.3 miles included in the county road system. Of this mileage, 0.3 miles are now surfaced; 6.2 miles are built to permanent grade; 44.8 miles are constructed to temporary grade; 56.4 miles are built to natural grade, and on 46.6 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$40,863.30.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$58,646.80, of which \$19,873.68 or 34.0% was spent for permanent bridges and culverts; \$5,629.56 or 9.6% was spent for temporary bridges and culverts; \$8,405.65, or 14.3% was spent for repairs; \$17,984.14 or 30.5% was spent for culvert material for townships; \$2,133.89 or 3.7% was spent for equipment and unused material; \$2,400.24, or 4.1% was spent for filling bridges and culverts, and \$2,219.64, or 3.8% was spent for special cases.

Of the total amount \$25,503.24 spent for new bridges and culverts, \$19,-873.68, or 77.9% was spent for permanent work and \$5,629.56 or 22.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 15 concrete box culverts costing \$6,050.80; 5 headwalls on culverts previously constructed, costing \$1,083.61; 4 concrete slab bridges costing \$5,889.28; 1 concrete thru girder costing \$758.40; 4 I-beam spans on concrete abutments, costing \$6,091.59: 17 concrete pipe without headwalls, costing \$1,366.33; 132 corrugated pipe without headwalls, costing \$2,120.80; 41 boiler pipe without headwalls, costing \$1,244.54 and 11 I-beam spans on piling, costing \$897.89.

Roads.

MARION COUNTY.

The total county road expenditure was \$26,422.96 of which \$1,051.49, or 4.0% was spent for permanent work; \$8,285.71, or 31.4% was spent for temporary work; \$4,497.75, or 17.0% was spent for repairs; \$5,503.11, or 20.8% was spent for maintenance; \$4,109.61, or 15.5% was spent for road equipment and unused material; and \$2,975.29, or 11.3% was spent for special cases.

0.25 miles were built to permanent grade at a cost of \$520.00; 0.25 miles were built to temporary grade at a cost of \$404.20; 51.8 miles were built to natural grade at a cost of \$8,285.71. No roads were surfaced or oiled.

The county road system was dragged an average of 26 times at an average cost of \$32.37 per mile, the average cost per mile one round trip being \$0.77. The average cost of repairs and maintenance was \$56.47 per mile of county road. The total average expenditure per mile of county road was \$158.41.

There are 166.8 miles included in the county road system. Of this mileage, 3.53 miles are built to permanent grade; 1.54 miles are constructed to temporary grade; 108.0 miles are built to natural grade, and on 53.73 miles, only repair and maintenance work has been done. No roads have been surfaced.

The total township road expenditure indicated by reports from all of the townships, was \$34,441.91.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$62,056.94 of which \$39,594.12, or 63.9% was spent for permanent bridges and culverts; \$883.64 of 1.4% was spent for temporary bridges and culverts; \$6,231.15, or 10.1% was spent for repairs; \$2,178.18, or 3.5% was spent for culvert material for townships; \$6,328.63, or 10.2% was spent for equipment and unused material; \$6,786.70, or 10.9% was spent for filling bridges and culverts, and \$54.52, or .01% was spent for special cases.

Of the total amount \$40,477.76 spent for new bridges and culverts, \$39,594.12 or 97.8% was spent for permanent work and \$883.64, or 2.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 29 concrete box culverts costing \$19,571.09; 1 boiler pipe with headwalls, costing \$97.80; 1 headwall on culvert previously constructed, costing \$20.90; 8 I-beam spans on concrete abutments, costing \$12,380.58; 1 pony truss with concrete abutments and floor, costing \$7,523.75; 21 corrugated pipe without headwalls, costing \$753.20 and 2 wood pile bridges, costing \$130.44.

Roads.

MARSHALL COUNTY.

The total county road expenditure was \$63,539.52 of which \$33,080.54, or 52.0% was spent for permanent work; \$4,146.24, or 6.5% was spent for temporary work; \$11,686.95, or 18.4% was spent for repairs; \$4,354.99, or 7.0% was spent for maintenance; \$4,698.94, or 7.4% was spent for road equipment and unused material, and \$5,571.86, or 8.7% was spent for special cases.

12.9 miles were built to permanent grade at a cost of \$27,499.54; 4.36 miles were surfaced with gravel at a cost of \$5,279.60; 43.25 miles were built to natural grade at a cost of \$4,146.24. No roads were oiled or built to temporary grade.

The county road system was dragged an average of 32 times at an average cost of \$25.61 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$84.91 per mile of county road. The total average expenditure per mile of county road was \$336.52.

There are 188.8 miles included in the county road system. Of this mileage, 4.36 miles are now surfaced; 8.54 miles are built to permanent grade; 175.9 miles are built to natural grade. No roads have been constructed to temporary grade, and there are no roads on which only repair and maintenance work has been done.

The total expenditure for bridge and culvert work during 1917 was of the townships was \$46,887.93.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$162,188.16 of which \$142,698.25, or 88.0% was spent for permanent bridges and culverts; \$1,574.44, or 1.0% was spent for temporary bridges and culverts; \$2,292.79 or 1.4% was spent for repairs; \$3,302.04 or 2.0% was spent for culvert material for townships; \$947.64 or 0.6% was spent for equipment and unused material; \$9,355.27 or 5.8% was spent for special cases.

Of the total amount \$144,273.69 spent for new bridges and culverts, \$142,698.25 or 98.9% was spent for permanent work and \$1,574.44 or 1.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 103 concrete box culverts costing \$60,596.67; 28 circular concrete culverts costing \$3,706.60; 12 corrugated pipe culverts with headwalls, costing \$557.11; 1 cast iron pipe culvert with headwalls, costing \$237.58: 9 concrete slab bridges costing \$18,987.49; 1 concrete arch bridge costing \$5,967.77; 3 concrete deck girders costing \$10,458.75; 2 retaining walls costing \$2,065.87; 5 I-beam spans on concrete abutments costing \$19,866.64; 4 pony trusses with concrete abutments and floor, costing \$20,343.77; and 21 corrugated pipe without headwalls costing \$1,574.44.

Roads.

MILLS COUNTY.

The total county road expenditure was \$20,433.16, of which \$8,187.80 or 40.0% was spent for permanent work; \$421.60 or 2.1% was spent for temporary work; \$7,451.56 or 36.5% was spent for repairs; \$2,361.65 or 11.5% was spent for maintenance; \$482.65 or 2.4% was spent for road equipment and unused material and \$1,527.90 or 7.5% was spent for special cases.

22.0 miles were built to temporary grade at a cost of \$7,766.71, and 2.0 miles were built to natural grade at a cost of \$421.60. No roads were surfaced or oiled, and none were built to permanent grade.

The county road system was dragged an average of 16 times at an average cost of \$27.32 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$89.21 per mile of county road. The total average expenditure per mile of county road was \$185.76.

There are 110.0 miles included in the county road system. Of this mileage, 21.5 miles are constructed to temporary grade; 2.0 miles are

built to natural grade, and on 86.5 miles, only repair and maintenance work has been done. No roads have been surfaced or built to permanent grade.

The total township road expenditure indicated by reports from all of the townships, was \$29,342.63.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$66,630.89, of which \$22,839.13 or 34.3% was spent for permanent bridges and culverts; \$10,430.13 or 15.6% was spent for temporary bridges and culverts; \$18,631.46 or 28.0% was spent for repairs; \$4,052.66 or 6.1% was spent for culvert material for townships; \$3,718.26 or 5.6% was spent for equipment and unused material; \$3,757.32 or 5.6% was spent for special cases.

Of the total amount \$33,269.26 spent for new bridges and culverts, \$22,839.13 or 68.6% was spent for permanent work; and \$10,430.13 or 31.4% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 12 concrete box culverts costing \$11,384.48; 15 concrete pipe with headwalls costing \$6,028.90; 9 headwalls on culverts previously constructed, costing \$585.40: 1 concrete slab bridge costing \$1,886.00; 2 concrete abutments costing \$2,954.35; 5 concrete pipe without headwalls costing \$674.60; 13 corrugated pipe without headwalls costing \$408.75; 2 pony trusses on piling, wood floors, costing \$4,802.14; 11 wood pile bridges costing \$3,079.88 and 1 high truss on piling costing \$1,464.76.

MITCHELL COUNTY.

Roads.

The total county road expenditure was \$26,414.12 of which \$7,167.78 or 27.2% was spent for permanent work; \$2,748.95 or 10.4% was spent for temporary work; \$3,679.75 or 13.9% was spent for repairs; \$3,333.29 or 12.6% was spent for maintenance; \$8,097.35 or 30.7% was spent for road equipment and unused material; and \$1,387.00 or 5.2% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 25 miles were built to permanent grade at a cost of \$839.42; 2.5 miles were surfaced with gravel at a cost of \$1,758.87 and 25.5 miles were built to natural grade at a cost of \$2,748.95.

The county road system was dragged an average of 27.5 times at an average cost of \$20.62 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$54.26 per mile of county road was \$204.36.

There are 129.25 miles included in the county road system. Of this mileage, 10.5 miles are now surfaced; 2.5 miles are built to permanent grade; 25.5 miles are constructed to temporary grade, and on 90.75 miles, only repair and maintenance work has been done. No roads were built to natural grade.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$63.051.43, of which \$40,832.92 or 65.0% was spent for permanent bridges and culverts; \$675.78 or 1.1% was spent for temporary bridges and culverts; \$4,985.15 or 7.9% was spent for repairs; \$1,890.08 or 3.0% was spent for culvert material for townships; \$6.523.05 or 10.0% was spent for equipment and unused material; \$6,271.55 or 10.0% was spent for filling bridges and culverts. and \$1,872.90 or 3.0% was spent for special cases.

Of the total amount \$41,508.70 spent for new bridges and culverts, \$40,832.92 or 98.4% was spent for permanent work and \$675.78 or 1.6% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 37 concrete box culverts costing \$12,127.06; 1 concrete deck girder costing \$3,605.02; 11 I-beam spans on concrete abutments costing \$15,043.42; 1 pony truss with concrete abutments and floor costing \$8,138.33; 1 high steel truss with concrete abutments costing \$1,919.09; 27 corrugated pipe without headwalls costing \$675.78.

MONONA COUNTY.

Roads.

The total county road expenditure was \$32,204.87 of which \$10,938.64 or 34.0% was spent for permanent work; \$10,327.04 or 32.0% was spent for temporary work; \$3,360.42 or 10.4% was spent for repairs; \$3,431.73 or 10.7% was spent for maintenance; \$1,644.75 or 5.1% was spent for road equipment and unused material and \$2,502.29 or 7.8% was spent for special cases.

There were no roads surfaced or oiled. 8.45 miles were built to permanent grade at a cost of \$10,049.50; 1.50 miles were built to temporary grade at a cost of \$889.14; and 62.7 miles were built to natural grade at a cost of \$8,552.53.

The county road system was dragged an average of 26.5 times at an average cost of \$21.18 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$42.06 per mile of county road. The total average expenditure per mile of county road was \$199.41.

There are 161.5 miles included in the county road system. Of this mileage 9.7 miles are built to permanent grade; 3.5 miles are constructed to temporary grade; 110.9 miles are built to natural grade, and on 37.4 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 19 townships was \$43,810.10.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$93,932.27 of which \$28,821.14 or 28.6% was spent for permanent bridges and culverts; \$30,363.44 or 32.3% was spent for temporary bridges and culverts; \$18,135.95 or 19.3% was spent for repairs; \$5,901.43 or 6.3% was spent for culvert material for townships; \$5,181.98 or 5.5% was spent for equipment and unused material: \$5,114.59 or 5.4% was spent for filling bridges and culverts and \$2,413.74 or 2.6% was spent for special cases.

Of the total amount \$57,194.58 spent for new bridges and culverts \$26,821.14, or 46.9% was spent for permanent work and \$30,363.44, or 53.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 32 concrete box culverts costing \$23,064.34; 1 corrugated pipe with headwalls costing \$81.65; 1 boiler pipe with headwalls costing \$108.15; 1 I-beam span on concrete abutments costing \$3,567.00; 46 corrugated pipes without headwalls costing \$2,982.87; 1 boiler pipe without headwalls costing \$49.50; 11 I-beam spans on piling costing \$8,950.92; 3 pony truss spans on piling, wood floors costing \$12;502.50 and 1 miscellaneous bridge and culvert costing \$5,877.65.

MONROE COUNTY.

Roads.

The total county road expenditure was \$19,563.78 of which \$1,017.60 or 5.2% was spent for permanent work; \$4,291.66 or 22.0% was spent for temporary work; \$6,668.89 or 34.1% was spent for repairs; \$3,342.65 or 17.0% was spent for maintenance; \$2,643.48 or 13.5% was spent for road equipment and unused material and \$1,599.50 or 8.2% was spent for special cases.

There were no roads built to permanent grade and none were surfaced or oiled or built to natural grade. 0.15 miles were built to temporary grade at a cost of \$1,017.60.

The county road system was dragged an average of 23 times at an average cost of \$17.35 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$59.17 per mile of county road. The total average expenditure per mile of county road was \$116.79.

There are 167.5 miles included in the county road system. Of this mileage 0.5 miles are constructed to temporary grade; 163.0 miles are built to natural grade, and on 4.0 miles only repair and maintenance work has been done. There are no roads surfaced and none are built to permanent grade.

The total township road expenditure indicated by reports from all of the 12 townships was \$20,816.25.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$56,761.27 of which \$37,933.30 or 66.7% was spent for permanent bridges and culverts; \$1,627.79 or 2.9% was spent for temporary bridges and culverts; \$8,856.54 or 15.6% was spent for repairs; \$4,463.33 or 7.9% was spent for culvert material for townships; \$782.46 or 1.4% was spent for equipment and unused material; \$2,938.60 or 5.2% was spent for special cases.

Of the total amount \$39,561.09 spent for new bridges and culverts \$37,933.30 or 95.9% was spent for permanent work and \$1,627.79 or 4.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 26 concrete box culverts, costing \$20,396.11; 1 circular concrete culverts costing \$168.00; 7 concrete pipes with headwalls costing \$1.804.20; 1 masonry box culvert costing \$702.38; 5 headwalls on culverts previously constructed costing \$2,143.29; 1 retaining wall costing \$1,671.10 2 I-beam spans on concrete abutments costing \$2,043.72; 2 pony truss spans with concrete abutments and floor costing \$9,004.50; 18 concrete pipes without headwalls costing \$1,056.50 and 12 corrugated pipes without headwalls costing \$571.29.

MONTGOMERY COUNTY.

The total county road expenditure was \$35,862.68 of which \$8,052.37 or 22.5% was spent for permanent work, \$8,504.45 or 23.7% was spent for temporary work, \$7,079.04 or 19.8% was spent for repairs, \$4.499.61 Jr 12.5% was spent for maintenance, \$1,892.05 or 5.3% was spent for road equipment and unused material and \$5,835.16 or 16.2% was spent for special cases.

There were 2.0 miles of road built to permanent grade at a cost of \$6,744.52, 2.0 miles built to temporary grade at a cost of \$1,307.85. No roads were surfaced. 75 miles were built to natural grade at a cost of \$8,504.45. No roads were oiled.

The county road system was dragged an average of 41.37 times at an average cost of \$28.96 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$91.35 per mile of county road. The total average expenditure per mile of county road was \$282.94.

The total township road expenditure indicated by 6 of the 12 townships was \$10,787.22.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$75,064.77, of which \$20,889.23 or 27.9% was spent for permanent bridges and culverts, \$17,041.33, or 22.7% was spent for temporary bridges and culverts; \$20,482.45 or 27.3% was spent for repairs, \$4,985.52 or 6.6% was spent for culvert material for townships, \$5,760.21 or 7.7% was spent for equipment and unused material, \$5,793.98 or 7.7% was spent for filling bridges and culverts and \$112.05 or 0.1% was spent for special cases.

Of the total amount \$37,930.56 spent for new bridges and culverts, \$20,889.23 or 55.2% was spent for permanent work and \$17,041.33 or 44.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 8 concrete box culverts, costing \$11,806.48, 10 corrugated pipe culverts with headwalls costing \$2,609.32, 1 boiler pipe culvert with headwall costing \$420.51, 1 headwall on culvert costing \$20.94, 2 concrete abutments costing \$6,031.98, 37 concrete pipe without headwalls costing \$2,160.00, 1 I-beam span on piling costing \$510.40 7 pony trusses on piling, wood floors costing \$4,583.54, 27 wood pile bridges costing \$9,259.68 and 4 miscellaneous bridges and culverts costing \$527.71.

MUSCATINE COUNTY.

Roads.

The total county road expenditure was \$40,431.79, of which \$26,820.42 or 66.2% was spent for permanent work, \$2,262.93 or 5.6% was spent for temporary work, \$2,728.61 or 6.8% was spent for repairs, \$5,045.93 or 12.5% was spent for maintenance \$1,367.94 or 3.4% was spent for road equipment and unused material, and \$2,205.96 or 5.5% was spent for special cases.

10.9 miles were built to permanent grade at a cost of \$22,527.58. There were no roads built to temporary grade. 1.16 miles were surfaced with clay, shell and gravel at a cost of \$1,595.60, 15.07 miles to natural grade at a cost of \$1,253.63, and 5.0 miles were oiled at a cost of \$1,009.30.

The county road system was dragged an average of 43.3 times at an average cost of \$31.73 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$55.35 per mile of county road. The total average expenditure per mile of county road was \$287.87.

There are 140.45 miles included in the county road system. Of this mileage 2.43 miles are now surfaced; 20.84 miles are built to permanent grade; no miles are constructed to temporary grade; \$9.88 miles are built to natural grade, and on 27.30 miles only repair and maintenance work has been done.

The total towship road expenditure indicated by reports from all of the 15 townships was \$30,191.23.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$31,845.24 of which \$16,018.38 or 50.5% was spent for permanent bridges and culverts, \$1,898.39 or 5.9% was spent for temporary bridges and culverts, \$6,781.92 or 21.3% was spent for repairs, \$5,685.46 or 17.8% was spent for culvert material for townships, \$934.96 or 2.9% was spent for equipment and unused material, \$68.78 or 0.2% was spent for filling bridges and culverts, and \$457.35 or 1.4% was spent for special cases.

Of the total amount, \$17,917.77, spent for new bridges and culverts, \$16,018.38 or 89.4% was spent for permanent work and \$1.898.39 or 10.6% Was spent for temporary work.

The amounts last above referred to were spent on the following construction: 56 concrete box culverts costing \$10,725.47; 15 circular con-

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crete culverts costing \$1,642.77; 1 concrete pipe with headwalls costing \$126.25; 1 headwall on culvert previously constructed costing \$51.63; 1 concrete slab bridge costing \$3,206.01; 1 pony truss with concrete abutments costing \$266.25; 6 concrete pipe without headwalls costing \$158.88; 54 corrugated pipe without headwalls costing \$567.76; 22 boiler pipe without headwalls costing \$99.05; 13 cast iron pipe without headwalls costing \$1,048.00; and 6 miscellaneous bridges and culverts costing \$24.70.

Roads.

O'BRIEN COUNTY.

The total county road expenditure was \$37.421.94, of which \$24,599.25 or 65.8% was spent for permanent work, \$1,550.96 or 4.1% was spent for temporary work, \$3,779.82 or 10.1% was spent for repairs, \$4,403.88 or 11.8% was spent for maintenance \$1,580.58 or 4.2% was spent for road equipment and unused material, and \$1,507.45 or 4.0% was spent for special cases.

There were 17.91 miles built to permanent grade at a cost of \$20,178.49; 0.75 miles built to temporary grade at a cost of \$1,233.29. No roads were surfaced. 14.0 miles were built to natural grade at a cost of \$1,550.96. No roads were oiled.

The county road system was dragged an average of 20 times, at an average cost of \$15.07 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$43.64 per mile of county road. The total average expenditure per mile of county road was \$199.58.

There are 187.50 miles included in the county road system. Of this mileage no surfacing has been done; 43.78 miles are built to permanent grade; 4.44 miles are constructed to temporary grade; 137.40 miles are built to natural grade, and on 1.88 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 16 townships was \$36,572.30.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$59,545.58, of which \$44,504.56 or 74.7% was spent for permanent bridges and culverts, \$785.30 or 1.3% was spent for temporary bridges and culverts, \$4,591.58 or 7.7% was spent for repairs; \$2,750.93 or 4.6% was spent for culvert material for townships; \$6,147.84 or 10.4% was spent for equipment and unused material; \$531.10 or 0.9% was spent for filling bridges and culverts, and \$234.27 or 0.4% was spent for special cases.

Of the total amount \$45,289.86 spent for new bridges and culverts, \$44,504.56 or 98.3% was spent for permanent work and \$785.30 or 1.7% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 92 concrete box culverts costing \$27,211.15; 23 circular concrete culverts costing \$2,613.10; 3 concrete slab bridges costing \$4,877.19; 4 pony trusses with concrete floor and abutments costing \$9,803.12; 16 corrugated pipe culverts without headwalls costing \$387.68, and 60 miscellaneous bridges and culverts costing \$397.62.

Roads.

The total county road expenditure was \$37,036.73, of which \$27,680.84 or 74.7% was spent for permanent work. No temporary road work was done. \$1,338.56 or 3.6% was spent for repairs; \$4,245.62 or 11.5% was spent for maintenance; \$370.84 or 1.0% was spent for road equipment and unused material; and \$3,400.87 or 9.2% was spent for special cases.

OSCEOLA COUNTY.

There were 12.9 miles built to permanent grade at a cost of \$14,944.18 and 10.5 miles built to temporary grade at a cost of \$12,185.91. No surfacing was done, no roads built to natural grade, and no roads oiled.

The county road system was dragged an average of 24 times at an average cost of \$18.02 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$42.30 per mile of county road. The total average expenditure per mile of county road was \$280.43.

There are 132.0 miles included in the county road system. Of this mileage 1.0 mile is now surfaced; 30.0 miles are built to permanent grade; 15.0 miles are constructed to temporary grade; 78.0 miles are built to natural grade, and on 8.0 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$11,547.10.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$74,198.00, of which \$49,515.70 or 66.8% was spent for permanent bridges and culverts, \$7,312.20 or 9.9% was spent for temporary bridges and culverts \$5,145.32 or 6.9% was spent for repairs, \$2,770.43 or 3.7% was spent for culvert material for townships, \$2,832.68 or 3.8% was spent for equipment and unused material, \$1,420.98 or 1.9% was spent for filling bridges and culverts, and \$5,200.69 or 7.0% was spent for special cases.

Of the total amount \$56,827.90 spent for new bridges and culverts, \$49,515.70 or 87.2% was spent for permanent work, and \$7,312.20 or 12.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 77 concrete box culverts costing \$27,459.80; 32 circular concrete culverts costing \$3,951.47; 4 concrete slab bridges costing \$6,144.90; 3 concrete deck girders costing \$6,654.87; 1 pony truss with concrete abutments and floor costing \$5,304.66; 4 concrete pipe without headwalls costing \$25.10; 2 corrugated pipe without headwalls costing \$8.80; and 16 wood pile bridges costing \$7,278.30.

PAGE COUNTY.

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Roads.

The total county road expenditure was \$28,620.38, of which \$15,826.96 or 55.4% was spent for permanent work \$2,372.52 or 8.3% was spent for temporary work, \$2,070.84 or 7.2% was spent for repairs, \$4,914.91 or 17.2% was spent for maintenance, \$955.92 or 3.3% was spent for road equipment and unused material, and \$2,479.23 or 8.6% was spent for special cases.

There were 2.7 miles built to permanent grade at a cost of \$8,127.02, 0.5 miles built to temporary grade at a cost of \$7,661.13, no surfacing done, 21.0 miles built to natural grade at a cost of \$2,372.52.

The county road system was dragged an average of 19 times at an average cost of \$27.98 per mile, the average cost per mile one round trip being \$1.50. The average cost of repairs and maintenance was \$40.15 per mile of county road. The total average expenditure per mile of county road was \$164.48.

There are 174.0 miles included in the county road system. Of this mileage there is no surfacing, 2.0 miles are built to permanent grade; 40.0 miles are constructed to temporary grade; 112.0 miles are built to natural grade, and on 20.0 miles only repair and maintenance work has been done.

The total towship road expenditure indicated by reports from all of the 16 townships was \$27,337.60.

Bridges.

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The total expenditure for bridge and culvert work during 1917 was \$90,443.18, of which \$36,997.98 or 40.9% was spent for permanent bridges and culverts, \$13,160.81 or 14.6% was spent for temporary bridges and culverts, \$15,905.73 or 17.6% was spent for repairs; \$10,519.09 or 11.6% was spent for culvert material for townships; \$157.90 or 0.2% was spent for equipment and unused material; \$6,010.36 or 6.6% was spent for special, cases.

Of the total amount \$50,158.79 spent for new bridges and culverts, \$36, 997.98, or 73.9% was spent for permanent work and \$13,160.81, or 26.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 22 concrete box culverts costing \$16,530.75; 1 concrete arch culvert costing \$262.20; 2 concrete pipe culverts with headwalls costing \$861.57; 3 headwalls on culverts previously constructed costing \$716.86; 1 retaining wall costing \$545.65; 2 pony trusses with concrete floor and abutments costing \$18,080.95; 96 concrete pipe without headwalls costing \$4,837.80; 185 corrugated pipe without headwalls costing \$7,017.61; 4 wood pile bridges costing \$1,115.14 and 2 miscellaneous bridges and culverts costing \$190.26.

Roads.

PALO ALTO COUNTY.

The total county road expenditure was \$59,511.85, of which \$46,286.20, or 77.7% was spent for permanent work; \$216.00, or 0.4% was spent for temporary work, \$1,665.49, or 2.8% was spent for repairs; \$5,214.04 or 8.8% was spent for maintenance; \$2,582.83, or 4.3% was spent for road equipment and unused material and \$3,547.29, or 6.0% was spent for special cases.

There were 41.55 miles built to permanent grade at a cost of \$39,733.69. No temporary grade work, nor no surfacing was done. 1.5 miles were built to natural grade at a cost of \$216.00. No oiling was done. The county road system was dragged an average of 24 times at an average cost of \$10.60 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$41.22 per mile of county road. The total average expenditure per mile of county road was \$356.56.

There are 166.88 miles included in the county road system. Of this mileage, 2.83 miles are now surfaced; 99.13 miles are built to permanent grade; 0.10 miles are constructed to temporary grade; 28.0 miles are built to natural grade, and on 36.82 miles only repair work and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 16 townships was \$41,743.68.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$84,484.99 of which \$53,311.77, or 63.1% was spent for permanent bridges and culverts; \$3,428.44, or 4.0% was spent for temporary bridges and culverts; \$10,638.32, or 12.6% was spent for repairs; \$7,846.81, or 9.3% was spent for culvert material for townships; \$6,359.93, or 7.5% was spent for equipment and unused material; \$872.85, or 1.0% was spent for filling bridges and culverts, and \$2,026.87, or 2.5% was spent for special cases.

Of the total amount \$56,740.21 spent for new bridges and culverts, \$53,-311.77 or 94.0% was spent for permanent work and \$3,428.44, or 6.0% was spent for temporary work.

The amounts last above mentioned were spent on the following construction; 58 concrete box culverts costing \$19,777.38; 3 circular concrete culverts costing \$463.77; 1 headwall on culvert previously constructed costing \$173.53; 4 concrete slab bridges costing \$6,105.51; 1 concrete deck girder costing \$6,821.90; 1 retaining wall costing \$71.05; 3 I-beam spans on concrete abutments costing \$2,345.39; 4 pony trusses with concrete floor and abutments costing \$17,553.24; 129 corrugated pipe without headwalls costing \$3,216.94, and 1 wood pile bridge costing \$211.50.

PLYMOUTH COUNTY.

Roads.

The total county road expenditure was \$21,702.14, of which 0.0% was spent for permanent work, \$3,982.49, or 18.3% was spent for temporary work; \$4,808.62, or 22.2% was spent for repairs; \$4,733.97, or 21.8% was spent for maintenance; \$1,257.40, or 5.8% was spent for road equipment and unused material, and \$6,919.66, or 31.9% was spent for special cases.

There was no permanent and temporary grading done, and no surfacing. 4.0 miles were built to natural grade at a cost of \$3,982.49. No oiling was done.

The county road system was dragged an average of 25 times at an average cost of \$32.44 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$45.77 per mile of county road. The total average expenditure per mile of county road was \$104.08.

ROAD AND BRIDGE EXPENDITURES

There are 208.5 miles included in the county road system. Of this naileage, no surfacing, permanent grading, temporary grading or natural grading has been done. 208.5 miles only repair and maintenance work has been done.

The total towship road expenditure indicated by reports from 22 of the 24 townships was \$34,939.67.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$105,804.21, of which \$58,126.82, or 55.0% was spent for permanent bridges and culverts; \$14,376.59, or 13.5% was spent for temporary bridges and culverts; \$13,334.26, or 12.6% was spent for repairs; \$5,837.06, or 5.5% was spent for culvert material for townships; \$13,454.48, or 12.8% was spent for equipment and unused material: 0.0% was spent for filling bridges and culverts, and \$675.00, or 0.6% was spent for special cases.

Of the total amount \$72,503.41 spent for new bridges and culverts, \$58,-126.82, or 80.2% permanent work, \$14,376.59, or 19.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 35 concrete box culverts costing \$23,606.60; no circular concrete culverts built; 81 concrete pipe culverts with headwalls costing \$3,449.79; 3 concrete slab bridges costing \$5,942.30; 3 I-beam spans on concrete abutments costing \$12,070.71; 2 pony trusses with concrete floor and abutments costing \$13,057.42; 74 corrugated pipe without headwalls costing \$2,821.78, and 45 wood pile bridges costing \$11,554.81.

POCAHONTAS COUNTY.

Roads.

The total county road expenditure was \$74,714.74 of which \$49,224.47, or 65.9% was spent for permanent work; \$892.23, or 1.2% was spent for temporary work; \$6,451.06, or 8.7% was spent for repairs; \$3,243.93, or 4.3% was spent for maintenance; \$6,324.55, or 8.4% was spent for road equipment and unused material, and \$8,578.50, or 11.5% was spent for special cases.

There were 36.5 miles built to permanent grade at a cost of \$29,963.32. No roads were built to temporary grade. 17.0 miles were surfaced with gravel at a cost of \$14,670.03, and 13.0 miles were built to natural grade at a cost of \$892.23. No oiling was done.

The county road system was dragged an average of 21.45 times at an average cost of \$20.15 per mile, the average cost per mile one round trip bing \$0.87. The average cost of repairs and maintenance was \$57.53 per mile of county road. The total average expenditure per mile of county road was \$443.41.

There are 168.5 miles included in the county road system. Of this mileage 37.5 miles are now surfaced; 43.0 miles are built to permanent grade: 23.9 miles are constructed to temporary grade; 61.85 miles are built to natural grade, and on 2.25 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 18 townships was \$48,901.28.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$64,552.72 of which \$40,430.62, or 62.8% was spent for permanent bridges and culverts; \$2,935.47, or 4.5% was spent for temporary bridges and culverts; \$7,468.21, or 11.5% was spent for repairs; \$6,471.02, or 10.0% was spent for culvert material for townships; \$5,202.25, or 8.1% was spent for equipment and unused material; \$1,506.31, or 2.3% was spent for special cases.

Of the total amount, \$43,366.09 spent for new bridges and culverts \$40,-430.62, or 93.2% was spent for permanent work and \$2,935.47, or 6.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 17 concrete box culverts costing \$6,914.77; 16 circular concrete culverts costing \$2,678.64; 4 concrete arch culverts costing \$728.25; 1 corrugated pipe culvert with headwalls costing \$245.43; 3 concrete slab bridges costing \$4,628.32; 1 concrete deck girder costing \$2,163.00; 1 retaining wall costing \$16.85; 4 I-beam spans on concrete abutments costing \$5,642.02; 4 pony trusses with concrete floor and abutments costing \$17,413.34, and 114 corrugated pipe without headwalls costing \$2,935.47.

Roads.

POLK COUNTY.

The total county road expenditure was \$158,890.71 of which \$114,500.96, or 72.0% was spent for permanent work; \$2,598.78, or 1.6% was spent for repairs; \$17,170.06, or 10.9% was spent for maintenance; \$5,852.19, or 3.7% was spent for road equipment and unused material and \$18,-768.72, or 11.8% was spent for special cases.

There were no roads built to natural grade and none were oiled. 7.36 miles were built to permanent grade at a cost of \$38,292.25; 2 miles of monolithic brick pavement were built at a cost of \$68,190.72, and 4.8 miles were surfaced with gravel at a cost of \$4,991.84.

The monolithic brick pavement reported above was constructed partly on 58th Street and partly on the Beaver Road extending from the city limits of Des Moines to Camp Dodge. This pavement when completed will be 4.8 miles in length and outside of the pavement on the Mason City-Clear Lake road in Gerro Gordo County, will be the longest continuous paved rural highway in the state of which we have information. The contract for the work was let September 15, 1917, and work was started shortly after. The grading of the road was completed and about two miles of pavement laid. The surfacing of this road consists of monolithic brick pavement, 20 feet wide, and a gravel shoulder 6 feet wide on each side of the pavement. The width of the road from the bottom of one ditch to the bottom of the other is 48 feet.

The total estimated cost of the improvement based on the contract prices is approximately \$225,000.00. An extra heavy pavement and gravel shoulder is specified because of the anticipated heavy traffic to the cantonment. The county road system was dragged an average of 41.7 times at an average cost of \$41.70 per mile, the average cost per mile one round trip being \$1.00. The average cost of repairs and maintenance was \$106.42 per mile of county road. The total average expenditure per mile of county road was \$856.12.

There are 185.75 miles included in the county road system. Of this mileage 17.25 miles are now surfaced; 20.25 miles are built to permanent grade; 1.5 miles are constructed to temporary grade; 122.0 miles are built to natural grade, and on 24.75 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 19 townships was \$41,449.96.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$103,157.02 of which \$50,932.23, or 49.5% was spent for permanent bridges and culverts; \$8,111.07, or 7.9% was spent for temporary bridges and culverts; \$27,886.19, or 26.8% was spent for repairs; \$5,036.00, or 4.9% was spent for culvert material for townships; \$4,653.22, or 4.5% was spent for equipment and unused material; \$3,471.01, or 3.4% was spent for special cases.

Of the total amount \$59,043.30 spent for new bridges and culverts \$50,932.23, or 86.2% was spent for permanent work and \$8,111.07, or 13.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 36 concrete box culverts costing \$38,403.26; 3 circular concrete culverts costing \$632.54; 2 concrete slab bridges costing \$3,687.63; 1 concrete arch bridge costing \$5,683.80; 1 pony truss with concrete abutments and floor costing \$2,525.00; 18 corrugated pipes without headwalls costing \$3,780.26; 17 boiler pipes without headwalls costing \$1,128.87, and 9 wood pile bridges costing \$3,201.94.

Roads.

POTTAWATTAMIE COUNTY.

The total county road expenditure was \$47,177.69 of which \$1,564.48, or 3.3% was spent for permanent work; \$14,847.71, or 31.4% was spent for temporary work; \$12,747.18, or 27.0% was spent for repairs; \$11,-086.23, or 23.6% was spent for maintenance; \$5.071.49, or 10.8% was spent for road equipment and unused material; and \$1,860.60, or 3.9% was spent for special cases.

0.5 miles were built to temporary grade at a cost of \$301.06; 1.00 mile was surfaced with cinders at a cost of \$737.50; .0075 of a mile was surfaced with concrete at a cost of \$525.92; 95.0 miles were built to natural grade at a cost of \$14,847.71. No roads were built to permanent grade, and none were oiled.

The county road system was dragged an average of 36.63 times at an average cost of \$27.47 per mile, the average cost per mile one round trip

being \$0.75. The average cost of repairs and maintenance was \$93.83 per mile of county road. The total average expenditure per mile of county road was \$185.69.

There are 254.0 miles included in the county road system. Of this mileage, 2.00 miles are now surfaced; 6.21 miles are built to permanent grade; 10.24 miles are constructed to temporary grade; 235.55 miles are built to natural grade, and there were no roads on which only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the townships was \$64,161.48.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$173,267.31 of whch \$46,578.63, or 26.9% was spent for permanent bridges and culverts; \$28,935.58, or 16.7% was spent for temporary bridges and culverts; \$45,163.05, or 26.1% was spent for repairs; \$15,992.01, or 9.2% was spent for culvert material for townships; \$16,622.69, or 9.6% was spent for equipment and unused material; \$13,041.81, or 7.5% was spent for filling bridges and culverts, and \$6,933.54, or 4.0% was spent for special cases.

Of the total amount \$75,514.21 spent for new bridges and culverts, \$46,-578.63, or 61.7% was spent for permanent work and \$28,935.58, or 38.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 7 concrete box culverts costing \$5.645.09; 70 concrete pipe with headwalls costing \$12,036.28; 2 corrugated pipe with headwalls costing \$610.75; 2 cast iron pipe with headwalls costing \$6.05; 30 headwalls on culverts previously constructed, costing \$3,308.92; 2 I-beam spans on concrete abutments costing \$1,590.20; 3 pony trusses with concrete abutments and floor, costing \$23,381.34; 27 concrete pipes without headwalls costing \$1,472.70; 83 corrugated pipe without headwalls, costing \$2,884.48; 3 boiler pipe without headwalls costing \$69.80; 3 I-beam spans on piling, costing \$3,927.02; 5 pony trusses on piling, wood floors, costing \$2,982.36; 48 wood pile bridges costing \$17,538.59; and 2 miscellaneous bridges and culverts costing \$60.63.

Roads.

POWESHIEK COUNTY.

The total county road expenditure was \$25,576.76, of which \$10,762.99, or 41.9% was spent for temporary work; \$6,958.12, or 27.3% was spent for repairs; \$4,460.51, or 17.5% was spent for maintenance; \$2,609.10, or 10.2% was spent for road equipment and unused material; and \$786.04, or 3.1% was spent for special cases.

37.0 miles were built to, natural grade at a cost of \$8,887.27, and 8.0 miles were oiled at a cost of \$1,875.72. No roads were built to permanent or temporary grade, and none were surfaced.

The county road system was dragged an average of 20 times at an average cost of \$23.59 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$28.56 per mile of county road. The total average expenditure per mile of county road was \$184.90.

There are 138.3 miles included in the county road system. Of this mileage, 10.0 miles are built to permanent grade; 128.0 miles are built to natural grade, and on 0.3 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 11 of the 16 townships was \$30,521.42.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$135,171.69, of which \$97,339.15, or 72.0% was spent for permanent bridges and culverts; \$330.19, or 0.2% was spent for temporary bridges and culverts; \$9,587.09, or 7.1% was spent for repairs; \$15,136.22, or 11.2% was spent for culvert material for townships; \$1,631.35, or 1.2% was spent for equipment and unused material; \$5,790.56, or 4.3% was spent for filling bridges and culverts, and \$5,357.13, or 4.0% was spent for special cases.

Of the total amount \$97,669.34 spent for new bridges and culverts, \$97,-339.15, or 99.7% was spent for permanent work and \$330.19, or 0.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 61 concrete box culverts costing \$43,352.57; 9 circular concrete culverts costing \$2,632.78; 4 headwalls on culverts previously constructed, costing \$436.77; 22 I-beam spans on concrete abutments costing \$35,082.43; 5 pony trusses with concrete abutments and floor costing \$15,-834.60, and 13 corrugated pipe without headwalls, costing \$330.19.

Roads.

RINGGOLD COUNTY.

The total county road expenditure was \$12,731.27 of which \$1,991.94, or 15.7% was spent for permanent work; \$4,473.76, or 35.1% was spent for temporary work; \$1,313.53, or 10.3% was spent for repairs; \$3,858.60, or 30.4% was spent for maintenance; \$235.03, or 1.8% was spent for road equipment and unused material; and \$858.41, or 6.7% was spent for special cases.

1.75 miles were built to temporary grade at a cost of \$1,991.94, and 35.25 miles were built to natural grade at a cost of \$4,473.76. No roads were built to permanent grade, and none were surfaced or oiled.

The county road system was dragged an average of 34.02 times at an average cost of \$17.01 per mile, the average cost per mile one round trip being \$0.50. The average cost of repairs and maintenance was \$28.14 per mile of county road. The total average expenditure per mile of county road was \$69.14.

There are 183.75 miles included in the county road system. Of this mileage 1.75 miles are constructed to temporary grade; 35.25 miles are built to natural grade, and on 146.75 miles, only repair and maintenance work has been done. No roads are surfaced or built to permanent grade.

The total township road expenditure indicated by reports from 13 of the 17 townships was \$18,731.37.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$62,077.34, of which \$23,703.19, or 38.2% was spent for permanent bridges and culverts; \$5,207.43, or 8.4% was spent for temporary bridges and culverts; \$12,116.66, or 19.5% was spent for repairs; \$4,306.04, or 6.9% was spent for culvert material for townships; \$2,940.-81, or 4.7% was spent for equipment and unused material; \$12,748.46, or 20.6% was spent for filling bridges and culverts, and \$1,054.75, or 1.7% was spent for special cases.

Of the total amount \$28,910.62 was spent for new bridges and culverts, \$23,703.19 or \$2.0% was spent for permanent work and \$5,207.43 or 18.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 38 concrete box culverts costing \$21,001.35; 14 concrete pipe with headwalls costing \$2,595.84; 1 headwall on a culvert previously constructed, costing \$106.00; 1 concrete pipe without headwalls, costing \$62.50; 40 corrugated pipe without headwalls, costing \$1,533.87; 7 boiler pipe without headwalls, costing \$189.07; 25 wood pile bridges costing \$3,398.49 and 3 miscellaneous bridges and culverts costing \$23.50.

SAC COUNTY.

Roads.

The total county road expenditure was \$60,419.15, of which \$50,562.56, or 83.6% was spent for permanent work; \$1,445.21 or 2.4% was spent for repairs; \$2,187.78, or 3.6% was spent for maintenance; \$1,417.30, or 2.4% was spent for road equipment and unused material; and \$4,806.30, or 3.0% was spent for special cases.

35.93 miles were built to permanent grade at a cost of \$38,587.98 and 9.23 miles were surfaced with gravel at a cost of \$9,440.97. No roads were built to temporary or natural grade, and none were oiled.

The county road system was dragged an average of 18 times at an average cost of \$14.58 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$24.35 per mile of country road. The total average expenditure per mile of county road was \$404.87.

There are 149.23 miles included in the county road system. Of this mileage, 35.3 miles are now surfaced; 78.91 miles are built to permanent grade; 13.0 miles are built to natural grade, and on 22.02 miles, only repair and maintenance work has been done. No roads have been constructed to temporary grade.

The total township road expenditure indicated by reports from all of the townships was \$43,654.65.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$91,778.57 of which \$70,713.14, or 77.0% was spent for permanent bridges and culverts; \$2,025.36, or 2.2% was spent for temporary bridges and culverts; \$5,196.80 or 5.7% was spent for repairs; \$2,547.53, or 2.8% was

spent for culvert material for townships; \$4,027.62, or 4.4% was spent for equipment and unused material; \$1,645.62, or 1.8% was spent for filling bridges and culverts, and \$5,622.50, or 6.1% was spent for special cases.

Of the total amount \$72,738.50 spent for new bridges and culverts, \$70,-713.14, or 97.2% was spent for permanent work and \$2,025.36, or 2.8% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 45 concrete box culverts costing \$20,850.12; 30 circular concrete culverts costing \$3.123.49; 53 concrete arch culverts, costing \$4,644. 19; 11 corrugated pipe with headwalls, costing \$595.72; 2 cast iron pipe with headwalls costing \$221.76; 12 headwalls on culverts previously constructed, costing \$284.60; 19 I-beam spans on concrete abutments, costing \$24,608.73; 3 pony trusses with concrete abutments and floor, costing \$10,384.53; 1 high steel truss with concrete abutments, costing \$6,000.00; 82 corrugated pipe without headwalls, costing \$1,434.65; 1 I-beam span on piling, costing \$578.00; and 5 concrete pipe without headwalls, costing \$12.51.

Roads.

SCOTT COUNTY.

The total county road expenditure was 30.492.31 of which 10,461.20, or 34.3% was spent for permanent work; 5,900.10, or 19.4% was spent for temporary work; 3,231.76, or 10.6% was spent for repairs; 3,547.38, or 11.7% was spent for maintenance; 6,177.77, or 20.3% was spent for road equipment and unused material and 1,174.10, or 3.7% was spent for special cases.

4.5 miles were built to permanent grade at a cost of \$8,487.08; 0.5 miles were built to temporary grade at a cost of \$298.25; 0.72 miles were surfaced with gravel and macadam at a cost of \$1,175.87; 16.0 miles were built to natural grade at a cost of \$676.92 and 17.6 miles were oiled at a cost of \$5,223.18.

The county road system was dragged an average of 15 times at an average cost of \$25.55 per mile, the average cost per mile one round trip being \$0.85. The average cost of repairs and maintenance was \$49.92 per mile of county road. The total average expenditure per mile of county road was \$224.54.

There are 135.8 miles included in the county road system. Of this mileage 36.86 miles are now surfaced; 15.55 miles are built to permanent grade; 3.4 miles are constructed to temporary grade; 15.8 miles are built to natural grade, and on 64.19 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 14 townships was \$29,481.84.

Bridges.

The total expenditure for bridges and culvert work during 1917 was \$46,042.99, or which \$22,129.74, or 48.2% was spent for permanent bridges and culverts; \$1,378.80, or 3.0% was spent for temporary bridges and culverts; \$4,712.78, or 10.0% was spent for repairs; \$4,345.64, or 9.4%

was spent for culvert material for townships; \$6,858.02, or 14.9% was spent for equipment and unused material; \$2,507.31, or 5.5% was spent for filling bridges and culverts and \$4,110.70, or 9.0% was spent for special cases.

Of the total amount \$23,508.54 spent for new bridges and culverts, \$22,-129.74, or 94.1% was spent for permanent work and \$1,378.80, or 5.9% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 42 concrete box culverts costing \$17,831.24; 13 circular concrete culverts costing \$2,217.36; 2 masonry culverts costing \$614.56; 1 headwall on culvert previously constructed costing \$40.94; 1 concrete slab bridge costing \$1,425.64; 17 corrugated pipes without headwalls costing \$485.81; 21 boiler pipes without headwalls costing \$690.92 and 1 wood pile bridge costing \$202.07.

Roads.

SHELBY COUNTY.

The total county road expenditure was \$18,554.45 of which \$6,060.00, or 32.7% was spent for temporary work; \$8,182.29, or 44.1% was spent for repairs; \$4,055.41, or 21.8% was spent for maintenance; \$256.75, or 1.4% was spent for road equipment and unused material. There was no permanent work done.

There were no roads built to permanent or temporary grade and none were surfaced or oiled. 61.0 miles were built to natural grade at a cost of \$6,060.00.

The county road system was dragged an average of 37 times at an average cost of \$25.35 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$77.65 per mile of county road. The total average expenditure per mile of county road was \$117.62.

There are 157.75 miles included in the county road system. Of this mileage 0.4 miles are constructed to temporary grade; 72.0 miles are built to natural grade, and on 85.05 miles, only repair and maintenance work has been done. There are no roads which are surfaced.

The total township road expenditure indicated by reports from all of the 16 townships was \$36,540.44.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$55,-159.39, of which \$12,367.15, or 22.4% was spent for permanent bridges and culverts; \$13,864.23, or 25.1% was spent for temporary bridges and culverts; \$14,371.84, or 26.1% was spent for repairs; \$8,184.99, or 14.8% was spent for culvert material for townships; \$1,366.98, or 2.5% was spent for equipment and unused material; \$4,344.95, or 7.9% was spent for filling bridges and culverts and \$659.25, or 1.2% was spent for special cases.

Of the total amount \$26,231.38 spent for new bridges and culverts, \$12,-367.15, or 47.2% was spent for permanent work and \$13,864.23, or 52.8% was spent for temporary work.

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The amounts last above referred to were spent on the following construction: 12 concrete box culverts costing \$11,876.27; 1 concrete pipe with headwalls costing \$490.88; 4 concrete pipes without headwalls costing \$542.24; 47 corrugated pipes without headwalls costing \$2,564.52; 1 pony truss on piling, wood floor costing \$1,450.00 and 25 wood pile bridges costing \$9,307.47.

Roads.

SIOUX COUNTY.

The total county road expenditure was \$23,846.42, of which \$2,746.27, or 11.5% was spent for permanent work; \$5,887.27, or 24.6% was spent for temporary work; \$4,796.82, or 20.2% was spent for repairs; \$2,549.93, or 10.7% was spent for maintenance; \$4,769.61, or 20.0% was spent for road equipment and unused material and \$3,096.52, or 13.0% was spent for special cases.

There were no roads built to temporary grade and none were surfaced or oiled. 1.0 miles were built to permanent grade at a cost of \$2,729.02 and 52.5 miles were built to natural grade at a cost of \$5,887.27.

The county road system was dragged an average of 14 times at an average cost of \$10.34 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$34.01 per mile of county road. The total average expenditure per mile of county road was \$110.40.

There are 216.0 miles included in the county road system. Of this mileage 2.0 miles are built to permanent grade; 55.0 miles are built to natural grade, and on 159.0 miles only repair and maintenance work has been done. There are no roads surfaced and none are constructed to temporary grade.

The total township road expenditure indicated by reports from all of the 23 townships was \$39,154.70.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$97,930.24, of which \$63,927.96, or 65.3% was spent for permanent bridges and culverts; \$2,915.09, or 3.0% was spent for temporary bridges and culverts; \$12,423.07, or 12.7% was spent for repairs; \$569.06, or 0.6% was spent for culvert material for townships; \$14,568.76, or 14.9% was spent for equipment and unused material; \$343.15, or 0.3% was spent for filling bridges and culverts and \$3,183.15, or 3.2% was spent for special cases.

Of the total amount \$66,843.05 spent for new bridges and culverts, \$63,-927.96, or 95.6% was spent for permanent work and \$2,915.09, or 4.4% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 173 concrete box culverts costing \$50,134.71; 4 concrete slab bridges costing \$6,149.15; 3 concrete deck girders costing \$7,644.10; 3 corrugated pipes without headwalls costing \$108.50; 5 wood pile bridges costing \$2,546.03 and 17 miscellaneous bridges and culverts costing \$260.56.

STORY COUNTY.

Roads.

The total county road expenditure was \$47.548.42 of which \$30,648.26, or 64.4% was spent for permanent work; \$3,093.66, or 6.5% was spent for repairs; \$8,947.31, or 18.9% was spent for maintenance; \$1.620.85, or 3.4% was spent for road equipment and unused material and \$3,238.34, or 6.8% was spent for special cases.

There were no roads constructed to temporary or natural grade and none were oiled. 32.25 miles were built to permanent grade at a cost of \$19,992.91 and 16.0 miles were surfaced with gravel at a cost of \$8,163.36.

The county road system was dragged an average of 25 times at an average cost of \$31.36 per mile, the average cost per mile one round trip being \$0.85. The average cost of repairs and maintenance was \$89.23 per mile of county road. The total average expenditure per mile of county road was \$352.21.

There are 135.0 miles included in the county road system. Of this mileage 32.5 miles are now surfaced; 102.5 miles are built to permanent grade; there are no roads constructed to temporary grade or natural grade and none on which repair and maintenance work has been done.

The total township road expenditure indicated by reports from 15 of the townships was \$48,486.78.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$30,473.08 of which \$21,433.30, or 70.4% was spent for permanent bridges and culverts; \$281.41, or 0.9% was spent for temporary bridges and culverts; \$7,165.22, or 23.5% was spent for repairs; \$924.41, or 3.0% was spent for culvert material for townships; \$407.00, or 1.3% was spent for filling bridges and culverts and \$261.74, or 0.9% was spent for special cases.

Of the total amount \$21,714.71 spent for new bridges and culverts, \$21,-433.30, or 98.8% was spent for permanent work and \$281.41, or 1.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 37 concrete box culverts costing \$11,693.15; 32 circular concrete culverts costing \$2,727.55; 6 I-beam spans on concrete abutments costing \$6,768.52; 1 pony truss with concrete abutments and floor costing \$244.08; 13 corrugated pipes without headwalls costing \$270.38, and 1 miscellaneous bridge and culvert costing \$11.03.

Roads.

TAMA COUNTY.

The total county road expenditure was \$55,822.64 of whch, \$26,222.68, or 46.9% was spent for permanent work; \$7,484.98, or 13.4% was spent for temporary work; \$11,714.76, or 21.0% was spent for repairs; \$4,603.06, or 8.3% was spent for maintenance; \$3,416.82, or 6.1% was spent for road equipment and unused material and \$2,380.34, or 4.3% was spent for special cases.

There were no roads built to temporary grade. 6.08 miles were built to permanent grade at a cost of \$25.528.99; 0.75 miles were surfaced with crushed rock at a cost of \$2,693.69; 73.0 miles were built to natural grade at a cost of \$7,187.98 and 1.0 miles were oiled at a cost of \$297.00.

The county road system was dragged an average of 21 times at an average cost of \$16.48 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$78.83 per mile of county road. The total average expenditure per mile of county road was \$269.67.

There are 207.0 miles included in the county road system. Of this mileage 0.75 miles are now surfaced; 26.53 miles are built to permanent grade; 1.75 miles are constructed to temporary grade; 173.0 miles are built to natural grade, and on 4.97 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 21 townships was \$52,008,48.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$113,882.54 of which \$70,410.95, or 61.8% was spent for permanent bridges and culverts; \$15,609.26, or 13.7% was spent for temporary bridges and culverts; \$14,648.32, or 12.9% was spent for repairs; \$6,602.74, or 5.8% was spent for culvert material for townships; \$73.93, or .06% was spent for equipment and unused material; \$2,830.23, or 2.5% was spent for special cases.

Of the total amount \$86,020.21 spent for new bridges and culverts, \$70,-410.95, or 81.9% was spent for permanent work; \$15,609.26, or 18.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 50 concrete box culverts costing \$30,558.87; 1 boiler pipe culvert with headwalls costing \$128.01; 1 cast iron pipe culvert with headwalls costing \$201.95; 1 concrete slab bridge costing \$1,313.44; 1 concrete deck girder costing \$1.435.27; 10 I-beam spans on concrete abutments costing \$21,515.20; 6 pony trusses with concrete abutments and floor costing \$15,258.21; 89 cast iron pipes without headwalls costing \$6,177.27; 38 wood pile bridges costing \$9,202.43, and 2 miscellaneous bridges and culverts costing \$229.56.

TAYLOR COUNTY.

Roads.

The total county road expenditure was \$14,002.39 of which \$3,642.35, or 26.0% was spent for temporary work; \$6,225.01, or 44.5% was spent for repairs; \$2,899.66, or 20.7% was spent for maintenance; \$1,235.37, or 8.8% was spent for road equipment and unused material.

There were no roads built to permanent or temporary grade and none were surfaced or oiled. 38.25 miles were built to natural grade at a cost of \$3.642.35. The county road system was dragged an average of 27 times at an average cost of \$16.11 per mile, the average cost per mile one round trip being \$0.60. The average cost of repairs and maintenance was \$53.05 per mile of county road. The total average expenditure per mile of county road was \$\$1.41.

There are 172.0 miles included in the county road system. Of this mileage 0.37 miles are built to permanent grade; 86.0 miles are built to natural grade, and on 85.63 miles only repair and maintenance work has been done. There were no roads surfaced or constructed to temporary grade.

The total township road expenditure indicated by reports from all of the 17 townships was \$29,623.09.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$71,556.19, of which \$26,399.87, or 36.9% was spent for permanent bridges and culverts; \$16,894.21, or 23.7% was spent for repairs; \$872.89, or 1.2% was spent for culvert material for townships; \$8,214.63, or 11.5% was spent for equipment and unused material; \$15,508.08, or 21.6% was spent for filling bridges and culverts; and \$1,414.16, or 2.0% was spent for special cases.

Of the total amount \$28,652.22 spent for new bridges and culverts, \$26,399.87, or 92.2% was spent for permanent work and \$2,252.35, or 7.8% was spent for temporary work.

The amounts last above referred to were spent on the following constructions: 31 concrete box culverts costing \$15,472.18; 93 concrete pipes with headwalls costing \$10,927.69; and 16 wood pile bridges costing \$2,252.35.

Roads.

UNION COUNTY.

The total county road expenditure was \$8,147.62, of which 0.0% was spent for permanent work; \$4,687.98 or 57.6% was spent for repairs; \$2,269.71 or 27.9% was spent for maintenance; \$1,130.43 or 13.8% was spent for road equipment and unused material, and \$59,50 or 0.7% was spent for special cases.

No roads were built to permanent, temporary, or natural grade. No roads were surfaced and none were oiled.

The county road system was dragged an average of 20 times at an average cost of \$14.01 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$44.61 per mile of county road. The total average expenditure per mile of county road was \$52.72.

There are 135.5 miles included in the county road system. Of this mileage 0.0 miles are now surfaced; 0.0 miles are built to permanent grade; 0.0 miles are constructed to temporary grade; 0.0 miles are built to natural grade, and on 135.5 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 8 of the 12 townships was \$19,207.38.

Bridges.

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The total expenditure for bridge and culvert work during 1917 was 69,681.53, of which 838,421.85 or 55.2% was spent for permanent bridges and culverts; \$1,710.81 or 2.5% was spent for temporary bridges and culverts; \$10,373.07 or 14.8% was spent for repairs; \$5,849.90 or 8.4% was spent for equipment and unused material; \$7,587.20 or 10.9% was spent for filling bridges and culverts, and \$2,371.30 or 3.4% was spent for special cases.

Of the total amount \$40,132.66 spent for new bridges and culverts, \$38,421.85 or 95.7% was spent for permanent work and \$1,710.81 or 4.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 19 concrete box culverts costing \$11,614.63; 58 concrete pipe culverts with headwalls costing \$10,885.00; 50 headwalls on culverts previously constructed, costing \$2,181.15; 1 concrete abutment costing \$4,-686.00; 1 I-beam span on concrete abutments costing \$2,753.22; 1 pony truss with concrete floor and abutments costing \$6,301.85; 39 corrugated pipe without headwalls costing \$1,363.81, and 1 wood pile bridge costing \$347.00.

Roads.

VAN BUREN COUNTY.

The total county road expenditure was \$15,332.35, of which 0.0% was spent for permanent work; \$3,295.40 or 21.4% was spent for temporary work; \$2,256.67 or 14.8% was spent for repairs; \$3,589.85 or 23.4% was spent for maintenance; \$3,859.16 or 25.2% was spent for road equipment and unused material, and \$2,331.27 or 15.2% was spent for special cases.

No roads were built to permanent or temporary grade, and no roads were surfaced. 19.75 miles were built to natural grade at a cost of \$3,295.40. No roads were oiled.

The county road system was dragged an average of 39 times at an average cost of \$26.99 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$43.93 per mile of county road. The total average expenditure per mile of county road was \$115.02.

There are 133.3 miles included in the county road system. Of this mileage 0.0 miles are now surfaced; 0.0 miles are built to permanent grade; 0.0 miles are built to temporary grade; 68.0 miles are built to natural grade, and on 65.3 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from all of the 14 townships was \$30,191.17.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$71,151.45, of which \$15,398.25 or 21.6% was spent for permanent bridges and culverts; \$14,832.82 or 20.8% was spent for temporary bridges and culverts; \$23,201.30 or 32.6% was spent for repairs; \$12,831.17 or 18.1% was spent for culvert material for townships; \$2,603.44 or 3.7% was spent

for equipment and unused material; \$890.09 or 1.3% was spent for filling bridges and culverts, and \$1.394.38 or 1.9% was spent for special case.

Of the total amount \$30,231.07 spent for new bridges and culverts, \$15,398.25 or 50.9% was spent for permanent work, and \$14,832.82 or 49.1% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 28 concrete box culverts costing \$14,295.79; 1 boiler pipe with headwalls costing \$85.10; 1 I-beam span on concrete abutments costing \$1.017.36; 73 boiler pipe culverts without headwalls costing \$5,532.96; 10 cast iron pipe culverts without headwalls costing \$1,249.90; 5 I-beam spans on piling costing \$2,018.17; 6 pony trusses on piling wood floors costing \$3,057.75; 21 wood pile bridge costing \$2,974.04.

Roads.

WAPELLO COUNTY.

The total county road expenditure was \$24,158.30, of which \$8,520.02 or 35.3% was spent for permanent work; \$1,266.40 or 5.3% was spent for temporary work; \$3,558.00 or 14.7% was spent for repairs; \$4,174.39 or 17.2% was spent for maintenance; \$4,577.71 or 19.0% was spent for road equipment and unused material, and \$2,061.78 or 8.5% was spent for special cases.

1.5 miles were built to permanent grade at a cost of \$3,788.98; 1.5 miles were built to temporary grade at a cost of \$3,599.94; 0.3 miles were surfaced with clay at a cost of \$1,023.00; 10.0 miles were built to natural grade at a cost of \$1,266.40. No roads were oiled.

The county road system was dragged an average of 29 times at an average cost of \$26.16 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$56.39 per mile of county road. The total average expenditure per mile of county road was \$176.17.

There are 137.13 miles included in the county road system. Of this mileage 0.35 miles are now surfaced; 2.75 miles are built to permanent grade; 4.25 miles are constructed to temporary grade; 42.0 miles are built to natural grade, and on 87.78 miles only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 14 of the 14 townships was \$26,389.41.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$55.313.11, of which \$27,213.21 or 49.2% was spent for permanent bridges and culverts, \$1,227.65 or 2.2% was spent for temporary bridges and culverts, \$7,953.20 or 14.4% was spent for repairs, \$9,860.31 or 17.8% was spent for culvert material for townships, \$5,539.35 or 10.0% was spent for equipment and unused material, \$3,020.43 or 5.5% was spent for filling bridges and culverts, and \$498.96 or 0.9% was spent for special cases.

Of the total amount \$28,440.86, spent for new bridges and culverts, \$27,213.21 or 95.7% was spent for permanent work and \$1,227.65 or 4.3% was spent for temporary work.
ROAD AND BRIDGE EXPENDITURES

The amounts last above referred to were spent on the following construction: 17 concrete box culverts costing \$11,427.27; no circular concrete culverts were built; 14 concrete pipe with headwalls costing \$6,338.86; 1 corrugated pipe with headwalls costing \$220.24; 9 headwalls on culverts previously constructed costing \$1,589.80; 5 I-beam spans on concrete abutments and floor costing \$7,208.55; 13 concrete pipe without headwalls costing \$817.62; 5 corrugated pipe without headwalls costing \$199.17; and 6 wood pile bridges costing \$210.86.

Roads.

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WARREN COUNTY.

The total county road expenditure was \$18,266.24 of which, \$5.10 or 0.03% was spent for permanent work; \$5,777.77 or 31.50% was spent for temporary work; \$2,087.88 or 11.45% was spent for repairs; \$6,141.83 or 33.55% was spent for maintenance; \$3,669.99 or 20.28% was spent for . road equipment and unused material and \$583.67 or 3.19% was spent for special cases.

There were no roads built to permanent or temporary grade, and none were surfaced or oiled. 90.75 miles were built to natural grade at a cost of \$5,777.77.

The county road system was dragged an average of 21 times at an average cost of \$29.10 per mile, the average cost per mile one round trip being \$0.70. The average cost of repairs and maintenance was \$48.41 per mile of county road. The total average expenditure per mile of county road was \$107.33.

There are 170.0 miles included in the county road system. Of this mileage 3.5 miles are built to permanent grade; 0.25 miles are constructed to temporary grade; 155.25 miles are built to natural grade, and on 11.0 miles only repair and maintenance work has been done. There are no roads surfaced.

The total township road expenditure indicated by reports from all of the 16 townships was \$33,523.98.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$31,925.18, of which \$8,358.62 or 26.1% was spent for permanent bridges and culverts; \$6,228.17 or 19.5% was spent for temporary bridges and culverts; \$7,794.92 or 24.3% was spent for repairs; \$521.05 or 1.6% was spent for culvert material for townships; \$3,165.57 or 10.2% was spent for equipment and unused material; \$5,411.44 or 16.9% was spent for filling bridges and culverts and \$445.41 or 1.4% was spent for special cases.

Of the total amount \$14,586.79 spent for new bridges and culverts, \$8,358.62 or 57.3% was spent for permanent work and \$6,228.17 or 42.7% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 10 concrete box culverts costing \$5,111.68; 19 circular concrete culverts costing \$2,497.88; 1 corrugated pipe with headwalls costing \$220.24; 1 high steel truss, concrete abutments costing \$659.13; 2 corrugated pipes without headwalls costing \$11.50; 1 boiler pipe without headwalls costing \$38.50; 34 wood pile bridges costing \$6,049.77; 6 miscellaneous bridges and culvert costing \$128.40.

WASHINGTON COUNTY.

Roads.

The total county road expenditure was \$48,165.28, of which \$5,998.89 or 12.4% was spent for permanent work; \$8,264.20 or 17.1% was spent for temporary work; \$13,535.60 or 28.2% was spent for repairs; \$13,855.90 or 28.8% was spent for maintenance; \$6,144.22 or 12.7% was spent for road equipment and unused material; and \$366.47 or 0.8% was spent for special cases.

There were no roads built to temporary grade and none were surfaced. 0.7 miles were built to permanent grade at a cost of \$5,908.08; 55.3 miles were built to natural grade at a cost of \$8,139.20 and 0.25 miles were oiled at a cost of \$125.00.

The county road system was dragged an average of 26 times at an average cost of \$42.32 per mile, the average cost per mile one round trip being \$0.80. The average cost of repairs and maintenance was \$142.30 per mile of county road. The total average expenditure per mile of county road was \$250.21.

There are 192.5 miles included in the county road system. Of this mileage 8.9 miles are built to permanent grade; 181.6 miles are built to natural grade and on 2.5 miles only repair and maintenance work has been done. There are no roads surfaced and none are constructed to temporary grade.

The total township road expenditure indicated by reports from all of the 15 townships was \$50,337.41.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$88,690.41, of which \$42,625.51 or 48.1% was spent for permanent bridges and culverts; \$3,467.10 or 3.9% was spent for temporary bridges and culverts; \$23,308.99 or 26.3% was spent for repairs; \$7,389.50 or 8.2% was spent for culvert material for townships; \$10,028.69 or 11.3% was spent for equipment and unused material; \$821.95 or 0.9% was spent for filling bridges and culverts and \$1,048.67 or 1.2% was spent for special cases.

Of the total amount \$46,092.61 spent for new bridges and culverts. \$42,-625.51 or 92.5% was spent for permanent work and \$3,467.10 or 7.5% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 44 concrete box culverts costing \$20,387.50; 3 concrete slab bridges costing \$6,614.69; 2 concrete abutments costing \$2,160.44; 2 concrete deck girders costing \$6,107.16; 1 I-beam span on concrete abutments costing \$2,818.82; 1 pony truss with concrete abutments and floor costing \$4,536.90; 2 corrugated pipes without headwalls costing \$3,393.80.

RGAD AND BRIDGE EXPENDITURES

IOWA STATE HIGHWAY COMMISSION

Roads.

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WAYNE COUNTY.

The total county road expenditure was \$16,103.98 of which \$2,909.14 or 18.1% was spent for temporary work; \$1,572.90 or 9.7% was spent for repairs; \$8,649.80 or 53.7% was spent for maintenance; \$2,061.64 or 12.8% was spent for road equipment and unused material and \$910.50 or 5.7% was spent for special cases.

There were no roads built to permanent or temporary grade and none were surfaced or oiled. 22.75 miles were built to natural grade at a cost of \$2,909.14.

The county road system was dragged an average of 27 times at an average cost of \$26.49 per mile, the average cost per mile one round trip being \$1.00. The average cost of repairs and maintenance was \$59.26 per mile of county road was \$93.36.

There are 172.5 miles included in the county road system. - Of this mileage 141.0 miles are built to natural grade, and on 31.5 miles only repair and maintenance work has been done. There are no roads surfaced and none have been constructed to permanent or temporary grade.

The total township road expenditure indicated by reports from all of the 16 townships was \$24,551.95.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$69.626.18 of which, \$21,568.74 or 31.0% was spent for permanent bridges and culverts; \$9,507.54 or 13.6% was spent for temporary bridges and culverts; \$7,727.11 or 11.1% was spent for repairs; \$5,137.92 or 7.4% was spent for culvert material for townships; \$3,482.71 or 5.0% was spent for equipment and unused material; \$19,045.36 or 27.4% was spent for filling bridges and culverts and \$3,156.80 or 4.5% was spent for special cases.

Of the total amount \$31,076.28 spent for new bridges and culverts, \$21,568.74 or 69.4% was spent for permanent work and \$9,507.54 or 30.6% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 22 concrete box culverts costing \$13,322.26; 1 I-beam span on concrete abutments costing \$654.25; 2 pony trusses with concrete abutments and floor costing \$7,592.23; 8 concrete pipes without headwalls costing \$543.52; 1 corrugated pipe without headwalls costing \$10.75; 10 boiler pipes without headwalls costing \$550.47; 2 cast iron pipes without headwalls costing \$90.63; 28 wood pile bridges costing \$8,312.17.

Roads.

WEBSTER COUNTY.

The total county road expenditure was \$43,846.75, of which \$13,921.59 or 31.7% was spent for permanent work; \$13,381.26 or 30.6% was spent for temporary work; \$2,820.85 or 6.4% was spent for repairs; \$6,549.00 or 14.9% was spent for maintenance; \$3,470.50 or 7.9% was spent for road equipment and unused material; and \$3,703.35 or 8.5% was spent for special cases.

There were no roads built to temporary grade and none were surfaced or oiled. 7.1 miles were built to permanent grade at a cost of \$9,270.99; and 61.5 miles were built to natural grade at a cost of \$13,381.26.

The county road system was dragged an average of 35 times at an average cost of \$35.00 per mile, the average cost per mile one round trip being \$1.00. The average cost of repairs and maintenance was \$50.55 per mile of county roads. The total average expenditure per mile of county road was \$236.54.

There are 185.37 miles included in the county road system. Of this mileage 2.0 miles are now surfaced; 57.75 miles are built to permanent grade; 112.5 miles are built to natural grade, and on 13.12 miles, only repair and maintenance work has been done. There are no roads constructed to temporary grade.

The total township road expenditure indicated by reports from 19 of the 23 townships was \$56,060.21.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$41,469.97 of which \$30,630.00 or 68.8% was spent for permanent bridges and culverts; \$2.572.36 or 5.8% was spent for temporary bridges and culverts; \$4,324.02 or 9.7% was spent for repairs; \$3,668.25 or 8.2% was spent for culvert material for townships; \$1,003.18 or 2.3% was spent for equipment and unused material; \$1,182.35 or 2.7% was spent for filling bridges and culverts and \$1,089.81 or 2.5% was spent for special cases.

Of the total amount \$33,202.36 spent for new bridges and culverts, \$20,630.00 or 92.3% was spent for permanent work and \$2,572.36 or 7.7% was spent for temporary work.

The amounts last above referred to were spent for the following construction: 26 concrete box culverts costing \$9,888.57; 1 circular concrete culvert costing \$140.50; 3 concrete slab bridges costing \$3,224.40; 2 concrete deck girders costing \$4,748.98; 1 I-beam span on concrete abutments costing \$158.75; 3 pony trusses with concrete abutments and floor costing \$12,468.80; 39 corrugated pipes without headwalls costing \$475.72; 150 clay tile without headwalls costing \$1,106.42; 3 cast iron pipes without headwalls, costing \$8.50; 5 I-beam spans on piling costing \$426.30 and 10 miscellaneous bridges and culverts costing \$555.42.

Roads.

WINNEBAGO COUNTY.

The total county road expenditure was \$58,808.66, of which \$47,515.08 or 80.8% was spent for permanent work: \$1,478.26 or 2.5% was spent for temporary work; \$3,503.02 or 6.0% was spent for repairs; \$3,706.60 or 6.3% was spent for maintenance; \$1,701.76 or 2.9% was spent for road equipment and unused material; and \$903.94 or 1.5% was spent for special cases.

There were no roads surfaced and none were oiled. 14.75 miles were built to permanent grade at a cost of \$41,341.06; 3.25 miles were built to temporary grade at a cost of \$4,839.50; and 8.0 miles were built to natural grade at a cost of \$1.478.26.

IOWA STATE HIGHWAY COMMISSION

The county road system was dragged an average of 26 times at an average cost of \$28.18 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$54.80 per mile of county road. The total average expenditure per mile of county road was \$447.04.

There are 131.55 miles included in the county road system. Of this mileage 43.75 miles are built to permanent grade; 3.5 miles are constructed to temporary grade; 69.0 miles are built to natural grade, and on 15.75 miles only repair and maintenance work has been done. There are no roads surfaced.

The total township road expenditure indicated by reports from 9 of the 12 townships was \$20,009.36.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$29,303.72 of which \$12,876.97 or 44.0% was spent for permanent bridges and culverts; \$7,946.03 or 27.1% was spent for temporary bridges and culverts; \$2,254.37 or 7.7% was spent for repairs; \$3,165.97 or 10.8% was spent for culvert material for townships; \$2,044.83 or 7.0% was spent for equipment and unused material; and \$1,015.55 or 3.4% was spent for special cases.

Of the total amount \$20,823.00 spent for new bridges and culverts \$12,876.97 or 61.8% was spent for permanent work and \$7,946.03 or 38.2% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 8 concrete box culverts costing \$1,632.27; 20 circular concrete culverts costing \$3,665.60; 12 corrugated pipes with headwalls costing \$1.298.65; 4 I-beam spans on concrete abutments costing \$6,280.45; 164 corrugated pipes without headwalls costing \$4,855.56 and 8 wood pile bridges costing \$3,090.47.

WINNESHIEK COUNTY.

Roads.

The total county road expenditure was \$32,109.52 of which \$1,838.98 or 5.7% was spent for permanent work; \$12.750.33 or 39.6% was spent for temporary work; \$8,723.57 or 27.2% was spent for repairs; \$5,931.32 or 18.5% was spent for maintenance; \$2,165.43 or 6.8% was spent for road equipment and unused material and \$699.89 or 2.2% was spent for special cases.

There were no roads built to temporary grade and none were surfaced or oiled. 0.5 miles were built to permanent grade at a cost of \$597.63 and 30.9 miles were built to natural grade at a cost of \$12,356.81.

The county road system was dragged an average of 30 times at an average cost of \$25.35 per mile, the average cost per mile one round trip being \$0.83. The average cost of repairs and maintenance was \$72.44 per mile of county road. The total average expenditure per mile of county road was \$158.70.

There are 202.3 miles included in the county road system. Of this mileage 0.5 miles are built to permanent grade; 131.65 miles are built

to natural grade, and on 69.15 miles only repair and maintenance work has been done. There are no roads surfaced and none are constructed to temporary grade.

The total township road expenditure indicated by reports from all of the 20 townships was \$37,832.86.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$84,806.37 of which \$52,332.80 or 61.8% was spent for permanent bridges and culverts; \$4,466.37 or 5.3% was spent for temporary bridges and culverts; \$17,955.38 or 21.2% was spent for repairs; \$4,705.34 or 5.5% was spent for culvert material for townships; \$1,901.55 or 2.2% was spent for equipment and unused material; \$1,289.06 or 1.5% was spent for filling bridges and culverts and \$2,155.87 or 2.5% was spent for special cases.

Of the total amount \$56,799.17 spent for new bridges and culverts, \$52,332.80 or 92.1% was spent for permanent work and \$4,466.37 or 7.9% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 63 concrete box culverts costing \$13,448.37; 4 circular concrete culverts costing \$471.60; 21 masonry box culverts costing \$3,559.83; 5 headwalls on culverts previously constructed costing \$318.16; 1 concrete slab bridge costing \$1,418.10; 2 concrete abutments costing \$1,294.36; 1 concrete deck girder costing \$2,923.40; 2 masonry abutments costing \$1,815.51; 2 I-beam spans on concrete abutments costing \$3,278.62; 5 pony trusses with concrete abutments and floor costing \$2,804.85; 16 corrugated pipes without headwalls costing \$1,239.59; 3 I-beam spans on piling costing \$1,883.20; 1 pony truss on piling, wood floor costing \$641.68; 1 wood pile bridge costing \$241.72 and 3 miscellaneous bridges and culverts costing \$460.18.

Roads.

WOODBURY COUNTY.

The total county road expenditure was \$51,536.61 of which \$25,443.05 or 49.5% was spent for permanent work; \$2,446.40 or 4.7% was spent for temporary work; \$11,822.72 or 22.9% was spent for repairs; \$5,216.93 or 10.1% was spent for maintenance; \$664.42 or 1.3% was spent for road equipment and unused material, and \$5,943.09 or 11.5% was spent for special cases.

15.0 miles were built to permanent grade at a cost of \$24,704.76; 0.23 miles were built to temporary grade at a cost of \$393.60; 0.15 miles were surfaced with gravel at a cost of \$344.69; and 28.0 miles were built to natural grade at a cost of \$2,446.40. No roads were oiled.

The county road system was dragged an average of 20 times at an average cost of \$23.44 per mile, the average cost per mile one round trip being \$1.17. The average cost of repairs and maintenance was \$80.00 per mile of county road. The total average expenditure per mile of county road was \$241.91.

There are 213.0 miles included in the county road system. Of this mileage, 0.2 miles are now surfaced; 16.5 miles are built to permanent

grade; 9.0 miles are constructed to temporary grade; 150.0 miles are built to natural grade, and on 37.3 miles, only repair and maintenance work has been done.

The total township road expenditure indicated by reports from 18 of the 23 townships, was \$37,832.86.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$85,177.16 of which \$46.553.37 or 54.7% was spent for permanent bridges and culverts; \$14,124.79 or 16.6 was spent for temporary bridges and culverts; \$11,852.80 or 13.9% was spent for repairs; \$2,352.26 or 2.8% was spent for culvert material for townships; \$7,586.94 or 8.9% was spent for equipment and unused material; \$2,579.00 or 3.0% was spent for filling bridges and culverts, and \$128.00 or 0.1% was spent for special cases.

Of the total amount \$60,678.16 spent for new bridges and culverts, \$46,553.37, or 76.7% was spent for permanent work and \$14,124.79, or 23.3% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 45 concrete box culverts costing \$24,614.44; 19 concrete pipe with headwalls, costing \$2.583.94; 1 boiler pipe with headwalls, costing \$92.42; 5 headwalls on culverts previously constructed, costing \$507.46; 1 concrete slab bridge costing \$562.80; 4 I-beam spans on concrete abutments and floor, costing \$10,991.60; 202 concrete pipes without headwalls, costing \$6,257.27; 1 I-beam span on piling, costing \$427.87; 38 wood pile bridges costing \$7,439.65.

Roads.

WORTH COUNTY.

The total county road expenditure was \$18,935.97 of which \$3,240.05, or 17.1% was spent for permanent work; \$9,083.73, or 48.0% was spent for temporary work; \$2,171.48, or 11.5% was spent for repairs; \$2,800.74, or 14.8% was spent for maintenance; \$1,258.14, or 6.6% was spent for road equipment and unused material and \$381.83, or 2.0% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 3.0 miles were built to permanent grade at a cost of \$1,194.75; 1.75 miles were surfaced at a cost of \$562.65 and 15.25 miles were built to natural grade at a cost of \$6,302.89.

The county road system was dragged an average of 25 times at an average cost of \$18.75 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$43.42 per mile of county road. The total average expenditure per mile of county road was \$165.37.

There are 114.5 miles included in the county road system. Of this mileage 3.0 miles are now surfaced; 105.5 miles are built to natural grade, and on 6.0 miles only repair and maintenance work has been done. There are no roads built to permanent or temporary grade.

The total township road expenditure indicated by reports from all of the 12 townships was \$21,685.62.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$22,-215.84 of which \$17,822.00, or 80.3% was spent for permanent bridges and culverts; \$109.90, or 0.5% was spent for temporary bridges and culverts; \$992.92, or 4.4% was spent for repairs; \$1,436.16, or 6.5 was spent for culvert material for townships; \$1,115.97, or 5.0% was spent for equipment and unused material; and \$736.89, or 3.3% was spent for special cases.

Of the total amount \$17,931.90 spent for new bridges and culverts \$17,-\$22.00, or 99.4% was spent for permanent work and \$109.90, or 0.6% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 74 concrete box culverts costing \$11,226.89; 1 headwall on culvert previously constructed costing \$46.50; 8 I-beam spans on concrete abutments costing \$6,548.61 and 6 concrete pipes without headwalls costing \$109.90.

WRIGHT COUNTY.

Roads.

The total county road expenditure was \$63,044.46, of which \$42,792.51, or 67.9% was spent for permanent work; \$5,948.26, or 9.5% was spent for temporary work; \$4,614.09, or 7.3% was spent for repairs; \$3,167.12, or 5.0% was spent for maintenance; \$3,469.07, or 5.5% was spent for road equipment and unused material and \$3,053.41, or 4.8% was spent for special cases.

There were no roads built to temporary grade and none were oiled. 25.0 miles were built to permanent grade at a cost of \$16,643.91; 35.0 miles were surfaced with gravel at a cost of \$23,197.73 and 45.0 miles were built to natural grade at a cost of \$5,948.26.

The county road system was dragged an average of 24 times at an average cost of \$17.74 per mile, the average cost per mile one round trip being \$0.75. The average cost of repairs and maintenance was \$44.83 per mile of county road. The total average expenditure per mile of county road was \$363.37.

There are 173.50 miles included in the county road system. Of this mileage 69.0 miles are now surfaced; 14.0 miles are built to permanent grade; 75.5 miles are built to natural grade and there are no roads built to permanent grade. There has been no repair or maintenance work done.

The total township road expenditure indicated by reports from all of the 16 townships was \$47,190.65.

Bridges.

The total expenditure for bridge and culvert work during 1917 was \$59,833.23, of which \$45,954.00, or 76.8% was spent for permanent bridges and culverts; \$2,408.30 or 4.0% was spent for temporary bridges and culverts; \$4,135.17, or 6.9% was spent for repairs; \$4,019.93, or 6.7% was spent for culvert material for townships; \$750.15, or 1.3% was spent for equipment and unused material; \$2,126.88, or 3.6% was spent for filling bridges and culverts and \$438.80, or 0.7% was spent for special cases.

IOWA STATE HIGHWAY COMMISSION

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Of the total amount \$48,362.30 spent for new bridges and culverts, \$45,-954.00, or 95.0% was spent for permanent work and \$2,408.30, or 5.0% was spent for temporary work.

The amounts last above referred to were spent on the following construction: 55 concrete box culverts costing \$21,290.48; 1 corrugated pipe with headwalls costing \$230.00; 2 concrete arch bridges costing \$4,976.84; 1 concrete abutment costing \$1,017.00; 2 I-beam spans on concrete abutments costing \$3,676.48; 1 high steel truss, concrete abutments costing \$8,004.00; 1 deck truss, concrete abutments costing \$6,759.20; 155 corrugated pipes without headwalls costing \$2,000.00 and 1 wood pile bridge costing \$408.30.

SUMMARY TABLE No. 1.

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Amount Spent for Bridges and Road Work-All County Funds-Annual Reports of County Engineers.

		Bridge	es and Cul	verts						
County	Bridge Fund	Motor Vehicle Fund	Road Fund	All Other Sources	Total	County Road Cash Fund	Motor Vehicle Fund	All Other Sources	Total	Total Bridge and Road Expendi- tures
Adair	452 104 07	61.051.0r								-
Adams	\$56,194.97	\$3,051.95	\$5,371.29	\$163.65	\$60,781.88	\$ 3,382.87	\$15,988.0	CONTRACTOR	\$19,370.91	\$80,152.70
Allamakee	29,/14.77	0,989.84	5,825.32	**********	42,529.93	10,003.54	······		10.003.54	52 533 47
Appanoose	89,048.69	101.55	**********		89,150,24	16,210,19	16,744.60		32 954 79	122 105 03
Audubon	45,222.05	15,494.62	11,150.75		71,867,42	13,310,84			13,310,84	85 178 26
Benton	77,207.39	**********	2,303.50	6,070,20	85,581.09	18,095,81	7.841.58		25 937 38	111 510 47
Black Hawk	98,330.12		8,505.27	3.53	106.838.92	29,601,26	11 636 73	67 01	41 345 00	111,010.4/
Baone	67,101.26	2,117.70	338.63		69,557,59	30 445 37	12 527 21	\$1.01	42.073.24	198,083.92
Beaution	51,386.40		4,439.00		55 825 40	22 472 94	7 112 24		42,972.30	112,330,17
Bremer	46,290.32	**********	255.47		46 545 70	21 027 47	1,110.01	*********	90,585.18	90,410.67
Buchanan	65,580,34	3.819.87	and a str		60,045.79	17,007.47	11111111111111	**********	21,037.47	67,583.26
Buena Vista	217,809,17				07,400.21	14,459.02	15,159.01		27,618,63	97,018.84
Butler	98,504 36	3 918 90	3 810 54	**********	217,809.17	142,548.70	13,813.76		156,162.46	373,971.63
Calhoun	73 045 02	0,140,30	2,019.50		100,242.82	31,468.33	11,021.09	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	42,489,42	148,732.24
Carroll	82 571 04	*******	2,230.34	************	76,876.46	51,734.62	23,721.29	*********	75,455.91	152,332.37
Cass	- 51 007 07	21 021 54	333.3/	32222444444444	83,106.61	36,189.00	19,305.28	74.93	55,569,18	138,675,79
Cedar	57,007.23	61,861.30	1,857.23	**********	80,766.02	17,202.92	**********	77.10	17,280.02	98.046.01
Cerro Gordo	57,001.03	**********	60,20	**********	57,061.23	17,967.50	16,380,22		34,347.72	91,408,95
Cherokee	0/,1/8.4/	***********	***********	**********	67,178.47	69,173.68	11.075.64	18,100.62	98,349,94	165 528 41
Chickasaw	183,503.50	10,828.25	6,978.94	***********	201,310.69	32,633,74	********		32 633 74	233 014 43
Clarke	41,144.60	2,146.29	556.60	*********	43,847,49	17,763.35	6.056.76		23,820,11	67 667 60
Clay	25,684.68	**********	10,834.79	**********	36,519,47	3.084.96	5,304.14		8 380 10	44 009 57
Claston	101,825.57	104.93	1,482.49		103,412 00	117 802 13	15 224 80	0 217 06	142 264 00	71,700.3/
Clinton	58,413.52	13,954.13	4,413.22		76,780,87	23 336 56	5 000 00	7,007.90	20, 222, 52	243,777.85
Canton	51,449.09	23,283.76	1,961.94		76.694.70	34 270 12	5,000.00		20,330.50	105,117.43
Della-	208,815.21		6,927.95		215 743 16	142 244 26	22 682 10	200 50	39,370.13	111,064.92
Dallas	63,088,12		3.977.07		67 065 10	20 107 64	45,055,10	229,50	100,120.96	381,870.12
Davis	33,204,33	15,263,20	7,105 59		55 572 12	11 627 27	15,708.80	**********	41,906.44	108,971.63
Decatur	24,968,29	6.089.03	2 928 49	3 025 65	33,5/ 5.12	11,027.37	1,211.20	**********	12,838.57	68,411.69
Delaware	43,391,87		1 437 20	0,060.00	44 820 07	22,312.30	6,317.94	**********	28,630.24	65,641.69
Des Moines	16.327.79	13 000 46	1 470 13	*********	44,629.07	43,238.88	13,023.48		38,282,36	83,111.43
Dickinson	81,487,37	10,000.40	160.27	2 200 24	30,807.38	11,643.03	305.29	515.38	12,463.70	43,271.08
Dubuque	106.331.47		502.17	2,280.34	83,936.98	117,100.61	10,712.82	**********	127,813.43	211,750,41
e contraction of the second se	1001001.41		304.171	203,75	107,097.39	72,859.27	23,013.26	33,902.47	129,775.00	236,872,39

Emmet $21,255,00$ $32,60,00$ $32,60,00$									1	I start a start start	and share and	
Pyyettc. y_{2}, y_{0}, y_{0} y_{0}, y_{0} y_{0}, y_{0} y_{0}, y_{0} $y_{0}, y_{0}, y_{0}, y_{0}$ $y_{0}, y_{0}, y_{0}, y_{0}$ $y_{0}, y_{0}, y_{0}, y_{0}, y_{0}$ $y_{0}, y_{0}, y_{0}, y_{0}, y_{0}, y_{0}, y_{0}, y_{0}, y_{0}, y_{0}, y_{0}$ $y_{0}, y_{0}, y_{$	Emmet	21,505.09	436.62	1,874.27		23,815.93	32,899.6	16,248.83	**********	49,148.48	72,964.45	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Fayette	97,660.56	1,704.51	447.59	4,538,79	104,411.45	35,706.07	10 707 22		33,700.07	01 009 42	
Franklin 60,264,73	Floyd	55,167.33	**********	504,45	*********	20,0/1./0	49,143.36	10,195.56	1 100 00	47 490 00	110 854 63	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Franklin	67,364.73	**********	************	110.0000000000	0/,304.73	42,309.81	***********	1,120.09	43,409.90	100,034.03	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Fremont	62,544.12	14,230.03	99.03	**********	76,873.15	29,280.28	3,090.55	**********	32,370,83	109,295.95	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Creene	32,542.51	**********	10,215.85		42,758.36	37,208.71	**********	***********	37,208.71	79,967.07	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Crundy	42,615,19	12,847.96	1,665.55		57,128.70	32,309.43	**********		32,309.43	89,438.13	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Carbaia	126,577,89	96.40	2,294.87		128,969.03	15,087.42	7,678.02	1,201.22	23,966.66	152,935.74	12
Hamilton 42.314.68 694.24 600.99 47.65.95 11.851.29 49.27.27 92.917.18 Hardin 82.804.46 22.335.53 272.00 105.411.97 28.373.66 3.697.34 32.071.10 137.375.75 32.071.00 137.385.29 Harrison 32.261.10 11.080.64 7.65.85 -45.066.71 13.236.41 3.677.346 3.697.34 32.071.10 137.385.29 147.29 Heury 34.836.66 9.397.85 2.442.05 -46.067.76 17.388.23 59.15 18.333.38 64.099.91 Humboldt 43.107.45 9.128.71 4.797.47 6.00 57.009.64 17.407.9 2.279.28 -2.281.45 79.77.11 107.10 Tockson 60.275.260 6.433.57 3.951.65 745.17 107.966.16 51.366.67 13.843.92 -32.667.38 140.24.93 20.187.48 77.977.71 107.21 108.876.67 21.133.06 63.243.92 32.067.38 140.24.93 20.187.48 77.977.71 107.279.48 107.877.64 77.496.16 11.690.15 66.066.75 52.266 57.677.67 21.413.36 11.260.15	Guinfic	76,703 63		2,150.85		78,854,48	63,492,53	15,123,12		78,615.65	157,470.13	5
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Hamilton	42 714 68	694.24	630.99		43,630,01	37 425 01	11 851 29		49.277.27	92,917,18	1
Harrison. $22,07,07$ $22,035,35$ $272,00$ $105,411,07$ $28,036,46$ $32,071,05$ $32,071,070,073,070,073,070,070,070,070,070,070$	Hancock	75 804 40		2 252 80		78 147 20	36 650 32	21 008 25	561.60	59 210 25	137 357 51	4
Harrison 22,033,20 22,033,20 20,03,00 30,02,3 20,03,00 30,02,3 20,01,30 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,00,01 10,10,10,00,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,01 10,10,10,10,01 10,10,10,10,10,10,10,10,10,10,10,10,10,1	Hardin	03,054.49	33 335 53	272 (1)		105 411 0	00,000.00	* 2 (07 2)	201.03	22.071.03	127 102 03	5
Henry 32,220,19 11,039,04 1/(20,83) 60,06,74 13,230,41 S56,664 11,47,23,38 66,909,91 17,073,03 66,809,99 17,073,03 66,809,91 17,073,03 66,809,91 17,073,03 66,809,91 17,073,03 66,809,91 17,073,03 66,809,91 18,333,86 66,909,91 17,079,47 44,609,75 24,022,60 8,430,32 20,918,748 77,77,711 170 177,746 66,15 17,938,92 33,236,61 13,423,93 103,237,711 107,567,67 24,113,51 107,567,67 24,113,51 103,237,731 128,233,34 29,377,51 131,243,93 128,263,24 33,233,25 33,237,253 340,219,33 77,111 107,567,67 24,113,33 11,332,24,93 33,237,253 340,219,33 77,111 107,567,67 24,113,31,31,31,31,31,32,33,333,333,333,33	Harrison	82,809.40	44,000.00	1 7/2.00		105,411.9	28,373.03	3,097.34	**********	32,071.00	137,406.97	2
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Henry	32,261.19	11,039.64	1,/03.88	**********	45,000.71	13,236.41	536.61	**********	13,773.05	58,839.70	F
$ \begin{array}{ $	Howard	34,836.66	9,397.85	2,342.05	**********	46,576.55	17,938.23	395.15	**********	18,333.38	64,909.91	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Humholdt	42,789.63	456.42	1,363.68		44,609.73	24,029.69	8,430,32	20.91	32,480.95	77,090.63	2
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Ida	43,107,45	9,128.71	4,797.47	6.00	57,039.63	17,407.91	2,779.58	**********	20,187.48	77,277.11	1
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Town	64,817,92	8,592.83	4,085.41		77,496.16	21,393.08	632.43	55.84	22,081.35	99,577,51	77
Jackson Sr,017,66 South	IOWR	102 870 87	3 951 65	745.1ª		107.567.67	21,413,36	11,243,92		32,657,28	140 224 95	0
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Jackson	87 017 66	03244.000	8 660 82		95 678 48	51 305 61	11 600 15		63 086 75	158 765 21	20
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Jasper	61 252 57	260.12	7 080 22		69 803 03	20 107 40	2 661 75	\$73.36	24 421 51	152 324 53	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Jefferson	60,000 (0)	500.15	\$ 190.74		71 902 1	22,075,43	3,001./3	312.20	27 700 42	95,239.32	20
	Johnson	00,275.00	0,430.84	3,109.74		67 540.00	25,0/2.9/	2,/15.00	**********	37,720,43	109,680.03	2
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Jones	66,032.69	1,517.30	***********	***********	07,549.9	25,025.54	11,921.70		36,947.20	104,497.2)	0
Korsuth66,580.68	Keokuk	42,968.65	5,624.36	0,0/3.54		55,200.55	7,131.38	7,761.29	ARABARANA .	14,892.67	70,159.22	T
Lee. 27,968.30 9,500.25 106.75 37,575.30 28,181.47 3,004.11 31,185.50 68,700.84 01 Linn 39,432.47 233.60 19,820.38 82,844.37 31,383.09 31,385.50	Kossuth	65,580.68	**********	***********	**********	65,580.63	66,285.2	34,384.02	**********	100,669.29	166,249.97	-
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Lee	27,968.30	9,500.25	106.75	*********	37,575.30	28,181.47	3,004.11	**********	31,185.54	68,760.84	2
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Linn	63,023.99		19,820.38		82,844.37	31,383.09		***********	31,383.09	114,227,45	2
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Louisa	39,432.47	253,60	***********	incorrection .	39,686.07	19,337.4	**********	***********	19,337.40	59,023,47	10
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Lucas	57,463,43		13,326.67	·····	70,790.10	20,037.07			20,037.07	90,827,17	4
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Twon	71,154,77	11.163.81		27,021.05	109,339.63	36.551.51	4,890,49	9.171.27	50,613,27	150 052 01	-
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Madicon	32,131,36	10,509,44	7,697,81		50,338,61	20.088.12	3,744,77	*******	23,832,89	. 74 171 53	R
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Madison	56 254 53	110.50	2,281,77		58 646 80	27.752.46	10 715 70		38 468 16	07 114 05	-
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Pianaska	52,816 54	*******	9,240,40		62.056.94	26 422 96	AUG7 4.0.1915		26 422 96	89 470 00	10
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Marion	161 528 47	280.70	378.01	112122101000000	162 188 16	30 421 49	20 602 70	2 424 24	63 530 52	00,973,23	4
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Marshall	50 765 00	200.20	6 864 00		66 630 80	20 422 16	50,055.70	2,767.07	20 433 16	663,767,000	63
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Mills	49 155 05	0 764 00	6 122 15		63 051 43	10,007,00	£ 120 12		20,403,10	87,009.05	9
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Mitchell	71,500,61	8,709,23	5 114 50		03,031.43	19,983.99	0,430.13	*********	20,414.12	89,403.55	H
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Monona	71,380.01	17,237.07	7,202,40		56 761 97	36,209.8/	**********	**********	32,204.8/	126,137.14	E C
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Monroe	37,933.30	11,504.57	7,525.40		30,/01.2/	19,563./*	***********	*********	19,563.78	76,325.05	12
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Montgomery	02,141.73	7,129.05	5,193.93	**********	75,004.77	32,000.38	3,856,30	***********	35,862.62	110,927.45	ĩõ
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Muscatine	31,845.24	**********	**********	**********	31,845.24	24,0/6.97	16,262.95	91.87	40,431.79	72,277.03	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	O'Brien	54,263.15	4,751.33	531.10	*********	59,545.58	27,510.07	9,911.87	**********	37,421.94	96,967.52	
Page. 72,754.93 9,456.31 6,156.70 2,075.24 90,443.18 19,083.46 8,976.24 560.68 28,620.38 119,063.56 Palo Alto. 68,866.35 15,094.32 524.32 84,484.99 59,511.85 59,511.85 143,996.84 Plymouth. 87,450.30 17,302.56 1,051.35 105,804.21 21,702.14 21,702.14 21,702.14 21,702.14 127,506.35 Pocahontas 63,522.06	Osceola	69,031.03	1,020.17	4,146.80		74,198.00	33,816.6?	3,220.11		37,036.73	111,234.73	
Palo Alto 68,866.35 15,094.32 524.32 84,484.99 59,511.85 59,511.85 143,996.84 Plymouth 87,450.30 17,302.56 1,05,804.21 21,702.14 21,702.14 21,702.14 127,506.35 Pocahontas 63,522.06 1,030.66 64,552.72 74,172.55 231.39 310.80 74,714.74 139,267.46 129,267.46 129,267.46 128,260.71 226,047.73 128,260.71 226,047.73 128,260.71 226,047.73 128,260.71 128,260.71 126,2047.73 129,267.46 129,267.46 129,267.46 129,267.46 128,260.71 126,2047.73 128,260.71 126,2047.73 129,267.46 128,2047.73 128,2047.7	Page	72,754.93	9,456,31	6,156.70	2,075.24	90,443.18	19,083.46	8,976.24	560.68	28,620.38	119,063.56	
Plymouth	Palo Alto	68,866.35	15,094.32	524.32		84,484.99	59,511.85	***********	**********	59,511.85	143,996.84	
Pocahontas	Plymouth	87,450.30	17,302.56	1,051.35	*********	105,804.21	21,702.14		**********	21,702.14	127,506.35	
Polk	Pocabontas	63,522.06		1,030.66		64,552.72	74,172.55	231.39	310.80	74,714,74	139,267.46	63
	Polk	99,645.86		3,511.16		103,157.02	158,890.71			158,890.71	262,047.73	19

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 1-Continued.

		Bridg	es and Cul	verts				Total		
County	Bridge Fund	Motor Vehicle Fund	Road Fund	All Other Sources	Total	County Road Cash Fund	Motor Vehicle Fund	All Other Sources	Total	Total Bridge and Road Expendi- tures
Pottawattamie. Poweshiek. Sac. Sac. Sout. Shelby. Story. Tama. Taylor. Union. Van Buren. Wapello. Warren. Washington. Warren. Washington. Webster. Winnebago. Winneshiek. Woodbury. Worth. Wright.	$\begin{array}{c} 156,958.96\\ 117,002,94\\ 30,475,74\\ 91,754.39\\ 45,761.86\\ 47,137,44\\ 91,430.07\\ 29,730.88\\ 113,411.82\\ 41,947,73\\ 50,233.58\\ 53,228.79\\ 53,822.34\\ 26,513.74\\ 88,363.51\\ 38,602.92\\ 44,469.97\\ 18,940.32\\ 74,828.13\\ 36,616.19\\ 22,213.84\\ 59,833.23\\ \end{array}$	5,758.25 11,990.00 19,237.54 6.00 17.50 4,217.00 6,157.02 14,100.38 11,860.75 17,922.66 1,490.77 11,977.90 4,919.70 8,689.18 18,960.97	10,550.06 6,218.75 12,364.06 18.18 263.63 3,804.95 343.15 742.20 470.72 15,508.08 7,587.20 		$\begin{array}{c} 173,267,31\\ 135,171,67\\ 62,077,3,39\\ 91,778,52\\ 46,042,99\\ 55,159,33\\ 97,930,24\\ 30,473,08\\ 113,882,54\\ 71,153,45\\ 55,313,11\\ 31,925,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 88,690,41\\ 69,626,18\\ 71,157,16\\ 62,213,84\\ 59,833,23\\ 84,806,37\\ 85,177,16\\ 62,22,213,84\\ 59,833,23\\ 84,806,37\\ 85,177,16\\ 84,806,37\\ 84,806,$	4 45,368.93 21,307.46 8,098.49 42,853.73 17,003.60 18,554.45 23,846.42 34,688.50 55,822.64 12,482.33 8,147.62 15,203.13 23,925.60 18,266.24 34,203.18 9,718.78 9,625.23 54,327.12 30,384.84 51,536.61 18,935.97 63,044.46	1,808.7¢ 4,269.30 4,632.78 17,565.42 13,488.71 12,859.92 1,520.06 129.22 232.70 13,962.10 6,385.20 34,221.52 4,281.54 1,724.68	200.00	. 47,177.6 22,576.7 12,731.2 60,419.1 30,492.3 18,554.4 47,548.4 47,548.4 55,822.61 14,4002.39 8,147.62 8,8147.62 15,332.35 24,158.30 18,266.24 16,103.98 48,165.28 16,103.98 43,846.75 55,898.66 32,109.52 51,536.61 18,935.97 - 63,044.46	2 220,445,00 160,748,45 74,808,61 152,197,72 76,535,30 73,713,84 121,776,65 78,021,50 169,705,18 85,558,59 87,829,15 86,483,80 79,471,41 50,191,42 136,855,69 85,730,16 88,316,72 88,
Totals	\$6,549,024.03	\$512,234.63	\$360,089.82	\$45,448.21	\$7,466,796.69	\$3,350,293.20	\$7,11,511.43	\$78,535.93	\$4,140,340.56	\$11,607,137.25

SUMMARY TABLE NO. 2.

Bridge and Culvert Construction-County Expenditures-Annual Reports of County Engineers.

County	Permanent Bridges and Culverts	Temporary Bridges and Culverts	Repairs	Culvert Material Purchased for Townships	Equipment and Material	Filling Bridges and Culverts	Miscellaneous Right of Way, Channel Changes, etc.	Total
Adala	027 600 00	110.10	AD (71 OK	A 724 FO	e 916 M	es 271 20	\$ 265.00	¢60 701 98
Adair	\$37,080.89	\$/,412.10	\$8,6/1.90	\$ 334.38	\$ 840.00	\$3,3/1.2/	\$ 205.00	42 520 03
Adams	12,488,94	5,881.04	7,027.34	4,815.44	0,137.01	3,823.32	1046 51	96,369.93
Allamakee	02,092.54	12,2/1.75	11,652.88	1,124.45	145.51	210.00	1,040.51	71 967 42
Appanoose	29,259.83	2,623.10	17,370.57	10,653.92	**********	10,691.95	1,205.05	71,807.42
Augubon	42,073.99	16,089.11	6,569.56	7,948.09	8,327.24	4,053.10	520.00	85,581.09
Benton	73,217.85	51.80	15,520.53	6,707.66	734.02	10,528.53	78.53	100,838.92
Black Hawk	26,806.60	15,984.67	14,826.33	4,218.76	6,780.84	745.73	194.66	69,337.39
Boone	40,059.93	1,081.07	6,556.23	3,426.56	1,927.09	2,454.30	320.31	55,825.49
Bremer	38,036.38	593.24	2,616.29	**********	4,976.70	255.47	67.71	40,545.79
Buchanan	52,038,80	2,612.92	7,185.00	3,023.29	4,535.20	5.00	**********	69,400.21
Buena Vista	182,969.57	24,336.17	1,766.78	**********	3,807.51	1,416 83	3,512 32	217,8/19.17
Butler	42,226,51	20,725.91	19,228.25	11,790.84	6,778 00	5,493.31	**********	105.242.82
Calhoun	59,073.80	4,170.92	1,835.79	3,418.74	2,590.99	2,635.25	3,150.96	76,876.46
Carroll	48,058.60	9,334.98	8,425.38	6,227.24	7,054.88	911.00	3,094.53	33,106.61
.ass	43,609.70	6,096.93	14,198.91	4,303.00	3,995.56	6,957.08	1,604.84	80,766.02
Cedar	44,398.34	793.72	10,197.70	1,146.24	23.00	86.75	415.48	57,061.23
Cerro Gordo	54,513.04	2,412.95	4,126.04	1,987.02	1,831.44	1,624.42	683.56	67,178.47
Cherokee	153,735.06	6,882.48	9,218.11	10,012.69	8,014.50	2,964.12	10,483.73	201.310.69
Chickasaw	16,592.39	9,685.55	6,828.65	2,389.60	6,671.67	637.35	1,042.28	43,847.49
Clarke	9,084.83	3,707.42	3,480.67	4,213.88	5,133 89	10,834.79	63.99	36,519 47
Clay	80,375.11	9,843.27	2,781.57	9,230.64	854.61		317.79	103,412.99
Clayton	66,334.75	2,795.12	3,185.25	2,403.69	9:9.31	787.00	335.75	76,780.87
Clinton	63,134.08	2,135.82	1,937.30	306.29	4,833.40	2,245.09	2,102.81	76,694.79
Crawford	141,349.81	7,193.89	33,645.71	12,082.55	10,000.00	10,292.72	1,178.48	215,743.16
Dallas	36,276.15	3,617.52	8,855.97	8,546.04	3,086.96	4,576.61	2,105.94	67,065.19
Davis	20,009,88	3,667.60	19,402.65		1,429.09	7,116.34	3,946.75	\$5,573.12
Decatur	9,382.15	1,516.44	12,101.94	4,712.32	5,302.39	2,928.48	1,067.72	37,011.45
Delaware	25,175.28	6,752.84	5,459.84	4,301.35	1,466.44	1,570.70	102.62	41,825.07
Des Moines	14,952.20	292.58	1,754.47	3,357.64	3,898.53	908.65	5,643.31	30,807.38
Dickinson	75,341.11	3,208.90	836.28	1,090.70	1,083.06	1,357.26	1,019.67	83,936.98
Dubuque	57,457.27	1,970.34	12,696.31	15,818.08	1,793 20	15,267.11	2,095.08	107,097.39
Emmet	14,958,38	2,037.94	2,693.65	1,806.17	2,105.85	83,15	130.84	23,815.98

ANNUAL REPORTS OF COUNTY ENGINEERS

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SUMMARY TABLE NO. 2-Continued.

County	Permanent Bridges and Culverts	Temporary Bridges and Culverts	Repairs	Culvert Material Purchased for Townships	Equipment and Material	Filling Bridges and Culverts	Miscellaneous Right of Way, Channel Changes, etc.	Total	
Fayette. Floyd. Franklin Fremont. Greene. Grundy. Guthrie. Hamilton. Hancock. Hardin. Harrison. Henry. Howard. Humboldt. Ida. Joward. Jasper. Jefferson. Johnson. Jones. Keokuk. Kossuth. Lee. Linn. Lyon. Matison. Marshall Mills. Mitchell. Monona. Monroe.	$\begin{array}{c} 81,578.76\\ 30,771.35\\ 49,267.95\\ 25,913.84\\ 27,757.67\\ 43,727.82\\ 91,259.70\\ 59,731.93\\ 25,181.27\\ 67,096.36\\ 61,398.31\\ 35,673.76\\ 25,091.34\\ 38,683.06\\ 31,679.93\\ 42,719.07\\ 81,091.66\\ 59,908.18\\ 42,809.52\\ 40,654.90\\ 28,078.86,26\\ 26,265.55\\ 23,995.13\\ 21,011.95\\ 61,612.06\\ 20,830.72\\ 46,291.44\\ 91,865.42\\ 12,409.52\\ 40,654.20\\ 20,830.72\\ 46,291.44\\ 91,865.42\\ 12,409.82\\ 12,608.25\\ 22,839.13\\ 40,832.92\\ 26,821.14\\ 37,933.30\\ \end{array}$	$\begin{array}{c} 1,093.07\\ \hline \\ 6,429,40\\ 21,310.44\\ 826.42\\ 1,822.04\\ 7,972.00\\ 10,163.27\\ 4,306.16\\ 996.18\\ 13,360.05\\ 391.10\\ 5,709.60\\ 30.28\\ 5,177.08\\ 2,459.17\\ 1,971.70\\ 2,267.66\\ 4,488.52\\ 7,898.92\\ 6,181.41\\ 1,536.83\\ 13,996.05\\ \hline \\ 1,040.53\\ 7,677.66\\ 2,565.78\\ 10,849.51\\ 1,642.64\\ 5,629.56\\ 883.64\\ 1,574.44\\ 10,430.13\\ 675.78\\ 30,363.44\\ 1,627.79\\ \hline \end{array}$	$\begin{array}{c} 12,083,44\\ 15,390,85\\ 6,928,01\\ 18,876,74\\ 7,740,71\\ 4,877,35\\ 14,027,64\\ 3,708,98\\ 3,774,83\\ 3,782,30\\ 20,192,66\\ 5,662,14\\ 7,223,12\\ 828,78\\ 11,639,05\\ 22,266,41\\ 13,808,42\\ 7,018,74\\ 7,617,64\\ 30,799,18\\ 17,332,36\\ 17,886,48\\ 10,724,81\\ 11,497,17\\ 3,972,99\\ 3,375,10\\ 3,389,10\\ 14,752,46\\ 8,405,65\\ 6,231,15\\ 2,292,79\\ 18,631,46\\ 4,985,15\\ 18,135,95\\ 8,856,54\\ \end{array}$	6,139,94 1,790,47 838,32 1,996,47 3,644,08 7,026,74 1,957,10 4,091,55 1,502,20 1,606,86 4,376,26 76,67 6,136,04 6,741,25 252,26 2,472,80 5,815,34 4,907,98 1,737,84 1,919,53 6,391,43 1,977,84 1,919,53 6,391,43 1,977,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,14 2,77,84,16 10,580,56 17,984,16 1,980,08 5,901,43 4,463,33	1,152,50 7,194,86 3,667,23 4,015,55 3,528,88 205,13 910,92 4,713,07 2,464,46 90,00 1,573,83 1,794,19 870,74 217,95 10,314,03 14,765 6,739,76 1,051,87 6,816,75 1,515,50 3,756,29 2,55,00 509,12 762,95 1,634,85 2,737,61 2,133,89 6,328,63 9,947,64 3,718,26 6,523,05 5,5181,98 782,46	$\begin{array}{r} 472.34\\ 924.25\\\\ 2,199.12\\ 257.43\\ 1,935.85\\ 7,127.41\\ 2,257.05\\ 322.00\\ 2,252.80\\ 2,152.21\\ 1,765.88\\ 2,342.05\\ 2,709.01\\ 2,152.01\\ 3,512.57\\ 1,061.65\\ 8,660.83\\ 7,089.32\\ 2,922.03\\ 725.20\\ 6,6679\\ 2,003.47\\ 106.75\\ 2,465.54\\ 1.02\\ 8,594.00\\ 1,590.54\\ 1.02$	1,891.40 203.82 4,557.46 650.75 826.43 644.67 1,036.15 1,251.03 142.99 6,611.90 40.00 1,411.19 111.02 776.34 1,820.84 529.71 1,077.94 27.50 941.49 2,956.65 641.08 396.25 10.25 509.30 2,212.64 54.52 2,017.73 3,201.93 1,872.90 2,413.74 159.25	$\begin{array}{r} 104,411,45\\ 56,071.78\\ 67,364.73\\ 76,873.15\\ 42,758.36\\ 57,128,70\\ 128,990.08\\ 78,854.48\\ 43,639.91\\ 78,147.29\\ 105,411.99\\ 45,066.71\\ 46,576.56\\ 44,609.73\\ 57,039.63\\ 77,496.16\\ 107,567.67\\ 95,678.48\\ 68,803.02\\ 71,896.16\\ 107,567.67\\ 95,678.48\\ 68,803.02\\ 71,896.16\\ 67,549.99\\ 55,266.55\\ 55,800.68\\ 37,575.30\\ 82,814.37\\ 39,986.16\\ 67,549.99\\ 55,266.55\\ 55,800.68\\ 37,575.30\\ 82,814.37\\ 39,986.16\\ 67,549.99\\ 55,266.55\\ 55,800.68\\ 37,575.30\\ 82,814.37\\ 39,986.16\\ 67,549.99\\ 55,266.55\\ 55,800.68\\ 37,575.30\\ 82,814.37\\ 39,986.16\\ 67,549.99\\ 55,266.55\\ 55,800.68\\ 37,575.30\\ 82,814.37\\ 39,932.48\\ 56,56.94\\ 162,188.16\\ 66,630.89\\ 63,051.43\\ 93,932.27\\ 56,761.27\\ \end{array}$	IOWA STATE HIGHWAY COMMISSION

Monteomery	20,889.23	17,041.33	20,482.45	4,985.52	5,760.21	5,793.98	112.05	75,064 77
Muscatine	16,018.38	1,898,39	6,781.92	5,683.46	934.96	68 78	457.35	31,845.24
O'Brien	44,504.56	785.30	4,591.58	2,750.93	6,147.84	531.10	234.27	59,545.58
Osceolu	49,515.70	7,312.20	5,145.32	2,770.43	2,832.68	. 1,420,98	5,200.69	74,198.00
Page	36,977,98	13,160.81	15,905.73	10,519.09	157.90	6,010.36	7,691.31	90,443.18
Palo Alto	53,311.77	3,428,44	10,638.32	7,846.81	6,359.93	872.85	2,026.87	84,484.93
lymouth	58,126,82	14,376.59	13,334.26	5,837.06	13,454,48	THE CONTRACTOR OF THE PARTY OF	675.00	105,504.21
Pocahontas	46,430,63	2,935,47	7,468,21	6,471.02	5,202.25	1,506.31	538.84	64,552.72
Polk	50.032.23	8.111.07	27,886.19	5.036.00	4,653,22	3,471.01	3,067,30	103,157.02
Pottawattamie	46 578 62	28 935 58	45,163.05	15 992.01	16.622.69	13.041.81	6,933,54	173,267.31
Poweshiek	07 330 15	330.10	9,587.09	15 136 22	1 631 35	5,790,56	5,357,13	135,171.69
Dinggold	22 702 10	5 207 43	12 116 66	4 306 04	2 040 81	12748 46	1.054.75	62.077.34
angeoid	70 712 14	2 035 26	5 106 80	2 547 52	4 027 62	1 645 63	5 622 50	91 778 57
Santt	22 120 24	1 370 00	4 713 70	A 245 64	6 959 00	2 507 71	4 110 70	46,042,00
Scotteresses	10.207.10	12 964 03	14 271 04 1	9,040,04	1 266 02	A 744 05	650 05	55 150 30
SDC10 y	12,307.15	10,809.23	17,071.09	0,109.99	1.300,98	94299.23	2 102 15	07.070.24
Sloux	03,927.95	2,915.09	7 167 22	509,00	14,308./0	.043.15	3,103.13	30,330.64
story	21,433.30	281.41	1,103.44	924.41	1933493349455	407,00	201./4	30,973.08
Tama	70,410.95	15,609.26	14,048.32	6,602.74	73.93	2,850.23	3,707.11	113,882,59
Taylor	26,399.87	2,252.35	16,894.21	872.89	8,214.63	15,508.08	1,414.16	71,556.19
Jnion	38,421.85	1,710.81	10,373.07	5,849.90	3,367.40	7,587.20	2,371,30	69,681.53
van Buren	15,398.25	14,832.82	23,201.30	12,831.17	2,603.44	890.09	1,394.38	71,151.45
Wapello	27,213.21	1,227.65	7,953.20	9,860.31	5,539.35	3,020.43	498.95	55,313.11
Warren	8,358,62	6,228.17	7,794.92	521.05	3,165.57	5,411.44	445.41	31,925.18
Washington	42,625.51	3,467.10	23,308.99	7,389.50	10,028.69	821.95	1,048.57	88,650.41
Wayne	21,568.74	9,507.54	7,727.11	5,137.92	3,482.71	19,045.36	3,156,80	69,635.18
Webster	30,630.00	2,572.36	4,324.02	3,668.25	1,003.18	1,182.35	1,089.81	44,469,97
Winnebago	12,876.97	7,946.03	2,254.37	3,165.97	2,014.83	*********	1.015.55	29,303.72
Winneshiek	52,332.80	4,466.37	17,955.38	4,705.34	1,901.55	1,289.06	2,155,87	84,806.37
Woodbury	46,553.37	14,124,79	11,852 80	2,352.26	7,586.94	2,579.00	128.00	85,177.16
Worth	17,822.00	109.93	992.92	1,436.16	1,115.97	**********	736.89	22,213.84
Wright	45,954.00	2,408.30	4,135.17	4,019.93	750.15	2,126.83	438,80	59,833.23
Totals	\$4,485,781.23	\$503,490.24	\$1,039,391.95	\$463,553.59	\$356,255.98	\$362,319.27	\$156,004.43	\$7,466,796 69

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SUMMARY TABLE NO. 3-Part I.

Classification of Permanent Bridge and Culvert Construction for Which Warrants Were Issued in 1917-County Expenditures-Annual Reports of County Engineers.

	Concrete Box Culverts		Cir	cular Con- te Culverts	Concrete Arch Culverts		Concrete Culverts with Headwalls		C Pij wit	forrugated of Culverts	Are	Masonry ch Culverts
County										a area a marre	1.000	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Adula			-	4000 55							-	1000
Adame		\$12,701.53	1	\$280.55			83	\$15,674.48	2444	**********	axes.	*********
Homeles	2	2,071,08	24.94		4.4.4.5		50	7,687.97	1	\$141.85	****	**********
Auamakee	12	2,034.00	1.1.1.1	**********	58.08	**********	66.63.61	***********	1000		80.00	
Appanoose	14	0,413.40			2.2.4.4		10000	********	1.8.9.9		****.	
Audibon	124	24,195.62	1498	**********		*********	1	590.68	1.1.1.1		23.9.8	
senton	124	42,206.76	9	556.80		**********	****	*********			3.000	
lack Hawk	89	22,440.42	****	**********	****	**********		**********	3	250.69		
oone	20	16,672.32	1	72.69	****	*********		***********	See.	**********	++++	
sremer	24	7,670.00	11	1,286.56	****	**********	1000	***********		**********	14.4	
uchanan	29	7,524.23	4	421.44		**********			2	411.04	****	
uena Vista	101	40,564.21			1000			***********			1014	
utler	55	18,897.28		********	****							
alhoun	17	10,049.30	57	6,727.40	****		1	82.50	·			
arroll	30	14,620.67	13	2,641.52	2000				4	599.11		
R\$5	24	23,011.96							1000		1.1.1	
edar	129	30,770.57	7	474.12	erer .						100	
erro Gordo	70	23,131,78	45	5,361.81								
herokee	142	69,800.80	5	548.58		*********						
hickasaw	18	3,327.63									1.1.7.8	
larke	13	9,084.83										
lay	76	38,588.97				100	1000			*********	2.2.2.2	**********
layton	48	20,240,43			2	\$1,482.00	10.00		1	70.00	1111	
linton	45	31,227,93				11, 101.00	1.100			70.00		
rawford	136	88,738.07										**********
allas	25	18,497,14	3	884.01	10000					*********		*********
Davis	10	7.029.60	6	2 581 08	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		49	5 690 04				*********
Decatur	17	8,470,41	1. Co.	4,001.00	1.11		1	84.56		*********	2122	
Delaware	60	19.013 91						01.20	****			
Des Moines	19	8,098.06	5	1.017.57			21	2,728,80		**********	****	

											a second s		The second secon	
	Dickinson	43	19,522.81	133	14,079.97	+1.4.91		1 4.8.4.9	**********	1			**********	
	Dubuque	91	38,841.34				**********	****				1444	*********	
	Emmet	21	9,257.70	32	2,927.77	4.4.9.4		4.4.4.1		1.0.0.0				
	Fayette	52	17,956.45				**********	1433	**********	3.8.4.4		31.64	**********	
in	Floyd	83	20,060.13	2	305.12				***********	2	569.18	1 1 1 1 1		
~.	Franklin	43	23,183,87	1	176.77	2	126 93			1111		See.		
	President		8 322 70				178.06		8 220 07			1.1.1.1.1.1.1.1.1	\$163.34	
	Fremont	10	0,066.70	01	0 204 70	1.7.1.1	100.70		0,0003.31	1.1.1.1			QAMPLUT.	
	Greene	10	- 0,617.96	10	0,094.78	0.000	**********	1.02.04	********			1144	*********	2
1	Grundy	95	38,200.82	(++++)		1439.4		1.6.6.4	*********	****		3.8.8.8.5		
	Guthrie	53	38,164.04		**********			13	3,560.14	1.1.1.1	**********	1000	**********	
	Hamilton	51	29,094.50	19	1,866 23									1
	Hancock	32	15,716,41	1	80.20						and the second second		a contraction of the second	
	Hardin	62	23 520 34	63	6 314 96	10000						1.1.1.1		*
	Haruin	7	7 705 40	00	0,514.00	****		24	6 700 40		400.04	1.000		5
	Harrison		7,793.40		***********	1.444	********	24	0,709.40	4	499.04	****	*********	
	Henry	58	22,554.71	1	149.30		*********		**********	****	**********	19.9.9	**********	
	Howard	34	14,393.92	9	1,455.16				**********	1	137.50		*******	t
	Humboldt	30	10,183.47	3	323.50							1111		+
	Ida	28	17,905.93		100000000000000000000000000000000000000	1 march	- marine and a second	Sec.		2		1222		0
	Iowa	27	18 939.70							4	314 89			2
	Incheon	52	31 026 18	4	00.290					2	149 45			-
	Jacksoussessessessessessessessesses	51	24 086 68		203.00	1.14.14.1			**********	ĩ	175.65	1 4 4 4	*********	0
	Jasper	01	24,700,00			1.4344	**********		*********	1	1/3.03	33.83	*********	
13	Jefferson	00	22,333.51			****	**********	1.1.1.1	***********			4.4.6.2	**********	C
	Johnson	82	28,105.58	****	***********	5			**********	****	*******	4.4.4.4	**********	5
	Jones	15	6,797.07							3	341.85			
- 2	Keokuk	49	21.267.13	1	292.85			30	4,705.57	1.1.1.1		1.1.1		C
- 1	Kossuth	18	11.681.30					13	1 632 76			100	Goodenaaraa	C
	Lee	22	5 755 50	15	2 280 02				4,000.10					C
	Time	72	20 632 76			100000			*********	1.1.1.1		49.9.9	********	2
	A.M.M		6 200 00		05.02			26994	*********		**********	0.028	**********	F
	Louisa		0,280.98	1	95.05	****	********	122.22	***********		**********	3.5.5.5	**********	H
	Lucas	43	19,811.31	****	***********			47	8,370.46	****	**********	11.14	**********	
	Lyon	70	31,683.30	****	***********			2020	**********			1114	**********	1
3	Madison	23	9,395.44	29.00			*********			24394		1.1.1.1	************	5
2	Mahaska	15	6,050.80				***********	1 4 4 4 4				1244	**********	6
	Marion	29	19,571.09		********	****								1
	Marshall.	103	60,596,67	28	3,706.60					12	557.11	1000		2
	Mills	12	11.384.48					15	6.028.90	1000	Contract Contract of the			1
	Mitchell	37	12,127,06						0,000,70					H
	Monona	32	23 064 34							1	23 19			H
	Monolia	36	20, 104, 11	****	168.00			****	1.004.00		01.03		*********	î
	Monroe	04	11 006 40		100.00			1	1,004.20	10	2 600 12	1111	*******	-
	Montgomery	0	11,800.48	4114	1 642 77	****	*********	****	**********	10	2,009.32	****	*********	
	Muscatine	20	10,725.47	15	1,042.77	****		1	126.25	****	**********	****	*********	
	O'Brien	92	27,211.15	23	2,613.10				**********	10000			**********	
	Osceola	17	27,459.80	32	3,951.47				**********		*********	2.4.4.4	**********	
	Page	22	16,530.75		********	1	262.20	2	861.57		**********	++++		
	Palo Alto	58	19,777.38	3	463.77		**********	****	**********	eres	**********			13
	Plymouth	35	23,606.60					81	3,449,79	See.				10

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10WA STATE HIGHWAY COMMISSION

County	Bo	Concrete x Culverts	Circular Con- crete Culverts		Concrete Arch Culverts		Concrete Pipe Culverts with Headwalls		C Pip with	orrugated e Culverts h Headwalls	Arc	Masonry h Culverts
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Pocahontas Polk Pottawattamie. Poweshiek Ringgold. Sac. Sac. Story. Tama. Taylor. Union. Van Buren. Wapello. Warren. Washington. Wayne. Webster. Winnebago.	17 36 7 61 38 45 42 12 173 37 50 31 19 28 17 10 44 422 26 8	6,914.77 38,403.26 5,645.09 43,352.57 21,001.35 20,850.12 17,831.24 11,876.27 50,134.71 11,693.15 30,558.87 15,472.18 11,614.63 14,295.79 11,427.27 5,111.68 20,387.50 13,322.26 9,888.57 1,632.27	16 3 9 30 13 32 19 1 20	2,678.64 632.54 2,632.78 3,123.49 2,217.36 2,727.55 	4	728.25	70 70 14 93 53 14 	12,036.28 2,595.84 490.88 10,927.69 10,885.00 6,338.86		245.43 610.75 595.72 220.24 89.93	····· 2 ·····	614.35
Winneshiek. Woodbury. Worth. Wright.	63 45 74 55	13,448.37 24,614.44 11,226.89 21,290.48	4	471.60	····· ····		19 	2,583.94	····· ····· 1	230.00	····· ·····	
Totals	4,330	\$1,982,831.14	782	\$96,223.43	61	\$7,382.53	682	\$123,926.53	77	\$10,198.85	2	\$777.90

SUMMARY TABLE NO. 3-PART I-Continued.

SUMMARY TABLE NO. 3-PART II.

Classification of Permanent Bridge and Culvert Construction for Which Warrants Were Issued in 1917—County Expenditures—Annual Reports of County Engineers.

County	Be Cul He	oiler Pipe verts with ad Walls	Cast Iron Pipe Culverts with Head Walls		Masonry Box Culverts		Head Walls on Iulverts Previously Constructed		. Co	ncrete Slab Bridges	Co	rcrete Arch Bridges
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Adair. Adams.			3	\$ 798.99			5 2	\$ 550.20 82.45		e 2705 55		
ppanoose udrbon enton			1	12.03	****		****		1 10	5,932.26 11,909.75	****	*******
oone							14	2,403.00	2	5,989 07	2	\$ 11,111.40 43,682.09
utler	····· ····			491.73	****		7	1,206.83	 1 1	2,745.50	****	
ass edar erro Gordo herokee			····i	110.80	 1 	\$ 1,550.00	3	344.00 484.65		3,768.60	+++++ ++++	
hickasaw larke lay.	····· ····				****		****		 i	411.18		
linton rawford					****				12	4 454 00		
avis. ecatur. elaware			8	827.28		107.10	9	763.63		2,846.15	****	
les Moines	18.46	***********	****			**********		***********				

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 3-PART II-Continued.

County	Be Cul He	oiler Pipe lverts with ead Walls	Cas Cui H	t Iron Pipe lverts with ead Walls	M	asonry Box Culverts	Hea	d Walls on rts Previously onstructed	y Concrete Slab Bridges		Concrete Arc Bridges	ncrete Arch Bridges
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Dishinan	-											
Dubuque			****	**********			1	296.00		***********		
Emmet							****	*******		15 024 52	2.221	
Floyd	****								6	4,517.26		**********
Franklin								720.00		•••••	****	******
Greene						8,337.97	4	150.33	3	254 85		**********
Grundy			****	******	****		6	922.39	1	1,740.00	****	
Hamilton		**********							****	***********		
Hancock Hardin	****	•••••					****		4 3	6,782.52 1.838.31	1	8,381.57
Harrison												
Howard				186.41	****			*********	4	6,913.55	****	
Humboldt		*******	****						2	2,698.00		******
Iowa		**********			****			**********	2	7,245.22	****	
Jackson	1	50 70					3	376.30	18	16 343 50		
Jefferson	5355	43.83					1	63.04				**********
Johnson	4333			•••••			1	114.30			****	*********
Keokuk				*********		********						
Lee		**********		*********		**********		850.00		5,612.70	****	
Linn			****								****	
Lucas		**********		**********		***********	4	335.23	1	1,533.06	****	**********
Lyon		51 25				*******					****	minin
Mahaska					10112		5	1,083.61	4	5,889.28	1111	

Marion	1 1	1 92.81	14	1	1		100					
Marshall	A seen		1	237.58	10000		1	20.90	1	**************************************	1 1 4 4 4 4	11112200220
Mills		Assassiance .	149449				9	585.40	1	1,896,00	1	5,967.77
Mitchell							Lunia	PUST TO	1	1,000.00		
Monona	1	108.15			0.004		100005	*********			1.000.000	*********
Monroe					1	702 39	11112	2 142 20			(10.000)	
Montgomery	1000	420 51	1.553		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	106.00	3	6,193.69				
Museetin	1 *	460.51	2.8.5.7	*********	100000		1 1	20.94	1.4.6.6.6		1.4444	
Muscatine	1.000.0	***********			1		1	51.63	1	3 206 01		
O'Brien	ana .	- concerning	1.000	Contraction of	anage o		-	Staroor .	2	4 027 10		
Osceola		1 hourses	1.00			*********	1.1.1.1		9	9,0/7.19	4.4.4.4	
Pace	Sec.				199.4		1.000	*********	4	6,144.90		Concerning and
The second secon	19.855		4.8.8.4				3	716.86				
Palo Alto			in		(ester)	and the second states	1	172 52	4	6 105 51	10000	
Plymouth	1		1000				1 1	110.00	1 3	0,105.51	1111	***********
Porshantas	1.262		1.2.0.2	10100000000000	4.4.4.4				3	5,942.30	1	
Dalla			1111		1643				3	4,628.32	6050	
Folkersterstersterstersterstersterstersterst	2000	***********		**********				and a start of the	2	3 697 63	1	E (02 00
Pottawattamie	1.124		2	6.05			20	3,200,02	~	0,007.00		5,683.80
Poweshiek			~	0.03	1000		30	3,308.92	1.8.8.x(e)	***********	1111	***********
Dinggold	A.8.9.4			***********			4	436.77			See.	
Kinggold	****	***********		*********			1	106.00				*********
Dac			2	221.76	1993		12	200.00		**********	4444	**********
Scott			-			*********	14	284.00	100000	**********		**********
Shelby	10010			*********	1.1.1.1		1	40.94	1	1,425.64		and a second
Claure		**********	1.2.2.5	**********	14.64	**********		1000000000000	1.22			
Sioux	****	**********	****	**********			1.1.1.1.1		3	6 140 15	12.5.2	
Story			1438.5					**********		0,143.13	1.000	**********
Tama	1	100.01		201.05	1.644		****		****			
Taylor		120.01		201.95	1944	***********	****	**********	1	1,313.44	0.55	and the second second
Uning		**********	3366	***********		******			. /			**********
Union			See.	· · · · · · · · · · · · · · · · · · ·	1.15		50	2 101 10				********
Van Buren	1	85 10					50	2,101.15	****		CRA+41	***********
Wapello	See.		1000			**********		***********				22622222000000
Warren						***********	9	1,589,80	17.00			
Washington		***********		**********		***********		A CONTRACTOR OF THE OWNER			104240	*********
washington		***********							****	**********		**********
Wayne		Latra Bank		and the second se	5.55			*********	3	6,614.69	14.55	**********
Webster.		*********				**********		**********	14444	and a second sec	1	
Winneham				**********		***********			3	3 224 40		
Winnebago	****	***********	1.1.1.	**********			1.1.1			01001110		*********
Winneshiek	see.				21	1 550 87		210 16	1112	2424 (00044444	4444	Case Acase waxa
Woodbury	1	02 42				01003.00	3	318.10	1	1,418.10		
Worth		10.74			****	**********	5	507.46	1	562.80		
Wright		*********		**********			1	46.50	1100			
	2.522	**********		**********	****							1076 74
							1926			**********	4	4,970.84
Totals	10	\$ 1,279.89	32	\$ 3,094,58	21	\$ 14 257 20	200	e 22 240 40			_	
	1 100		1963			9 19,601.20	200	\$ 23,340.37	115	\$ 220,271.61	8	\$ 79,803,47

IOWA STATE HIGHWAY COMMISSION

ANNUAL REPORTS OF COUNTY ENGINEERS

SUMMARY TABLE NO. 3-PART III.

Classification of Permanent Bridge and Culvert Construction for Which Warrants Were Issued in 1917-County Expenditures-Annual Reports of County Engineers.

		butments	Concrete Through Girders		Dec	k Girders	Retaining Walls		A	butments.	I-Beam Spans on Concrete Abutments		
	No,	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	
Adair		6 E14 E2									1		
dame		10 2071.04	11.55	********	1222	THREE	24.00	1411111111111	1.000	**********		\$ 3,142.80	
Main Second	122490	**********		********			A		144.6		1.000	ATTACATOR AND	
Mamakee	12.5.8.8.1	*********	10.04	**********	1111	*********	14.44		3	\$ 1,056.15	2	1,738.53	
appanoose	1111	accountlesant.	2.8.6.4		1.4.4.6	**********	11.0			**********	5	10,591.04	
ugubon		**********				***********	1200		Same	**********	1	4,603.00	
Senton			6	\$ 15,804,54	See.	**********					Sec. 1	100000000000000000000000000000000000000	
lack Hawk		***********	Carda .	**********			1.1.1		1.1.1		1	1.651.81	
oone	100.00		1.1.1		I	\$ 1.528.33			N.S.		1	1, 317 (0)	
remer			1	2.010.17	2	5 682 23	10000		1.1.1		11 2	41000 000	
luchanan	1.1.1			alos or av	1.0	.,			1000	***********	1.000		
tuena Vista	****		15.66	11111111111111	1000		4440	********	1.444		1000		
ather	1944	4 224 10			1.1	A 030 00	3993		1.0000	**********	100	132,793.16	
- Hannes		2,722,18	1.0.6.8	100000000		2,630.20	3.448	**********	1000				
alloun	1. A.	4,145.48			1	3,698.60	449.61		1144	Astensidenside	2	4,344.55	
arroll	2232	**********	9020		3	26,888.66	1	\$ 564.11			1	1,452.80	
A58			1111			**********					4	12,741.06	
edar			110	minimi	1	3,456.00	ine :				4	3.855.05	
erro Gordo	Sec.				4	3,581.23	11.1		1.1.1	10.00 million (1997)	5	6 155 12	
herokee		arriterated.			1	1,581.80	1	226.00			30	55 481 80	
hickasaw	1	298.25	10.00					1.0000000000000000000000000000000000000			1	245.08	
larke	1227		6.23		10000							673.00	
lay									1000	and an and a second	1.12	22 7 16 71	
layton	2	1.952.28	2	779.00	2	6.426.50	1000		1	179 10	33	0 764 15	
Vinton							1000			arecati	1.0	14 691 07	
rawford				1000 CONSTRUCTION			1000				2	\$ 702.46	
allas					The second second		1.11					34105.40	
Davis		Ferrenderen.		Transa and the second	Ares .				1000		1	1.529.49	
Decatur	Cales?	CREASURANTERS C		- Characteria		Colorentary	See.		100		Sec. 2	- A A A A A A A A A A A A A A A A A A A	
Delaware		CRACKTONIALA.	1200	and a second second	Adda .		dara		-44		3	2,061.65	
Des Moines		assistants!							1442	*************	1.1	1,521 82	

		10 100000000			and the second second	C. S. A. P. W. S. S. S. S.			1000	A and the second second	4.1	10,675.88	
Dubuque	1 3	4,576.33			1000	2.8.00.83	1	233.02	1440	Sections and a		ARRENT AREA AREA	
Emmet	1444	**********	12222	12.839.93	3	4,405.86		***********	22.24		11	3.731.45	
Fayette	1.2.2	871.77		and the second	1	1,725.44	****		A 194		31	1 272 37	
Floyd	2	1 170.00			1	4,285.55	44.64	all and a state of the state of	4.80.91			and an and a second second	
Franklin	- 1	6185 0-00	2222		4444		1.104	11(19931031	1000	COLUMN TO DESCRIPTION OF	2014	421.80	
Fremont	253	711.05			7	9,304.04		ATTACAST AND	TATIAN .	***********		Tanking .	1
Greene		and the second se	1	3,727,00		· · · · · · · · · · · · · · · · ·	1000		4994	+ITTOFFFFFFF	1444	6 304 82	2
Grund	1.422	**********	1.151		1.1.1	and a second second	4666		149.8		1. 22	6.516.00	4
Guthrichanteressanteress	100	1,200,95			11	18.875.21		*********	Cases			0,010.00	Z
Lamilton		1,197.05	449.4			in a second second	in		and a	**********	10000	0.200.00	G
Hancock	4444		4494	4 427 04		10.490.39	1.1.1			·············	6	9,329.20	2
Hardin	4.002	***********		3,107.04	1	12 767 67	1000		1000	***********	conter.	**********	
Harrison	2	4,437.40	43.14			1011.02.184					3	4,269.48	
Henry	2	1,600.31	49.60	10000000000000	10.000						1	4,836.46	2
Howard	Sec.			**********	4.44.4	4 100 00	142.64				1	2,938.08	E
Humholdt	1	2,130.78	- 4	7,110.90	1	1,970.91	2352		++++		1 3	9,234.00	5
Ida			1	***********	****	111111111111	100.00	**********	1.1.1.1	**********	6	11 133 26	0
Lawn .			1.1.1		210	***********	1.444	2212224122277	21.4.8		1	\$2 276.87	R
1	122.2	8 534 00	1	4,839,43		Accession and	1	239.00	1	* 1,452.00		Later alor	-
ackson		Cline and	1.		1.1.1	***********	2	1,581.21			1.4+*	425.00	00
Jasper		*********	0.444			and the second	Such	**********	ine	***********	1 1	402.83	100
Jefferson					1.22.2	500000000000000000000000000000000000000	1	202.03	1.00	*********	9	10,190.30	0
Johnson	inte	**********	41.47	**********	199.6		0.000	Reconstruction	1	1.001.00	9	15,937,58	- 33
lones			44.44	**********	1.642		155.7				1.111	***********	
Keakuk		**********			1115	# 0.10 DD			1.000		1.0.00	***********	2
Kossuth	1	~ 30.00			0	2,000-60	1.444		1.22		1	7,327.62	2
Los	1.1.6		40.00	**********	1400				1.22		6	13,915.07	
Linn	15.3				449.6	***********	1144		21.25		1	1,365.27	Z
Linu			1.000		24.90		11112	*1************************************	+ + + + + +	*********	1 4	5,316,18	-
Louisa	1		0.25550				1	1.60	4.84.8	111111111111111	1 7	14 110 24	M.
Lucas	1		1.00				1.4.4.1	**********	1000		1 1	2 038 08	24
Lyon	1 -11	016.96	1.1.1		10.22			***********	++++	**********	1	6,000,00	0
Madison	1	910.00	1.1.1	758 40	2.2			*********	1111	Augusta and a second	1 2	0.091.39	Z
Mahaska	4,000			130.40	1.000		1 Sec.	**********			8	12,383.58	
Marion	444.0		1.88.83	*********	1114	10.458.75	2	2,065.87	1		5	19,866.64	
Marshall	100.00		10000	AND ADDRESS.		any source of	10.00		1.6223		1.000	Average assess	-
Mills	2	2,954.35	1.114		1111	1 605 02			1.5.5		11	15,043.42	100
Mitchell	a see	**********		**********	1.1	3,000,04	1000		1.27	1.1.1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2	1	3,567.00	9
Monona	1		See.		++++		1	1 671 10			1 2	2,043.72	22
Montoe	1.1.1.		1.111		4444		1	1,00 1.100			3		- 00
Montgomery	2	6.031.98							9.03		1	1000000000	
Montgomery	1	1.	1	*********	4444	**********		*********	47.64		0000		
Aluscatine			10000		1		1. 1.1.2.2	***********	100.00	**********			
O'Brien	1		1000		1 3	6,654.87	1 4444	*********			7977		
Osceola	1.444		1		1.000		1	545.65			1000	A 147.70	
Page	9		1		1	6.821.90	1 1	71.05		. ertereteres	1 3	2,343,39	
Palo Alto		**********	2414		1 *		1 1	********	1111		3	12,070.71	10
Plymouth	Acres 1		1.000	ALCONTRACT.	1000	2 163 (0)	1	16.85			4	5,642.02	H
Pocahontas	in and		1 10.00	*********	1 4	1		3.1	100.0	CALL WITH			

IOWA STATE HIGHWAY COMMISSION

County	A	Concrete butments	Thro	Concrete ough Girders	Concrete Deck Girders Retaining Walls		Retaining Walls	Masonry Abutments		I-Beam Spans on Concrete Abutments		
57	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Polk. Pottawattamie. Poweshiek.											···· 2 22	1,590.20 35,082.43
Ringgold. Sac. Scott									****		19	24,608.73
Shelby Sioux Story Tama					····; 3 ;	7,644.10			****		 6 10	6,768.52 21,515.20
Taylor Union Van Buren Wapello	1	4,685.00						<u></u>	****		1 1 5	2,753.22 1,017.36 7,208.55
Warren. Washington. Wayne. Webster.	2 	2,160.44			2	6,107.16	••••				1	2,818.82 654.25 158.75
Winnebago Winneshiek Woodbury Worth	2	1,291.36			···i	2,923.40			2	1,815.51	42482	6,280.45 3,278.62 7,200.71 6,548.61
Totals	37	\$ 51,576.09	22	\$ 50,985.28	61	\$ 179,046.34	13	\$ 7,423.03	8	\$ 5,501.76	456	\$ 684,115.55

SUMMARY TABLE NO. 3-PART III-Continued.

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SUMMARY TABLE NO. 3-PART IV.

Classification of Permanent Bridge and Culvert Construction for Which Warrants Were Issued in 1917-County Expenditures-Annual Reports of County Engineers.

County		el Girders Concrete butments	Pony Con- ment	Truss With lerete Abut- ts and Floor High S Trusses, C Abutm		igh Steel es, Concrete butments	ch Steel *Deck s, Concrete Co utments Abu		Total Cost of Per- panent Bridges an fulverts Constructe	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost		
				e 4776.01	-		-			27 690 90
dair		**********	1	\$ 4,700.01	****	**********	1111		\$	37,080.89
dams		**********				A 10 154 01	1414			12,488.94
llamakee	++++		WANE .	1411111111111	3	\$ 18,454.01	5	\$ 36, 193 64		62,692.54
ppanoose	1.944	**********	3	12,255.39		+344444444444444				29,259.83
adubon			1	6,740.40	14445		Sec.	VERSEASERS		42,073.99
enton		**********	1	2,740.00		**********	1000	********		73,217.85
ack Hawk		**********	1.414			**********				26,806.60
oone		**********			1	3,349,12		·····		40,059.93
remer			10000		1	21,387.32	V			38,036.38
ichanan	****			***********	aner.		6446	and an and a second second		52,038.80
iena Vista			3	8,408.37						182,969.57
atler	****	*********	2	8,116 85	2	10.260.00				42,226,51
dhoun	****		7	22,282.47	1	5,000.00				59,073,80
arroll		*********								48.058.60
155			2	7.512.68	- and a		in the second			43,609,70
dar			2	4,291,70					1. 1.	44,398,34
erro Gordo			3	11,919,05	1000		Frite.			54 513 04
herokee	1 all		4	16,181,73				*********		151 735 06
hickasaw.			4	12,721,43						16 502 30
arke										0 084 83
av			7	18,638,75			2333A	***********		90 275 11
syton	1000		4	13 766 34				**********		66 124 75
inton	****		4	15 018 30		2 201 70	112	*********	24	62 124 09
awlord		********	12	46 0 18 29	-	2,205.79	****	**********		141 240 81
llas	1.2.2.2.2		15	40,9.00,20		12 441 00		*********		141,549.81
allas			1112	2 426 04		12,441.00	2117	***********	1	30,270.15
avis			1	2,420.04	****			**********		20,009.88
ecatur		***********	1115	1 146 17	****	**********				9,382.15
claware	****	***********	4	1,140.47	11.44	**********		course finance		25,175.28
es moines		**********	1 1	1,585.95	1.0000	**********	Deres 41			14,952.20

County	Ste	eel Girders Concrete butments	Pony Cor men	y Truss With acrete Abut- ts and Floor	H Trus A	ligh Steel ses, Concrete Abutments	De	ck Trusses, Concrete Abutments	Total Cost of Per- manent Bridges and
	No,	Cost	No.	Cost	No.	Cost	No.	Cost	unverts Constructed
Dickinson			9	28,048.92					75,341,11
Dubuque		**********	2	3,068.60					57,457.27
Emmet			****	20.254.40				*********	14,958.38
Floyd	****			20,334.40	1.11			*******	81,578,76
Franklin			9	19,051.46					49,267,95
Fremont									25,913.84
Greene		**********					10.89.97		27,757.67
Guthrie				20 114 50		22 102 91		*********	43,727.82
Hamilton	1	\$ 1,580.14		20,114.50		22,195.61			59,731,91
Hancock		**********	1	2,593.05					25,181.27
Hardin			3	4,114.65	····		14,416,411	*********	67,096.36
Henry			1 '	21,025.95	1	2,102.57	****	**********	61,.93.31
loward					1	4,268,30			25.091.34
Humboldt			3	9,664.59	1	1,656.83			38,683.06
da	****	********	2	1,485.00	****	*********		*******	31,679.93
ackson		*********	4	5,086.00	****	*********			42,719.07
lasper			4	13,998.50	1	2,576,79			59.908.18
efferson					1	19,950.12	****	**********	42,809.52
ohnson	****		2	2;042.69					40,654.90
Keokuk.			1	4,002.36	****		****	**********	28,078.86
Kossuth								*********	20,205.55
.ee			1	4;798.72					21,011.95
inn		*********	6	17,064.23		********			61,612.06
ucas		*********	2	13,079.44			****		20,820.72
Lyon			3	20,184.49	3	25,887,39	****		91.865.42
Madison						*********			12,401.73
Mahaska	****								19,873.68
Marshall. Mills			4	20,343.77					142,608.25 22,839.13
Mitchell.	144.6	**********	1	8,138.33	1	1,919.09	++++	*********	40,832.92
Monroe			2	9,004.50			1111		37,933.30
Montgomery			see.		cases.	"	++++	********	20,889.23
Muscatine	(4944)		1	266.25		***********	1.1.1.1	********	16,018.38
Osceola			1	5,304,66			10.11	**********	49,515,70
Page			2	18,080.95		***********			36,997.98
Palo Alto		*********	4	17,553.24			****		53,311.77
Plymouth		********	2	13,057.42	****	**********	****		58,126.82
Polk	3144		1	2,525.00		*********		**********	50.032.23
Pottawattamie			3	23,381.34					46,578.63
Poweshiek	22.6.6		. 5	15,834.60				**********	97,339.15
Kinggold	1000			10 294 52	1111	6 000 00	1211		23,703.19
Scott			2	10,304.33		0,000.00	5555	**********	22 120 74
Shelby							5.22		12.367.15
Sioux									63,927.96
Story		*******	1	244.08	1		***	*********	21,433.30
Taylor.	14.88		0	15,258.21			11111		70,410.95 × 26 200.97
Union			1	6,301.85					38,421,85
Van Buren		*********	****	******			1122		15,398.25
Warren		*********	- 1	428.49	****		KAWN.		27,213.21
Washington			1	4,536,90	1	039,13	74.8.8		42,625,51
Wayne			2	7,592.23			****		21,568.74
Webster	***	*********	3	12,468.80	****		1444		30,630.00
Winneshiek		*********	. 5	23 804 85		*******	74.9.9	**********	12,876.97
Woodbury			6	10,991.60					46,553.37
Worth		*******							17,822.00
w right		**********	****		1	8,004.00	1	6,759 20	45,954.00
Totals	1	\$ 1,580.14	201	\$ 727,498.19	27	\$ 168,313.27	6	\$ 43,352.84	\$4,485,781.23

SUMMARY TABLE NO. 3-PART IV-Continued.

IOWA STATE HIGHWAY COMMISSION

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SUMMARY TABLE NO. 4-PART I.

Classification of Temporary Bridge and Culvert Construction for Which Warrants Were Issued in 1917-County . Expenditures-Annual Reports of County Engineers.

County	Cor	orrete Pipe out Headwalls	With	ugated Pipe out Headwalls	Nitho	oiler Pipe out Headwalls	Cas With	t Iron Pipe out Headwalls	I-	Beam Spans on Piling
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Adaia	130	\$ 6,102,14	4	\$ 30.17					1	\$ 966.6
Adams	3	102.81					****	**********	1	830 8
llamakee	1.1.1.4		15	1,268 98				e 100 50	2	367.5
ppanoose		570.42	16	448.04	42	\$ 1,995.50	4	\$ 1/9.30		*********
udabon	3	330.42	2	5.00		**********	1	46.80		*********
lack Hawk		**********	181	1,727.85	1	12.50			3	13,585.0
oone			23	589.03		*********	****	*********	104.0.0	+++++++++
emer			110	2 612 02	****	*********		**********	****	
ichanan	1111		524	24 116 26	****	**********	****			
ilen vista	1.55		197	4,445.91				*******		
dhoun	- 5	113.79	79	1,619.65	17	388.68	1	52.50	6	1,275.
rroll	27	349.53	46	1,541.85	5	67.75	3	129.60	****	
188	19	1,280.70	1	04.70	21	605 20	127		****	
dar		**********	135	2,412.95		070.47			4444	
erokee			116.	4,203.04			1444		3	1,617.
nickasaw			15	493.98	$(a,a+b) \in$		000	*********	(2,2,2,2,2)	
arke	****	**************************************	62	1,813.88		********	1.1.1	*******	****	********
ay	44	033.44	37	1,150.09			132			
inton			40	1,514.47	3	21.00	in the		1	80
awford		**********	23	981.10	****		1.1.1	*********		
allas	180	1,207.45	73	2,213.99		**********	1444			2.919
appis	69.9.4	**********	58	1,516.44						
elaware	1.1.1.		35	931.08			1	90.50	2	3,930.2
es Moines		1.014.20	10	282.08			2	10.50	2	1.001.0
*	-	_	-		_		-		_	
ubuque	25	1,741.34			1111		1 ::::	1	1	**********
ayette			65	1,093.07				*********		********
anklin			17	6,418 93				**********		**********
remont	5	170.53	17	144.07			15	690.68		
reene	1	15.87	3	89.05	****	********	1	21.53	****	********
rundy	1000	78 50	15	2 701 55		122.25	2.4.2	*********	****	*********
amilton		78.30	479	9,960.36		166.63		*********	1	202.91
ancock	71	1,744,42							1.000	
ardin			45	906.18	****				11.44	
irrison	5	624.75	****	*********		*******			1	1,220,3
enry			8	391.10		**********		********	****	
umboldt		**********	0	124.80	****	*********				
a			43	1,655.57						
wa			36	1,462.20	1.1 × 1	**********	A	0.000		
ckson	5	148.45					3	1,687.70		
fferson		*******	51	2,239.66	18	28.00			****	*******
hnson	****		78	3 020 27	****		8	971.83	****	*********
			10	0,000.27			1.1.1	**********		
nes			14	518.00	· · · ·				1 1	656.68
nes okuk	····i	31.88	14 70	518.00 1,504.95		******			1	656.68
eokuk	1 	31.88	14 70 200	518.00 1,504.95 3,414.56					1	656.68

370.39

2,957.72

272.10 9,182.66

1,132.73

2,120.80

753.20

408.75 675.78

571.29

567.76

387.68

8.80 7.017.61

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Linn.....

Louisa.....

Lucas.....

Lyon.....

Madison.....

Marion..... Marshall

Mills.....

Mitchell.....

Monosa.....

Monroe.....

Montgomery.....

Muscatine..... O'Brien.....

Osceola Page..... Palo Alto.....

Plymouth.....

Pocahontas.....

Mahaska.....

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IOWA STATE HIGHWAY COMMISSION

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County	Con itho	crete Pipe ut Headwalls	Corr Witho	ugated Pipe out Headwalls	BWithe	oiler Pipe out Headwalls	Cas Witho	t Iron Pipe out Headwalls	I-I	leam Spans on Piling
County	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Polk. Pottawattamie.	 27	1,472.70	18 83	3,780.26 2,884.48	17 3	1,128 87 69.80			3	3,927.02
Poweshiek Ringgold Sac	1 5	62.50 12.51	13 40 82	330.19 1,533.87 1,434.85	7	. 189.07			 1	578.00
Scott Shelby Sioux	4	542.24	17 47 3	485.81 2,564.52 108.50	21	690.92	 	**********	****	
Story Tama Taylor	****		13	270.38	****		89	6,177.27	****	*********
Union Van Buren Wapello	13	817.62	39	1,363.81	73	5,532.96	10	1,249.90	5	2,018 17
Warren. Washington. Wayne		543.52	2 2 1	11.50 73.30 10.75	1 56 10	38 °0 3,393.80 550.47	2	90.63	 	******
Webster. Winnebago. Winneshiek		**********	39 164 46	475.72 4,855.56 1,239.59	150	1,106.42	3	8 50		426.30 1,883.20
Woodbury Worth Wright	202	6,257.27 109.90	155	2,0-20.00		*********	**** **** ****	**********	1	427.87
Totals	1,134	\$ 37,965.47	,253	\$ 169,387.38	514	\$ 17,516 93	156	\$ 12,554.14	69	\$ 49,172.49

SUMMARY TABLE NO. 4-PART I-Continued.

SUMMARY TABLE NO. 4-PART II.

Classification of Temporary Bridge and Culvert Construction for Which Warrants Were Issued in 1917—County Expenditures—Annual Reports of County Engineers.

County		y Trusses on Wood Floors	Wood Pile Bridges Miscellaneous Bridges and Culverts				Total Cost of Tem- porary Bridges and	
	No.	Cost	No.	Cost	No,	Cost	Culverts Constructed	
Adair				e 112.16				
Idams		0.000	15	\$ \$15.10		**********	\$ 7,412.16	
llamakaa	1	\$ 328.02	15	4,389.92	8.834		5,881.64	
namakee	4	2,940.30	15	7,088.95	1.111		12,271.75	
ndahar			1100		****		2,623.10	
udubon	115.0	********	36	14,030.59	****		16,089.11	
enton	****			**********			51.80	
lack Hawk			2	538.00	9	\$ 120.64	15,984,67	
oone	t				16	492.04	1.081.07	
remer	11.1.4		2	593.24	5.00		503 24	
uchanan						ma un para de la composition d	2 612 92	
uena Vista					9	210.01	24 336 17	
utler			46	16,280,00			24,000,17	
alhoun	1	- 213.55	3	507 48		*********	4 170 00	
arroll		and in state	21	7 117 65	4	120.60	4,170.99	
ass			18	4 435 09	16	224.45	9,334.98	
edar		**********	40	4,403.00	10	229.93	0,096.93	
erro Gordo	1111				2	98.43	793.72	
herokee		*******		********			2,412.95	
hickasaw.		*********	42	0.101.17	34.	1,062.42	6,882.48	
larke		1 003 7/	96	9,191.57		*********	9,685.55	
lav		1,093.34	++++	**********	2284.8	**********	3,707.42	
layton	****	********	1112	1.1.1.1.1.1.1.1.1.1.1	10000	**********	9,843.27	
linton			0	1,580.58	1	64.45	2,795.12	
rawlord	A	*********		520.05		*********	2,135.82	
	1.0.0.0.0	*********	28	6,212.79	****	**********	7,193.89	
#11#	50.000	**********		**********	6	196.08	3,617,52	
A VIS		*********	2	748.39		**********	3,667,60	
ecatur	****	**********	****				1,516,44	
leiaware	144.8.4	**********	10	1,750.56		*********	6,752.84	
Jes Moines	1.0.0.0.0	*******				**********	292.58	
hckinson		**********		**********	1	263.60	3 208 90	

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 4-PART II-Continued.

	Pony Piling.	Trusses on Wood Floors	Woo	d Pile Bridges	M Bridg	iscellaneous es and Culverts	Total Cost of Tem-	
County	No.	Cost	No.	Cost	No.	Cost	Culverts Constructed	IO
Dubuque					2	229.00	1,970.34	WA
Emmet		*********	6	2,005.04	1	32.90	2,037.94	00
Fayette	****		****				1,095.07	E
Franklin					1	10.50	6,429,40	S
Fremont		472.60		19,650.44	****	182.12	21,310.44	E
Greene		******	1	172.67	0	527.33	826.45	-
Grundy			7	4 301 34	33	588.36	7 972 00	I
Hamilton t				1,00001			10,163.27	G.
Hancock	****		8	2,561.74		*********	4,306.16	AF.
Hardin					****	1 100 71	906.18	V.A
Harrison	5	6,050.85	10	4,343.39	20	1,120.71	13,360.05	2
Henry			25	5,584,80			5,709,60	0
Humboldt	****				1	30.28	30.28	ö
Ida			8	3,521.51		*********	5,177.08	X
Iowa		*******	1	339.37	22	657.60	2,459.17	M
Jackson	1111				1	135.55	1,9/1./0	S
Jefferson			15	2,006.06			4,488,52	IS
Johnson			5	639.28	212	4,239.37	7,898.92	0
Jones	****	*******	18	5,006.73	1		6,181.41	z
Keokuk	****	******		0 878 00	11	703.40	1,536.83	
Lee							10,993.00	
Linn	****		4	670.14			1,040.53	
Louisa		********	6	3,439.55	45	1,280.39	7,677.66	
Lucas				498.14	9	269.36	10,849,51	
Madison			2	258.91	1	251.00	1,642.64	
Mahaska	44.44			130.44	****	**********	- 5,629.56	
	-							
Marshall			1		1 1		1 574 44	
Mitchell	2	4,802.14	11	3,079.88	1	1,464.76	10,430.13	
Monona	3	12,502.50			1	5.877.65	675.78	
Monroe		**********	****				1,627.79	
Muscatine.	1	4,583.54	27	9,259.68	4	527.71	17,041.33	
O'Brien		**********	****		6	24.70	1,898.39	
Osceola		**********	16	7,278.30		397.04	7 312 20	A
Palo Alto		*********	4	1,115.14	2	190.26	13,160.81	Z
Plymouth	****		1	211.50		*********	3,428.44	4
Pocahontas		********	45	11,554.81	1999.8	*********	14,376.59	A
Polk			9	3,201,94	44.4.4	*********	2,935.47	2
Poweshiek	5	2,982.36	48	17,538.59	2	60.63	28,935,58	HH.
Ringgold	1999.65	*******			++++	********	330.19	E
Sac		*********	25	3,398.49	3	23.50	5,207.43	P
Scott		*********	1	202.07			2,025.36	HO
Sioux	1	1,450.00	25	9,307.47			13,864.23	A
Story			5	2,546.03	17	260.56	2,915.09	00
Tama			38	9.202.43	2	11.03	281.41	0
Union			16	2,252.35		269.30	2,252,35	F
Van Buren			1	347.00	4010		1,710.81	0
Wapello	0	3,057.75	21	2,974.04	++++	********	14,832.82	0
Warren		*********	34	6.049.77	1	128.40	1,227.65	Z
Wayne	****					*********	3,467.10	T
Webster	****		28	8,312.17	10		9,507.54	Y
Winnebago		*********	8	3,090.47	10	555.42	2,572.36	E
Woodbury	1	641.68	1	241.72	3	460.18	4,466.37	Z
Worth		*******	38	7,439.65	****		14,124.79	H

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408.30

251,072.34

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23,866.42

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41,955.07

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Worth. Wright.

Totals.....

5

VNI OF COUNTY ENGINEERS

109.90

2,408.30

603,490.24

\$

240

SUMMARY TABLE NO. 5.

Repairs to Bridges and Culverts-County Expenditures-Annual Reports of County Engineers.

County	Wooden Bridges and Culverts	Steel Bridges and Culverts	Permanent Bridges and Culverts	Miscellaneous	Total	
Adair	 \$ 8,112.83 5,966.51 11,573.48 14,475.92 6,569.56 9,019.82 6,248.33 3,712.05 2,027.17 2,188.48 446.55 16,534.45 685.90 5,886.21 11,653.31 7,828.58 2,662.55 3,303.79. 6,256.01 1,748.43 1,619.77 1,686.45 659.64 28,576.88 3,665.92 8,280.80 8,643.14 4,321.29 324.66 512.34 285.94 2,693.65 10,496.38 13,240.68 3,942.51 6,316.22 	\$ 860.83 69.25 2,701.65 5,590.42 7,263.17 2,404.19 497.63 675.00 456.91 140.94 1,012.68 2,421.32 2,466.23 1,807.25 293.59 3,415.52 216.07 791.06 1,090.70 901.16 1,170.85 1,823.40 * 5,190.05 10,840.47 2,420.92 769.12 578.03 224.24 5,460.19	 \$ 559.13 10.15 193.00 910.29 589.23 439.99 91.49 *820.82 2,552.86 137.21 98.25 79.37 569.90 2,001.94 308.57 941.18 10.90 553.64 15.56 3,245.43 247.04 178.68 262.66 687.45 40.00 6,156.69 829.56 1,021.24 2,763.81 5,473.18 	\$ 200.00 	 \$ 8,671.96 7,027.34 11,652.88 17,370.57 6,569.36 15,520.53 14,826.33 6,556.23 2,616.29 7,183.00 1,766.78 19,228.25 1,835.79 8,425.38 14,198.91 10,197.70 4,126.04 9,218.11 6,828.65 3,480.67 2,781.57 3,185.25 1,937.30 33,645.71 8,855.97 19,402.65 12,101.94 5,459.84 1,754.47 836.28 12,696.31 2,693.65 12,083.44 15,390.85 6,928.01 18,876.74 	IOWA STATE HIGHWAY COMMISSION
Grundy	$\begin{array}{c} 7,575,59\\ 4,046,01\\ 11,192,115\\ 1,051,08\\ 3,574,47\\ 2,804,85\\ 15,507,59\\ 1,958,53\\ 2,744,71\\ 523,33\\ 11,635,62\\ 8,652,77\\ 20,964,42\\ 12,865,21\\ 1,004,45\\ 2,448,03\\ 26,692,61\\ 16,664,03\\ 10,973,53\\ 5,050,50\\ 5,000,00\\ 3,923,88\\ 2,750,78\\ 2,743,89\\ 14,394,01\\ 3,310,37\\ 2,588,33\\ 2,147,40\\ 15,770,94\\ 665,63\\ 18,060,09\\ 4,287,07\\ 8,887,76\\ 113,71\\ 4,591,58\\ 3,171,20\\ 15,874,61\\ 7,873,25\\ 8,816,07\\ 6,891,29\\ 17,330,61\\ 37,010,18\\ 9,581,29\\ 11,588,61\\ 2,471,81\\ 2,534,65\\ 11,996,56\\ \end{array}$	52.00 633.14 664.61 1,411.46 50.97 977.45 4,544.75 2,077.02 4,434.82 4,150 2,643.13 808.38 3,50 5,288.51 4,171.73 533.00 6,139.40 1,731.41 5,909.27 4,57.01 509.10 4,659.25 2,128.93 145.39 2,501.60 2,014.90 4,7.86 4,559.87 10,425.34 6,189.62 878.30 877.11 4,420.42 853.50 878.30 877.11 4,420.42 853.50 878.30 877.11 4,420.42 853.50 878.30 877.11 4,420.42 853.50 878.30 877.11 4,420.42 853.50 878.30 877.11 4,420.42 853.50 878.30 877.11 4,420.42 853.50 878.30 878.30 877.11 4,420.42 853.50 466.90 1,919.48 2,178.13 2,375.28	70.95 198.20 1,341.35 1,246.44 	42.17 822.33 149.39 140.32 1,666.59 32.16 263.95 	7,740,71 4,877,35 14,027,64 3,708,98 3,774,83 3,782,30 20,192,66 5,662,14 7,223,12 828,78 11,635,62 11,639,05 22,266,41 13,808,42 7,018,74 7,617,64 30,799,18 17,332,36 17,886,48 10,724,81 17,332,36 17,886,48 10,724,81 11,497,17 3,972,99 3,375,10 3,389,10 14,752,46 8,405,65 6,231,15 2,292,79 18,631,46 4,985,15 18,135,95 8,856,54 20,482,45 6,781,92 4,591,58 5,145,32 15,905,73 10,638,32 13,334,26 7,468,21 27,886,19 4,5163,05 9,587,09 12,116,66 5,196,80 4,712,78	ANNUAL REPORTS OF COUNTY ENGINEERS 24

SUMMARY TABLE NO. 5-Continued	MARY TABLE NO.	5-Continued.
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County	Wooden Bridges and Culverts	Steel Bridges and Culverts	Permanent Bridges and Culverts	Miscellaneous	Total
SiouxStory Pama Paylor	12,423.07 5,847.66 13,304.28 12,727.28 9,285.04	1,109.76 577.87 3,538.60 833.50	207.80 474.30 367.54	291.87 260.79 254.53	12,423.07 7,165.22 14,648.32 16,894.21 10.373.07
Van Buren Wapello Warren	4,021.70 2,213.98 3,960.26	19,179.60 4,007.26 3,714.81	1,440.58 83.49	291.38 36.36	23,201.30 7,953.20 7,794.92
Washington Wayne Webster	11,500.00 5,958.27 1,254.86	11,808.99 810.53 2,700.73	958.31 25.70	342.73	23,308.99 7,727,11 4,324.02
Winnebago. Winneshiek Woodbury	6,191.15 11,656.40	10,698.25	557.44	508.54 196.40	2,254.37 17,955.38 11,852.80
WorthWright	2,119.91	1,479.30		535.96	4,135.17

160255

SUMMARY TABLE NO. 6.

Culvert Material Purchased for Townships-County Expenditures-Annual Reports of County Engineers.

County	Corrugated Pipe	Concrete Pipe	Boiler Pipe	Cast Iron Pipe	Lumber	Miscellaneous Materials	Total
Adair	\$ 44.00				# 400 FR		
Adams	706.72	\$ 3,908,72		********	\$ 420.58	111111111	\$ 534.58
Allamakee	1 000 85	4 0,100,14	*******	********	********	\$ 200.00	4,815.44
nnanakcentritti	5 727 06		8 4.01/20	********	33.60	******	1,124.45
udubon	7 124 27	017.02	\$ 4,914.30	*******	********	11.66	10,653.92
Auduoon	7,154.27	813.82	********		*********	********	7,948.09
denton track	5,810.59	********		\$ 647.70	*********	243.37	6,707.66
lack Hawk	4,193.42	********	*********	********	25.34		4,218,76
oone	2,850.32	*********	*********		********	576.24	3,426.56
remer		*********			********		
uchanan	3,023.29	*********	*********		*********		3.023.29
uena Vista							0,000,00
utler	11,790.84		*********				11 790 84
alhoun	*********	3,418.74					3 418 74
arroll	999.24	2,194.63	70.65	86.40	2 617 06	259.26	6 222 24
ass	2,945.40	1,357.60				and and	1 202 00
edar	12.58		611.54		516.12	600	1,303.00
erro Gordo	1,482.80	*********			245 11	250.11	1,140.24
herokee	10.012.69				240.11	437.14	1,987.02
hickasaw	1.677.60				712.00		10,012.09
larke	4,213,88				/12.00	******	2,389.60
lay	9,230,64		*********	*********	*********		4,213.88
layton	2,403,69	1000000	*********	1.1.1.1.1.1.1.1.1	A A A A A A A A A A A A A A A A A A A	********	9,230.64
linton	85.00		61.00	********	**********	*********	2,403.69
rawford	12 082 55		01.00	********	117.51	39.78	306.29
Dallas	\$ 890 10	2 656 04	********	********	*********	********	12,082.55
avis	5,007.10	4,000.24	*********		*********	********	8,546.04
lecatur	2 707 84		********		*********	********	*********
belaware	4 190 75	*********	********	********	1,009.48	********	4,712.32
les Moines	3 124 44	222.20	********	*********	111.60	********	4,301.35
ichineon	702.00	203.20	********	********	********	*********	3,357.64
uhuana	10 162 02	6/8.04	*********		*********	********	1,090.70
mmat	10,108.08	00 315	*********	*********	5,500.00	150.00	15,818.08
mmete.	5/0.88	835.29	*********	********	*********		1,806.17
Loud	0,139,94	********	********	********	*********		6,139,94
and the	1,790,47	********			*********		1,790.47
TAUKIII	838.32	*********		********	*********		838.32
remont		********					

10WA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 6-Continued.

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County	Corrugated Pipe	Concrete Pipe	Boiler Pipe	Cast Iron Pipe	Lumber	Miscellaneous Materials	Total	
	767 55	115 70			1.074.52	22.70	1 006 47	
Greene	3 644 08	105.70		********	1,0/4.52	22.10	3 644 08	
Cuthrie	6.855.94	170.80		********			7.026.74	-
Hamilton	1,957,10						1,957,10	0
Hancock	4.044.67				41.38	5.50	4,091.55	W
Hardin	1,501.24		********			.96	1,502.20	\mathbf{A}
Harrison	631,10	885,76	90.00				1,606.86	70
Henry	*******	*******	*******		********		********	T
Howard	4,376.26	********	********	********	*********		4,376.26	
Humboldt		*******				76.67	/0.0/	H
103	0,130.04				********		6 741 25	e
Toolson	0,741.25			********	********	********	252.26	Ħ
Tacher	2 472 80	********					2,472,80	=
Tefferson	4.948.34		204.00	63.00	600.00		5,815.34	£
Johnson	3,196,92	21.00		********	1.356.28	333.78	4,907.98	H
Jones	1,737.84		*********	********	********		1,737.84	N
Keokuk		*********			1,919.52		1,919.52	\triangleright
Kossut!	6,249.00	142.43					6,391.43	R
Lee	1,045.50			********	930.00		1,975.50	0
Linn	3,017.42	********	*******	********	********	*********	3,017.42	Ö
Louisa	5,323.68	*********		739.80			6,063.48	N
Lucas	5,865.24	939,33	******	********		in	0,004.57	M
Madison	10 590 56	********		*******	********	*********	10 590 56	E
Mahaska	7 086 53	5 705 52	4 405 62	********		796 47	17.984.14	20
Marion	2.106.94	3,103.34	71.24	********		100.47	2.178.18	H
Marshall	3,302.04		14+01		********		3,302.04	2
Mills	3,107.58				805.08	140.00	4,052.66	4
Mitchell	1,890.08			********			1,890.08	
Monona	5,864.51	18.25		18.67			5,901.43	
Monroe	4,361.83	101.50	*******	********			4,463.33	
Mussetine	348.00	4,540.50	4.011.16		82.70	14.26	4,985.54	
O'Brien	2,603,81	9.75	4,011.10		137 37	5.00	2,750.93	
Osceola	11.25	1,464.30			1.220.18	74.70	2,770.43	11/2
Page.	6,166.29	4,352.80					10,519.09	
Plymouth.	2,821.78	3.015.28	********	*********	*********	********	5,837.06	
				_				_
Pocahontas	6,471.02	1	1	1	1	[6,471.02	
Pottawattamie	15,247,45	447.95	137.31			159,30	15,992.01	
Poweshiek	6,031,82		9,104.40				15,136.22	
Ringgold	4,230,50	12.50	*******	********	15.48	20.50	2 547 53	
Scott	3.567.44	Awing	778.20		66.00	anvis-u	4.345.64	
Shelby	7,989.19	195.80					8,184.59	
Sioux	369.06				200.00	******	569.06	2
Story	796.36					128.05	924.41	1
Tama	6,428.85					173.89	6,602.74	-
Taylor	*********				872.89	********	872,89	-
Union	4,900.00			********	949.90		5,849.90	F
Van Buren	12,043.47		787.70		********		12,831.17	
Wapello	8,716.31	1,144.00	*******		*********	*********	9,860.31	R
Warren.	7 1 2 9 9 9			********	521.05	********	521.05	1
Wayne	7,158.00	4 405 50	231.50			********	7,389.50	P
Webster	1 070 10	1,423.30	712.42	207.01	*******		5,137.92	2
Winnebago	2 000 84	1,451.79	10.45	321.83	1 165 13	********	3,008.25	2
Winneshiek	4,705.34				4,105.15		4 705 34	10
Woodbury	Tyround	2,352.26				********	2,352.26	
Worth	1,123.20				120.00	192.95	1,436,16	0
Wright	4,019.93						4,019.93	3
Tetals								0
Totals	\$360,912.72	\$.47,262.28	\$ 26,204.49	\$ 1,883.40	\$ 23,411.94	\$ 3,878.76	\$463,553.59	DO

ANNUAL REPORTS OF COUNTY ENGINEERS

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SUMMARY TABLE NO. 7.

Equipment and Material Miscellaneous Filling Bridges County Moving Equipment Material and Culverts Right of Way Including Purchased Total Lengthening Mis-Total and Re-Repairs and Not cellaneous of erecting Culverts STATE to Same Used Old Spans Adair..... 846.00 6,137.01 \$ 5,371.29 5,825.32 216.60 \$ 846.00 \$ \$ 265.00 Ś 265 00 354.24 Adams..... \$ 6,117.51 19.50 \$ 354.24 \$ 759.00 ********* Allamakee..... 145.51 287.51 1.046.51 145.51 Appanoose..... 1.265.05 10,694.95 90.00 \$ 141.90 492.35 540.80 Audubon. Benton. Black Hawk..... 364.50 7,962.74 8,327.24 4,053,10 520.00 520.00 78.53 10.528 53 734.02 734.02 78 52 ********* 4.289.17 745.73 105.00 194.66 2,491.67 6,780,84 89.66 Boone... Bremer. Buchanan. Buena Vista. 563.30 1,363.79 2,454.30 320.31 1,927.09 320.31 ********* ********* 4,566.42 410.28 4,976.70 255.47 67.71 67.71 4,535.20 4,535.20 5.00 610.22 3,512.32 3,197.29 3.807.51 1,416.82 3,512.32 ********* Butler..... 3,000.00 6,778.00 5,493.31 3,778.00 26.50 ********* Calhoun..... 3,150,90 0 50 2 581 49 2,590.99 2,635.25 2,787.73 336.67 Carroll..... 1.193.04 5,861.84 3.094.53 911.00 57.65 2,846.28 ********* 190.60 3,995.56 3.08 Cass..... 3,768.09 6,957.08 227.47 8.00 1,604.84 1.604.84 ******** Cedar..... 20.00 3.00 23.00 86.75 404.40 ****** 415.48 Cerro Gordo..... 284 44 1,831.44 1,624.42 171.80 66.60 445.16 683.56 Cherokee..... Chickasaw..... ********* 18.50 7,996.00 2,964.12 2,434.75 8,014,50 8.75 8.048.98 10,483,73 332 22 6,339.45 6,671.67 637.35 34.00 1,008.28 ********* 1,042.28 Clarke..... 8.25 5,125.64 10,834,79 5,133,89 8.77 46.47 63.99 317.79 257.79 Clay..... 364.61 500.00 864.61 156.50 60.00 Clayton..... 787.00 939.31 4,833.40 939.31 4.833.40 78.00 335.75 101.25 ********* ********* Clinton. Crawford..... 2,245.09 1,482.00 832.08 1,420.87 620.81 2,102,81 ********* 2,245.09 10,292.72 4,576.61 7,116.34 2,928.48 10,000.00 10,000.00 1,178.48 346.40 626.72 3,501.79 86.96 ********* Dallas. Davis Decatur. Delaware. 3,086.96 1,429.90 5,302.39 2,105.94 3,000.00 58.35 97.23 1,221.42 292.47 1,332.67 4,080.97 1,173.97 444.96 3,946.75 1,067.73 102.63 2,63 100.00 1,570.70 1.466.44 Des Molpes Dickinson Dubuque Emmet 3,197.87 187.53 550.80 73.50 5,643.31 1,019.67 2,095.08 130.84 1,891.40 1,433,65 3,898,53 1,083.06 1,793.20 2,105.85 1,152.50 7,194.86 3,697.23 2,106.12 797.94 401.03 57.34 908.65 1,357.26 15,267.11 83.15 339.32 34.20 492.00 2,462,67 1,083.06 1,793.20 2,059.03 651.25 46.83 152.50 1,354.86 257.03 472.34 924.25 Fayette. Floyd. Franklin 1.000.00 1,891.40 86.07 28.85 57.65 31.25 840.00 203.82 4,557.46 3,440,20 1.144.34 4,015.55 2,199.12 625.65 Fremont..... 2,871.21 3,931.81 Greene..... 864.45 2,664.43 257.43 517.35 3,528,88 133.40 650.75 ANNUAL 263.07 414.81 Grundy..... Guthrie..... 7.85 287 28 395,13 1 935 85 563.36 826.43 323.32 125.00 587.60 7.127.41 910.92 104.86 644.67 37.34 2,257.05 275.00 761.15 1.036 15 ********** 4,675.73 322.00 2.252.80 4,713.07 689.22 561.81 1,251.03 279.04 2.185.42 2,464.46 1,315.50 ******** 142.99 142.99 2,152.21 5,031.59 ********* 90.00 90.00 ********* 264.81 6,611.90 REPORTS Henry...... 1,573.83 1,573.83 1,765.88 40.00 ***** 40.00 173.22 1,620.97 1,794.19 2,342.05 224.60 Humboldt 17.95 2,709.01 870 74 870.74 1,186.59 1,411.19 57.78 Ida..... 200.00 217 05 2,193.01 ********* 53.24 111.02 Iowa Jackson 132.85 10,181.18 10,314.03 3,512.57 24.36 10.80 298.58 1,061.65 265.00 8.00 478.98 136.85 147.65 776.34 lasper..... 6,739.76 210.00 333.70 6,441.18 8.660.83 ******** 1,466.24 144.60 1.820.84 Jefferson..... OF 297.27 754.60 7.089.32 ********* 196.01 529.71 Johnson..... 456.82 6,359.93 6,816.75 2,922.03 499.74 578.20 1.077.94 27.50 ********* 320.87 725.20 27.50 ********* ********* COUNTY 1,194.63 1,515.50 941.49 ********* Kosauth..... $366.63 \\ 427.11$ 2,003.47 366.63 ********* 941.49 3,756.29 255.00 3.329.18 106.75 2,956.65 509.12 2,956.65 Linn...... 255.00 2,465.54 ouisa..... ********* 509.12 1.02 762.96 641.08 641.08 Lucas..... 8,594.00 10.25 396.25 762,96 ********* 396.25 1,634.85 1,634.85 1,590.50 ********* 459.80 10.25 ENGINEERS ********* 2,584.40 153.21 2,737.61 7,714.34 39.40 759.52 49.50 509.30 Mahaska. Marion. Marshall 2,133.89 43.95 2.089.94 2,400.24 980.84 439,88 54.52 2,219,64 46,29 6,282.34 6,328,63 6,786.70 54.52 ******** 314.26 633.38 947.64 3,718.26 9,355.27 98.24 2,017.73 1,919.49 439.32 3,757.32 6,271.55 3.278.94 175.00 661.52 1,737.58 627.83 3,201.93 1,902.04 4,621.01 6,523.05 936.40 936.50 1,872.90 Monona. Monroe..... 444.00 4,737.98 5,181.98 5,114.59 2,413.74 2,413.74 ********* 782.46 782,46 2 938 60 159.25 52.05 159 25 252.20 134.75 5,508.01 5,760.21 156.43 Montgomery..... 60.00 5,793.98 112.05 270.95 Muscatine..... 800.21 934.96 68.78 29.97 457.35 O'Brien..... 714.78 5,433.06 6,147.84 531.10 35.31 ********* 198.96 234.27 Osceola..... 1.532.08 1,300.60 2,832.68 1,420.98 4,205.40 ********* 5,200.69 5,200.69 157.90 1,500.00 Page..... Palo Alto..... 157.90 6.010.36 ********* 1,985.91 7,691.31 856.93 5,503.00 6,359.93 872.85 365.00 852.95 ********* 2,026.87 249 Plymouth..... 708.20 12,746.19 13,454,48 675.00 675.00

Bridge Equipment, Unused Material, Filling Bridges and Culverts and Special Cases-County Expenditures-Annual Reports of County Engineers.

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IOWA

HIGHWAY

COMMISSION

SUMMARY TABLE NO. 7-Continued.

	Equipment and Material			Filling	Miscellaneous					
County	Equipment Including Repairs to Same	Material Purchased and Not Used	Total	Bridges and Culverts	Right of Way	Moving and Re- erecting Old Spans	Lengthening Culverts	Mis- cellaneous	Total	
Pocahontas. Polk. Pottawattamie. Poweshiek. Ringgold. Sac. Scott. Shelby. Sioux. Story. Tama. Taylor. Union. Van Buren. Wapello. Warren. Washington. Washington. Wayne. Webster. Winnebago. Winneshiek. Woodbury. Worth. Wright.	641.17 310.22 1,122.69 969.28 117.51 121.06 3,927.94 	4,561.08 4,343.00 15,500.00 662.07 2,823.30 3,906.56 2,930.08 1,366.98 14,047.57 	5,202.25 4,653.22 16,622.69 1,631.35 2,940.81 4,027.62 6,858.02 1,366.98 14,568.76 	1,506.31 3,471.01 13,041.81 5,790.56 12,748.46 1,645.62 2,507.31 4,344.95 343.15 407.00 2,830.23 15,508.08 7,587.20 890.09 3,020.43 5,411.44 821.95 19,045.36 1,182.35 1,289.06 2,579.00 2,126.88	10.00 55.00 	1,754.59 4,314.19 	1,257.71 2,619.35 1,341.18 244.38 636.03 165.65 1,015.55 45.59	528.84 5,019.13 270.80 1,545.33 4,022.85 585.50 2,938.77 236.74 3,485.25 215.90 758.35 333.31 141.89 956.67 415.18 382.25 1,748.33 66.32 713.49 258.85	$\begin{array}{c} 538.84\\ 3.067.30\\ 6.933.54\\ 5.357.13\\ 1.054.75\\ 5.622.50\\ 4.110.70\\ 659.25\\ 3.183.15\\ 261.74\\ 3.707.11\\ 1.414.16\\ 2.371.30\\ 1.394.38\\ 498.96\\ 445.41\\ 1.048.67\\ 3.156.80\\ 1.089.81\\ 1.015.55\\ 2.155.87\\ 1.28.00\\ 7.36.89\\ 438.80\\ \end{array}$	
Totals	\$ 47,763.54	\$308,492,44	\$356,255.98	\$362,319.27	\$ 12,097.53	\$ 45,880.64	\$ 18,783.99	\$ 79,242.27	\$156,004.43	

SUMMARY TABLE NO. 8.

Comparison of Bridge and Culvert Construction, 1914-1915-1916-1917-Annual Reports of County Engineers.

County	November 1, 1913 to November 1, 1914	November 1, 1914 to January 1, 1916	January 1, 1916 January 1, 1917	January 1, 1917 to January 1, 1918	Total Four-Year Period
Adair. Adams. Mlamakee. ppanoose. ppanoose. penton. lenton. lack Hawk. Boone. remer. uchanan. uena Vista. utler. alhoun. arroll. ass. edar	\$ 28,942.00 16,389.54 21,648.86 20,509.18 22,582.80 56,760.49 16,560.82 13,374.39 10,868.60 20,245.60 45,952.05 23,659.72 34,231.90 34,705.27 19,376.95 48,604.57 53,511.65 48,529.34 40,374.99 4,900.78 77,792.65 24,530.05 66,495.59 48,872.99 33,125.54 39,334.95 7,000.55 28,092.00 17,206.32 37,751.24 41,906.51 27,015.48 49,107.64 41,996.15	 \$ 39,477.24 36,764.09 37,300.02 40,028.99 50,441.85 62,481.69 80,316.88 24,513.51 48,238.48 48,102.40 91,326.65 73,666.27 58,733.92 49,707.51 58,280.17 60,968.88 44,511.84 56,329.15 32,161.02 18,268.99 121,815.17 102,244.00 73,480.93 81,688.44 72,561.29 38,498.71 32,109.88 47,314.84 20,018.01 45,349.26 84,966.05 48,921.32 69,664.53 51,676.90 18,381.21 	\$ 41,916.84 30,842.09 36,612.58 42,099.77 35,164.50 75,076.26 42,107.00 46,207.97 38,431.87 65,464.01 113,108.63 23,388.96 48,195.89 47,031.43 55,062.87 61,956.12 37,119.73 99,162.80 64,462.18 30,033.77 82,093.14 46,699.54 62,108.77 91,660.53 101,041.70 30,360.37 21,523.36 49,105.32 25,311.08 36,508.63 102,314.62 35,767.11 113,367.09 56,230.27 40,517.87	 \$ 60,781.88 42,529.93 89,150.24 71,867.42 85,581.09 106,838.92 69,557.59 55,825.49 46,545.79 69,400.21 217,809.17 106,242,82 76,876.46 80,766.02 57,061.23 67,178.47 201,310.69 43,847.49 36,519.47 103,412.99 76,780.87 76,694.79 215,743.16 67,065.19 55,573.12 37,011.45 44,829.07 30,807.38 83,936.98 107,097.39 23,815.98 107,097.78 104,411.45 56,071.78 	 \$ 171,117.96 126,525,65 184,711.70 174,505,36 193,770.24 301,157.36 208,542.29 139,921.36 352,627.03 203,212.22 470,196,50 226,957,77 218,038,17 214,550,82 205,121.69 405,331.98 180,845,68 89,723.01 385,113.95 250,254.46 278,780.08 437,965,12 273,793.72 163,767.15 97,755,24 166,341.23 93,342.79 203,546.11 336,184.57 134,819.89 336,550.71 205,975.10

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SUMMARY	TABLE	NO.	8-Continued.

County	November 1, 1913 to November 1, 1914	November 1, 1914 to January 1, 1916	January 1, 1916 to January 1, 1917	January 1, 1917 to January 1, 1918	Total Pour-Year Period
Fremont. Greene. Grundy. Guthrie. Hamilton. Hardin. Harrison. Jackson. Jackson. Jackson. Jackson. Jackson. Johnson. Jones. Keokuk Kossutb. Lee. Linn. Louisa. Lyon. Matison. Marshall. Mill. Monroe. Montgomery. Muscatine. O'Breien. Osceola. Page.	$\begin{array}{c} 45,045.41\\ 25,138.91\\ 47,179.44\\ 16,264.75\\ 22,360.59\\ 25,167.22\\ 22,844.36\\ 15,518.97\\ 30,284.10\\ 60,266.75\\ 12,354.42\\ 42,269.99\\ 42,269.99\\ 42,269.99\\ 42,269.35\\ 24,095.44\\ 30,445.85\\ 34,386.04\\ 23,894.70\\ 34,4385.76\\ 49,771.65\\ 23,399.31\\ 43,082.31\\ 16,292.98\\ 31,721.51\\ 25,897.65\\ 29,432.89\\ 33,800.49\\ 33,800.49\\ 33,592.48\\ 25,990.02\\ 23,3592.48\\ 25,975.592\\ 33,592.48\\ 25,990.02\\ 21,083.12\\ 18,394.96\\ 5,815.05\\ 26,424.92\\ 33,610.42\\ 40,102.70\\ 30,147.60\\ 38,134.17\\ \end{array}$	36,639.46 25,558.43 69,441.92 43,236.06 65,222.64. 22,463.45 36,986.10 36,035.81 27,139.92 45,873.93 34,642.53 39,989.23 35,668.58 40,616.02 82,555.36 40,616.02 82,555.36 46,571.40 110,305.25 23,049.50 33,132.44 47,886.59 32,240.11 68,005.73 32,735.22 28,582.63 47,609.81 27,005.02 60,624.95 120,200.18 33,594.76 48,985.92 41,519.74 36,942.03 38,709.11 38,709.11 38,709.11 42,800.95 22,161.39 63,555.20 15,785.12 48,430.39	$\begin{array}{c} 37,627.10\\ 28,631.87\\ 52,661.50\\ 32,273.23\\ 87,268.30\\ 24,369.42\\ 40,927.24\\ 113,795.57\\ 22,578.68\\ 46,323.07\\ 41,487.63\\ 35,747.22\\ 53,693.09\\ 36,113.87\\ 70,120.07\\ 60,199.63\\ 52,484.76\\ 35,628.73\\ 46,763.38\\ 73,838.19\\ 38,871.93\\ 60,743.64\\ 42,049.77\\ 30,808.02\\ 41,915.13\\ 21,830.42\\ 64,211.83\\ 117,906.25\\ 102,606.63\\ 36,032.83\\ 35,3180.17\\ 48,159.82\\ 37,401.66\\ 34,623.62\\ 33,402.45\\ 50,199.94\\ 48,611.41\\ 45,711.80\\ \end{array}$	76,873.15 42,758.36 57,128.70 128,969.08 78,854.48 43,639.91 78,147.29 105,411.99 45,066.71 46,576.56 44,609.73 57,039.63 77,496.16 107,567.67 95,678.48 68,803.02 71,896.16 67,549.99 55,266.55 65,580.68 37,575.30 82,844.37 39,686.07 70,790.10 109,339.63 50,338.64 58,646.80 62,056.94 162,188.16 66,630.89 63,051.43 93,932.27 55,664.77 31,845.24 59,545.58 74,198.00 90,443.18	$\begin{array}{c} 196, 185.12\\ 122, 087.57\\ 226, 411.56\\ 220, 743.12\\ 253, 706.01\\ 115, 640.00\\ 178, 904.99\\ 270, 762.34\\ 215, 069.41\\ 199, 040.31\\ 133, 094.31\\ 175, 046.07\\ 228, 284.70\\ 186, 986.91\\ 272, 449.35\\ 206, 019.90\\ 269, 072.21\\ 150, 122.92\\ 169, 521.63\\ 237, 077.11\\ 132, 086.65\\ 254, 676.05\\ 130, 764.04\\ 161, 902.26\\ 224, 762.22\\ 128, 606.97\\ 217, 284.07\\ 355, 939.29\\ 331, 982.03\\ 177, 639.66\\ 178, 834.46\\ 197, 429.08\\ 138, 687.09\\ 178, 914.26\\ 133, 019.50\\ 213, 401.42\\ 166, 742.13\\ 222, 719.54\\ \end{array}$
Palo Alto. Plymouth. Pocahontas. Potkawattamic. Pottawattamic. Potweshiek. Ringgold. Sac. Scott. Scott. Shelby Sioux. Story. Tama. Taylor. Union. Van Buren. Wapello. Warren. Washington. Wayne. Webster. Winnebago. Wodbury. Wordbury. Wordbury. Wordbury. Wordbury. Wordbury. Wordbury. Wordbury. Washigton. Wash	30,754.80 65,023.47 10,256.63 103,299.22 120,022.05 57,083.13 10,463.07 32,016.23 31,989.60 42,347.77 28,916.46 45,128.17 61,980.28 22,385.12 10,115.41 26,583.25 20,598.88 26,662.84 22,622.04 41,994.43 29,662.55 11,516.59 66,462.52 43,650.00 20,146.80 9,467.71 \$3,275,857.93	35,471.57 60,455.90 65,472.22 87,372.09 108,140.35 56,981.36 21,951.40 42,865.46 18,001.42 50,945.35 57,547.48 49,198.23 55,251.98 27,969.36 45,988.36 32,592.78 43,832.58 47,317.30 35,398.80 27,887.08 52,119.26 21,201.98 70,700.72 46,265.35 15,554.87 47,394.60 \$4,886,788.82	69,782.18 72,566.49 58,606.06 50,775.50 92,809.17 90,846.45 25,755.20 65,894.25 20,930.59 66,464.23 63,052.30 59,630.43 148,141.07 38,722.59 29,333.64 41,417.49 58,645.43 69,325.16 41,287.88 42,089.26 29,521.80 15,130.43 56,089.80 38,663.59 17,432.05 51,574.30	84,484.99 105,804.21 64,552.72 103,157.02 173,267.31 135,171.69 62,077.34 91,778.57 46,042.99 55,159.39 97,930.24 30,473.08 113,882.54 71,556.19 69,681.53 71,151.45 55,313.11 31,925.18 88,690.41 69,626.18 44,469.97 29,303.72 84,806.37 85,177.16 22,213.84 59,833.23	220,493.54 303,850.07 198,887.63 344,603.83 494,238.88 340,082.63 120,247.01 232,554.51 116.964.60 214,916.74 247,446.48 184,419.91 379,255.87 160,633.26 155,118.94 171,744.97 178,390.00 175,230.48 187,999.13 181,596.95 155,773.58 77,152.72 278,059.41 213,756.10 75,347.56 168,269.84 \$20,877,775.82

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IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 9.

Road Construction-County Expenditures-Annual Reports of County Engineers.

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County	Permanent Work	Temporary Work	Repairs	Maintenance	Equipment and Unused Material	Special Cases, Railway Cross- ings, Gravel Pits, etc.	Total	
Adair	\$ 684.45		\$ 5.070.94	5 7.748.70	\$ 5.113.51	\$ 753.31	\$ 19.370.91	10
Adams		\$ 3.304.02	3.901.82	2,292,89	474.81	30.00	10.003.54	2
Allamakee	4,687,50	6.329.29	12,460,47	1.942.11	5,619,97	1.915.45	32,954.79	1
Annanoose		· · · · · · · · · · · · · · · · · · ·	6,604,14	4,354,20	1.607.81	744.69	13,310.84	
Auduhon	12,988.11	972.00	7,116.63	3,763.85	851.29	245.50	25,937.38	- 2
Benton	7,346.91	13,707.75	8,892.33	3,776.26	6,864.74	657.01	41,245.00	
Black Hawk	19,671.06	7,984.37	4,080.10	7,244.55	3,652.28	340.22	42,972.58	5
Boone	19,687.78	2,920.78	1,315.96	5,897.23	7,698.26	3,065.17	40,585.18	-
Bremer	7,044.05	4,988.11	1,721.03	3,349.64	3,348.38	586.26	21,037.47	1
Buchanan	5,317.64	5,275.04	9,359.32	4,423.79	189.20	3,052.64	27,618.63	H
Buena Vista	134,574.94		4,554.53	7,145.74	1,373.60	8,513.65	156,162,46	3
Butler	5,271.74	5,381.42	12,298.91	10,246.71	8,978.95	311.69	42,489.42	9
Calhoun	58,588.21	3,114.75	1,426.18	4,888.87	2,407.45	5,030.45	75,455.91	
Carroll	39,152.70	7,470.98	3,663.90	2,961.62	809.66	1,510.32	55,569.18	C
Cass	3,336,42	281.85	7,329.65	5,668.82	571.68	91.60	17,280.02	Ċ
Cedar	11,886.37	11,565.66	2,686.11	6,573.82	724.01	911.75	34,347.72	TX1
Cerro Gordo	77,092.27	418,86	6,533.04	6,152.56	1,257.73	6,895.48	98,349.94	N
Cherokee	21,600.04	1,064.25	4,007.55	2,905.30	361.90	2,694.70	32,633.74	E
Chickasaw	6,514.85	6,566.91	5,234.05	3,509.07	1,681.28	313.95	23,820.11	9
Clarke		2,354.88	1,199.55	2,926.36	1,068.14	840.17	8,389.10	ž
Clay	118,167.02	********	2,805.69	5,003.49	1,668.20	14,720.49	142,364.89	C
Clayton	6,741.28		2,195.77	16,031.04	3,135.91	232.56	28,336.56	2
Clinton	14,104.14	7,066.21	3,680.78	5,190.78	2,784.17	1,544.05	34,370.13	
Crawford	144,152.60		9,989.45	5,895.52	1,449.32	4,640.07	166,126.96	
Dallas	20,699.41	8,264.82	665.13	6,681.94	1,743.67	3,851.47	41,906.44	
Davis		5,122.97	3,871.49	2,823.52	679.68	340.91	12,838.57	
Decatur	8,775.98	2,167.49	387.00	11,204.33	2,155.72	3,939.72	28,630.24	
Delaware	18,385.27	6,211.09	6,326.05	4,622.37	2,227.63	509.95	38,282.36	
Des Moines	2,892.27	2,670.29	578.39	4,070.37	981.58	1,270.80	12,403.70	
Dickinson	104,098.50	3,947.08	1,108.72	9,938.59	2,506.26	6,214.28	127,813.43	
Dubuque	93,657.21	2,629.84	23,981.42	2,551.00	3,752.64	3,202.89	40 148 48	
Limmetarrenterrenterrenterrenterrenter	30,500.39	\$5.00	3,842.41	5,902.19	1,527.95	3,407.34	93,140.40	

			1000	× 207 10 .	3 811 79 1	2,188.88	35,706.07	
and the second s	11.785.68	9,062.58	2,649.84	6,207.30	6 525 19	520.00	34,936.64	
Fayette	11 533 08	3,092.75	8,428.97	4,830.05	2 432 66	2.041.68	43,489.90	
Floyd	17 827 24	11.177.75	5,567.91	4,442.00	1 061 10	3 581 03	32,370.83	
Franklin	2 017 22	13.068.33	5,632.84	5,108.21	1,903.10	560.04	37 208 71	
Fremont	3,017.54	5 357 44	1,753.08	5,849.36	5,682.11	300.04	22 200 43	
Greene	18,000.08	4 411 50	14.579.32	3,011.56	2,199.69	2,280.71	21 066 66	
Grundy	5,820.50	4,411.37	7 510 03	5 391.06	2,177.66	1,084.18	23,900.00	
Cuthele	509.94	7,293.19	7,510,05	5 733 50	5.767.86	14,565.05	78,615.65	-
Guthrie	45,398,11	1,556.57	5,594.50	0,014,50	4 444 80	4,741,51	49,277.27	5
Hamilton	23 004 65	3,622.30	4,449.51	9,014.50	2 507 04	2 942 77	59,210,25	3
Hancock	42 617 63	2.056.07	1,105.93	5,890.81	3,397.04	2 064 36	32 071 00	Z
Hardin	45,017.05	13 373 87	9,415.11	3,697.34	920.31	5,004.50	12 773 05	G
Harrison	1,600.01	012 64	5 381 76	5.112.04	1,175.52	255.09	10,770.00	3
Hanry	1,037.00	813.04	075 53	1 782 58	964.19	3,320.80	18,333.38	H
Hamand	9,826.69	1,463.59	975.55	2 222 25	352.88	239.00	32,480.95	
Howard	24,600.87	1,678.95	2,280.90	5,522,55	1 376 69	388.00	20,187.48	H
Humboldt	649 35	8,241.74	5,398.92	4,132.78	1,075,65	2 407 43	22.081.35	111
Ida	E 413 36	3,387,95	5,207.61	4,639.35	1,025.05	2 707 02	32 657 28	E H
Iowa	10,410,00		11,615.00	4,478.86	1,770.82	2,703.92	62 086 75	č
Tackson	12,000.00	6 521 52	8.010.42	5,062.94	2,622.41	3,740.32	03,000.7.5	Ť
Tasner	37,123.14	0,501.50	2 928 62	8 236.70	2,826.94	6,008.23	24,431.50	-
Tefferson	51.55	3,4/9.40	FOIDE	5 260 06	2.862.06	1,749.60	37,790.48	10
Tehnson	14,975.64	7,129.57	3,610.33	6 1 30 51	1.657.24	610.95	36,947.26	0.
Johnson	4.532.89	5,821.72	18,184.95	2,025,00	1 480 00	216.98	14,892.67	0
Jones	361.16		8,898.73	3,925.90	1 502 60	24 974 79	100.669.29	ž
Keokuk	44 252 57	7,186.30	11,479.49	11,2/3.54	1,502.00	446.75	31 185 54	
Kossuth	0.500.66	8,121,97	2,526.57	9,165.93	1,333.00	0.205-00	21 292 00	0
Lee	9,390.00	594 72	16.884.65	10,103.95	1,165.23	2,323.28	10 227 40	č
Linn	309.20	6 561 19	1 731 05	3,242,50	2,962.73	1,128.03	19,037,40	ē
Louisa	3,711.31	2 045 99	6 672 17	3.084.24	1.379.54	1,265.87	20,037.07	5
Lucas	1,689.37	3,943.00	12 115 05	2 380 91	5,131,48	289.84	50,613.27	100
Lyon	7,307.23	23,388.70	0 445 70	3 976 97	4,185,15	1,407.13	23,832.89	10
Madison		11,917.94	2,445.70	5,070.57	4 075 06	412.00	38,468.16	
Madison	17.390.36	3,808.40	6,276.87	5,005.47	4 100 61	2 075 20	26,422.96	in the
Manaska	1.051.49	8,285.71	4,497.75	5,503.11	4,109.01	5 571 86	63 539 52	1
Marion	33 090 54	4,146,24	11,686.95	4,354.99	4,00/8.04	1 577 00	20 433 16	-
Marshall	0 107 80	421.60	7,451.56	2,361.65	482.65	1,527.90	26 414 12	8
Mill5	0,107,00	2 748 95	3.679.75	3,333.29	8,097.35	1,387.00	20,414,12	5
Mitchell	7,107.70	10 227 04	3.360.42	3,431.73	1,644.75	2,502.29	32,0,9.8/	
Monona	10,938.64	0 504 45 1	7 079 04	4,499,61	1,892.05	5,835.16	35,862.68	1
Montgomery	8,052.37	0,301.43	6 668 80	3 342 65	2,643,48	1,599.50	19,563.78	12
Montoe	1,017.60	4,291.00	0,000.05	5 045 03	1 367 94	2,205.96	40,431.79	5
Muzentine	26,820.42	2,262.93	2,728.61	4 402 99	1 580 58	1.507.45	37,421.94	0.
O'Delen	24,599,25	1,550.96	3,119.84	4,405.00	170 84	3 400 87	37.036.73	
Orecele	27.680.84	*********	1,338.50	4,243.02	055.02	2 470 23	28,620,38	
Osceola	15 826 96	2,372.52	2,070.84	4,914.91	933.96	2 547 20	50 511 85	
Page	46 286 20	216.00	1,665.49	5,214.04	2,382.83	6 010 66	21 702 14	
Palo Alto	TUJACOLAG	3.982.49	4,808.62	4,733.97	1,257.40	0,919.00	24,706.17	
Plymouth	40 224 47	892.23	6,451.06	3,243.93	6,324.55	8,578.50	14,/14./4	60
Pocahontas	11, 500.00	Uransu	2,598,78	17,170.06	5,852.19	18,768.72	158,890.71	01
Polk	114,500.90	14 847 71	12,747,18	11,086.23	5,071.49	1,860.60	47,177.09	01
Pottawattamie	1,504.48	14,047.73	Carle Martin	10103				

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WA STATE UI

SUMMARY	TABLE	NO. 9	-Continued
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County	Permanent Work	Temporary Work	Repairs	Maintenance	Equipment and Unused Material	Special Cases, Railway Cross- ings, Gravel Pits, etc.	Total
Poweshiek	1,991,94	10,762.99	6,958.12 1,313,53	4,460.51	2,609.10	786.04	25,576.76
ac	50,562.56		1.445.21	2 187 78	1 417 20	858.41	12,731,27
cott	10,461.20	5,900.10	3,231,76	3 547 38	6 177 77	4,800.30	60,419.15
helby	*********	6,060.00	8,182,29	4.055.41	956.75	1,1/4.10	30,492.31
ioux	2,746.27	5,887.27	4,796.82	2,549,93	4 769 61	3 /006 52	18,354.45
tory	30,648.26		3,093.66	8,947.31	1.620.85	3 238 34	43,890.92
1ma	26,222.68	7,484.98	11,714.76	4,603,06	3,416.82	2 380 34	55 927 64
ylor		3,642.35	6,225.01	2,899.66	1.235.37	0,000,04	14 002 30
nion	*********		4,687.98	2,269,71	1,130,43	50 50	9 147 62
in Buren		3,295.40	2,256.67	3,598.85	3,859,16	2 331 27	15 332 35
apello	8,520.02	1,266.40	3,558.00	4,174.39	4,577,71	2.061.78	24 158 30
arren	5.10	5,777.77	2,087.88	6,141.83	3,669,99	583.67	18 266 24
asnington	5,998.89	8,264.20	13,535.60	13,855.90	6,144,22	366.47	48 165 28
ayne	**********	2,909.14	1,572.90	8,649.80	2,061.64	910.50	16 103 98
coster	13,921.59	13,381.26	2,820.85	6,549.00	3,470.50	3,703,55	43,846,75
innebago	47,515.08	1,478.26	3,503.02	3,706.60	1,701.76	903.94	58,808,66
andhury	1,838.98	12,750.33	8,723.57	5,931.32	2,165.43	699.89	32,109,52
orth	25,443.05	2,446.40	11,822.72	5,216.93	664.42	5,943.09	51, 536, 61
right	3,240.05	9,083.73	2,171.48	2,800.74	1,258.14	381.83	18,935,97
	42,792.51	5,948.26	4,614.09	3,167.12	3,469.07	3,053.41	63,044.46
Totals	\$2,028,625.08	\$ 477,616.13	\$ 562,245.39	\$ 525,805,19	\$ 264,192.98	¥ 291 955 70	21 140 240 56

SUMMARY TABLE NO. 10.

Classification of Permanent Road Construction-County Expenditures-Annual Reports of County Engineers.

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County	Built to Finished Grade. 3-A Grade. 3-B		o Temporary ade. 3-B	Permanently Sur- faced. 3-C		Tile Drain- age. 3-D	Special Cases	Total	
	Miles	Cost	Miles	Cost	Miles	Cost	Cost	Cost	Total
Adair. Adams. Mlamakee. Appanoose. Vuduhon. Senton. Black Hawk. Boone. Fremer. Buchanan. Suchan. Suc	2.39 3. 2.50 5.08 1.50 2. 75.75 5. 39.6 13.25 1.75 3.869 46.72 16.25 6.5 80.65 5.95	\$ 4,687.50 11,197.81 6,799.00 2,025.04 2,424.14 2,131.95 94,021.54 4,537.50 32,979.24 36,249.18 3,219.87 10,292.79 42,640.64 20,125.80 3,723.51 	.20 1. 	\$ 514.82 	 5.08 16. 1. 4. 29.31 14.65 .5 7.1 5.25 7.1 5.25 33.10	\$ 17,011.12 16,427.31 1,773.21 2,494.33 32,230.60 24,195.75 688.30 1,093.48 31,846.26 1,372.30 25,319.44 7,830.24	\$ 169.63 	\$ 19.75 1,611.67 1,000.00 113.10 25.00 135.69 898.90 6.741.28	\$ 684.45 4,687.50 12,988.11 7,346.91 19,671.06 19,687.78 7,044.05 5,317.64 134,574.94 5,571.74 39,152.70 3,336.42 11,886.37 77,092.27 21,600.04 6,514.85 118,167.02 6,741.28
allas	41.52 6.97	144,152.60 9,861.15			12.25	9,740.45	818.81	355.09	14,104.14 144,152.60 20,699.41
catur. Iaware. 5 Moines. ckinson. buque.	8.1 4. .37 40.89 4.25	7,869.61 12,407.78 1,541.00 45,984.14 13,358.27			5.5 .5 38.89 1.95	5,785.21 115.73 50,380.25 42,650.85	906.37 192.28 697.24 5,646.88 3,745.62	538.30 2,087.23	8,775.98 18,385.27 2,892.27 104,098.50

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 10-Continued.

	Built to Grad	Finished le. 3-A	Built to Grad	Temporary de. 3-B	Perman	mently Sur- ed. 3-C	Tile Drain- age. 3-D	Special Cases	Total	
County	Miles	Cost	Miles	Cost	Miles	Cost	Cost	Cost		
Emmet. Fayette. Floyd. Franklin. Fremont. Greene. Grundy. Guthrie. Hamilton. Hancock. Hardin. Harrison. Henry Howard. Humboldt. Ida. Iowa. Jasper. Jefferson. Johnson	16.55 2. 4.5 8.5 1.5 10.75 3. 12.75 6.08 21.62 2.25 .5 3. 2.375 2.5 9.25 8.5 1.11 16.5 .34 2. 7.5	15,894,47 10,402,88 4,821,35 13,405,00 3,117,32 8,892,45 5,012,65 118,810,20 8,338,48 19,244,45 1600,01 1,037,00 4,905,05 10,984,40 4,905,05 10,984,40 4,905,05 10,984,40 11,976,90 10,12,50 11,976,90	 	180.30 2,345.68 16,372.14 1,004.60 1,568.00 815.00	20.11 1.75 3.5 1.5 21.17 11.25 25.82 7. 	20,369.65 1,070.14 4,786.86 2,697.35 	802.27 412.66 1.788.37 1.093.78 4.093.78 448.69 5.875.34 6.268.31 127.44 2.575.96 4.917.61 125.55 1.27.59 4.917.61 125.55 1.35 137.10 1.286.05 674.97 51.55 1.131.94 297.54 361.16 2,600.68 77.24 309.26 528.01 121.37	6125 6125 929.87 524.00 1,640.76 1,182.36 357.35 15.00 811.14	36,566.39 11,785.68 11,533.08 17,827.24 3,017.32 18,006.68 5,820.56 509.94 45,398.11 23,004.65 43,617.63 1,600.01 1,037.00 9,826.69 24,600.87 649.35 5,413.36 12,088.68 37,123.14 51.55 14,975.64 4,532.89 361.16 44,252.57 9,590.66 309.26 3,711.31 1,689.37 7,307.23 	OWA STATE HIGHWAY COMMISSION
Marion Marshall Mills	.25 12.9	z 520.00 z 499.54	25.	404.20	4.36	5,279.60	127.29 301.40	421.09	1,051.49 33,080.54 8,187.80	

Mitchell	1 2.5	1 810 42		1		and the second			
Monona	8.45	10 049 50	1 50	111111111	2.3	1,758.87	4,051.19	518.30	7 167 78
Monroe		10,019.00	4.50	1 017 60		*********			10 018 64
Montgomery	1	6744 52	.15	1,017.60					1 017 60
Muscatine	1 10.00	0,744.54	2.	1,307.85			12.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		1,017.60
O'Price	10.90	24,527.58			1.16	1 505 60	1 251 24	***********	8,052.37
O briefland and a state of the	17.91	20,178.49	.75	1.233.29	1		1,001.24	1,340.00	26,820,42
Osceola	12.9	14 944 18	10.5	10 102 01		*********	3,187.47		24,509.25
Page	27	0 107 00	10.5	12,185.91			550.75		27 600 04
Pala Alto	4.1	8,127.02	.5	7,661.13		100 C	20.01	**********	27,080,84
and Altomation and and and and and and and and and an	41.55	39,733.69					00.01	**********	15,826.96
Plymouth		and the second second	CONT			*********	3,005.22	3,547,29	46 286 20
Pocahontas	26.6	00000 20	*****	*********	*****			- terminer	101-001-00
Dall	30.5	29,903.32	*****		17.	14 670 03	4 501 10	**********	
Folk	7.36	38,292.25	*****	Salar Barry	6.05	71,070,05	4,391.12	**********	49,224,47
Pottawattamie			50	201.00	0.05	13,182.50	213.44	2,812,71	114 500 06
Poweshiek			.30	301.06	1.01	1,263.42	*******		114,500.90
Dingentld			*****		10000	and the second second		**********	1,564.48
Kinggold			1 75	1 001 04			**********	**********	
Sac	35.93	38 587 09		43771.74	*****	*********	***********		1 001 04
Scott	1 1 2	30,307.90	*****		9.23	9,440.97	2 533 61		1,791.94
000111111111111111111111111111111111111	4.5	8,487.08	.5	298.25	72	1 175 97	500.00	**********	50,562.56
Shelby			1000		1	4347 3-07	500.00	***********	10,461.20
Sioux	1	2 7 20 02			*****	*********			
Story	10.05	6,7 67.06	*****	*********	*****		17.25		
	34.43	19,992.91			16	8 163 36	2 401 00	***********	2,746.27
1ama	6.08	23;528.99		1 Stores 197	75	0,100,00	2,491.99	**********	30,648.26
Taylor					./3	2,693.69			26 222 68
Union				*********			- management		a0,000.00
Van Duran	*****		*****					*********	**********
Vali Durchererererererererer		*********			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		**********	**********	*********
Wapello	1.5	3,788.98	15	7 500 04		*********			
Warren		- rouse	4	3,399.99	.30	1,023.00	108.10	Construction in the same first	0 500.00
Washington			*****		*****		5 10		6,520.02
Wayne	1.	5,908.08					5.10	**********	5.10
wayne	*****			States and			90.81	**********	5,998.89
Webster	7.1	9 270 00			*****	*********	***********		
Winnebago.	14 70	13,243.04	*****	*********		*********	4 650 60		11 0 0 0 00
Winnechiel	14.75	41,341.06	3.25	4,839.50			1 224 50		13,921,59
Winnesmek	.5	597.63				********	1,334.52	***********	47,515,08
woodbury	15.	24 704 76	22	201.00	*****	********		1.241.35	1 838 08
Worth	3	1 104 77	- 40	393.60	.15	344.69			05 442 05
Wright	25	1,194.75	*****	*********	1.75	562.65	23 695 7	**********	23,443.05
	43.	16,643.91	*****		35	23 107 73	1,406.03	Torthereses.	3,240,05
755					001	23,197.75	2,950.87		42,792,51
Totals	879.97	\$1.238 077 04	40.00	A 20.242.00	1000000				A A A A A A A A A A A A A A A A A A A
		110000111.04	40.00	\$ 70,347.30	411.54	\$ 548,159.70	\$ 106,756,67	\$ 64 797 AT	62.030 (21 44
	_	1				St. Concernation	a seal and	· ····	\$2,028,625.08

ANNUAL REPORTS OF COUNTY ENGINEERS

SUMMARY TABLE NO. 11.

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Classification of Temporary Road Construction-County Expenditures-Annual Reports of County Engineers.

	Built to Grade	Natural s. 2-A		Oi		Special Cases		
County	Miles	Cost	Miles	Average Width Oiled	Average Cost Per Mile	Total Cost	Cost	Total
Adair								*******
Adams	22.25 18.19	\$ 3,304.02 5,149.06	2.75	16 ft.	\$ 429.18	\$ 1 180 23		\$ 3,304.02 6.329.29
Appanoose.	*							
udubon	9.	972.00	*******					972.00
enton	41.	4,534.02	68.50	15 ft.	128.92	9,173.73		13,707.75
lack Hawk	31.25	7,984.37						7,984.37
oone	29.75	2,920.78						2,920.78
remer	47.50	4.988.11				*******	*********	4,988.11
uchanan	31.25	5,276.04			*******		*********	5,276.04
uena Vista				*******			*********	
utler	33.	5,381.42						5,381.42
alhoun	57.50	3,114.75	*******	·····				3,114.75
arroll	35.25	7,470.98	*******	*******		********	*********	7,470.98
ass	*******	281.85			*******		*********	281,85
edar	39.49	4,424.99	40.85	16 ft.	174.80	7,140.67	*********	11,565.66
erro Gordo	3.	418.86	*******		*******			418.86
herokee	8.	1,064.25					********	1,064.25
hickasaw	36.	6,566.91	*******		*******			6,566,91
larke	22.	2,354.88			*******			2,354.88
lay	*******	********	*******	*******			*********	*********
layton			*******		*******			
rewlord	14.7	1,616.97	17.1	16 ft.	318.70	5,449.24		7,066.21
alla	C2 10		*******					
Javia	03.50	6,204.82		*******	*******	*********	********	8,204.82
Decatur.	45.	5,122.97		*******		********	A 012 00	3,122.97
Delaware	42 5	6 211 00	*******	*******	*******	********	\$ 813.50	6 211 00
Des Moines	20.10	1.664.02	2.75	16 ft.	369.55	1.006.27		2.670.20

Dickinson	12.	2,531.36	1.9	16 ft.	458.33	1 815.87	1 599.85	1 3,947.08	
Duouque	13.	2,629.84						2.629.84	
Emmet	1.10	35.00						35.00	
Fayette	48.50	9,062.58	*******					0.062.59	
Floyd	*******			1			3 003 75	7,002.30	
Franklin	3.00	7 260 42	- Constant	Accession and			3,094.13	3,094.15	
Fremont.		12 007 69		*******		********	3,917.33	11,177.75	
Greene	20	13,007.08	*******	*******	*******	*********	60.65	13,068.33	
Grundy	67.	4,409.09	*******	*******	*******	**********	948.35	5.357.44	36
Catholic	41.	4,411.59	*******				a service and	4 411 50	5
Guthrie	25.1	2,455.46	1.	18 ft.	600.00	600.00	4 238 22	7 202 70	1
Hamilton	9.13	1,556.57				000100	1,000,00	1,695,19	2
Hancock	19.25	2,825,55					200 mm	1,550.57	C
Hardin	26 375	2.056.02			*******	********	190.15	3,622.30	A
Harrison	24 75	12 272 07	*******	*******	*******		*********	2,056.07	E
Henry	12	13,313.81	*******	*******	*******	*********		13,373,87	2
Howard	14	813.64	*******	*******				813.64	H
Humbolds	12.	1,463.59	Sec					1 463 50	E
Ta	13.50	1,678.95						1.679.05	1
Aua	*******	********					8 241 74	2,0/0.92	C
Iowa	9.25	3.387.95			*******	*********	0,641.74	8,241,74	H
Jackson	********	-j-04.55	******	*******	*******	*********	*********	3,387.95	-
Tasper.	48	A 606 70	2.75		*******	*********	*********	********	to
Tefferson	27.25	9,000.78	3.75	21 ft.	489.26	1,834.74		6.521.52	
Tohnson	46.6	2,2/0.40	3.75	18 ft.	320.80	1,203.00	********	3 479 46	0
Johnson	40.0	7,129.57	*******	*******				7 120 57	1
Jones	8,	576.00	26.	16 ft.	201.76	5.245.72		2 031 73	
Keokuk	*******	********	*******		and the second s		*********	0,041.14	0
Kossuth	47.	7,186.30					TTABAPTARK	********	0
Lee	41.	4,300,60	12.50	14 60	207.01		********	7,186.30	G
Linn	*******	-leaded	2	14 16.	305.71	3,821.37	********	8,121.97	Z
Louisa	36.25	2 002 08	17.00	24 It.	297.36	594.72	*********	594.72	H
Lucas	45.50	4 001 00	17.88	16 it.	244.33	4,468.20		6,561.18	K
Lyon	50 50	9,001.88		*******		*********	1,944,00	5 945 99	
Madison	39.30	23,110.40	*******				272.30	72 200 74	5
Mahaska	34,00	4,154.83	*******		*******		7.763.12	11 017 04	- Z
Marian	34.375	3,808.40		*******			. proversa	7 808 40	0
Marion	51.8	8,283.71	*******					3,808,40	
Marshall	43.25	4,146.24		100100000			********	8,285.71	1
Mulls	2,	421.60			*******	********	*********	4,146.24	E
Mitchell	25.5	2,748.95					********	421.60	E
Monona	62.70	8,552,53		*******	********	*********	*********	2,748.95	R
Monroe		Cingerand		*******	*******	********	1,774.51	10.327.04	20
Montgomery	75	8 504 45			*******	********	4,291.66	4,291.66	
Muscatine	15.07	1 052 63		*******	*******	********	********	8 504 45	
O'Brien.	14	1,200.05	5.00	10 ft.	201.86	1,009.30		2 262 02	
Osceola	14,	1,000.96	*******	*******	*******			1,006.93	
Page	*******	*********	*******	*******				1,550.96	
Data Alta	21.	2,372.52	*******				*********	**********	160
raio Alto	1.5	216.00					********	2,372.52	6
							*********	216.00	and .

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 11-Cintinued.

	Built to Grade	Natural e. 2-A		Oil	Special Cases			
County	Miles	Cost	Miles	Average Width Oiled	Average Cost Per Mile	Total Cost	Cost	Total
Plymouth. Pocahontas. Polk	4, 13, 95, 37, 35,25 16, 61, 52,5 73, 38,25 19,75 10, 90,75 55,3 22,75 61,5 8, 30,9 28, 15,25	3,982.49 892.23 14,847.71 8,887.27 4,473.76 	8.00 	16 ft. 16 ft. 19 ft.	234.46 	1,875.72 5,223.18 297.00 125.00	393.52	3,982.49 892.23 14,847.71 10,762.99 4,473.76 5,900.10 6,060.00 5,887.27 7,484.98 3,642.35 3,295.40 1,266.40 5,777.77 8,264.20 2,909.14 13,381.26 1,478.26 12,750.33 2,446.40 9,962.25
Totals	2,490.66	\$384,622.91	232.58	······	\$ 327.80	\$ 51,063.96	\$ 41,929.26	\$477,616.13

SUMMARY TABLE NO. 12-PART I.

Road Repairs and Maintenance-County Expenditures-Annual Reports of County Engineers.

	Maintenance										
County			Repairs by Patrolmen								
	No. of Miles Regularly Dragged	Average No. of Times Dragged	Average Cost Per Mile of Road	Average Cost Per Mile One Round Trip	Total Cost of Dragging	No, of Miles in County Road System	No. of Patrol Districts in County				
dair dams	172 125 116 164 140 206 167 157 126 175 170 175 170 175 171 173 140 120 149 144 144 114 150 199 184	23.33 26.20 18.00 35.0 35.0 12.22 31.0 31.0 31.0 35.0 16.4 24.3 19.0 31.7 31.0 31.7 31.0 35.0 43.6 28.3 25.0 18.0 36.0 17.0 38.5 28.46	\$ 16.32 18.34 16.18 26.32 24.44 18.33 24.18 23.21 26.06 9.84 18.21 14.24 27.77 17.12 27.70 32.71 25.31 20.17 14.40 25.67 14.06 26.06 21.35	\$.70 .90 .75 .70 .75 .75 .75 .75 .75 .75 .75 .75 .75 .75	\$ 2,845.09 2,202.89 1,942.11 4,354.20 3,495.40 3,776.26 4,038.53 3,349.64 1,775.28 3,097.06 2,555.42 4,748.72 2,961.62 3,876.74 3,925.36 3,771.25 2,905.30 2,102.93 2,926.36 2,151.04 5,890.95 3,927.78	172.0 126.7 116.0 166.5 140.0 211.0 186.4 157.0 125.5 175.4 170.3 174.7 173.6 175.0 142.5 158.3 151.9 153.5 156.5 114.0 150.0 199.3 195.5	30 3 13 4 5 5 6 12 4 37 4				

ANNUAL REPORTS OF COUNTY ENGINEERS

SUMMARY TABLE NO. 12-PART I-Continued.

...

	Maintenance											
County			Dragging			Repairs by Patrolmen						
	No. of Miles Regularly Dragged	Average No. of Times Dragged	Average Cost Per Mile of Road	Average Cost Per Mile One Round Trip	Total Cost of Dragging	No. of Miles in County Road System	No. of Patrol Districts in County					
Decatur Delaware Des Moines Dickinson Dubuque Emmet Flayette Flayette Flayette	152 170 81 100 152 101 202 142 150	39.0 35.00 22.0 60.9 21.0 26.0 32.92	30.58 27.18 28.00 48.74 16.81 13.18 14.26 24.69	.\$0 .76 .75 .80 .80 .80 .80 .75	4,901.06 4,622.37 2,308.97 4,873.96 2,551.00 1,331.67 3,025.01 3,509.54	152.0 175.8 81.5 106.4 172.5 103.5 202.0 142.2	5 6 11 5 18 4					
Fremont Greene. Grundy Guthrie Hamilton Hancock. Hardin.	150 129 158 194 160 163 - 174	24.4 25.2 15.3 32.0 35.0 25.0	20.70 17.07 18.82 27.78 35.83 28.36 20.85	.70 .70 .75 .80 1.00 .75	3,932,19 3,102,91 2,202,03 3,011.56 5,391.06 5,733.50 4,623.05 3,640.28	185.0 154.4 132.5 158.0 196.0 177.4 164.6	1 . 6 8					
Harrison Henry Howard Humboldt Ida Iowa	167 140 120 125 132 171	31.0 26.0 16.54 23.0 19.0 57.99	22.14 36.52 14.76 26.57 19.92 26.77	.70 .70 .75 .80 .80 .80	3,697,34 5,112,04 1,782,58 3,322,35 2,629,27 4,639,35	174.3 168.0 142.3 122.3 131.5 132.0 171.0	13 3					
Jasper. Jefferson Johnson Jones. Keokuk Kossuth.	205 141 157 175 168 279	39.0 18.0 20.0 26.3 30.0 26.5 33.4	29.85 24.70 29.43 33.29 21.67 18.58 28.43	.75 .70 .75 .75 .70 .85	4,478.86 5,062.94 4,150.71 5,260.06 3,792.00 3,288.65 8,160.27	157.5 205.0 141.3 157.0 185.5 167.8 279.5	13 7 5 3 5					

Lee	150	50.5	35.35	1 .70	5.317.55	150.0	1 8	
Linn	212	32.47	32.47	1.00	6.883.68	218.8	19	
Louisa	111	20.0	20.10	80	3 242 50	112.0	13	
Lucas	159	28.0	10.52	.00	2 004 24	112.0	****	
Lyon	107	40.0	19.36	.70	3,084.24	147.0	6444	
Madian	10/	11.11	10.90	.75	2,038.51	188.5	110.1	
Madison	162	15.0	23.49	.78	3,876.97	162.0	2000	
Manasza	152	23.0	36.88	.80	5,605.47	154.3	1000	
Marion	167	26.0	32.37	.77	5,503.11	166.8	1	24.
Marshall	170	32.0	25.61	75	4 354 99	188.8		A
Mills	84	16.0	27 32	20	2 204 88	110.0	0	Z
Mitchell	130	27.5	20.62	75	2,690,50	120.0	0	Z
Monona	162	26.5	21.10	./ 3	2,000.39	169.6	1	C
Monroe	140	22.00	21.18	.80	3,431.73	101.5	6424	10
Montgomen	149	23.00	17.35	.75	2,585.02	167.5	5	F
Montgomery	12/	41,37	28.96	.70	3,677.53	126.7	4	-
Muscatine	136	43.3	31.73	.75	4,318.73	140.5	9	Ħ
O'Brien	190 190	20.0	15.07	.75 .	2,864,68	187.5	5	Ŧ
Osceola	125	24.0	18.02	.75	2,252.87	132.0	i	F
Page	174	19.0	27.98	1.50	4 914 91	174.0		ŏ
Palo Alto	156	24.0	10.60	75	2 740 89	166.9	7	H
Plymouth	208	25.0	32.44	80	3 802 47	208.5	4	S
Pocahontas	161	21.45	20.15	87	3 241 07	160 E	1	10
Polk	186	41.70	41.70	1.00	2 001 00	106.3		
Pottawattamie	254	16.63	77.47	1.00	7,921.98	185.8	10	0
Poweshiek	129	30.03	02.50	./3	7,857.98	254.0	8	1
Ringgold	100	20.0	23.59	.80	3,727.76	1,38.3	1	
Sac	100	34.02	17.01	.50	3,113.63	183.8	3	0
Scott	130	18.0	14.58	.75	2,187.78	149.2		0
Shelby	130	15.0	25.55	.85	3,547.38	135.8	i i i i	G
Sions	158	37.0	25.35	.75	4,055.41	157.8		Z
Change	213	14.0	10.34	.75	2,200.12	216.0	2	F
Tama	132	25.0	31.36	.85	4,155.35	135.0	7	Y
Paula	207	21.0	16.48	.80	3,461.25	207.0	4	100
Taylor	172	27.0	16.11	.60	2,899.66	172.0	and the second	E
Union	161	20.0	14.01	.70	2.269.71	155.5		Z.
Van Buren	133	39.0	26.99	.70	3 589 85	133.3	10	P
Wapello	137	29.0	26.16	.80	3 812 84	137 1	10	17
Warren	165	21.0	29.10	70	4 801 48	170.0	0	4
Washington	184	26.0	42 32	90	7 797 09	102.5		10
Wayne	173	27.0	26.40	1.00	4 592 10	172.5	14	8
Webster	185	35.0	25.00	1.00	6 540 00	1/4.5	12	20
Winnebago	121	26.0	20.10	1.00	0,549.00	185.4		02
Winneshiek	202	20.0	20,10	./3	5,700.00	131.5		
Woodbury	212	30.0	63.33	.83	5,399.38	202.3	52	
Worth	101	20.0	23.44	1.1/	5,216.93	213.0		
Wright	101	25.0	18.75	.75	1,899.99	114.5	3	
	1/4	24.0	17.74	.75	3,167.12	173.5		
Totals	A.C. MAL				the second secon			10
	15,724	27.98	\$ 24.04	.774	\$377,932.77	16,084.8	485	6

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IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 12-PART II.

Road Repairs and Maintenance-County Expenditures-Annual Reports of County Engineers.

	-	Mainte	nance				Average Cost Per Mile	
		Repairs by	Patrolmen		Total Cost of Repairs Not	Total Cost of		
and a	Average Length of Patrol Districts	Average Monthly Salary Paid Patrolman	Average Cost per Mile Repair and Gen. Main. by Patrolman	Total Cost of Repairs and Gen. Main. by Patrolman	Done by Patrolman	Repair and Maintenance	Repair and Maintenance	
kdair kdair kdams klamskee hypnotow kento	5.81 46.0 7.9 7.9 7.9 7.5 16.6 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 10.0 10	\$130.00 150.00 150.00 125.00 125.00 125.00 125.00 125.00 125.00 100.00 130.00 130.00 125.00 1	\$ 28.13 1.88 19.06 14.11 14.71 17.75	\$ 4,903.61 328.45 3,229.65 2,429.65 2,446.51 4,646.68 7,601.29 140.15 1,2763.68 2,646.58 2,646.58 2,646.58 2,646.58 2,646.58 2,646.51 1,466.54 1,465.54 1,465.54 1,465.54 5,255.55 1,25	\$ 5,070,594 3,201,827 46,004,447 6,004,447 7,116,641 7,116,641 7,116,641 7,116,641 7,116,641 7,116,641 4,080,110 1,227,005 1,222,100 2,086,01 1,426,130 2,086,01 2,208,601 1,426,130 5,20,005,451 2,208,601,6001 2,208,6001,6001,6	\$ 12,219,64 4,194,71 14,047,18 14,058,34 10,058,34 10,058,34 10,058,34 10,058,34 10,058,34 10,058,34 10,058,34 11,058,34 11,007,22 25,954,62 6,055,50 10,059,91 12,059,91	\$ 74.33 40.98 124.152 124.152 124.152 124.152 125.05 125.0	

Delaware	0.000	1 /11111	1 100000 1	Contraction ()	6.326.05 1	10,948.42	62.27	
Des Moines	10.40	130.00	21.36	1,761.40	578.39	4,648.76	\$7.01	
Dickinson	9.1	125.00	50.65	5.064.63	1,108.72	11,097.31	103.83	
Dabuque		Taxaa.	anised.	according 1	23,981.42	26,532.42	158.23	
Emmet	20.2	125.00	26.04	2,630.52	3,849.41	7,811.60	75,47	
Favette	15.0	90.00	15.01	3,182.29	2,649,84	8.857.14	43.84	
Floyd	12.25	100.00	9.14	1.327.31	8.428.97	13,265,62	93.22	
Franklin	10.0	132.00	\$1.05	510.47	5 567 01	10/010.57	54.11	
Frament	4000	A	11.00	7 (005 10	5 612 44	10 741 05	61.00	
Contraction	20.5	110.0	57.00	3 647 11	1 051 10	2 402 44	27.17	
Ofeene	10.5	110.0	24.09	3,047+33	1,733.08	7,00,00,00	31.31	
Grundy	445724		bases i	CALLANDA.	14,579.32	17,290.88	111.3.8	1
Guthrie	444344		******		7,510.03	12,901.09	65.82	1.0
Hamilton	******		******	444,74744	5,594.56	11,328.06	63.85	
Hancock	17.7	128.00	31.03	4,391.45	4,449.51	13,464.01	81.79	
Hardin	13.4	110.00	12.81	2,241.53	1,105.93	6.996.74	40.14	
Harrison					9.415.11	15 112.45	78.05	
Henry			1000000		5 191 76	10,491 80	71.74	
Howard	*****				075 \$1	3 752 11	33.66	1
Hambalds	*****	111111	******		2/3.33	5,7 20, 11	43.26	
Lis	******	TTRIAN		8 535 58	2,030.90	5,0677.23	41.00	
Audianteressanterestations	44.0	150.00	11.39	1,30.3.51	2,398.92	9,231.79	16.21	2
10w2	******		******	********	5,207.61	9,846.96	27.58	
Jackson	******	******	******	2422444	11,615.00	16,093.86	102.18	
Jasper	Sectors.		4493.44	annexes.	8,010.42	13,073.36	63.75	
Jefferson	10.85	135.00	28.98	4,085.99	3,828.62	12,065.32	85.38	
Johnson	22.5				5,813.55	11.073.61	70.53	
Jones	36.8	100.00	12.75	2,347.51	18,184.91	34,324,46	131.13	
Keokuk	20.0	110.00	10.62	637.25	8 908 71	12,824,63	26.42	
Kossuth	57.4	150.00	10.85	3 113 27	11 470 40	22 753 01	81.05	
Lee	10.0	150.00	25.66	1 648 72	0.536.59	11 407 50	77 05	
Linn	15.0	441178	15 33	2 220 27	76 993 68	26 968 60	1 22, 24	*
Louing	11.0	******	13.00	3,203.21	10,884.85	20,703.00	1.00.04	
A	443377	4.4.1.9.2.8	*14***	. SXXXXXX	1,731.05	4,9/3.55	44,40	2
Lucasererererererererererererere	101130	111110	ABBEFR	AVALANCE.	6,672.17	9,756.41	60.37	2
Lyon		100018	******	242.40	12,115.05	14,395.96	76.37	6
Madison	******		+++++	*******	2,445.70	6,322.67	39.03	5
Mahaska	******			Antestes.	6,276.87	11,882.34	77.01	
Marion		******	******		4,497.75	10,000.86	56.47	3
Marshall					11,686.95	16.041.94	84.91	5
Mills	15.0	125.00	.56	66.77	7,451.56	9,813.21	89.21	2
Mitchell	3.5	120.00	186.48	652,70	3,679.75	7,013.04	54.26	0
Monona		1000000			3,360.43	6.792.15	42.06	
Monroe	18.00	112.50	8.43	757.63	A 697.89	10.011.54	59 17	
Montgomery	21.75	1/2.00	6.07	822.08	7 070 04	11 679 45	01.15	
Magaating	35.4	195.00	36.3	777.20	3,228,63	7 774 54	57.15	
O'Delas	10.4	120.00	8.10	1 530 35	2 270 02	2 161 70	33.19	
Oceant	00.0	10.00	8.10	1,009,20	3 220 66	C.100.70	42.09	
P	431994	150,00	15.30	1,376.73	1,038.90	3,364,18 c (a) br	96.30	3
Fagermannen	851558	8 049974	arear .	and a second sec	2,070.84	0,963.75	-90.15	

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 12-PART II-Continued.

	100	Mainte	nance				
		Repairs by	Patrolmen	1	Total Cost of	Tatal Cast of	Average Cost
County	Average Length of Patrol Districts	Average Monthly Salary Paid Patrolman	Average Cost per Mile Repair and Gen. Main. by Patrolman	Total Cost of Repairs and Gen. Main. by Patrolman	Done by Patrolman	Repair and Maintenance	Repair and Maintenance
Palo Alto	18.0	120.00	20.40	2,473.15	1,665.49	6,879.53	41.23
Plymouth	12.0	125.00	70.10	041.30	4,808.62	9,542.59	45.77
Pocanontas		120.00	26.12	0.040.00	6,451.06	9,694.99	57.53
Polk	12.13	120.00	30.13	9,248.08	2,598.78	19,768.84	106.42
Pottawattamie	35.75	130.00	11.28	3,228,23	12,747.18	23,833.41	93.83
Powesniek	20.0	130.00	30.04	136.15	6,958.12	11,418.63	82.56
Kinggold	61.0	123.50	4.0/	744.97	1,313.53	5,172.13	28.14
Sac				*******	1,445.21	3,632.99	24.35
Scott	******	******	3.4 + 3.4 *	*******	3,231.76	6,779.14	49.92
Shelby		111111		*******	8,182.29	12,237.70	77.65
Sioux	20.0	115.00	8.71	349.81	4,796.82	7,346.75	34.01
Story	18.93	150.00	36.16	4,791.95	3,093.66	12,040.97	89.23
Tama	20.0	125.00	14.27	1,141.81	11.714.76	16,317.82	78.83
Taylor		******			6,225.01	9,124.67	53.05
Union		******		*******	4,687.98	6,957.69	44.61
Van Buren	13.3			*******	2,256.67	5,846.52	43.93
Wapello	15.0	130.00	26.40	361.55	3,558.00	7,732,39	56.39
Warren	33.0	137.50	8.12	1,340.35	2,087,88	8,229,71	48.41
Washington	13.0	130.00	33.00	6,068.82	13,535,60	27,391,50	142.30
Wayne	14.0	130.00	23.51	4.067.70	1,572.90	10,222,70	59.26
Webster					2,820,85	9.369.85	50.55
Winnebago					3,503,02	7,209,62	54.80
Winneshiek	4.1	143.75	2,49	531.74	8,723,57	14,654,89	72 44
Woodbury					11.822.72	17.039.65	80.00
Worth	12.0	125.00	25.02	900.75	2.171.48	4.972.22	43.42
Wright					4,614.09	7,781.21	44.83
						+	
Totals	15.25	\$129.09	\$ 20.69	\$154,685.27	\$562,245.39	\$1,087,950.58	\$ 67.64

SUMMARY TABLE NO. 13.

Road Equipment and Material and Miscellaneous Items-County Expenditures-Annual Reports of County Engineers.

	Equipment and Material			Special Cases (MIScellaneous)								
County County Including Repairs to Same	Cost of Equipment Including	Cost of	Total	R. ings	R. Cross- Improved	Pi Gr	urchased avel Pits	Right	Drainage	Missel	Total Special Cases	
	Repairs to Same	to Material	10111	No.	Cost	No,	Cost	Way	ments	laneous		
dair	* 5 112 51		¢ 5 112 51								1. 1. 1.	
dams	474 81		474.81	**,			*******	e 20.00	*******	\$ 155.51	\$ 753.31	
lamakee	4 782 58	\$ 817 70	5 610 07			**	*******	1 022 00		01.67	30.00	
nnanoose	1 607 81	. 001.0%	1 607 91	0.4.4			*******	1,823.80	*******	91.05	1,915.45	
udubon	\$22.02	20.27	1,007.01	19.8	1.1.1.1.1.1.1	4.4.		50,20	*******	694.49	744.69	
anton	6 864 74	60.01	6 964 74		1.1.1.1.1.1.1.1	1995	*******	97.50	*******	198.00	245.50	
ack Hawk	3,652.20	*******	2,652,20	14.8	*******			*******	*******	657.01	657.01	
dCK HdWK	7 602 26		3,032.28	**	*******	1	\$ 100.00	********		240,22	340.22	
MIC	2 248 20	*******	7,698.20	264	*******	**	*******	783.00	\$ 1,403.56	878.61	3,065.17	
cheron	3,348.38	170.00	3,348.38		*******		497.11	89.15	*******		586.26	
achanan	10.00	179.20	189.20		*******	2	600.00	550.00	1,778.14	124.50	3,052.64	
iena vista	1,373.00	*******	1,373.60		********	3	1,180.00	50.00	5,308.24	1,975.41	8,513.65	
there	8,978.95	*******	8,978.95			I	311.69		*******	********	311.69	
inoun	2,1/9.65	227.82	2,407.45	1	\$ 669.90	4	2,828.80	352.20	1,179.55	*******	5,030.45	
irroll	809.66	*******	809.66					299.85		1,210.47	1,510.32	
ass	571.68	*******	571.68			1.1		91.60			91.60	
dar	724.01		724.01		********		*******	200.00	********	711.75	911.75	
rro Gordo	1,241.23	16.50	1,257.73		*******	3	1,379.67	130.55	1,013.61	4,371.65	6,895,48	
lerokee	357.60	4.30	361.90			**	364.50	1,737.70	********	592.50	2.694.70	
nickasaw	1,170.61	510.67	1,681.28		*******	1	218.75	25.00		70.20	313.95	
arke	986.67	81.47	1,068.14			**	********	169.00		671.17	840.17	
ay	1,374.89	293.31	1,668.20			5	5,706.35	509.00	183.00	8,322,14	14,720.49	
ayton	2,917.03	218.88	3,135.91	**			*******	212.00		20.56	232 56	
inton	2,664.87	119.30	2,784.17	**	*******	**	*******	53.05	171.55	1.319.45	1.544.05	
awford	1,449.32	********	1,449.32			2.0	********	4,297.50		342 57	4 640 07	
Illas	1,743.67		1,743.67			3	655.75	1,135,40	2,060.32	V 14-37	3 851 47	
IVIS	679.68		679,68				increased			340.01	340 01	
catur	2,155.72	*******	2,155.72	3	1,029.71			2.517.58		302.43	3 030 72	
elaware	1,795.70	431.93	2.227.63	24		100	264.95	245.00		376.43	500.05	

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 13-Continued.

1.			SUMMA	RY ?	TABLE N	0. 13	-Continue	ed.	-		-	270
	Equip	Equipment and Material Special Cases (Miscellaneous)										
County	Cost of Equipment	Cost of	m	R. ings	R. Cross- Improved	. Cross- Gra Improved Pu		Right	Drainage	Missal	Total Special Cases	
	Repairs to Same	Material	Total	No,	Cost	No.	Cost	Way	ments	laneous		IOW
Des Moines	981.58		981.58					225.50		1,045.30	1,270.80	A ST
Dickinson	1,557.13	949.13	2,506.26			3	450.00	663.81	1,529.78	3,570.69	6,214.28	A
Dubuque	2,022.01	1,730.63	3,/52.04				*******	240.00	2 139 67	2,962.89	3,202.89	TH
Favette	3,811.79	100.00	3,811.79			1	75.00	965.35		1,148.53	2,188.88	6
Floyd	4,544.56	1,980.63	6,525.19	**		1	500.00	20.00			520.00	H
Franklin	1,271.95	1,160.71	2,432.00		108 50	1	275.00	58.33	1,195.09	513.20	2,041.68	9
Greene	5,588.31	93.80	5,682.11		100.00	ï	200.00	1,741.30	108.61	251.43	560.04	H
Grundy	2,199.69		2,199.69							2,286.71	2,286.71	N
Guthrie	2,177.66		2,177.66		2700.70		700.00	1,019.73	35.45	29.00	1,084.18	Y
Hamilton	5,767.86	403.47	5,767.86	1	2,109.18	1	300.00	*******	4,250,50	230.55	4 741 51	0
Hardin	3,597.04	400.47	3,597.04			î	407.25	1,874.00	522.85	138.67	2,942.77	ö
Harrison	920.31		920.31			**		3,064.36		*******	3,064.36	M
Henry	1,157.52		1,157.52				600.00	253.09		2 620 80	253.09	A
Humboldt	352.88		352.88				050.00	239.00		2,000.80	239.00	S
Ida	1,376.69		1,376.69			**				388.00	388.00	IS
Iowa	768.09	257.56	1,025.65		*******		*******	1,939.65	*******	467.78	2,407.43	0
Jackson	1,770.82		2,622,41	2	479.65			2 492 50		1,583.20	2,703.90	4
Jefferson	2,826.94		• 2.826.94					97.25		5,910.98	6,008.23	
Johnson	1,563.85	1,298.21	2,862.06					1,251.40		498.20	1,749.60	
Jones	1,657.24		1,657.24		*******			216.98		610.95	610.95	
Kossuth	1,502.60		1,502.60			5	1,300.00	1111111	20,399.81	3,274.98	24,974.79	
Lee	1,333.66		1,333.66		*******	-2		340.00	o united	106.75	446.75	
Louisa	2,955.86	6.87	2,962.73	ï	274.90	3	602.50	372.38	1,722.78	481.35	2,325.28	
Lyon	5,131.48		5,131.48	į				217.00		72.841	289.84	
Mahaska	4,185.15 4,975.06	*******	4,185.15 4,975.06					1,376.25 187.00		30.88 225.00	1,407.13 412.00	
Marshall	3,854.93	254.68	4,109.61	1	120.00			1,325.65	10100.00	1,529.64	2,975.29	
Mills	482.65	********	482.65	ï	488.65			1,039.25	2,193.30		5,571.86	
Mitchell	8,097.35		8,097.35				250.00			1,137.00	1,387.00	
Monroe	2,632,48	11.00	1,044.75			••		2,502.29		*******	2,502.29	A
Montgomery	1,892.05		1,892.05					689.60	********	5 145 56	1,599.50	Z
Muscatine	1,367.34	.60	1,367.94	**	*******	**		791.55	28.36	1,386.05	2,205.96	Z
O'Brien	4,553.83	26.75	1,580.58			**	*******	307.80	********	1,199.65	1,507.45	JA
Page	956.92		955.92					1.660.87	3,400.87	818 76	3,400.87	F
Palo Alto	2,582.83		2,582.83					75.00	3,033.99	438.30	3,547.29	ht
Plymouth	1,257,40		1,257,40			12		643.50	25.00	6,251.16	6,919.66	E
Polk	5,852.19	76.66	5.852.19	ï	8 524 93	1	530.34	1,175.00	163.62	6,703.54	8,578.50	P
Pottawattamie	5,071.49		5,071.49					100.00	*******	1,760,60	1.860.60	OR
Poweshiek	2,609.10	*******	2,609.10					85.00	********	701.04	786.04	H
Sac	1.417.30	********	235.03	••				372.00		486.41	858.41	ŝ
Scott	6,177.77		6,177.77					40.90	252.00	2,0/0.30	4,806.30	2
Shelby	256.75		256.75	-		++.		*******		1,155,20	1,174-10	ন্দ্
Story	1,620,85		4,769.61	1	1,311.60		*******	80.00	1.000.000	1,704.92	3,096.52	0
Tama	3,416.82		3,416.82					1,325.80	1,6/9.92	232.62	3,238.34	ğ
Taylor	1,235.37		1,235.37				*******			201.44	2,300.34	Z
Van Buren	1,130,43	*******	1,130.43	**	*******			59.50			, 59.50	E
Wapello	4,577.71		4,577.71			**	*******	407.50	*******	1,923.77	2,331,27	~
Warren Washington	3,669.99		3,669.99		*******			398.45	175.00	10.22	583.67	E
Wayne	2.061.64		0,144.22	1	127.50	**	*******	366.47		*******	366.47	NG
Webster	3,470.50		3,470.50		357.50		********	310.00	2 610 31	4.00	910.50	IJ
Winneshiek	1,701.76	220 17	1,701.76		*******		*******	*******	563.69	340.25	903.94	E
Woodbury	423.02	241.40	664.42	2	3,887 54	**	********	256.00	********	443.89	699.89	EI
Worth	1,258.14		1,258.14	-				4,700.25	255.00	289.30	5,943,09	S
Totale	3,469.07		3,469.07			1	450.00	300.00	1,207.35	1,096.06	3,053.41	255
totals	\$251,857.68	\$ 12,317.30	\$264,174.98	17	\$20,015.53	43	\$ 20,443.66	\$ 64.537.37	\$ 71.858.64	\$105.000.59	\$281.855.79	

SUMMARY TABLE NO. 14.

Amount Spent for Township Work-All Township Funds-Annual Reports of County Engineers.

County	No. Twp. in County	No. Twp. Reporting	Road Fund	Drag Fund	Drainage Fund	All Other Sources	Total
Adair. Adams Allamakee. Appanoose. Audubon. Benton Black Hawk Boone. Bremer. Buchanan Buchanan Buchanan Buchanan Buchanan Buchanan Buchanan Buchanan Buchanan Buchanan Buchanan Calton Carroll. Carsoll.	18 12 18 17 13 20 18 17 14 16 16 16 16 16 16 16 12 12 12 12 20 20 20 20 16 16 16 16 16 16 16 16 16 16	18 12 17 17 12 20 18 15 6 12 17 16 16 16 15 17 16 16 12 20 20 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 17 16 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 15 16 16 15 16 16 13 12 20 20 20 20 20 16 15 16 16 13 12 20 20 16 16 13 12 20 20 16 16 13 12 16 13 12 16 13 13 12 16 13 13 12 16 13 13 12 16 13 13 12 16 13 13 12 16 13 13 15 16 16 13 13 12 16 13 13 15 15 16 13 13 15 16 13 13 15 16 16 13 13 12 16 13 13 15 16 13 13 12 16 13 13 12 16 13 13 12 16 13 13 12 16 16 13 13 12 16 16 13 13 15 16 16 13 13 15 16 16 13 13 15 16 16 13 13 15 15 16 16 13 13 15 16 16 13 13 15 15 15 16 16 13 13 15 15 15 15 15 15 15 15 15 15	 \$ 28,365.84 17,018.52 20,971.44 19,545.64 17,408.94 44,220.32 29,825.53 33,258.07 11,963.14 27,747.06 27,995.52 35,664.17 26,458.77 24,511.00 43,461.92 30,729.74 23,377.59 30,560.17 12,875.89 9,630.66 28,149.39 37,860.32 34,033.72 18,104.08 18,333.44 25,007.15 18,682.97 17,138.00 25,429.96 20,435.31 38,607.12 22,540.44 26,604.74 	\$ 6,919.36 4,002.78 4,744.07 5,693.00 8,759.45 10,603.54 8,017.65 7,392.43 	\$ 339.84 313.09 267.83 7,478.68 916.55 15,375.65 12,834.35 3,061.27 9,242.31 4,499.81 4,499.81 3,290.84 479.75 7,441.02 10,001.42 19,649.25	\$ 1,919,40 1,169,21 5,170,30 2,230,40 	35,625,04 21,021,30 25,715,51 27,471,13 27,377,66 54,823,86 43,281,31 50,349,58 11,963,14 35,064,18 51,609,94 42,769,19 48,062,69 36,917,60 32,442,93 52,866,87 48,857,99 28,756,47 35,241,07 16,535,09 17,038,79 44,940,94 48,109,55 56,325,00 46,705,30 21,745,56 23,449,49 36,175,47 25,862,64 28,540,57 32,428,36 34,389,56 48,843,60 30,919,85 53,442,46
Fremont Greene Grundy Guthrie Hamilton Hancock Hardin Harrison Henry Howard Humboldt Ida. Iowa. Jackson Jones Keokuk Kossuth Lee Linn Louisa Lucas Lyon Mahaska Marion Marshall Mills Monroe Monroe Monroe O'Brien Osceola Page Palo Alto Plymouth Pocahontas Polk	13 15 14 17 16 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 13 16 17 28 18 18 18 18 18 18 18 18 18 18 18 18 18 18 13 16 19 12 12 13 16 16 16 16 16 16 16	10 15 14 16 11 12 14 20 12 12 12 12 12 12 12 12 12 12	17,764,74 27,949,47 30,387,10 28,078,92 20,318,47 21,084,80 29,130,60 34,827,75 19,041,25 14,342,62 21,235,29 18,536,20 33,336,59 24,785,61 46,531,93 29,292,10 36,299,31 28,560,50 33,306,89 31,143,44 21,890,03 40,382,62 24,183,42 18,722,18 22,756,38 26,766,56 33,271,27 26,854,92 34,850,52 21,045,84 15,919,19 35,824,81 17,112,60 8,571,99 19,976,65 28,943,89 17,663,35 28,649,60 28,875,86 32,211,46	4,134,66 5,886.70 5,929.53 7,384.16 5,756.29 5,820.33 8,181.12 8,138.51 6,381.25 3,683.82 8,312.61 6,254.95 8,414.67 6,280.03 9,571.22 6,389.00 8,965.66 8,270.87 7,177.51 8,350.45 7,959.45 10,095.00 6,148.36 4,386.39 3,953.37 6,383.90 7,592.03 7,586.99 7,520.52 7,472.81 5,389.77 3,703.65 2,215.23 6,598.39 7,628.41 3,674.64 6,850.99 5,873.20 8,290.07 5,70.578 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 8,902.40 1,659.78 1,007 1,659.78 8,902.40 1,659.78 1,007 1,659.78 1,007 1,00	248.50 7,704.02 8,235.40 9,304.40 2,055.68 2,947.70 	507.80 	22,645.20 41,540.19 36,316.63 35,463.08 34,310.16 36,209.53 39,367.40 45,913.96 25,422.60 18,026.44 37,866.18 25,003.84 41,995.43 31,330.52 56,103.15 35,681.10 45,264.97 37,288.64 40,484.40 63,117.09 29,849.48 50,943.40 30,471.70 23,108.57 26,709.75 33,150.46 40,863.30 34,441.91 46,887.93 29,342.63 21,778.15 43,810.10 20,816.25 10,787.22 30,191.23 36,572.30 23,827.36 35,592.44 41,743.68 34,979.67 48,901.28 41,449.96

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VTY ENGINEERS

SUMMARY TABLE N. 1	4-Continued.
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County	No. Twp. in County	No. Twp. Reporting	Road Fund	Drag Fund	Drainage Fund	All Other Sources	Total
Scott	14	14	22,414.75	7.067.09			29,481.84
Shelby	16	16	27,373.14	8,567,30	600.00		36,540,44
Sioux	23	23	29,572.93	9,581.80			39,154.70
Story	16	15	29,026.12	7,564,56	-11.896.10		48,486,78
Tama	21	21	40,791.08	7,982,40		3.235.00	52,008,48
Taylor	17	17	24,492.62	5,130,47			29,623.09
Union	12	8	14,309,31	4,898.07			19,307.38
Van Buren	14	14	22.355.24	3,808,24		4.027.69	30,191,17
Wapello	14	14	21.257.07	5.092.07	40.27		26,389,41
Warren	16	16	26,757.03	6,766.95			33,523,98
Washington	15	15	38,935,19	11,402,22			50.337.41
Wayne	16	16	19,046,10	5,458,44	47.41		24,551.95
Webster	23	19	34,839,87	8,918,40	12.301.94		56.060.21
Winnebago	12	9	10.364.06	4,239,62	5,405,68		20.009.36
Winneshiek	20	20	29,241,80	8,573.05			37.814.85
Woodbury	23	18	27.391.22	7,894,22	2,547,42		37,832.86
Worth	12	12	16,509,26	4.377.28	799.08		21,685,62
Wright	16	16	27,123.22	7,278.46	12,788.97		47,190.65
·fotals	1.613	1.521	\$2,606.418.93	\$ 671 685 58	\$ 238,265 63	\$ 41.968.37	\$3,558,338,51

SUMMARY TABLE NO. 15.

Road Construction-Township Expenditures-Annual Reports of County Engineers.

County	No. Twp. in County	No. Twp. Reporting	Permanent Con- struction	Temporary Con- struction	Repairs	Maintenance	Equipment and Unused Material	Special Cases	Total
			4 10 14						
Adair	18	18	\$ 7.229.16	\$ 6.367.74	\$ 9.930.04	\$ 7 207 00	\$ 4 801 10		+ 15 C15 CM
dams	12	12	1.912.66	3.029.92	7 780 97	4 002 78	3 245 00	e 1.040.07	\$ 33,023.04
llamakee	18	17	1.446.12	71.30	18 303 83	4 744 07	1 150 10	\$ 1,043.07	21,021.30
ppanoose	17	17	772 15	3 150 82	16,005,65	4,678.06	1,150,19	1 201 (2	25,/15.51
udi bon	12	12	110.13	12 141 91	10,003.07	4,0/ 8,90	1,249.90	1,524.63	27,471.13
enton	20	20 '	4 205 15	12 001 07	4,010.40	0,/ 39.93	022 80	*******	27,337.60
lack Hawk	18	10	9,203.13	13,001.03	0,109.03	10,003.54	12,824.74	7,278.97	54,823.86
oone	17	10	6,721.89	7,239.00	15,878.62	15,017.65	8,663.04	741.05	43,281.31
remer	1/	15	0,488.38	0,14/.9/	7,740.18	10,184.93	6,168.63	13,619.29	50,349.58
uchanan	17	0	*********	7,504.65	595.78	1,876.16	1,986.55		11,963.14
uena Vieto	10	12	3,073.47	15,547.75	6,183.34	4,548.20	2,287.00	3,424.42	35,064.18
atlas	18	17	16,431.53	12,866.34	3,666.17	7,376.67	2,612.91	8,656,32	51,609.94
lhour	16	16	3,429.06	13,075.19	14,164.11	7,105.02	4,995.81	197	42,769,19
41noun	16	16	7,904.99	10,550.79	1,640.12	9,173.12	9,978 90	8 814 77	48 062 60
arroll	16	15	9,824.65	7.648.57	7,579.78	7,397,56	2 312 62	2 154 42	36 017 60
158	16	15	4,793.63	1,169.95	12,255,76	7,931,93	2 914 31	3 277 26	32,442,03
edar	17	17	2,069,99	2.131.11	19,507,28	9 404 95	12 470.05	7 202 40	23 946.73
erro Gordo	16	16	6,549.55	11.373.38	11.846.38	8 885 94	2 560 14	7 642 60	32,800.87
herokee	16	16	6,801,20	4 352 53	6 252.00	5 703 10	1 000 52	7,092.00	48,857.99
hickasaw	12	12	1.082.38	12,750.26	6 284 05	4 680 00	10 442 49	3,839,00	28,750.47
arke	12	11	2,080,61	3 710 41	5 175 30	3,650,20	202 78	1 110 100	35,241.07
ay	16	6	4 499 81	3 852 15	554 27	2 604 62	196.18	1,116.70	16,535.09
ayton	22	22	1 200 61	240 51	27 601 91	0,697.14	363.33	5,004.59	17,038,79
inton	20	20	7 370 84	12 004 11	7 175 75	9,062.14	2,603.70	3,603.17	44,940.94
awford	20	20	6 600.00	17 650 00	12 175 00	12,000,00	4,280.89	5,016.60	48,109.55
allas	16	16	7,520,52	7 524 00	11 001 20	12,000.00	3,200.00	4,700.00	56,325.00
vis	15	15	1 704 53	F 004.05	0 200 27	9,380.74	3,977.81	6,241.33	46.705.30
catur	16	16	2,250,40	3,094,95	9,388.37	3,641.48	465.53	1,370.70	21,745.56
laware	10	16	3,339.40	12,891.28	1,815.40	4,391.39	992.02		23,449,49
s Moines	10	10	903.41	11,024.44	10,142.03	7,413.95	2,469.00	4,223.64	36,175,47
ckinson	13	13	3,377.25	485.18	12,527.00	6,686.47	1,594.53	1,192.21	25,862.64
huque	12	12	8,504.88	5,323.01	3,832.32	3,837.95	1,597.79	5,444.62	28,540,57
nmet	17	16	4,880.30	1,263.47	18,842.88	5,789.23	1.652.48		32,428,36
watta	12	13	2,247.18	5,684.46	5,728 14	4,310 23	5,631.45	10,788,10	34 389 56
and	20	20	*********	31,504.10	7,103.02	10,236 48			48 843 60
oyu	12 /	11 1	3,122.88	13,741.41	6,282.83	5,607.70	2,185.03		20.020.05

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 15-Continued.

County No. Turp. N	SUMMARY TABLE NO. 15—Continued.												
Franklin 16 15 6.00.7.3 8.68.9 8.811.6 7.18.6 2.200.00 19.52.76 3.442.6 Gentry 15 10	County	No. Twp. in County	No. Twp. Reporting	Permanent Con= struction	Temporary Con- struction	Repairs	Maintenance	Equipment and Unused Material	Special Cases	Total			
prement 33 10 900.00 147722 51627 5	Franklin	16	15	6 027 21		0 011 16	7 100 47	2 760 60	10.020.76				
Greens. 15 15 17,240,05 240,05	Fremont	10	- 13	0,007.55	14 517 82	1 107 74	5 162 87	1 608 77	248.50	33,442.40	-		
Grandy 15 14 1285.7 1106.64 329.10 529.53 529.13 529.10 549.13 527.16 529.15	Greene	15	15	7,450.05	8.033.42	11.670.38	5,886,70	2,660,28	5 839 36	41 540 19	0		
Gather D2 16 4.455.11 5.194.77 1.86.85 7.284.16 4.306.13 3.46.10 MA Hamilton 15 11 7.364.51 5.194.77 1.18.85 7.284.16 4.292.25 4.292.25 4.292.17 1.55.76 5.34.66 5.34.66 5.34.66 5.34.66 5.34.66 5.34.66 5.34.66 5.20.65 4.292.25 2.20.77 1.82.75 2.50.01.8 1.00.46 4.60.70 4.50.75 1.00.26 2.50.86.18 1.00.46 4.60.70 4.50.75 1.50.86 2.50.86.18 1.00.26 2.50.86.18 1.00.26 4.50.75 1.50.85 2.50.86.18 1.00.26 4.50.75 1.50.86.18 1.00.26 4.50.75 1.50.86 2.50.75 5.50.01.15 3.50.81.9 2.50.75 5.50.01.15 3.50.81.9	Grundy	14	14	1.238.57	13,005.64	5,921.70	5,929.53	4,943.13	5,278.06	36,316.63	W		
Hamilton	Guthrie	17	16	4,455.11	5,154.77	11,868.55	7,384.16	3,206.30	3,394.19	35,463.08	A		
Hancek	Hamilton	17	11	7,306.35	9,617.67	1,670.28	5,242.56	4,939.25	5,534.05	34,310.16	00		
Hardmann 15 14 277.03 844.97 2707.85 9.286.64 2.01.21 6.40.81 270.04 F Hardmann 12 12 13 4.51.77 7.60.85 2.21.77 3.01.27 5.00.15 5.00.15 <td>Hancock</td> <td>16</td> <td>12</td> <td>6,937.75</td> <td>7,388.98</td> <td>5,392.48</td> <td>5,820.33</td> <td>3,391.41</td> <td>7,278.58</td> <td>36,209.53</td> <td>H</td>	Hancock	16	12	6,937.75	7,388.98	5,392.48	5,820.33	3,391.41	7,278.58	36,209.53	H		
Internon DD DD Control Contro Contro <thcontro< td="" th<=""><td>Hardin</td><td>15</td><td>14</td><td>3,773.04</td><td>8,416.97</td><td>7,976.56</td><td>9,248.64</td><td>3,501.37</td><td>6,450 82</td><td>39,367.40</td><td>A</td></thcontro<>	Hardin	15	14	3,773.04	8,416.97	7,976.56	9,248.64	3,501.37	6,450 82	39,367.40	A		
Internation 13 <th13< th=""> 13 13</th13<>	Harrison	20	20	2,231.2/	1,157.8/	29,064.26	8,138.51	2,3/4.33	2,947.70	45,913 96	TH		
Timmboldt 12 12 12 563 50 992 26 397 15 431 22 226 42 398 15 998 15 Jowa 13 12 12 455 57 1631 20 1502 46 469 94 1522 38 2003 34 2003 44 469 94 1522 38 2003 44 2004 15 2003 15 210 15 2003 15 210 15 2	Howard	12	12	1 050 08	6 931 53	3 568 76	3 683 82	1 125 07	757.28	18 026 44	E3		
Ida 12 12 12 12 12.33.67 10.02.46 46.09.46 46.02.2 20.03.86 Display Jackson 38 38 18.02.67 18.07 227.03.9 6.20.01.01 1.00.05.01 <	Humboldt	12	12	5,615,91	9.972.63	5,997,15	8,312.61	2,674,23	5,293.65	37,866,18	H		
Jowa Jaka Jaka <thjaka< th=""> Jaka Jaka <thj< td=""><td>Ida</td><td>12</td><td>12</td><td>4.235.67</td><td>1,623.49</td><td>13,002.46</td><td>4,619,94</td><td>1,522.28</td><td></td><td>25,003.84</td><td>6</td></thj<></thjaka<>	Ida	12	12	4.235.67	1,623.49	13,002.46	4,619,94	1,522.28		25,003.84	6		
Jackson 18 18 1.84 1.85 1.84 1.85	Iowa	18	18	2,889.94	5,278 51	15,799.40	8,414.67	4,647.24	4,965.67	41,995.43	H		
Japper Japper<	Jackson	18	18	1,162.47	145.00	20,730.39	6,280.03	1,305.09	1,707.54	31,330.52	M		
12 12 <td< td=""><td>Jasper</td><td>19</td><td>19</td><td>9,392.64</td><td>12,504.57</td><td>15,438.12</td><td>9,571.22</td><td>6,878 34</td><td>2,318.26</td><td>56,103.15</td><td>A</td></td<>	Jasper	19	19	9,392.64	12,504.57	15,438.12	9,571.22	6,878 34	2,318.26	56,103.15	A		
Johnson	Jefferson	12	12	3,858.88	1,107.65	13,287.64	6,389 00	5,537.78	5,500.15	35,681.10	R		
Openet	Johnson	21	21	1,816.27	17,443.27	11,932.40	8,965.66	5,107.37	*******	45,264.97	-		
Constant. 23 23 2477.3 2538.10 1538.10 2135.11 2135.11 2135.11 2135.11 2135.11 2135.11 2135.11 2135.11 2235.21 2337.10 2235.21 2337.10 2235.21 2337.10 2235.21 2338.48 7399.44 1355.11 1416.60 539.92 2235.21 2338.48 7399.44 1355.11 1416.60 539.92 2338.38 644.44	Jones	10	10	2,101.2/	23,315.23	4,052.75	7,785,39	2 144 00	1.671.16	37,288.04	ä		
Cree Tis Tis <thtis< th=""> <thtis< th=""></thtis<></thtis<>	Keokuk	28	20	5,045.30	5,350.19	5 330 10	9 250 45	4 036 01	22 875 75	63,117,09	M		
Line	Lee	15	15	3 411 26	6 561 50	9 926 11	7 050 45	1,991.07	10101010	29.849.48			
Louisa 12 12 9.665.92 1278.88 3.800.12 6.448.36 2.001.76 5.666.56 30.071.70 92.08 Louisa 12 12 12 6.631.88 5.430.71 5.745.15 4.366.59 674.44	Linn	20	20	15,340,40	10.063.96	10,576.01	9,430,58	4,115.85	1,416.60	50,943.40	E		
Lacas 12 12 6651.88 549.071 5745.15 4,365.39 674.44	Louisa	12	12	9,695.92	2,798 58	3,890.12	6,448.36	2,001.76	5,636.96	30,471.70	00		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Lucas	12	12	6.851.88	5,450.71	5,745.15	4,386.39	674.44		23,108.57	Ĩ		
Madrison 16 16 411.00 1,534.73 21,347.35 6,638.30 2,257.37 1,127.70 33,130.46 42 Marison 15 15 3,126.80 1117.70 16,014.37 23,452.12 43,463.30 Marison 15 13 3,126.80 3,117.70 16,074.45 7,589.59 2,151.66 1.787.29 34,441.91 Marison 13 13 1,277.0 33,130.46 641.80 7,253.52 4,049.18 526.52 26,627.33 526.57 32,778.13 34,810.10 Monone 16 19 13 13,777.25 22,971.80 34,810.10 3078.166 914.27 712.18 28,816.10 Monone 12 12 263.778 13,577.99 9,848.80 3,701.66 914.27 712.18 28,816.10 30,977.25 Monotgomery 12 12 16 14,69.66 6,666.11 11,377.82 7,152.54 1,477.80 3,197.36 Muscatine 15 14,69.26 6,604.79 2,421.84 3,674.64 3,694.42 2,499.57 3,58.97.36	Lyon	18	15	6,041.81	8,281.40	2,819.32	3.953.37	2,561 25	3,052.60	26,709 75	0		
Mainska	Madison	16	16	411.00	1,534.73	21,435.56	6,383.90	2,257.57	1,127.70	33,150.46	4		
Algronh	Mahaska	19	19	4,286.31	1,473.20	18,024 91	7,592.03	6,034.73	3,452.12	40,863.30			
all fills iii iii<	Marion	15	15	3,126.80	3,117.70	10,6/1.45	7,586 99	2,151.08	1.787.29	34,441.91			
Mitchell 16 16 16 17,72,87 4,903,22 52,989,77 4,983,82,6 14,14 2,705,59 21,773,15 Monroe 13 12 2,033,78 3,597,59 9,917,00 5,917,00 5,917,00 5,911,40 7,715,00 7,715,710 7,715,710 7,715,710 7,715,710 7,7	Marshall	18	18	13,109.73	7 510 04	13 525 90	7,520.52	4,094.18	823.08	40,007.93			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Mitchell	16	16	1.478.87	4,903.22	5,989,97	5,858.96	841.14	2,705.99	21,778.15			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Monona	19	19	3,986.10	12,427.00	9,117.00	6,400,00	4,165.00	7,715.00	43,810.10			
Montgomery 12 6 1,200,25 4,029,72 2,994,84 2,215,23 277,18 1,1997,10 10,778,23 2,302,34 O'Brien 16 16 1,699,66 6,666,31 11,272,88 5,298,10 7,528,41 1,497,80 1,1997,10 36,572,30 36,592,46 48,50,38 36,522,44 48,50,30 36,521,44 49,50,32 <t< td=""><td>Monroe</td><td>12</td><td>12</td><td>2,053 78</td><td>3,547.59</td><td>9,884.80</td><td>3,703.65</td><td>914.25</td><td>712,18</td><td>20,816.25</td><td></td></t<>	Monroe	12	12	2,053 78	3,547.59	9,884.80	3,703.65	914.25	712,18	20,816.25			
Muscatine 15 15 16 1697.66 6.666.31 11.477.82 7.152.54 1.447.89 1.497.89 36.572.39 OBTrien 16 16 16.452.78 5.095.40 5.262.41 2.790.99 2.497.57 21.897.46 36.572.39 Page 16 16 17.212.84 6.892.27 12.484.85 5.863.97 4.581.46 2.497.57 21.897.46 31.292.46 Page 16 16 5.931.02 7.128.02 12.124.48 5.893.97 4.581.46 1.168.91 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.46 34.997.67 31.592.339 35.101 31.997.46 31.997.67 31.592.339 35.101 31.997.69 45.91.233 45.91.233.46 41.499.94 31.997.69	Montgomery	12	6	1,250.25	4,029.72	2,994.84	2,215 23	297 18	11111111	10,787 22			
Casecola 11 11 5 503.40 6.091.70 2.421.87 3.674.64 5.093.42 2.499.37 31.822.46 Pales 16 15 712.88 6.992.71 3.668.84 5.883.87 3.674.64 5.093.42 2.499.37 31.822.46 31.592.46 Pales 16 16 5.201.62 12.124.48 5.873.31 5.881.48 4.815.44 41.733.68 Polta 18 19 9.274.31 16.273.97 2.994.04 7.697.97 6.732.31 6.011.81 48,909.67 Polta 19 19 383.64 2.685.18 20.002.03 8,922.40 980.64 3.56.10 41.499.66 6.11.48 49.096 356.10 41.499.66 6.16.1.48 30.521.42 11.55 2.017.89 5.10.38 2.499.67 2.403.91 18.731.37 18.232.44 19.224.42 11.55 2.012.87 3.661.50 2.249.67 2.401.91 18.731.37 19.224.42 11.55 2.012.87 3.661.50 2.422.61 11.65.13 1.228.66 12.97.95	O'Brien	15	15	1,659.66	6,666.31	5,298,10	7,152.54	1,437.80	1,897.10	30,191,23			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $				1				to attraction					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $													
Casecola 11 11 13 5 505-40 6,094.70 2,421.8' 3,674.64 3,694.42 2,409.37 23,352.44 35,592.44 Prymatth 13 12 12112.84 5,801.48 6,885.57 4,100.50 2,433.64 4,815.44 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 41,733.68 43,039.67 6,732.33 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 6,011.83 48,902.87 5,010.03 5,100.41,449.99.67 2,011.93 30,521.42 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.37 18,731.56 2,412.		_							_		-		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	County of the local sector												
Palo Alto 16 16 5.921.02 7.128.02 12.124.48 5.873.20 5.881.48 4.815.48 4.753.68 Plymouth 24 22 1.84.48 556.63 21.374.53 8.300.07 1.354.68 1.168 1.48 4.893.67 Pocahontas 18 18 9.274.33 16.273.97 2.949.04 7.659.78 6.732.33 6.011.83 48.901.28 Potk 28 28 7.836.74 26.285.90 12.284.65 12.668.73 3.118.20 19.67.26 64.161.48 Ringgold 17 13 4.805.98 2.687.72 5.51.50 3.173.56 2.412.61	Page	16	11	11,712 88	6,041.70	2,421.8	3,674,64	3,694.42	2,489.37	23,827.36			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Palo Alto	16	16	5.921.02	7,128.02	12,124.48	5,873 20	5,881.48	4,815,48	41,743.68			
Polk 13 13 13 13 12 2.9.9.04 2.9.9.04 8.9.0.78 6./32.33 6.011.83 48,901.28 Polk 28 28 28 28 7.836.74 26.285.90 12.284.65 12.668.73 3.118.20 1.967.26 64.161.48 Portswisk 16 17 13 4.805.98 2.687.72 5.61.50 3.173.56 2.412.61 2.001.92 43.654.65 44.852 10.605.22 44.8452 10.605.22 44.8452 10.605.22 44.8452 10.605.22	Procabontas	24	22	1.864.85	586.63	21,574.53	8,390.07	1,354.68	1,168 91	34,939.67			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Polk	19	19	8.383.61	2.685.18	20.062.03	7,059.78	0,732.33	6,011.83	48,901.28			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Pottawattamie	28	- 28	7.836.74	26,285,90	12 284 65	12 668 73	3 118 20	1 067 26	41,449,90			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Poweshick	16	11		411.55	20,517,89	5,160.38	2.399.67	2 031 93	30,521,42			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ringgold	17	13	4,805.98	2,687.72	5,651.50	3,173,56	2,412.61		18 731 37	A		
Scott 14 14 14 2,148,23 10,114,47 8,483,25 7,067,09 1,668,80 22,9481,84 22,9481,84 Sioux 23 23 5,207,97 6,994,63 9,174,07 9,581,80 4,933,89 3,262,23 39,154,70 Story 16 15 10,703,55 8,861,93 8,622,18 8,245,38 1,448,52 10,605,22 48,486,78 Tama. 21 21 5,333,76 9,372,85 19,053,98 7,982,40 3,626,48 6,639,01 53,008,48 Taylor 17 17 3,285,74 4,035,33 12,906,57 5,130,47 2,863,16 1,401,82 29,623,09 Van Buren 12 8	Sac	16	16	6,598.59	13,863.66	6,720.19	7,279 95	2,191.67	7,000.59	43,654,65	2		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Scott	14	14	2,148 23	10,114,47	8,483.25	7,067.09	1,668.80	********	29,481.84	2		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Siour	16	16	3,093.50	7,041.19	15,257.17	8,567.30	1,981.28	600.00	36,540.44	0		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Story	23	23	5,207.97	6,994.63	9,174.07	9,581.80	4,933.89	3,262.34	39,154.70	E		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Tama	10	15	10,703.55	8,861.93	8,622.18	8,245.38	1,448.52	10,605.22	48,486.78	r		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Taylor	17	17	5,555.70	9,3/2.85	19,053.98	7,982.40	3,626.48	6,639.01	52,008.48	X		
Van Buren. 14 14 14 3,630.79 2,454.47 13,158.83 3,804.24 5.081.08 2,061.76 30,191.17 Wapello 14 14 991.42 571.29 17,659.90 5,092.07 2,034.46 40.27 26,389.41 Waye. 4,393.04 4,393.04 4,393.04 4,393.04 4,393.04 40.27 26,389.41 Waye. 40.27 26,389.41 40.27 26,389.41 40.27 26,389.41 40.27 26,389.41 40.27 26,389.41 40.27 26,389.41 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.27 26,389.41 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.23.98 40.35.21.95 40.35.21.95 40.35.21.95 40.35.21.95 40.35.21.95 40.35.21.95 40.35.21.95 40.35.21.95 40.350.21 56.060.21 40.27 26.060.21 40.27 26.060.21 40.27 26.060.21 40.27 40.350.30 37.814.85 40.650.15 37.814.85	Union	12	8	3,203.74	4,055.55	12,900.5/	5,130.47	2,863.16	1,401.82	29,623.09	E.		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Van Buren	14	14	3 630 79	2 454 47	13 158 83	4,898.0/	5 001 00	2061.76	19,207,38	1		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Wapello	14	14	991.42	571.29	17,659,91	5 (92 07	2 034 46	2,001.70	30,191.17	OI		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Warren	16	16	1,761,01	424.95	17.747.43	6.766.95	5 583 04	1 240 60	33 521 08	1		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Washington	15	15	3,924.75	16,927.25	2,122,53	11.366.71	11,603,13	4,393,04	50 337 41	U		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Wayne	16	16	********		18,623.70	4,836,63	1.091.62	- Hereiter	24,551,95	-		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Winnebage	23	19	7,724.63	22,097.36	4,515.27	8,918.40	6,454,34	6,350.21	56,060.21	C1		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Winneshiek	12	9	2,347.87	2.014.68	7,721.31	4,239.62	541.82	3,144.06	20,009,36	4		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Woodbury	20	20	8.058.36	4,714.89	8.154.75	8,573.05	3,260.50	5,053.30	37,814.85	C		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Worth	12	10	1,235.50	1,082.69	21,426.38	7,884.30	1,555.84	4,650.15	37,832.86	C		
Totals	Wright	16	16	14 222 26	7 575 60	0,333.19	4,377.28	2,589.23	897.30	21,685.62	5		
Totals 1,613 1,521 \$441,263.69 \$769,202.96 \$1,010,831.17 \$674,534.07 \$318,273.32 \$344,233.30 \$3,558,338,51				14,200.20	1,575.09	9,090.71	1,218.20	2,026,78	6,395.95	47,190.65	1		
	Totals	1,613	1,521	\$441,263.69	\$769,202.96	\$1,010,831.17	\$674,534.07	\$318,273,32	\$344,233,30	\$3,558,338,51	H		

SUMMARY TABLE NO. 16.

Classification of Road Construction-Township Expenditures-Annual Reports of County Engineers.

			Permanent Work					Total					
County Twps. T in County po	Twps. Re- porting	Built to Finished Grade	Built to Temporary Grade	Perma- nently Surfaced	Tile Drainage	Filling Bridges and Culverts	Built to Natural Grade	Oiling	Hauling and Plac- ing Tem- porary	Special Cases	Cost Township Construc- tion	IOWA S	
Adair	18	18	*******			\$ 420.44	\$ 6,808 72	\$ 2,604.23		\$ 3,763.51	*******	\$ 13,596.90	PATI
Adams	12	12			*******	5.50	1,907.16	779.82		2,250.10 71.30	*******	4,942.58 1,517.42	E
Appanoose	17	17		*******			772.15			3,159.82	W 1 955 55	3,931.97	H
Audubon	12 20	12 20			\$ 178.00	872.97	3,354.18	6,814.78		4,460.37 788.51	\$ 1,800.00	18,006 93	GH
Black Hawk	18	18			412.54		2,309.35	6,548.85		710.21	*******	9,980.95	W
Boone Bremer	17	15		\$ 1,652.20	1,316.33	1,991.76	1,528.29	5,322.97		825.00		7,504.65	A
Buchanan	16	12		415.00	1,279.97	916.55	461.95	13,351.68		343.70	1,852.37	18,621,22	-
Butler	18	17	\$ 1,335.85	1,575.40	460.12	9,052.84	1,702.17	11,952.28		1,122.91	0,097.07	16,504.25	Ó
Calhoun	16	16	0.000.00	1,600.75	467.00	4,656.77	1,180.47	9,591.37	······	959.42	2 070 40	18,455.78	MAN
Cass	16	15	188.20	609.88	2,402.09	900.85	3,995.55	1,169.95		*******		5,963.53	11
Cedar	17	17				257.20	1,812.73	11.052.12	\$ 2,020.82	110.29		4,201.10	0.
Cherokee	16	10				4,842.00	6,719.98	3,668.10		684.43	********	11,153.73	0
Chickasaw	12	12		*******			1,082.38	12,426.24		324.02	1 032 81	13,832 61	Z
Clay	13	6				4,499.81	2,080.01	3,852.15		2,241.30	1,002.01	8,351.95	
Clayton	22	22		1 670 16	*******	790.97	1,209.61	12 176 03		240,51	270-03	1,450,13	
Crawford	20	20	150.00	1,0/9.10		/ 00.0/	6,450.00	15,700.00		1,950.00	********	24,250.00	
Dallas Davis	16	16	156.00		1271.60	1,787.77	4,364.16	6,654.35		879.65		15,113.53 6,879,48	
Decatur	16	16	*******		*******	*******	3,359.40	12.065.22		826.06		16,250.63	
Des Moines	1/1	16	\$90.80	460.27	*******	273.98 616.06	628.43	10,704.17		320,27 485.18		3,862,43	
Dickinson Dubuque Emmet	12 17	12 16		2,933.33	380.40	4,011.53	1,179.62 4,880.30	5,019.76		303.25		13,827.82	
Fayette	21	20	*******		158.00	1,481.63	268.20	5,107.21 31,504.10		577.25	******	7,931 61	
Franklin	16	15	1,171.45	*******	402.12	1,262.81 3,155.83	1,860.07	11,927,85	******	366.67	1,446.89	16,864.27	
Greene	13	10	960.45		2 225 20	1.001.00		3,384.01	********	7,416.52	3,717.29	14,722.27 14,517.83	
Grundy	14	14	*****			1,864.66	2,399.74	7,519.07	*******	514.35		15,483.47	A
lamilton	17	16 11	188.00	747.83	685.00	684.22	3,770.89	4,365.28		789.49	*******	9,609 83	Z
lancock	16	12	*******	445.35	601.76	4,058.29	1,832.35	9,400.51 6,934.31	*******	151.16		16,934.02	5
Tarrison	20	13 20	272.15	200.00	47.00	1,296.28	2,157.61	7,914.82		502.15		12,190.01	AL
lenry	12	12	********	1,690.00			2,031.2/ 2,741.67	6,500.00	*******	138.67	210.75	3,389.14	-
Iumboldt	12	13	*******	•••••	•••••	4.070 50	1,959.08	6,450.13		481.40		8,890.61	RE
da	12	12		2,118.20	45.75	212.69	1.859.03	9,349.74	*******	622.89		15,588.51	PC
ackson	18	18		*******	194.74	266.63	2,428.57	4,026,63		1,251.88	*******	8,168.45)R
asper	19	19		5,443.84	*******	209.91	3,738.89	12,072.47	*******	145.00 432.10		1,307.47 21.897.21	rs
ohnson	21	21			*******	*******	3,858.88	177.63		930.02	*******	4,966.53	0
ones	15	16				457.27	. 1,644.00	23,315.23	*******	521.82	******	19,259.54	12
lossuth	28	20		*******	162.50	3 778 43	3,045.30	4,104.77	*******	1,251.42		8,401.49	0
ce	15	15	*******				3,411.26	4,192.63		336.20	2 045 56	21,623.88	DC
ouisa	11	12	300.00	9,591.66 5.626.78	2,341.62	699.78	2,707.34	5,169.32		865.99	4,028.65	25,404.36	Z
ucas	12	12		1,266.48			5,585.40	3,491.35	*******	61812 497.73	1 461 63	12,494.50	TY
Iadison	15	15	********	2,659.22	*******		3.382.59	7,554.55		726.87	4,401.00	14,323.21	ET.
lahaska	19	19		*******	*******	427.39	3,858.92	200.04	*******	1,534.73	********	1,945.73	N
farshall	18	18	2518.15		1,578 88	76.50	3,126.80	2,684.55		433.15		6,244.50	GI
fitchell	13	13	*******		670.40			7,289.94	*******	230,00	*******	23,563.21 7.519.91	NE
lonona	19	19	356.10	2,180.00	0/2.40	237.85	568.62	4,535.01	*******	368.21	*******	6,382.07	E
Ionroe	13	12					2,053.78	*******	*******	1,826.14	1,721,45	5,601.37	SS
luscatine	15	15	131.52		*******	252.07	1.290.25	1,915.50	*******	2,114.22		5,279 97	
Sceola	16	16	*****	077.40		392.66	2.029.45	17.983 17	*******	449.61		8,325 97 20,854 82	
age	16	16	285.15	7.545.04	81.50	209.61	4,354.25	5,850 47 6,048 24	50.00	191.23		11,547.10	
lymouth	16	16	2,093.19	******	25.67	2,000.09	1,802 07	6,679.49	******	448 53	******	18,605 59	10
A second second second s					********		1,804.85	*******		586.63		2,451.48	29

TOWA n T TE HIGHWAY
SUMMARY TABLE NO. 16-Continued.

	No.	No.		Perman	ent Work			Te	mporary W	/ork		Total
County	Twps. in County	Twps. Re- porting	Built to Finished Grade	Built to Temporary Grade	Perma- nently Surfaced	Tile Drainage	Filling Bridges and Culverts	Built to Natural Grade	Oiling	Hauling and Plac- ing Tem- porary	Special Cases	Township Construc- tion
Pocahontas	18	18			123.00	8 049 40	1 102.91	15 706 70		547.25		1
Polk	19	10		2 110 67	100.00	0,010.47	6 272 04	13,120.12		501.41	2 192 22	23,398,39
Pottawattamie	28	28		602.48			7 144 26	20 601 78		2 235 02	3 449 20	11,008.79
Poweshiek	16	11					1111100	20,001.70		411.55	0,110.20	411 55
Ringgold	17	13	********	687.10			4,118,88	2 019 64		668.08		7 401 70
Sac	16	16	********	764.00	722.65	1.982.99	3,128,95	13,621,16		242.50	******	20.462.25
Scott	14	14		945.63		46.65	1,155,95	6.022.70		1,279,43	2,812.34	12 262 70
Shelby	16	16				8.50	3,085.00	0,000110		866.95	6,174,24	10,134,62
Sioux	23	23	*******			14.91	5,193.06	5 401 96		710.92	881.75	12 202 60
Story	16	15	3,076.15		1,806.99	5,120,41	700.00	8,164.57		697.36		19 565 48
Tama	21	21	*******	959 58		180.40	4,193.78	7.676.03		1,329.47	367.35	14,706,61
Taylor	17	17					3,285.74	4.035.33				7.321.07
Union	12	8	********		*******							
Van Buren	14	14					3,630,79			2,454,47		6.085.26
Wapello	14	14	********	991.42				571.29				1.562.71
Warren	16	16				49.39	1.711.62			424.95		2 185 95
Washington	15	15				179.54	3,745,21	15.602.35		1.324.90		20,852.00
Wayne	16	16	*******									
Webster	23	19			490.32	5,951.73	1.282.58	14,416,16		336.20	7.345.00	29,821,91
Winnebago	12	9	*******			2,261.62	86.25	2,014,68				4,362.55
Winneshiek	20	20	********	5,476.61	200.00		2,381.75	4,395,52		319.37		12,773.25
Woodbury	23	18	********		*******		1,233,50			1.082.69		2,316,19
Worth	12	12				891.53		5,888 91		246.43	458.75	7,488,62
Wright	16	16	*******	4,659.38	1,145.02	6,735.90	1,682.96	7,137.90	*******	437.79		21,798.95
Totals	1,613	1,521	\$ 16,080.93	\$ 69,610.30	\$ 24,726 06	\$101,442.67	\$229,403.73	\$632,889.45	\$ 2,070.82	\$ 82,249.54	\$ 51,993.15	\$1,210,466.65

SUMMARY TABLE NO. 17.

Road Repairs and Maintenance-Township Expenditures-Annual Reports of County Engineers.

				Maintenan	ce				
County	No. Twps. in County	No. Twps. Reporting	No. Miles Regularly Dragged	Aver. No. of Times Dragged	Aver. Cost Per Mile of Road	Aver. Cost Per Mile, One Round Trip	Total Cost of Dragging	Total Cost of Repairs	Total Cost of Repairs and Maintenance
Adair	10	10							
Adams	10	18	560			A	\$ 7,207.00	\$ 9,930.04	\$ 17 117 04
Allamakee	10	12	504	11.30	\$ 7.93	\$ 0.70	4,002.78	7,780.97	11.701.75
Appanoose	18	17	******				4,744.67	18 303 83	22,017,00
Auduban	17	17	580	14.00	8 05	0.58	4 678 96	16 095 67	25,047.90
Renton	12	12	500	25.00	17.50	0.70	9,750.45	4 817 40	20,764.03
Black Hamb	20	20				0.75	10 602 54	6100.63	1.5,572.93
Roome	18	18	684	15.70	12.30	0.76	9 017 55	0.107.03	16.713.17
soone	17	15	00.1	45.79	14.30	0.70	8,017.00	15,8/8.62	23,896.27
remer	14	6		******		******	10,183.93	7,740,18	17,925.11
uchanan	16	12	630	11.50	2.00	******	1,876.16	595.78	2,471.94
uena Vista	18	17	0.00	11.50	1.22	0.63	4,548.20	6,183,34	10,731.54
utler	16	16	700	12.00	0.224	0.75	7,376.67	3,666.17	11.042.84
alhoun	16	16	780	13.00	9.10	0.70	7,105.02	14,164.11	21,269,13
arroll	16	15	******	******	******	******	9,173.12	1,640,12	10 813 24
ass	16	15		111111	******		7,397.56	7.579.78	14 977 34
edar	17	15	11114	******	******		7,931.93	12 255 76	20 187 60
erro Gordo	16	14	798	15.70	11.78	0.75	9.404.95	19 507 28	28 012 21
herokee	10	10	670	10.00	13.26	0.75	8 885 04	11 846 20	20,712.20
hickasaw	10	10	491	14.00	11.61	0.80	\$ 703.10	6 252 00	20,732.32
larke	14	13	782	8.00	5.98	0.75	4 680.00	6 284 05	11,925.19
lav	14	11	480	11.00	7.63	0.65	1 650 30	0,009,00	10,964,95
layton	16	6			and the second	0.02	2 604 62	0,175.39	8,834.59
linton	22	22	700	21.00	13.83	0.66	2,004.02	234,2/	3,158.89
rawford	20	20			40.00	0.00	9,082.14	27,601.81	37,283,95
dwioru	20	20				1	11,065.36	7,375.75	18,441.11
allaS	16	16	780	15.5	12.00	0.75	12,000.00	12,175.00	24,175.00
avis	15	15		10.0	10.00	0.775	9,380.74	11,991.89	21,372.63
ecatur	16	16	502		7.42	A	3,641.48	9,388.37	13,029,85
elaware	16	16			1.46	0.50	4,391.39	1,815.40	6,206.79
es Moines	13	13	604	15.0	11.02	******	7,413.95	10,142,03	17,555,98
ickinson	12	12	318	15.00	11.00	0.69	6,686.47	12,527.00	19,213,47
	100	44 1	200 1	15,00 1	11.34	0.75	3,837.95	3,832,32	7 670 27

SUMMARY TABLE NO. 17-Continued.

1				Maintenan	ce					
County	No. Twps. in County	No. Twps. Reporting	No. Miles Regularly Dragged	Aver. No. of Times Dragged	Aver. Cost Per Mile of Road	Aver. Cost Per Mile, One Round Trip	Total Cost of Dragging	Total Cost of Repairs	Total Cost of Repairs and Maintenance	IOV
Dubuque Emmet Fayette Floyd Fremont Greene Grundy Guthrie Hamilton Hardin Harrison Henry Howard	17 12 20 12 16 13 15 14 17 17 16 15 20 12 12 12 12	16 12 20 11 15 16 16 11 12 14 20 12 12 12	256 850 492.5 580 566 7774 419 400	56.00 18.00 19.00 14.3 11.50 16.00 12.27 20.00	22.61 12.04 11.95 10.20 13.05 9.30 8.80 8.80 8.80	0.81 0.75 0.70 0.63 0.71 0.75 0.75 0.75 0.75 0.60 0.60	5,789.23 4,310.23 10,236.48 5,607.70 7,188.47 5,886.70 5,929.53 7,384.16 5,242.56 5,820.33 9,248.64 8,138.51 6,341.25 3,683.82	18,842.88 5,728.14 7,103.02 6,282.83 8,841.36 1,107.74 11,670.38 5,921.70 11,868,55 1,670.28 5,392.48 7,976.56 29,064.26 3,201.69 3,568,76	23,632.11 10,038.37 17,339.50 11,890.53 16,029.83 6,270.61 17,557.08 11,851.23 19,252.71 6,912.84 11,212.81 17,225.20 37,202.77 9,632.94 7,252.58	WA STATE HIGHWAY CON
Ida	12 12 18 18 19 12 21 16 17 28 15 20 12 12 12 12 18 16 19	12 12 18 18 19 12 21 16 17 20 15 20 15 20 12 12 12 15 16 19	490 825 720 1,243 660 700 806 398 595 946 528 785	12.00 15.00 12.00 11.00 14.8 14.8 14.00 30.00 22.30 17.00 13.50 14.00	16.97 8.55 10.58 8.65 7.70 9.70 12.81 11.12 8.91 20.98 13.38 9.97 8.31	0.83 0.75 0.72 0.75 0.70 0.70 0.70 0.70 0.70 0.70 0.70	8,312.61 4,619.94 8,414.67 6,280.03 9,571.22 6,389.00 8,965.66 7,785.39 7,177.51 8,350.45 7,959.45 9,430.58 6,448.36 4,186.39 3,953.37 6,383.90 7,592.03	5,97,15 13,002,46 15,799,40 20,730,39 15,438,12 13,287,64 11,932,40 4,052,75 21,089,34 5,330,10 9,926,11 10,57,60,12 3,890,12 5,745,15 2,819,32 21,435,56 18,034,91	14,309.76 17,622,40 24,214.07 27,010.42 25,079.34 19,676.64 20,898.06 11,838.14 28,266.85 13,689.55 17,885.56 20,006.55 10,338.48 10,131.54 6,772.69 27,819.46 25,616.94	IMISSION
Marion Marshall Milts Mitchell Monoona Montgomery Muscatine O'Brien O'Brien O'Brien O'Brien O'Brien O'Brien O'Brien O'Brien O'Brien O'Brien Palo Alto Page Palo Alto Page Palo Alto Page Palo Alto Pottawattamie Pottawattamie Pottawattamie Pottawattamie Pottawattamie Pottawattamie Poweshiek Sac Scott Shelby Sioux Story Tama Taylor Union Van Buren Wapelo Warten Washington Wayne Webster Winnebago	15 18 13 16 19 12 15 16 11 16 16 17 16 14 16 24 18 19 28 16 17 16 14 16 23 16 21 17 12 28 16 17 16 17 16 17 16 17 16 17 18 19 28 16 17 12 14 16 17 16 16 16 17 16 17 16 17 16 17 16 16 17 16 16 17 16 16 16 17 16 16 16 16 16 16 16 16 16 16	15 16 19 12 6 15 16 15 16 11 16 16 11 16 16 11 16 16	600 655 400 511 677 300 420 700 490 780 919 733 600 415 640 750 280 280 	10.00 13.00 13.00 19.20 15.00 16.00 15.00 14.00 11.3 16.00 11.94 12.39 10.00 30.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 11.3 16.00 15.00 16.00 11.3 16.00 10.00 10.00 11.3 16.00 10.00 11.3 16.00 10.00	12.65 9.75 9.26 14.00 11.26 12.24 7.60 10.40 14.43 11.00 8.68 7.00 8.68 7.00 15.00 15.14 14.00	0.70 0.65 0.75 0.75 0.72 0.73 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75	7,586,99 7,520,52 7,472,81 5,858,96 6,400,00 3,703,65 2,215,23 7,152,54 7,628,41 3,674,64 6,885,87 5,873,20 8,390,07 7,659,78 8,982,40 12,668,73 5,160,38 3,173,56 7,279,95 7,067,69 8,567,30 9,581,80 8,245,38 7,982,40 7,067,69 9,581,80 8,245,38 7,982,40 7,084,20 7,676,95 11,366,71 4,898,07 3,804,24 5,130,47 4,898,07 3,804,24 5,130,47 4,898,07 3,804,24 5,1366,55 11,366,71 4,836,63 8,9718,40 4,239,62 8,573,05 7,884,30 4,377,28 7,278,26	16.6271.45 6.413.30 13.525.90 5.989.97 9.117.00 9.884.80 2.994.84 11.377.82 5.298.10 2.421.83 3.686.84 12.124.48 21.574.53 2.910.04 20.062.03 12.284.65 20.517.89 5.651.50 6.720.19 8.483.25 15.257.17 9.174.07 8.622.18 19.053.98 12.906.57 14.309.31 13.158.83 17.659.90 17.747.43 21.22.53 18.623.70 4.515.27 7.721.31 8.154.75 21.426.38 6.33.19 9.600.71	24, 258, 44 3, 944, 35 20, 998, 71 11, 848, 93 15, 517, 00 13, 588, 45 5, 210, 07 18, 530, 36 12, 926, 51 6, 096, 47 10, 572, 71 17, 907, 68 29, 964, 60 10, 608, 82 29, 044, 43 24, 953, 38 25, 678, 27 8, 825, 06 14, 000, 14 15, 550, 34 23, 824, 47 18, 755, 87 16, 867, 56 27, 036, '8 18, 037, 04 19, 207, 38 16, 963, 07 22, 751, 97 24, 514, 38 13, 489, 24 13, 433, 67 11, 960, 93 16, 927, 80 29, 310, 68 10, 270, 47 16, 968, 97 11, 665, 265, 24	ANNUAL REPORTS OF COUNTY ENGINEERS

SUMMARY TABLE NO. 18.

Road Equipment and Material and Miscellaneous Items-Township Expenditures-Annual Reports of County Engineers.

	No. Turns	No. Twne	Cost of Equip-		Special Cases	
County	in County	Reporting	Unused Material	Drainage Assessments	Miscellaneous	Total Special Cases
Adair. Adams. Allamakee. Appanoose. Audubon. Benton Black Hawk. Boone	$\begin{array}{c} 18\\ 12\\ 18\\ 17\\ 12\\ 20\\ 18\\ 17\\ 14\\ 16\\ 18\\ 16\\ 16\\ 16\\ 16\\ 16\\ 16\\ 16\\ 12\\ 12\\ 12\\ 12\\ 12\\ 16\\ 16\\ 16\\ 15\\ 16\\ 16\\ 15\\ 16\\ 16\\ 13\\ 12\\ 17\\ 12\\ 17\\ 12\\ 17\\ 12\\ 12\\ 17\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12$	18 12 17 17 12 20 18 15 6 12 17 16 16 16 15 16 16 12 20 20 20 16 15 16 16 15 16 12 17 16 16 15 16 12 17 12 18 15 16 16 15 16 16 17 12 17 12 18 15 16 16 16 17 12 17 12 18 15 16 16 16 17 16 16 17 16 16 16 17 16 16 17 16 16 17 16 16 17 16 16 17 16 16 17 16 16 12 20 20 20 17 16 16 17 16 16 12 20 20 20 18 17 16 16 17 16 16 12 20 20 20 16 15 16 16 15 16 16 12 20 20 20 20 20 20 20 20 20 16 15 16 15 16 15 16 16 15 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 15 16 16 15 16 15 16 15 16 16 15 16 16 15 16 16 15 16 15 16 16 15 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 15 16 16 12 12 11 16 16 16 15 16 16 12 12 11 16 16 16 16 12 12 16 16 16 16 12 12 16 16 16 12 12 16 16 16 12 12 16 16 16 12 12 16 16 12 12 16 16 12 12 16 16 16 12 12 16 16 12 12 16 16 16 12 12 16 16 16 16 12 12 16 16 16 16 16 12 12 16 16 16 16 16 16 16 12 12 16 16 16 16 16 16 16 16 16 16	$\begin{array}{c} \$ 4,891.10 \\ 3,245.90 \\ 1,150.19 \\ 1,249.90 \\ 622.86 \\ 12,824.74 \\ 8,663.04 \\ 6,168.63 \\ 1,986.55 \\ 2,287.00 \\ 2,612.91 \\ 4,597.81 \\ 9,978.80 \\ 2,312.62 \\ 2,914.31 \\ 12,470.05 \\ 2,560.14 \\ 1,808.52 \\ 10,433.48 \\ 792.78 \\ 523.35 \\ 2603.70 \\ 4,286.89 \\ 3,200.00 \\ 3,977.81 \\ 465.53 \\ 992.02 \\ 2,469.00 \\ 1,594.53 \\ 1,597.79 \\ 1,652.48 \\ 5,611.45 \\ \end{array}$	\$ 198.50 5,590.17 7,794.22 8,814.77 2,154.42 4,399.66 1,598.14 4,055.19 8,506.54	\$ 1,049.07 1,524.63 7,278.97 542.55 8,029.12 3,424.42 862.10 3,377.35 7,283.49 3,242.94 3,839.03 1,116.70 5,004.59 3,603.17 5,016.60 4,700.00 4,643.19 1,370.70 4,223.64 1,192.21 1,389.43 2,281.56	\$ 1,049,07 1,534,63 7,278,97 741.05 13,619.29 3,424,42 8,656.32 8,814,77 2,154,42 3,377,35 7,283,49 7,642.60 3,839.03 1,116.70 5,004.59 3,603,17 5,016.60 4,700.00 6,241,33 1,370.70 4,223,64 1,592,41 5,444,62 10,788,10
Fayette Floyd Franklin Fremont Greene. Grundy. Guthrie. Hamilton. Hardin. Harrison. Harrison. Henry. Howard. Humboldt. Ida. Iowa. Jackson Jasper. Jefferson. Johnson. Jones. Keokuk Kossuth. Lee. Linn. Louisa. Lyon. Matison. Mathaska. Marshall. Mills. Mithell. Monroe. Monroe. O'Brien. Page. Palo Alto.	20 12 16 13 15 14 17 17 16 15 20 12 12 12 12 12 12 12 12 12 12	$\begin{array}{c} 20\\ 11\\ 11\\ 15\\ 10\\ 15\\ 14\\ 16\\ 11\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12\\ 12$	$\begin{array}{c} 2,185.03\\ 2,760.60\\ 1,608.77\\ 2,660.28\\ 4,943.13\\ 3,206.30\\ 4,919.25\\ 3,391.41\\ 3,501.37\\ 2,374.35\\ 275.77\\ 1,125.97\\ 2,674.23\\ 1,522.28\\ 4,647.24\\ 1,305.69\\ 6,878.34\\ 5,537.78\\ 5,107.37\\ 34.00\\ 2,144.90\\ 4,936.91\\ 1,991.07\\ 4,115.85\\ 2,001.76\\ 674.44\\ 2,561.25\\ 2,257.57\\ 6,034.73\\ 2,151.68\\ 4,094.18\\ \hline 841.14\\ 4,165.00\\ 914.25\\ 2,97.18\\ 1,437.80\\ 2,790.90\\ 3,694.42\\ 4,100.50\\ 5,881.48\\ 1,354.68\\ 6,732.33\\ \hline \end{array}$	16,493,42 248,50 5,839,36 2,935,13 5,246,11 2,666,52 2,947,70 3,338,70 3,338,70 19,844,77 139,92 139,92 139,92 823,98 3,075,00 2,489,37 4,815,48 6,011,83	3,436.34 5,278.06 3,394.19 2,598.92 2,032.47 3,784.30 3,621.87 757.28 1,954.95 4,965.67 1,707.54 2,318.26 5,500.15 1,671.16 3,030.98 1,416.60 5,497.04 3,052.60 1,127.70 3,452.12 1,787.29 5,296.22 2,705.97 4,640.00 712.18 1,897.10 .2,313.64 1,168.91	19,929,76 248,50 5,8°,9,36 5,278,06 3,394,19 5,534,05 7,278,58 6,450,82 2,947,70 3,621,87 757,28 5,293,65 4,965,67 1,707,54 2,318,26 5,500,15 1,671,16 22,875,75 1,416,60 5,636,96 3,052,60 1,127,70 3,452,12 1,787,29 5,296,22 8,23,98 2,705,99 7,715,00 712,18 1,897,10 2,489,37 2,313,64 4,815,48 1,168,91 4,011,83

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ANNUAL REPORTS OF COUNTY ENGINEERS

SUMMARY TABLE NO. 18-Continued.

	No. Twps.	No. Twps.	Cost of Equip- ment and		Special Cases			
County	in County	Reporting	Unused Material	Drainage Assessments	Miscellaneous	Total Special Cases		
Poweshiek Ringgold Sac	16 17 16 14 16 23	11 13 16 14 16 23	2,399.67 2,412.61 2,191.67 1,668.80 1,931.28 4,933.89	2,326.05 600.00	2,031.93 4,674.54	2,031.93 7,000.59 600.00 3.262.34		
tory ama aylor nion	16 21 17 12	15 21 17 8	1,448.52 3,626.48 2,863.16	7,119.16	3,486.06 6,639.01 1,401.82	10,605.22 6,639.01 1,401.82		
an Buren. Vapello. Varren. Vashington.	14 14 16	14 14 16	5,081.08 2,034.46 5,583.04	40.27 208.16	2,061.76 1,032.44	2,061.76 40.27 1,240.60		
ayne ebster innesbago	16 23 12	16 19 9	1,091.62 6,454.34 541.82	6,350.21 3,144.06	4,393.04	4,393.04 6,350.21 3,144.06		
oodbury orth right	. 23 12 16	20 18 12 16	3,260 50 1,555.84 2.589.23 2,026.78	1,216.85 75.00 6,395.95	5,053.30 3,433.30 822.30	5.053.30 4,650.15 897.30 6.395.95		
Totals	1.613	1.521	\$318.273.32	\$147.859.21	\$196.374.09	\$344,233,30		

Nore: No railroad crossings reported improved with township funds.

SUMMARY TABLE NO. 19.

Progress Report-County Road Surveys and Construction During 1917-Annual Reports of County Engineers.

		Surveys	and Profiles	•		Const	truction	
County	No. Miles Surveyed	No. Miles Platted	No. Miles Grade Line Approved by Dist. Engrs.	No. Miles Profile Approved by Commission	Built to Natural Grade— Standard Width	Built to Temporary Grade- Standard Width	Built to Permanent Grade- Standard Width	Surfaced
Adain	1.50	1.00	1.00	1.00	103.00		20	
Adome		4.00	1.00	4.00	22.25		.20	
Allamakao	1.67	1.67	1.67	1.67	19 10		1.67	
Anamakee	1.07	5.00	5.00	5.00	10.19		1.03	(14444).
Audubas	2.50	7.00	7.00	5.00	0.00		******	649492
Augucon	2.50	7.00	7.00	7.00	9.00	.50	3.00	
Denton	******		*****		41.00	******	2.50	******
black Hawk			10722		31.25		5.08	5.08
soone	0.75	1.15	14.75	6.00	29.34		1.75	16.00
sremer	5.00	1.00			47.50		2.00	· 1.00
Suchanan		******	******	******	31.25			4.00
Suena Vista		17.75	75.75	75.75			75.75	29.31
Butler	9.00	6.00	5.00	5.00	33.00		5.00	
alhoun	12.00	15.00	15.00	28.00	57.50	60	39.60	14.65
arroll	35.00	12.50	13.25	13.25	35.25	1.00	13.25	5.00
ass	.50	.50	.50	.50			1.00	0.00
edar			1.00	1.00	30.49		3.07	27
erro Gordo	8 50	17.00	17.00	17.00	3.00		16 73	5.70
herokee	21.25	19 50	13.00	11.00	8.00		16.05	5.70
hickasaw	14.00	11.00	9.00	0.00	26.00		10.23	*****
larke	1.00	1.00	1.00	1.00	30.00	******	0.50	5.25
lav	1.00	23.00	62.00	62.00	22.00		00.00	27.10
layton	2 50	50	50	02.00		******	80.05	33.10
linton	17 50	17 50	150	1.50	14.70		11101	*******
rawford	43.40	43.40	1.50	41.70	14.70	.63	5.95	4.92
Dallas	17.25	22.35	21.00	21.00	67 50	******	41.52	******
avis	17.55	44.33	21.00	21.00	45.00		· 6.97	12.25
lecatur	1.75	2.00	2.00		45.00		******	*****
Jelaware	10.00	2.00	2.00	2.00	13.97	8.10	******	******

ANNUAL REPORTS OF COUNTY ENGINEERS

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SUMMARY TABLE NO. 19-Continued.

		Surveys	and Profiles			Const	ruction -		= 1 0
County	No. Miles Surveyed	No. Miles Platted	No. Miles Grade Line Approved by Dist. Engrs.	No. Miles Profile Approved by Commission	Built to Natural Grade- Standard Width	Built to Temporary Grade- Standard Width	Built to Permanent Grade Standard Width	Surfaced	, uor
Des Moines Dickinson Dubuque. Emmet. Fayette. Floyd. Franklin Fremont. Greene. Grundy. Guthrie. Hamilton. Hancock. Hardin. Harcock. Hardin. Harrison. Henry. Howard. Humboldt. Ida. Jowa. Jackson. Jasper. Jefferson. Johnson. Jones. Keokuk. Kossuth. Lee. Linn. Louisa. Lucas.	2.57 108.70 1.25 28.00 5.00 15.50 16.00 13.00 30.00 0.47 28.05 23.00 4.00 3.00 13.50 20.00 2.00 3.00 9.50 10.00 1.50 0.00 2.50 0.34 3.6 88 0.25	2.57 98.97 1.25 29.00 3.00 17.00 16.00 10.00 0.47 14.20 14.00 25.00 2.50 16.25 5.00 12.50 16.25 3.00 8.50 1.50 0.00 11.50 0.34 	2.57 77.88 29.00 14.00 10.00 9.75 2.00 0.47 10.00 7.50 36.00 2.00 1.00 6.00 16.25 .50 4.00 10.50 1.50 0.34 .50 0.34 	2.57 77.88 29.00 14.00 10.00 0.47 23.25 6.50 33.00 2.00 1.00 3.00 9.25 .50 1.00 4.00 1.00 4.00 1.50 0.00 1.50 0.34 	19.50 12.00 13.00 48.50 29.00 27.00 25.10 9.13 19.25 26.38 24.75 11.50 13.50 23.25 42.60 8.00 0.00 47.00 41.00 23.25 42.60 8.00 0.00 47.00 45.50	0.50 0.75 0.75 0.30 0.00 0.00	40 89 4.25 16.55 2.00 4.50 8.50 10.75 3.00 12.75 6.08 21.62 2.25 3.00 8.50 2.25 3.00 8.50 2.38 2.50 9.25 8.50 1.11 0.00 16.50 0.75 0.96	.50 38 89 1.95 20.11 1.75 3.50 1.50 11.50 21.17 11.25 25.81 10.50 10.50 1.75 0.00 0.50 1.11 0.00 1.78 0.00 1.11 0.00 1.80 2.45 	A STATE HIGHWAY COMMISSION
Lyon	12.00 38.30 14.75 0.50 9.25 12.80 1.15 3.00 11.00 7.14 12.90 31.75 14.25 38.50 1.80 16.00 25.50 13.50 6.00 0.00 20.10 9.00 15.50 7.00 20.10 9.00 15.50 7.00 20.10 9.00 15.50 7.00 20.00 13.50 9.00 13.50 14.25 38.50 13.50 14.25 38.50 13.50 14.25 38.50 13.50 13.50 14.25 38.50 13.50 13.50 14.25 38.50 13.50 13.50 13.50 13.50 13.50 13.50 14.25 13.50 13.50 13.50 9.00 20.10 9.00 15.50 13.50 9.00 13.50 9.00 15.50 13.50 9.00 15.50 15.10 	2 00 0.00 12.75 0 50 11.60 8.00 10.00 15 1.00 13.00 18.00 12.90 32.10 29.00 13.50 29.00 13.50 23.00 25.00	2.00 0.00 10.75 11.60 6.70 0.00 1.00 13.00 12.90 34.25 35.25 23.00 0.00 34.25 35.25 23.00 0.00 0.00 12.90 34.25 0.00 15.75 0.00 1.00 13.00 12.90 34.25 0.00 1.00 13.00 12.90 0.00 10.00 13.00 12.90 34.25 0.00 0.00 1.00 13.00 12.90 0.00 0.00 12.90 34.25 0.00 0.00 15.75 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 	2.00 0.00 10.75 11.69 9.30 0.00 0.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 13.00 15.00 36.00 6.00 15.75 0.00 4.00 6.00 15.00	79.50 32.00 34.38 27.00 43.25 2.00 25.50 62.70 3.00 15.07 14.00 26.97 1.5 13.00 122.00 95.00 37.00 35.25 16.00 61 52.50 19.75 10.00 90.75 55.30 16.50 8.00 30.90 28.00	1.00 0.25 21.50 1.50 1.5 1.50 1.5 1.50 1.50 19.60 4.00 1.50 50 1.75 0.00 0.00 0.00 0.00 0.00 0.00 0	2.00 5.00 0.25 12.90 2.50 8.45 0.00 11.42 17.91 12.90 1.50 41.55 35.5 7.36 0.00 35.93 4.50 1.60 0.00 1.60 0.00 7.10 14.75 .50 .50 	0.00 4.36 2.50 0.00 0.00 0.00 1.16 0.00 17.0 17.0 17.25 1.01 9.23 .70 16.00 .75 16.00 .75 355 0.00 0.00	ANNUAL REPORTS OF COUNTY ENGINEEI

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SUMMARY TABLE NO. 20.

Progress Report-County Road Surveys and Construction-Total Work Done to Jan. 1, 1918-Annual Reports of County Engineers.

* 1 ²		Surveys	and Profiles			Const	ruction			
. County	No. Miles Surveyed	No. Miles Platted	No. Miles Grade Line Approved by Dist. Engrs.	No. Miles Profile Approved by Commission	Built to Natural Grade- Standard Width	Built to Temporary Grade- Standard Width	Built to Permanent Grade— Standard Width	Surfaced	Total No. of Miles in County System	IOWA STAT
Adair. Adams. Allamakee Appanoose Audubon. Benton. Black Hawk. Boone. Bremer. Buchanan Buena Vista. Butler. Calhoun. Carroll. Cass. Cedar. Cerro Gordo. Cherokee. Chickasaw Clarke. Clayton. Clinton. Clinton. Carwford. Dallas. Davis. Decatur.	$\begin{array}{c} 37.49\\ 5.00\\ 25.26\\ 32.50\\ 10.00\\ 79.30\\ 86.10\\ 61.55\\ 60.27\\ 20.90\\ 170.25\\ 46.75\\ 123.75\\ 77.50\\ 9.25\\ 16.26\\ 84.52\\ 56.25\\ 49.50\\ 1.00\\ 150.00\\ 150.00\\ 101.49\\ 70.33\\ 0.00\\ 2.75\\ \end{array}$	$\begin{array}{c} 16.00\\ 2.00\\ 25.26\\ 37.50\\ 7.50\\ 51.30\\ 79.98\\ 67.55\\ 54.77\\ 20.90\\ 141.03\\ 30.75\\ 122.75\\ 40.75\\ 6.00\\ 15.41\\ 89.40\\ 57.50\\ 41.25\\ 1.00\\ 143.74\\ 20.00\\ 70.04\\ 101.49\\ 66.58\\ 0.00\\ 3.00\\ \end{array}$	$\begin{array}{c} 10.00\\ 2.00\\ 12.08\\ 6.00\\ 7.50\\ 43.60\\ 79.78\\ 34.75\\ 36.35\\ 15.21\\ 110.02\\ 18.25\\ 117.75\\ 47.25\\ -6.00\\ 13.17\\ 80.60\\ 44.54\\ 27.00\\ 1.30\\ 1.00\\ 133.90\\ 6.75\\ 37.14\\ 17.30\\ 42.05\\ 0.00\\ 2.00\\ \end{array}$	$\begin{array}{r} 4.00\\ 2.00\\ 7.67\\ 6.00\\ 7.07\\ 42.50\\ 32.40\\ 56.00\\ 22.36\\ 4.30\\ 117.67\\ 9.50\\ 116.50\\ 29.25\\ 2.75\\ 12.17\\ 78.90\\ 52.54\\ 13.00\\ 1.00\\ 119.30\\ 3.50\\ 15.06\\ 82.98\\ 89.23\\ 0.00\\ 0.00\\ \end{array}$	$\begin{array}{c} 164.50\\ 105.25\\ 18.19\\ 29.00\\ 130.00\\ 174.00\\ 52.80\\ 35.00\\ 52.80\\ 35.00\\ 145.50\\ 50.10\\ 48.00\\ 121.00\\ 79.74\\ 35.00\\ 121.00\\ 79.74\\ 35.00\\ 0.00\\ 77.00\\ 106.75\\ 108.00\\ 0.00\\ 73.70\\ 1.00\\ 120.00\\ 1.0.75\\ 45.00\\ \end{array}$	2.50 13.00 0.00 0.50 27.50 0.28 4.00 0.00 2.40 2.40 2.40 2.40 2.75 1.33 0.00 0.00 2.75 1.33 0.00 0.00 2.75 1.33 0.00 0.00 2.75 1.33 0.00 0.00 2.75 1.33 0.00 0.00 2.75 0.28 2.40 0.00 2.75 0.28 2.40 0.00 2.40 0.00 2.75 0.28 2.00 2.75 0.28 2.00 2.75 0.27 5.00 2.75 0.28 2.00 2.75 0.27 5.00 2.75 1.33 0.00 0.00 2.75 1.33 0.00 0.00 2.75 1.33 0.00 0.00 0.00 2.75 1.33	1.50 0.00 24.05 0.00 3.50 8.50 4.59 9.50 6.75 11.75 117.50 8.50 90.62 35.00 2.25 14.40 68.20 52.50 10.00 15.77 96.00 15.77	0.00 0.00 0.00 1.00 1.3,43 25,50 1.25 4.00 52,50 1.50 27,90 0.00 0.00 1.90 7.70 0.00 8.75 45.00 1.00 12,19 0.00 23,73	172.00 126.75 116.00 166.50 140.00 211.00 186.43 157.00 125.50 175.41 170.25 174.70 173.62 175.00 142.50 153.50 154.50 155.50 156.50 199.30 199.30 199.30 155.50 155.50 155.50 155.50	TE HIGHWAY COMMISSION
Delaware. Des Moines. Dickinson Dubuque. Emmet. Fayette. Floyd. Franklin. Fremont. Greene. Grundy. Guthrie. Hamilton. Hancock. Hardin. Harrison. Henry. Howard. Humboldt. Ida. Jowa Jasper. Jefferson. Johnson. Jo	45.13 38.35 106.43 81.75 103.50 38.75 38.36 126.50 8.72 76.50 129.58 18.59 117.10 100.14 122.50 30.25 87.10 39.41 72.85 9.75 27.80 11.50 37.00 18.20 157.00 23.10 41.85 82.26 72.84 22.55 59.86 2.25 2.25 59.86 2.25 59.86 2.25 59.86 2.25 59.86 2.25 59.86 2.25 59.86 2.25 2.25 59.86 2.25 2.25 2.25 2.25 2.25 2.25 2.25 2.2	24.87 37.62 106.43 81.75 103.50 22.00 32.86 92.60 10.22 73.00 42.58 6.34 87.50 80.86 109.97 24.35 64.00 36.41 69.10 9.75 24.20 11.50 32.50 18.20 13.9,04 24.30 33.80 71.26 40.84 18.20 23.61 2.00 30.55 2.08 37.50 13.71 149.34 28.65 9.00 27.27 19.16 14.50 52.60 76.79 31.90 19.49	$\begin{array}{c} 21.50\\ 14.50\\ 81.59\\ 53.00\\ 101.63\\ 19.00\\ 21.67\\ 32.50\\ 4.12\\ 40.00\\ 2.00\\ 4.46\\ 70.15\\ 62.38\\ 108.72\\ 17.85\\ 16.00\\ 21.25\\ 62.50\\ 0.00\\ 32.50\\ 6.25\\ 62.50\\ 0.00\\ 32.50\\ 6.25\\ 25.50\\ 3.64\\ 75.77\\ 71.10.8\\ 19.34\\ 55.84\\ 2.40\\ 14.15\\ 0.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 11.00\\ 10.00\\ 16.29\\ 6.50\\ 11.00\\ 16.29\\ 6.50\\ 11.00\\ 3.25\\ \end{array}$	$\begin{array}{c} 14.00\\ 10.57\\ 10.3.59\\ 29.00\\ 76.57\\ 0.00\\ 23.06\\ 12.85\\ 3.12\\ 64.50\\ 7.00\\ 1.03\\ 69.90\\ 66.90\\ 100.72\\ 13.25\\ 3.00\\ 13.25\\ 3.00\\ 13.25\\ 45.50\\ 0.00\\ 14.02\\ 7.25\\ 17.75\\ 5.14\\ 5.50\\ 7.75\\ 5.14\\ 5.50\\ 7.75\\ 5.14\\ 5.50\\ 7.75\\ 16.07\\ 42.66\\ 5.84\\ 0.00\\ 14.15\\ 0.00\\ 14.15\\ 0.00\\ 14.15\\ 0.00\\ 14.15\\ 0.00\\ 14.15\\ 9.20\\ 0.00\\ 14.18\\ 14.21\\ 12.85\\ 9.20\\ 0.00\\ 12.13\\ 1.00\\ 1.00\\ 1.00\\ 1.00\\ 2.5.01\\ 33.50\\ 30.40\\ 3.00\\ $	105.80 38.25 19.30 13.00 23.00 167.00 135.00 101.75 23.75 132.00 80.70 97.65 30.75 95.00 69.00 100.20 57.25 81.25 10.00 109.41 0.00 109.41 0.00 108.41 0.00 108.41 0.00 118.25 87.50 120.00 140.00 140.00 143.50 140.00 143.50 123.50 72.50 56.40 108.00 123.50 123.00 143.50 123.50 72.50 56.40 108.00 163.00 75.90 2.00 0.00 163.00 75.90 2.00 0.00 163.50 163.00 163.50 163.00 163.50 163.00 16	0 000 1.54 0 000 0 000 1.12 9.25 0.50 0.00 0 000 3.00 0 000 3.00 0 000 3.3.71 0 000 3.00 0 000 3.50 0	19.00 6.36 11.81 4.25 10.60 22.00 7.25 7.00 0.00 56.63 4.00 1.28 39.65 6.08 25.50 13.00 12.50 7.25 7.00 13.00 12.50 7.25 7.00 13.00 12.50 7.25 7.00 13.00 12.50 7.25 7.00 13.00 13.25 0.60 9.50 5.50 0.00 27.30 0.75 5.80 7.47 1.00 1.50 6.20 3.53 8.54 2.50 9.70 0.00 20.75 5.80 7.47 1.00 1.50 6.20 3.53 8.54 2.50 9.70 0.00 27.30 0.75 5.80 7.47 1.00 1.50 6.20 3.53 8.54 2.50 9.70 0.00 27.30 0.75 5.80 7.47 1.00 1.50 6.20 3.53 8.54 2.50 9.70 0.00 2.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 7.47 1.00 1.50 9.70 9	$\begin{array}{c} 13.50\\ 0.50\\ 60.25\\ 20.95\\ 56.60\\ 3.00\\ 0.00\\ 20.50\\ 0.00\\ 41.12\\ 0.00\\ 2.00\\ 33.02\\ 14.25\\ 39.00\\ 0.00\\ 6.25\\ 23.00\\ 0.00\\ 6.25\\ 23.00\\ 0.00\\ 0.00\\ 0.50\\ 2.54\\ 0.00\\ 0.50\\ 2.54\\ 0.00\\ 0.50\\ 2.54\\ 0.00\\ 0.50\\ 2.55\\ 0.00\\ $	175.80 81.50 106.43 172.55 103.50 202.00 142.25 185.00 154.38 132.50 158.00 196.00 177.38 164.63 174.30 168.00 142.30 122.50 131.50 132.00 171.00 157.50 205.05 141.30 157.50 167.80 279.50 167.80 170.00 188.50 167.80 171.00 188.50 167.80 172.00 188.50 167.80 172.50 158.00 166.80 188.80 112.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 154.30 165.50 162.00 154.30 166.80 188.50 162.00 154.30 166.80 188.50 162.00 164.30 165.50 162.00 164.30 165.50 167.80 167.50 162.00 164.63 174.00 165.50 167.80 167.50 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.63 175.50 162.00 164.50 164.63 175.50 162.00 164.50 164.50 164.63 175.50 164.50 164.63 175.50 164.50	ANNUAL REPORTS OF COUNTY ENGINEERS 29

SUMMARY	TABLE	NO.	20-Cont	tinued.
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		Surveys	and Profiles			Constr	ruction		
County	No. Miles Surveyed	No, Miles Platted	No. Miles Grade Line Approved by Dist. Engrs.	No. Miles Profile Approved by Commission	Built to Natural Grade- Standard Width	Built to Temporary Grade- Standard Width	Built to Permanent Grade- Standard Width	Surfaced	Total No. of Miles in County System
Palo Alto Plymouth Pocahontas	146.14 33.41 117.65	122.64 33.41 114.65	115.29 91.90	112,39 	28.00 0.00 61.85	0 10 0.00 23.90	99.13 0.00 43.00	2.83 0.00 37.50	166.88 208.50 168.50
Polk Pottawattamie Poweshiek	71.98 115.18 12.55 16.00	64.13 103.28 11.05	37.68 28.51 8.50	28 00 23.80 0.00	122.00 235.55 128.00	1.50 10.24	20.25 6.21 10.00	17.25 2.00	185.75 254.00 138.30
Sac	149.73 30.73 20.77	1.36.12 28.23 20.77	117.05 21.73 0.00	109.05 21.73 0.00	13.00 15.80 72.00	3.40 0.40	78.91 15.55 0.30	35.30 36.86 0.00	149.23 135.80 157.75
Sioux	29.98 132.40 75.10 10.71	21.48 131.40 70.65 8.71	11.98 131.40 55.40 2.71	1.00 131.40 51.05 0.71	- 55.00 0.00 173.00 - 86.00	0.00 0.00 1.75 0.00	2.00 102.50 26.53 0.37	0.00 32.50 0.75 0.00	216.00 1.35.00 207.00 172.00
Union. Van Buren	1.00 0.00 29.50	1.50 0.00 23.00	0.00 0.00 14.50	0.00 0.00 11.50	0.00 68 00 42.00	0.00 4.25	0.00	0.00	135.50 133.30 137.13
Washington Wayne Webster	23.75 18.60 19.62 94.00	8.25 18.60 13.62 85.00	1.00 15.80 8.00 77.00	4.75 0.50 6.00 102.00	155.25 181.60 141.00 112.50	0.25	3.50 8.90 0.00 57.75	0.00	170.00 192.50 172.50 185.37
Winnebago Winneshiek Woodbury	131.55 7.75 106.30	63.25 0.00 87.00	42.75 0.00 24 9)	42.75 0.00 1.50	69.00 131.65 150.00	3.50 0.00 9.00	43.75 0.50 16 50	0.20	131.55 202.30 213.00
Wright	46.25 5,663.18	41.25	31.25 3,108.41	29.25	7,972.40	474.75	0.00 14.00 1,728.01	3.00 69.00 869.69	114.50 173.50 16,084.76

SUMMARY TABLE NO. 21.

Gravel Pits Owned by County, January 1, 1918-Annual Reports of County Engineers.

Allamakee 1 \$ 1,500.00 Benton 1 Black Hawk 6 3,500.00 Bremer 1 Buchanan 2 600.00 Byena Vista 9 Butler 10 2,000.00 Calhoun 12 Cerro Gordo 7 1,950.00 Cherokee 1 Dallas 9 1,800.00 Clay 16 Dallas 5 1,000.00 Delaware 5 Dickinson 5 1,200.00 Payette 1 Floyd 4 1,100.00 Fayette 1 Floyd 4 1,000.00 Hamilton 2 Kossuth 10 2,000.00 Hamilton 4 Yoon 3 650.00 Marion 1	Value
Palo Alto Alto Processor Pocabontas Pocabontas <t< td=""><td>500.00 4,000.00 3,100.00 3,64.50 8,000.00 1,175.00 75.00 1,975.00 500.00 1,000.00 3,000.00 1,060.00 4,50.00 4,600.00 1,400.00 2,876.675</td></t<>	500.00 4,000.00 3,100.00 3,64.50 8,000.00 1,175.00 75.00 1,975.00 500.00 1,000.00 3,000.00 1,060.00 4,50.00 4,600.00 1,400.00 2,876.675

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IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 22.

Amount of Road and Bridge Work Planned or Constructed by County Engineer-Annual Reports of County Engineers.

County		Constructed		Planned				
county	Road	Bridge	Total	Road	Bridge	Total		
Vdair	 \$ 43,347.11 15,324.05 15,670.22 10,070.22 10,070.02 20,000.00 31,245.00 36,230.37 24,500.00 12,032.16 148.014.00 22,000.00 63,129.14 47,900.00 3,219.87 26,198,34 87,880.74 23,551.81 36,662.72 18.796.94 142,364.89 6,500.00 23,000.00 150,000.00 150,000.00 143,800.00 9,167.49 27.320.17 26,000.00 11,500.00 134,394.60 22,405.61 38,705.79 	\$ 53,765.01 25,397.92 77,078.45 50,000.00 98,000.00 56,024.74 41,500.00 43,606.32 52,038.40 186,500.00 61,200.00 63,273.80 64,726.51 63,725.14 43,945.14 60,550.41 162,953.17 12,502.30 25,358.01 103,412.99 66,888.39 64,730 01 32,426.31 24,068.26 27,609.47 20,0000 83,936.98 70,979.66 16,304.38	\$ 97,112.12 40,721.97 92,748.67 60,000.00 93,000.00 92,245.00 92,255.11 66,000.00 55,638.48 52,038.80 334,514.00 83,200.00 126,402.94 112,626.51 66,945.01 70,143.48 148,431.15 186,504.98 49,165.02 44,154.95 245,777.88 73,388.39 87,730.00 3225,349.81 98,775.00 41,593.80 51,388.43 53,609.47 31,500.00 218,331.58 93,385.27 55,010.17	\$ 7,000.00 0,00 4,687,50 10,000.00 14,000.00 	\$ 50,156.10 19,411.82 4,647,00 54,587,28 58,345,15 41,897,29 41,778,34 16,394,15 9,166,00 20,565,18 53,241,98 	 \$77,156.10 19,411.82 9,334,58 24,250.00 68,587.28 58,345.15 51,515 51,897.29 78,970.66 17,894.15 9,166.04 42,730.00 25,836.92 74,311.98 36,249.00 62,907.79 39,509.08 146,704.89 163,278,73 23,732.00 14,32.00 14,32.00 14,32.00 14,32.00 56,775.00 23,094.28 25,268.23 33,233,98 40,979.14 32,854.00 56,538.76 		
Payette Floyd. Franklin Premont. Greene. Grundy. Guthrie. Hamilton Hancock. Hardin. Harrison. Henry. Howard. Humboldt. Ida. Iowa Jackson. Jasper. Jefferson. Johnson. Jones. Kcokuk. Kossuth. Lee. Linn. Louisa. Lucas. Lyon. Mahaska. Marshall. Mills Mitchell. Monona. O'Brien. O'Brien. O'Brien. Page Palo Alto. Plymouth. Pocahontas. Polk.	25,000.00 34,000.00 34,000.00 39,000.00 37,316,30 32,309.43 8,000.00 71,879.70 33,358.95 53,000.00 14,215.79 26,000.00 14,215.79 26,000.00 14,215.79 26,000.00 14,215.79 26,000.00 14,215.79 26,000.00 12,088.68 47,352.51 19,736.48 35,000.00 36,000.00 9,670.55 65,000.00 28,633.98 20,000.00 43,193.84 11,917.94 37,500.00 32,000.00 8,500.00 25,000.00 22,617.60 30,000.00 25,000.00	80.000.00 47,086.48 51,000.00 47,000.00 32,652,74 45,750.00 00,000,00 61,405.40 26,793.00 75,000.00 35,300.91 45,000.00 35,300.91 43,500.00 20,000.00 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 88,000.01 85,266.55 41,433.70 31,736.75 70,941.76 35,446.74 53,434.27 96,921.37 13,390.82 40,000.00 55,500.00 162,188.16 53,638.40 47,104.47 85,000.00 35,140.20 60,000.00 28,795.00 57,864.46 63,000.00 28,795.00 57,864.46 63,000.00 12,378.45 55,500.00 88,300.00 88,300.00 60,539.27 101,000.00	$\begin{array}{c} 105,000,00\\ 78,842,48\\ 85,000,00\\ 76,000,00\\ 69,969,04\\ 78,059,43\\ 108,000,00\\ 103,285,10\\ 60,151,95\\ 128,000,00\\ 103,725,00\\ 47,000,00\\ 49,516,73\\ (9,500,00\\ 20,000,00\\ 74,000,00\\ 98,284,79\\ 95,791,25\\ 78,969,89\\ 99,000,00\\ 103,000,00\\ 64,937,10\\ 106,433,70\\ 60,370,73\\ 90,941,76\\ 54,784,14\\ 66,434,27\\ 140,115,21\\ 25,308,76\\ 77,500,00\\ 87,000,00\\ 229,041,25\\ 83,638,40\\ 55,604,47\\ 110,000,00\\ 37,757,80\\ 90,00$	15,000.00 29,500.00 20,000.00 10,505.40 20,000.00 4,400.00 17,000.00 25,835.00 50,000.00 1,000.00 15,000.00 5,000.00 5,635.00 43,644.66 30,000.00 2,551.56 2,500.00 15,000.00 2,551.56 2,500.00 7,307.23 36,300.00 5,000.00 37,788.21 19,877.00 2,600.00 37,788.21 19,877.00 2,600.00 3,000.00 22,720.00 32,000.00 32,000.00 32,000.00	62,210.42 30,498.14 20,715.00 26,000.00 23,842.80 40,000.82 46,080.82 46,080.82 46,080.82 46,080.82 46,080.82 46,080.82 46,080.82 46,080.82 43,6461.63 16,219.45 19,025.54 55,705.00 14,000.00 27,829.48 14,908.00 7,500.00 56,876.51 38,194.00 37,858.20 20,939.00 45,685.30 43,886.56 32,016.55 7,901.97 711,706.40 49,624.45 7,933.84 7,307.23 11,931.02 5,521.17 28,898.00 73,041.00 48,891.00 48,891.00 48,891.00 23,394.07 35,304.72 22,555.11 44,127.09 44,211.04 50,000.00 22,394.07	$\begin{array}{c} 77,210,42\\ 99,998,14\\ 40,715,00\\ 26,000,00\\ 34,348,20\\ 60,000,82\\ 50,480,24\\ 53,461,63\\ 42,054,45\\ 129,025,54\\ 56,705,60\\ 39,000,00\\ 37,829,48\\ 29,908,00\\ 7,500,00\\ 61,876,51\\ 43,829,00\\ 81,502,86\\ 20,939,00\\ 75,685,30\\ 47,764,56\\ 32,016,55\\ 22,901,97\\ 14,257,96\\ 49,624,45\\ 10,433,84\\ 14,614,46\\ 11,931,02\\ 41,821,17\\ 33,898,00\\ 110,829,21\\ 0,00\\ 25,810,00\\ 68,768,00\\ 25,810,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 45,8275,11\\ 69,627,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 54,582,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 54,582,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 54,582,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 54,582,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 54,582,00\\ 54,920,15\\ 32,195,00\\ 37,578,34\\ 54,582,00\\ 54,920,15\\ 32,195,00\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,15\\ 35,920,$		

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SUMMARY TABLE NO. 22-Continued.

County		Constructed		Planned			
	Road	Bridge	Total	Road	Bridge	Total	
oweshiek	$\begin{array}{c} 18,762.00\\ 10,310.96\\ 57.000.00\\ 40,000.00\\ 12,640.00\\ 11,776.52\\ 50,000.00\\ 50,000.00\\ 50,000.00\\ 9,409.95\\ 6,147.00\\ 15,332.35\\ 27,054.00\\ 18,266.24\\ 25,000.00\\ 9,460.24\\ 37,000.00\\ 55,000.00\\ 14,589.31\\ 39,542.84\\ 14,400.00\\ 63,044.46\\ \end{array}$	$\begin{array}{c} 114,479.15\\ 54,640.49\\ 84,000.00\\ 39,185.00\\ 39,185.00\\ 38,650.00\\ 73,982.99\\ 28,000.00\\ 107.205.87\\ 64,133.64\\ 51,635.00\\ 71,151.45\\ 36,083.00\\ 38,003.90\\ 47,732.40\\ 67,574.21\\ 32,000.00\\ 20,000.00\\ 20,000.00\\ 55,559.58\\ 63,030.42\\ 600.00\\ 60,000.00\\ \end{array}$	$\begin{array}{c} 133,241.15\\ 64,951.45\\ 141,000,00\\ 79,185.00\\ 51,290.00\\ 85,759.51\\ 78,000,00\\ 157,205.87\\ 73,543.59\\ 57,782.00\\ 86,483.80\\ 63,137.00\\ 56,270.14\\ 72,732.40\\ 77,034.45\\ 69,000,00\\ 75,000,00\\ 75,000,00\\ 75,000,00\\ 75,328\\ 15,000,00\\ 123,044.46\end{array}$	50,000,00 32,000,00 0,00 663,60 35,000,00 28,500,00 6,000,00 21,900,00 0,00 5,908,08 10,000,00 14,000,00 14,000,00 75,000,00 14,389,00	47,804.00 25,710.97 77,001.45 23,122.07 29,195.00 73,385.60 29,343.23 31,303.00 16,442.82 34,580.00 14,147.25 42,625.51 30,393.00 14,750.00 11,207.20 27,240.00 57,258.39 	47,804.00 25,710.97 127,001.45 55,122.07 29,195.00 663.60 60,210.00 101,885.60 29,343.23 37,303.00 16,442.82 56,480.00 14,147.25 48,533.59 40,393.00 28,750.00 61,207.20 27,240.00 132,258.39 14,389.00 26,185.00	
Totals	\$3.351.342.93	\$5.870.601.62	\$9,221,914 55	\$1 679 169 74	\$1 251 025 12	\$4 020 205 OC	

SUMMARY TABLE NO. 23.

Cost of Engineering-Annual Reports of County Engineers.

		Roads			Bridges		
County	County Engineer's Salary and Expenses	Assistant Engineer's Salary and Expenses	Total	County Engineer's Salary and Expenses	Assistant Engineer's Salary and Expenses	Total	Total Eng neering Cost
dair		\$ 768.85 43.15 276.00 203.40 286.20 12.78 955.92 871.19 467.40 220.47 4,623.15 456.09 1,468.71 3,148.13 	\$ 1,489,25 85.976 776.00 6686.40 1,286.20 612.78 2,501.78 1,993.52 1,484.93 1,131.17 5,788.75 1,556.09 2,891.25 4,158.02 314.28 833.08 3,337.00 2,246.37 1,300.00 552.87 4,714.18 392.65 2,610.63 6,285.40 2,408.59 750.00 1,577.38 1,487.34 1,587.88 1,487.84 1,578.83 4,076.88	\$ 1,532.31 856.61 1,556.23 1,292.00 1,200.00 2,413.06 1,412.68 1,556.14 1,243.64 910.70 874.48 1,566.83 1,063.70 874.48 1,546.68 1,780.51 900.00 1,188.31 875.00 1,488.15 1,555.23 1,936.55 1,012.08 1,406.69 755.00 800.00 1,161.21 885.00 921.30 1,062.20	\$ 249.28 43.15 601.72 601.66 123.01 52.00 283.95 315.30 571.26 95.32 2,024.59 400.00 391.11 1,339.89 1,248.34 1,445.14 260.00 759.33 1,557.04 104.69 17.81 360.50 210.00 328.98 1,657.70	\$ 1,781.59	\$ 3.270.84 1.799 52 2.933.95 2.580.06 2.609.21 3.077.84 4.198.41 3.864.96 3.259.83 2.137.19 9.620.17 3.019.79 4.156.84 7.044.79 2.199.96 3.815.65 5.485.34 4.849.82 2.435.00 1.991.02 6.851.47 2.489.60 4.422.04 9.249.13 3.268.28 1.567.81 3.099.09 2.582.34 2.89.11

ANNUAL REPO

SUMMARY TABLE NO. 23-Continued.

		Roads		1.246	Bridges	-		
County	County Engineer's Salary and Expenses	Assistant Engineer's Salary and Expenses	Total	County Engineer's Salary and Expenses	Assistant Engineer's Salary and Expenses	Total	Total Engineering Cost	IO
Dubuque	$\begin{array}{c} 775.87\\ 872.40\\ 634.48\\ 1,362.43\\ 1,066.00\\ \hline\\ 1,027.13\\ 692.10\\ 476.09\\ 1,618.46\\ 1,063.84\\ 1,024.53\\ 1,024.53\\ 1,024.53\\ 1,024.53\\ 1,024.53\\ 1,024.53\\ 1,024.53\\ 1,000\\ 200.00\\ 880.92\\ 1,500.00\\ 424.91\\ 1,046.12\\ 441.83\\ 1,207.46\\ 800.00\\ 400.00\\ 400.00\\ 400.00\\ 400.00\\ 400.00\\ 1,345.15\\ 607.75\\ 700.00\\ 750.00\\ 508.34\\ 1,359.94\\ 728.83\\ 1,267.68\\ \end{array}$	$\begin{array}{c} 1,270.05\\ 1,519.22\\ 156.00\\ 977.89\\ 1,551.14\\ \hline \\ 1,513.01\\ 1,591.43\\ 68.47\\ 2,117.61\\ 862.77\\ 2,955.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 253.90\\ 227.70\\ 426.96\\ 133.75\\ 2,245.83\\ 50.00\\ 127.82\\ 2,257.33\\ 178.00\\ 475.00\\ 155.00\\ 34.65\\ 1,080.41\\ 401.80\\ 635.46\\ \end{array}$	$\begin{array}{c} 2,045.92\\ 2,391.62\\ 784.48\\ 2,340.32\\ 2,617.14\\ 2,283.53\\ 544.56\\ 3,736.07\\ 1,926.61\\ 3,990.43\\ 846.90\\ 200.00\\ 1,146.57\\ 2,421.73\\ 432.91\\ 1,707.37\\ 669.54\\ 1,634.42\\ 933.75\\ 2,845.83\\ 5,86.64\\ 827.82\\ 3,602.48\\ 785.75\\ 1,175.00\\ 905.00\\ 542.59\\ 2,440.35\\ 1,130.63\\ 1,893.14\\ \end{array}$	$\begin{array}{c} 2,500.00\\ 317.47\\ 1,174.88\\ 1,024.09\\ 534.00\\ 1,500.00\\ 1,201.15\\ 1,140.00\\ 2,105.86\\ 1,113.81\\ 1,095.76\\ 1,531.68\\ 1,773.50\\ 1,530.00\\ 1,531.68\\ 1,773.50\\ 1,530.00\\ 1,356.00\\ 2,209.94\\ 921.21\\ 1,200.00\\ 1,800.00\\ 1,800.00\\ 1,800.00\\ 1,800.00\\ 1,215.53\\ 1,215.53\\ 1,200.00\\ 886.06\\ 812.10\\ \end{array}$	$\begin{array}{c} 1,000.00\\ 493.07\\ 150.00\\ 488.72\\ 774.57\\ 720.00\\ 343.20\\ 839.31\\ 658.40\\ 668.66\\ 250.44\\ 1,198.24\\ 730.33\\ 240.47\\ 426.00\\ 336.00\\ 30.00\\ 30.00\\ 295.15\\ 94.75\\ 615.30\\ 647.5\\ 615.30\\ 647.5\\ 615.30\\ 64.75\\ 400.00\\ 1,128.66\\ 1,119.68\\ 275.00\\ 38.42\\ 946.49\\ 543.60\\ 360.42\\ \end{array}$	$\begin{array}{r} 3,500.00\\ 810.54\\ 1,324.88\\ 1,513.41\\ 1,308.57\\ 2,220.00\\ 1,544.35\\ 1,979.31\\ 2,764.26\\ 1,782.47\\ 1,346.20\\ 2,729.92\\ 2,503.83\\ 1,500.00\\ 1,063.60\\ 1,226.00\\ 510.01\\ 1,692.00\\ 2,239.94\\ 1,216.36\\ 1,294.75\\ 2,415.30\\ 1,161.40\\ 1,712.90\\ 3,668\ 97\\ 1,571.57\\ 3,019.68\\ 1,131.00\\ 1,150.89\\ 2,686.19\\ 1,529.66\\ 1,172.52\\ \end{array}$	5,545.92 3,202.16 2,109.36 3,883.73 3,925.71 2,220.00 4,084.49 4,262.84 3,308.82 5,518.54 3,272.81 6,720.35 3,350.78 2,210.17 3,647.73 942.92 3,399.37 2,909.48 2,280.78 2,228.50 5,261.13 1,698.04 2,2540.72 7,271.45 2,357.322 4,194.68 2,036.00 1,693.88 5,126.54 2,660.29 3,065.666	WA STATE HIGHWAY COMMISSION
Marshall. Mills Mitchell Monroe Monroe Montgomery Muscatine. O'Brien. Osceola. Page. Page. Palo Alto. Plymouth. Pocahontas. Polk. Pottawattamie. Poweshick. Ringgold. Sac. Scott. Shelby. Story. Story. Tama. Taylor. Tama. Taylor. Van Buren. Wapello. Wapello. Wayne. Wayne. Wayne. Winneshick. Story. Story. Story. Story. Story. Story. Story. Story. Story. Story. Story. Story. Story. Story. Marce. Marce. Marce. Story. St	975.00 855.86 419.60 510.90 943.88 476.72 796.75 1.396.82 979.32 789.38 600.00 1.306.21 600.00 1.370.38 1.457.78 700.00 838.45 848.00 770.21 1.200.00 1.764.22 931.66 687.00 1.764.22 931.66 570.00 1.089.25 570.00 819.85 570.00 1.976.14	$\begin{array}{c} 2, \ 561, \ 78\\ 617, \ 75\\ 700, \ 00\\ 281, \ 33\\ 27, \ 40\\ 496, \ 33\\ 1, \ 666, \ 47\\ 1, \ 079, \ 60\\ 990, \ 00\\ 236, \ 71\\ 1, \ 839, \ 00\\ 236, \ 71\\ 1, \ 839, \ 00\\ 10, \ 40\\ 215, \ 15\\ 2, \ 321, \ 10\\ 1, \ 609, \ 48\\ 23, \ 27\\ 916, \ 45\\ 743, \ 51\\ 1, \ 165, \ 34\\ 119, \ 86\\ 48, \ 10\\ 35, \ 92\\ 1, \ 180, \ 46\\ 168, \ 85\\ 15, \ 75\\ 352, \ 45\\ \end{array}$	3, 136, 38 855, 86 1, 037, 35 1, 210, 90 1, 225, 21 504, 12 1, 203, 08 3, 063, 29 2, 058, 92 2, 058, 92 2, 058, 92 1, 680, 38 8, 36, 71 3, 245, 21 600, 00 6, 266, 75 5, 596, 35 1, 200, 00 818, 85 1, 083, 15 3, 091, 34 2, 809, 48 743, 02 1, 603, 45 2, 507, 73 2, 150, 00 805, 72 748, 10 1, 116, 17 1, 821, 46 988, 70 545, 75 945, 52 2, 275, 14	975.00 1.611.92 1.80100 1.463.96 1.627.02 1.112.34 1.027.50 7718.75 1.179.60 800 00 1.202.51 898.73 2.400.00 1.023.26 2.069.28 3.000.00 1.635.55 1.343.35 2.005.60 1.880.00 1.889.74 1.813.00 1.092.29 2.590.00 1.371.73 740.00 1.770.835 1.0°9.00 1.600	2 592.01 200.00 450.00 1,310.54 81.10 538.70 583.65 5598.73 979.16 771.70 355.73 1,352.73 728.89 1,600.00 114.00 	3,567,01 1,611,92 2,000,00 1,913,96 2,937,56 1,193,44 1,611,20 1,302,40 1,778,33 1,779,16 1,974,21 1,254,46 2,400,000 2,375,99 2,798,17 4,600,000 1,779,355 1,343,35 2,307,33 2,789,69 1,642,75 2,446,200 1,317,12 4,340,18 1,611,47 1,642,75 2,446,200 1,317,12 4,340,18 1,611,47 1,640,000 1,744,27 1,438,16 1,920,000 1,080,000 2,836,57 2,856,57	6.903.39 2.467.78 3.037.33 3.124.86 4.162.77 1.697.56 2.904.28 4.365.69 3.837.25 3.468.54 2.810.93 4.499.67 3.000.00 8.642.74 8.394.52 5.800.00 2.558.40 2.548.40 2.426.50 5.598.67 5.599.17 2.385.77 4.019.53 5.899.17 2.385.77 4.019.18 2.417.19 1.788.10 2.580.44 3.259.62 2.908.70 1.625.75 3.782.00	ANNUAL REPORTS OF COUNTY I

SUMMARY TABLE NO. 24.

Financial Statement-Annual Reports of County Engineers.

		Count	y Bridge I	fund		County Motor Vehicle Road Fund					
County	Bolance or Overdraft Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918	Balance or Overdrait Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918	IOWA
Adair. Adams. Allamakee Appanoose. Andubon. Benton. Black Hawk. Boone. Bremer. Buchanan. Buena Vista. Butler. Calhoun. Carroll. Carsoll. Carsoll. Carsoll. Carsoll. Carsoll. Cherokee. Chickasaw. Clarke. Clayton. Clinton. Clayton. Clinton. Crayford. Dallas. Davis. Decatur. Delaware. Dickinson. Dubuque.	$\begin{array}{c} \$10, \$83, (9)^*\\ 597, 62\\ 878, 98\\ 2, 185, 25^*\\ 1, 028, 85\\ 466, 20\\ 817, 35\\ 9, 848, 84\\ 2, 435, 90^*\\ 1, 170, 22\\ 1, 983, 98\\ 88, 41\\ 1, 247, 39\\ 1, 477, 84\\ 629, 95\\ 919, 59\\ 91, 475, 84\\ 629, 95\\ 919, 59\\ 91, 59\\ 7, 654, 35^*\\ 1, 786, 02^*\\ 2, 124, 65\\ 1, 058, 55\\ 4, 162, 04^*\\ 7, 220, 72\\ 4, 260, 46\\ 3, 589, 61\\ 2, 071, 06^*\\ 370, 53\\ 99, 14\\ 53, 43\\ 265, 57\\ 4, 933, 99\\ \end{array}$	\$43,704 02 33,190.24 153,691.84 45,066.55 37,916.90 92,596.08 45,091.03 53,337.25 39,011.22 81,004.70 262,596.08 71,471.35 50,901.69 51,454.13 49,703.51 53,831.29 60,937.44 116,826.37 82,522.03 35,415.28 119,561.82 53,330.85 57,050.03 161,079.01 120,105.62 67,973.46 32,151.77 44,302.66 25,416.84 71,733.81 228,011.55	\$32,820,33 33,787.86 154,570.82 42,881.30 38,945.75 93,062.28 45,998,38 63,386.09 36,575.32 82,174.92 82,174.92 82,174.92 82,299.97 50,333.46 54,250,299.97 50,333.46 54,750,88 53,283.09 115,040,35 80,575.35 80,575,35 80,575,35 80,575,35 80,575,35 80,575,339.93 120,620,37 49,158,81 64,270.75 165,339,47 123,695,23 65,902.40 32,522.30 44,401.80 52,229.30 44,401.80 52,229.30 54,70.27 71,999.38 232,945.54	\$ 53,909 99 34,072.62 154,139.36 46,692.35 37,709.23 92,498 52 45,980.20 61,303.20 36,377.64 81,256.38 255,914.65 71,250.19 48,366.01 55,039.26 57,349.35 53,615.31 50,490.68 114,384.47 84,085 95 39,428.51 90,753.86 46,530 21 58,668.21 167,791.56 116,727.73 65,234.17 27,788.33 44,252.72 20,477.08 61,090.31 234,186.94	\$ 21,069,66* 284,76* 431,46 3,811,05* 1,236,52 563,76 71,82* 2,082,89 197,68 918,54 8,665,41 309,57 3,783,07 2,109,29* 7,015,89* 1,135,57 2,792,41 655,88 3,570,61* 1,888,58* 29,866,51 2,628,60 5,602,54 2,452,09* 6,967,50 668,23 4,783,97 149,08 4,993,19 10,909,07 1,241,40*	\$ 617.49* 464.87 7,343.34 4.65* 580.82 12,58 138.49* 859.14 	\$ 18,148.47 11,134.59 16,403.41 15,676.53 11,424.00 18,404.16 14,510.22 14,565.60 12,009.16 14,673.76 15,781.13 13,970.68 14,565.60 14,112.81 14,345.59 16,155.96 17,350.25 14,200.30 11,424.00 10,843.61 15,232.00 20,037.16 17,136.00 10,209.31 14,029.43 14,349.52 15,883.84 14,613.15 12,063.89 11,424.00 17,136.00	$\begin{array}{l} \$ 17,530.98\\ 11,59.86\\ 23,746.75\\ 15,671.88\\ 12,004.82\\ 18,416.74\\ 14,371.73\\ 15,424.74\\ 12,009.16\\ 14,674.12\\ 15,541.52\\ 14,852.75\\ 18,697.46\\ 10,156.87\\ 14,277.12\\ 16,155.98\\ 18,945.84\\ 30,047.75\\ 12,749.19\\ 12,714.28\\ 15,232.00\\ 21,289.05\\ 22,262.69\\ 105,478.76\\ 14,297.43\\ 16,098.10\\ 15,906.02\\ 14,634.12\\ 12,418.74\\ 11,424.00\\ 32,078.94 \end{array}$	\$ 17,810 87 6,989,84 - 19,236,28 15,494,62 7,851,43 12,074,47 14,644,91 13,066,92 12,009,16 18,792,79 14,709,61 13,334,85 18,648,59 19,355,95 14,058,99 16,126,94 12,774,35 9,679,17 8,871,97 5,358,39 15,991,72 18,954,13 23,363,42 92,449,25 13,708,80 16,088,10 15,362,91 13,306,24 13,305,75 10,712,82 23,717,46	\$ 279.89* 4,610.02 4,510.47 177.26 4,153.39 6,342.27 273.18* 2,357.82 4,118.67* 831.91 1,517.90 48.87 9,199.08* 218.13 29.04 6,171.49 20.368.58 3,877.22 7,355.89 759.72* 2,334.92 1,100.73* 13,029.51 588.63 10,000 543.11 1,427.88 887.01* 711.18 8,361.48	STATE HIGHWAY COMMISSION
Emmet Fayette Floyd. Franklin. Fremont Greene. Grundy. Guthrie Hamilton Hancock. Hardin Harrison. Harrison. Henry. Howard. Humboldt. Ida. Iowa. Jasper. Jefferson. Johnson Johnson Johnson. John	$\begin{array}{c} 744, 19\\ 1, 331, 23^{*}\\ 2, 557, 55\\ 4, 533, 90\\ 2, 644, 72\\ 389, 48\\ 1, 386, 50\\ 2, 306, 80\\ 7, 99, 38^{*}\\ 7, 767, 96\\ 2, 052, 63\\ 1, 592, 99\\ 10, 854, 13\\ 3, 211, 75\\ 6, 129, 41\\ 3, 377, 95\\ 3, 468, 09\\ 2, 361, 75\\ 6, 129, 41\\ 13, 377, 95\\ 3, 468, 09\\ 2, 361, 75\\ 1, 592, 99\\ 10, 854, 13\\ 3, 211, 75\\ 6, 129, 41\\ 13, 377, 95\\ 3, 468, 09\\ 2, 361, 75\\ 1, 568, 88\\ 6, 752, 45^{*}\\ 1, 344, 82\\ 5, 101, 85\\ 132, 06\\ 4, 91, 952, 75\\ 81, 94\\ 986, 06\\ 4, 991, 95\\ 2, 579, 05\\ 497, 84\\ 3, 792, 78^{*}\\ 3, 745, 08^{*}\\ 3, 358, 77\\ 6, 357, 83^{*}\\ 3, 745, 08^{*}\\ 3, 3388, 77\\ 12, 296, 08\\ 603, 90\\ 7, 092, 23\\ \end{array}$	28,231,92 126,617,19 88,179,38 72,768,59 94,343,71 35,953,20 45,976,44 43,404,17 93,512,30 35,481,30 52,936,42 168,264,89 38,475,74 48,288,82 35,975,22 37,737,49 85,355,16 42,625,16 42,625,16 131,598,18 80,268,96 66,243,94 45,057,71 51,487,28 98,501,66 34,280,05 54,455,61 28,603,44 45,508,54 45,516,64 153,288,64 86,09,51,07 34,731,36 45,516,64 153,288,64 126,516,64 153,288,64 126,516,64 153,288,64 126,516,64 153,288,64 126,516,64 153,288,64 126,516,64 153,288,64 126,516,64 153,288,66 126,516,64 153,288,66 126,516,64 153,288,66 126,516,64 153,288,66 126,516,64 153,288,67 253,34,277,28 38,962,25 34,277,28 38,962,25 34,277,28 38,962,25 34,277,28 38,962,25 34,277,28 38,962,25 34,277,28 38,962,25 34,277,28 38,962,25 34,277,28 34,277,28 35,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,13 37,377,49 37	28,976.11 125,285.9. 99,736.93 77,302.49 96,988.43 36,342.68 47,362.94 45,710.97 92,762.92 43,249.26 54,989.05 169,857.80 49,329.87 51,500.57 42,104.63 41,115.44 88,823.25 44,936.94 133,332.87 55,331.34 46,938.36 55,344.997 96,550.20 27,968.30 27,968.30 27,968.30 26,512.40 55,516.60 129,095.69 152,516 60,512.92 34,863.65 55,516.60 129,095.69 152,970.82 64,6494.60 129,095.69 152,790.82 64,848.75 39,555.30 46,494.60 22,199.09 42,910.11 35,873.95 53.21.44 47,536.49 54,729.90 52,2144 47,536.49 54,729.90 54,729.40	28,181,42 128,483,14 91,345,78 76,427,18 91,346,91 32,542,51 43,474,00 43,280,72 92,718,65 43,845,71 53,108,01 182,861,17 38,004,98 50,489,53 40,203,55 40,615,83 86,464,32 43,726,36 142,209,18 86,154,33 58,940,10 41,883,82 42,735,03 101,596,30 28,018,50 55,023,60 22,271,63 62,030,28 65,223,70 33,770,57 54,707,47 124,487,65 153,929,55 63,780,68 43,777,35 53,933,26 32,289,97 43,561,81 31,849,99 44,917,07 66,238,87 66,501,33 75,303,34 100,904,15 75,303,34 75,303,34 100,904,15 75,303,34 75,303,34 100,904,15 75,303,34 100,904,15 75,303,34 75,303	$\begin{array}{c} 794.69\\ 3.197.18^{*}\\ 2.698.85^{*}\\ 875.31\\ 5.641.52\\ 3.800.17\\ 3.888.94\\ 2.430.25\\ 44.27\\ 596.45^{*}\\ 1.881.04\\ 13.003.37^{*}\\ 11.234.89\\ 1.011.04\\ 1.811.04\\ 1.811.04\\ 1.811.04\\ 1.811.04\\ 1.811.04\\ 1.811.04\\ 1.811.04\\ 5.054.54\\ 3.608.76^{*}\\ 5.054.54\\ 8.760.59\\ 5.749.34^{*}\\ 3.608.76^{*}\\ 5.054.54\\ 8.760.59\\ 5.749.34^{*}\\ 3.608.76^{*}\\ 5.054.54\\ 8.734.75^{*}\\ 5.046.10^{*}\\ 5.020^{*}\\ 990.69\\ 420.64^{*}\\ 5.151.02\\ 8.29\ 222\\ 1.093.08\\ 809.13\\ 4.608.04\\ 1.138.73^{*}\\ 1.931.93^{*}\\ 4.222.05^{*}\\ 7.488.66^{*}\\ 10.69.88^{*}\\ 6.170^{*}\\ 4.023.96\\ 404.37\\ 16.702.38^{*}\\ 13.771.68^{*}\\ 6.86.47\\ 882.34\\ 2.615\ 37^{*}\\ 8.25.47\\$	5,625.86 2,462.34 8,444.82 259.31 163.86* 237.70 9,636.06 10,079.03 3,641.93 1,086.21* 13,485.76 418.29 1,737.50 2,978.99 41,41 2,654.42 2,755.18 7,990.62 14,334.15 3,232.61* 396.16* 70.83 12,459.69 1,189.43* 80.57 5,280,15 5,252.35 365.78 5,980.52 8,019.88 2,896.69 40.55*	$\begin{array}{c} 11,096.60\\ 19,040.00\\ 11,370.40\\ 11,268.54\\ 14,643.30\\ 12,764.76\\ 15,220.51\\ 16,184.00\\ 14,253.01\\ 14,569.85\\ 17,610.95\\ 10,384.83\\ 10,722.87\\ 11,995.20\\ 11,424.00\\ 17,136.00\\ 16,117.22\\ 16,811.20\\ 11,424.00\\ 18,728.02\\ 15,571.32\\ 16,199.83\\ 25,502.36\\ 14,604.33\\ 17,309.08\\ 11,615.40\\ 1,057.40\\ 1,980.49\\ 19,218.32\\ 16,763.96\\ 14,228.60\\ 13,268.15\\ 15,422.40\\ 12,376.00\\ 13,808.80\\ 16,763.96\\ 11,424.00\\ 13,396.11\\ 31.396.11\\ 31.396.11\\ 31.396.11\\ 31.396.11\\ 31.344.00\\ 31.396.11\\ 31.344.00\\ 31.396.11\\ 31.344.00\\ 31.396.11\\ 31.344.00\\ 31.3744.02\\ 31.396.12\\ 31.3744.02\\ 31.396.12\\ 31.3744.02\\ 31.396.12\\ 31.3744.02\\ 31.396.12\\ 31.3744.02\\ 31.396.12\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.396.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.3744.02\\ 31.37$	16,722,46 19,040,00 13,832,74 14,767,41 19,713,36 14,643,30 13,024,07 15,056,65 16,184,00 14,490,71 27,689,98 14,026,76 9,636,66 25,480,95 11,842,29 18,868,50 19,096,21 16,811,20 11,465,41 21,382,44 18,326,50 24,190,45 40,836,87 11,371,72 17,309,08 11,615,40 1,615,40 11,615,40 11,615,40 11,615,40 11,615,40 11,615,40 12,677,40 4,980,49 18,882,67 13,268,15 27,882,09 12,376 00 12,619,37 16,763,96 11,504,57 16,704,15 18,391,96 15,510,85 16,965,48 21,760,99 17,042,00 27,863,32 27,863,32	$\begin{array}{c} 16,686,13\\ 19,040.00\\ 10,865.91\\ 14,767.41\\ 17,593.13\\ 14,643.30\\ 12,983.93\\ 9,198.43\\ 16,184.00\\ 12,551.29\\ 20,238,73\\ 26,153.47\\ 11,810.53\\ 9,442.72\\ 8,886.74\\ 11,793.82\\ 10,824.09\\ 14,645.07\\ 11,690.15\\ 4,005.89\\ 9,297.62\\ 13,470.95\\ 14,657.90\\ 36,144.29\\ 12,531.33\\ 17,369.08\\ 247.12\\ 1,057.40\\ 4,980.49\\ 18,073.32\\ 10,874.05\\ 13,268.15\\ 27,890.13\\ 12,376.00\\ 14,936.89\\ 17,131.89\\ 11,504.57\\ 10,484.11\\ 16,262.09\\ 15,474.61\\ 4,240.28\\ 17,701.34\\ 14,708.95\\ 19,688.02\\ 10,688.02\\ 19,688.02\\ 10,6$	36.33 2,966.83 2,120.23 40.14 5,858.22 1,939.42 3,967.18 1,536.51 2,216.23 193.94 16,594.22 48.47 8,044.41 4,451.14 5,212.05 7,459.52 12,085.42 48.55.55 9,532.55 4,692.58 1,159.61* 11,368.28 	ANNUAL REPORTS OF COUNTY ENGINEERS

*Indicates overdraft.

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ANNUAL REPORTS OF COUNTY ENGINEERS

SUMMARY TABLE NO. 24-Continued.

		Cour	ty Bridge I	Fund		County Motor Vehicle Road Fund				
County	Balance or Overdraft Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918	Balance or Overdraft Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918
Polk Poweshiek. Ringgold. Sac Sott Story Story Tama Taylor Union Van Buren Wapello Warren Washington Washington Webster Winnebago Winneshiek Woodbury Worth Wright	9,685.72* 1,700.09 831.28 4,570.05* 14,128.93* 16,455.67 3,995.16 14,031.77* 954.86 \$06.68 2.056.12 1,704.21 423.10 2,604.37* 110.12* 13,907.08* 872.76* 460.59 \$94.87 102.73 1,474.03 3,107.74* 10,719.19*	49,873.54 228,285.75 104,315.51 29,483.10 76,814,42 45,483.16 49,844.78 57,462.02 40,428.68 118,477.39 37,274.25 29,610.74 27,821.02 62,729,48 91,570.34 53,624.50 53,073.46 44,200.65 15,524.83 119,625.81 15,524.83 119,625.81 54,256.47 20,888.41 72,112.01	$\begin{array}{c} 40,187.82\\ 229,986.65\\ 105,146.79\\ 24,913.05\\ 62,685.49\\ 61,938.83\\ 53,839.94\\ 43,430.25\\ 41,383.54\\ 118,984.07\\ 39,330.37\\ 31,314.95\\ 28,244.12\\ 60,1251\\ 191,460.22\\ 39,717.42\\ 52,200,74\\ 44,661.24\\ 16,119.70\\ 119,523.08\\ 55,730.50\\ 17,780.67\\ 61,392.82\\ \end{array}$	$\begin{array}{c} 41,685.70\\225,234.07\\104,194.66\\32,571.30\\62,136.81\\45,779.01\\53,500.39\\91,430.07\\34,507.45\\118,014.24\\37,507.49\\34,785.91\\27,309.18\\44,858.99\\68,823.08\\39,287.02\\50,775.04\\44,415.75\\18,815.20\\120,147.59\\55,593.12\\22,213.84\\65,753.46\end{array}$	$\begin{array}{c} 1,497.88^{*}\\ 4,752.58\\ 952.13\\ 7,658.25^{*}\\ 548.68\\ 16,159.82\\ 339.55\\ 47,999.82^{*}\\ 6,876.09\\ 969.83\\ 1,822.88\\ 3,470.96^{*}\\ 934.94\\ 15,266.12\\ 22,637.14\\ 430.40\\ 1,425.66\\ 245.49\\ 2,695.50^{*}\\ 624.51^{*}\\ 137.38\\ 4,433.17^{*}\\ 4,360.64^{*}\\ \end{array}$	2,453.89 228.46 8,478.27 5,852.20 163.69* 240.03 8,424.70* 2,839.52 114.01 1,066.42 85.39 333.60 0,000 2,711.03 2,022.11 7,031.27 2,510.07 1,103.73* 4,709.22 11,674.00	20,944,00 26,656,00 14,955,64 15,875,25 14,451,69 13,826,80 20,238,42 16,393,55 14,097,00 15,109,12 13,328,00 15,109,12 13,328,00 15,109,12 13,328,00 15,109,12 13,532,54 15,587,00 21,658,12 11,422,00 18,657,90 21,259,20 12,2376,00 17,136,00	$\begin{array}{c} 23,397.89\\ 26,656.00\\ 15,184.10\\ 24,353.52\\ 20,303.89\\ 13,663.11\\ 13,948.83\\ 11,813.72\\ 19,233.07\\ 14,097.00\\ 15,223.13\\ 14,394.42\\ 13,520.51\\ 12,328.80\\ 15,803.72\\ 16,243.57\\ 17,609.11\\ 28,689.39\\ 13,932.07\\ 17,554.17\\ 25,968.43\\ 24,050.00\\ 17,136.00\\ 17,136.00\\ \end{array}$	$\begin{array}{c} 6,696.79\\ 17,715.86\\ 24,039.03\\ 17,727.70\\ 13,576.95\\ 13,868.61\\ 6,157.02\\ 12.859.92\\ 7,197.00\\ 14,783.73\\ 13,046.31\\ 13,472.45\\ 11,940.34\\ 15,803.72\\ 14,580.84\\ 16,315.84\\ 37,655.64\\ 8.950.73\\ 17,782.41\\ 19,649.85\\ 0.00\\ 17,136.00\\ 17,136.00\\ \end{array}$	$\begin{array}{c} 23,397.89\\ 19,959.21\\ 2,531.76^{*}\\ 3314.49\\ 2,576.19\\ 86.16\\ 80.22\\ 5,656.70\\ 6,373.15\\ 6,900.00\\ 439.40\\ 1,348.11\\ 48.06\\ 388.46\\ 0.00\\ 1,662.73\\ 1,293.27\\ 8,966.25^{*}\\ 4,981.34\\ 228.24^{*}\\ 6,318.58\\ 24,903.00\\ \end{array}$
Totals	\$18,332.73	\$6,839,194.87	\$6,857,527.60	\$6,836,307.27	\$21,220.33	\$220,649.92	\$1,559,249.48	\$1,779,899.40	\$1,475,078.52	\$ 304,820.88

SUMMARY TABLE NO. 25. Financial Statement—Annual Reports of County Engineers.

County Balance or Overdraft Jan. 1, 1917 Receipts 1917 Total Disburse- ments 1917 Balance or Overdraft Jan. 1, 1918 Balance or Overdraft Jan. 1, 1918 Disburse- ments 1917 Balance or Overdraft Jan. 1, 1918 Disburse- ments 1917 Balance or Overdraft Jan. 1, 1918 Adair. \$ 8,286.83' \$24,660.81 \$16,573.98 \$12,033.96 \$4,320.02 \$1.91.25 \$28,847.81 \$30,341.06 \$28,365.84 \$1.975.22 Adams.			County	Road Cash	Fund		Township Road, Drag and Drainage Fund				
Adair.\$ 8,286,83°\$24,660,81\$16,373,98\$12,053,96\$ 4,320,02\$ 1,93,25\$28,847,81\$30,341,06\$ 28,365,84\$ 1,975,22Adams.3,444,1222,852,2422,626,3615,920,4010,375,962,2876,4223,643,9326,520,4021,021,305,499,10Appanoose.2,215,64'22,378,5020,162,8624,063,893,901,03°5,29,4228,455,4433,704,8628,485,175,219,69Appanoose.957,7319,919,1920,876,9218,51,60'2,225,2353,37030,340,5830,944,2829,743,371,148,91Benton.160,4739,034,4939,19,9638,749,26445,706,805,4154,209,4064,020,6188,410,155,29,94Boone.1,308,2933,228,8534,857,1434,126,70410,448,004,3948,515,4456,519,8348,110,1185,209,03Bremer.2,337,2427,500,9330,128,1721,134,228,993,95130,2928,588,7828,689,0728,489,17199,93Buena Vista1,433,87105,694,7735,904,75255,26*1,349,2534,462,1051,752,9224,891,17199,93Butler.1,433,87106,389,97,0641,263,1436,663,574,399,5517,371,1453,564,447,087,1149,063,8331,498,0830,708,2779,238,46Carroll.2,072,939,190,6541,263,1436,663,574,399,5517,31,1453,564,4470,877,1953,224,2453,564,20	County	Balance or Overdraft Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918	Balance or Overdraft Jan. 1, 1917	Receipts 1917	. Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918
Des Moines 942 65 20 703 40 31 676 55 32,461.07 145 58 831.88 38,098.74 38,930.62 36,234.46 2,646.16	Adair	\$ 8,286,83* 3,444,12 37,15 2,215,64* 957,73 160,47 1,547,56 1,308,29 2,537,24 5,201,38 1,451,85* 1,613,87* 2,072,29 9,480,49* 3,068,312 1,630,63 4,207,29* 12,2697,20 866,31* 142,44 3,343,65 3,571,59 8,102,10 3,379,45 1,918,28 1,624,38 99,21 8,27 94,265	\$24,660.81 22,852.24 18,191.75 22,378.50 19,919.19 39,034.49 33,317.61 33,228.85 27,590.93 57,538.37 140,308.91 37,283.34 39,190.65 30,549.76 26,731.95 48,264.04 74,276.97 30,511.84 18,912.11 25,283.16 87,595.40 28,383.40 34,671.93 102,079.31 22,602.46 19,381.11 16,335.49 32,598.38	\$16,373,98 26,296,36 18,131,90 20,162,86 20,876,92 39,191,95 34,865,17 34,537,14 30,128,17 62,740,15 138,957,06 35,649,47 41,263,14 21,069,27 29,800,27 49,894,67 70,069,68 17,814,64 18,045,80 25,425,60 91,240,05 31,954,99 42,774,03 105,478,76 34,520,74 21,005,49 16,424,70 32,606,654	\$12,053 96 15,920,40 14,653,96 24,063,89 18,551,69 38,749,26 29,484,67 34,126,70 21,134,22 40,954,91 133,402,44 35,904,75 36,863,57 36,863,57 36,863,57 39,117,00 26,597,32 43,580,84 67,362,54 19,225,74 18,486,79 25,968,60 91,309,69 27,606,99 38,593,53 92,409,25 33,102,38 19,872,33 16,525,82 32,461,07	$\begin{array}{c} \$ 4,320,02\\ 10,375.96\\ 3,475.94\\ 3,901.03^*\\ 2,325.23\\ 445.70\\ 5,380.50\\ 410.44\\ 8,993.95\\ 21,785.24\\ 5,554.62\\ 255.28^*\\ 4,399.57\\ 18,047.73^*\\ 3,202.75\\ 6,313.83\\ 2,707.14\\ 1,411.10^*\\ 69,64\\ 4,348.00\\ 4,180.50\\ 13,029.51\\ 1,418.36\\ 1,133.16\\ 101.12\\ 145.58\\ 14$	\$ 1, (91.25 2,876.42 1,190.54 5,2-9.42 553.70 6,805.41 2,538.78 8,004.39 130.29 1,434.25 1,509.62 8,249.55 17,371.14 3,142.22 11,598.74 9,431.19 2,978.60 8,123.88 1,710.46 2,284.67 7,301.53 14,425.49 6,787.11 7,003.55 4,887.46 1,783.37 1,296.04 8,31.88	\$28,847,81 22,643,93 27,056,79 28,455,44 30,340,58 54,290,04 41,081,26 48,515,44 28,558,78 30,063,83 52,682,48 44,422,74 53,526,34 44,422,74 53,526,34 44,422,74 53,546,34 45,526,34 40,958,78 35,145,62 50,145,85 54,977,19 29,935,75 35,096,21 17,398,57 15,588,30 37,105,61 49,164,54 57,304,82 49,360,64 25,002,79 26,583,17 38,098,74	\$30,341,06 26,520,40 28,247,33 33,704,86 30,894,28 61,095,81 43,620,04 56,519,83 28,689,07 31,498,08 54,192,10 52,672,29 70,897,48 44,101,00 46,744,36 59,577,04 55,957,79 38,059,63 36,806,67 19,663,24 22,889,83 51,531,10 55,951,65 64,308,37 53,748,60 26,786,16 27,879,21 38,930,62	\$ 28,365,84 21,021,30 28,051,78 28,485,17 29,745,37 54,833,86 38,411,01 48,129,18 28,489,17 30,706,82 51,732,95 43,482,91 48,91,01 37,923,86 32,283,91 53,922,74 53,452,57 29,309,21 55,356,01 37,811,53 48,182,10 57,333,37 48,988,37 21,745,56 24,591,52 24,591,52 24,591,52	\$ 1,975.22 5,499.10 195.55 5,219.69 1,148.91 6,271.95 5,209.03 8,91.65 199.90 791.25 2,459.15 9,189.38 22,401.47 6,177.14 14,466.45 5,654.20 4,503.22 8,660.42 32.97 7,760.55 6,975.01 4,799.63 5,040.60 3,287.60 2,646.16

"Indicates overdraft.

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SUMMARY TABLE NO. 25-Co

						Township Road, Drag and Drainage Fund					
County	Balance or Overdraft Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918	Balance or Overdraft Jan. 1, 1917	Receipts 1917	Total	Disburse- ments 1917	Balance or Overdraft Jan. 1, 1918	1
Dubuque Emmet Fayette Floyd Fremont Greene Grundy Guthrie Guthrie Hartison Hartison Hartison Henry Howard Humboldt Ida Jackson Jasper Jefferson Johnson Johnson Johnson Kossuth Lee Lucas	$\begin{array}{c} & \\ 21,876.86 \\ 479.46^* \\ 12,599.33 \\ 418.24 \\ 664.87^* \\ 1,792.65 \\ 11,235.27 \\ 203.30^* \\ 388.94 \\ 5,225.48^* \\ 1,352.23^* \\ 5,924.16 \\ 4,175.18^* \\ 3,522.56^* \\ 2,417.88 \\ 1,576.39 \\ 614.73 \\ 1,762.09 \\ 129.31 \\ 469.48^* \\ 1,396.83^* \\ 14,028.80 \\ 476.26 \\ 121.75 \\ 5,606.67 \\ 5,210.55^* \\ 964.97 \\ 2,147.06 \\ 7,673.22 \\ \end{array}$	38,072.95 67,398.87 49,460.15 29,664.54 47,187.78 19,530.73 40,999.92 38,331.25 23,183.61 57,740.09 925,817.52 49,562.07 26,166.29 25,620.99 32,219.93 26,427.45 21,630.90 37,126.64 59,818.51 30,244.55 23,631.63 34,637.75 44,389.93 26,444.45 60,175.07 18,082.53 26,714.65	59,949,81 66,919,41 62,059,48 30,022,78 46,522,91 21,323,38 52,235,19 38,127,95 23,572,55 52,514,61 24,465,29 55,486,23 21,991,11 22,098,43 35,637,81 28,769,54 21,760,21 36,657,16 58,421,68 41,273,35 24,106,89 34,759,50 49,996,60 21,233,90 61,140,04 20,229,59 34,387,87 28,588,25	61,799.98 63,052.46 38,258 54 32,910.19 37,841.78 22,051.82 52,156.09 29,513.33 22,235.29 52,666.39 27,829.88 46,414.59 28,040.12 17,419.40 37,796.35 25,257.06 20,740.61 28,430.05 21,077.86 37,110.36 58,225.23 39,810.47 20,891.76 23,347.44 66,813.91 26,475.28 62,639.29 20,953.63 34,168.55	$\begin{array}{c} 1,850.17^{*}\\ 3,866.95\\ 23,800.94\\ 2,112.59\\ 8,681.13\\ 728.44^{*}\\ 79.10\\ 1,385.38^{*}\\ 1,337.26\\ 151.78^{*}\\ 3,364.59^{*}\\ 9,071.64\\ 6,049.01^{*}\\ 4,679.03\\ 2,158.54^{*}\\ 2,746.78\\ 442.66\\ 339.49\\ 682.35\\ 453.20^{*}\\ 196.45\\ 1,462.88\\ 3,215.13\\ 11.412.06\\ 16,817.31^{*}\\ 5,241.38^{*}\\ 5,244.38^{*}\\ 5,244.38^{*}\\ 724.04^{*}\\ 219.32\\ 2,772.79^{*}\\ \end{array}$	5,382.12 4,928.79 6,197.06 1,885.58 17,846.87 900.22 14,078.44 6,638.18 2,988.56 15,497.40 10,307.54 5,642.84 5,949.05 6,578.25 4,166.73 10,239.58 5,241.23 12,366.53 6,664.11 7,591.12 3,020.21 10,113.29 4,750.76 9,212.55 18,141.38 12,649.78 12,649.78 2,553.08 3,934.48 3,202.51 11,211.79	$\begin{array}{r} 34,784.53\\ 38,494.05\\ 47,727.50\\ 33,183.09\\ 46,500.34\\ 23,694.59\\ 48,067.77\\ 37,801.71\\ 35,318.54\\ 42,560.74\\ 36,125.80\\ 43,929.41\\ 49,065.42\\ 26,736.50\\ 19,493.84\\ 40,776.65\\ 30,259.40\\ 41,880.94\\ 32,813.19\\ 55,351.98\\ 32,747.46\\ 42,319.35\\ 37,603.38\\ 38,706.20\\ 62,285.32\\ 30,832.86\\ 47,983.51\\ 29,554\\ 66\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 22,856\\ 63\\ 32,469,19\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10$	$\begin{array}{r} 40,166.65\\ 43,422,84\\ 53,924.56\\ 35,06867\\ 64,347.21\\ 24,594,81\\ 62,146.21\\ 44,649.89\\ 38,307.10\\ 58,058.14\\ 46,433.34\\ 49,582.25\\ 55,014,47\\ 33,314.75\\ 23,660.57\\ 51,016.23\\ 35,500.63\\ 54,247.47\\ 39,477.30\\ 62,943.10\\ 35,767.67\\ 52,432.64\\ 42,354.14\\ 47,918.75\\ 80,426.70\\ 43,482.64\\ 455,536.59\\ 33,489.14\\ 26,059.14\\ 38,680.98\\ \end{array}$	$\begin{array}{c} 33,398.53\\ 35,587.01\\ 48,954.14\\ 33,542.45\\ 54,756.41\\ 22,288.99\\ 42,383.28\\ 36,953.37\\ 35,681.93\\ 34,310.16\\ 36,209.53\\ 39,367.40\\ 46,230.17\\ 25,306.56\\ 19,019.98\\ 39,963.41\\ 24,003.84\\ 42,045.19\\ 31,330.52\\ 56,673.87\\ 35,731.10\\ 46,281.88\\ 37,288.64\\ 40,656.85\\ 64,175,51\\ 30,349.48\\ 51,811.18\\ 29,973.03\\ 23,395.03\\ 28,795.35\\ \end{array}$	$\begin{array}{c} 6,768.12\\ 7,835.83\\ 4,970.42\\ 1,526.22\\ 9,590.80\\ 2,305.82\\ 19,762.93\\ 7,696.52\\ 2,625.17\\ 23,747.98\\ 10,223.81\\ 10,214.85\\ 8,784.30\\ 8,008.19\\ 4,640.59\\ 11,052.82\\ 11,496.79\\ 12,202.28\\ 8,146.78\\ 6,269.23\\ 36.57\\ 6,150.76\\ 5,065.50\\ 7,261.90\\ 16,251.19\\ 13,133.16\\ 3,725.41\\ 3,516.11\\ 2,664.11\\ 2,885.61\\ \end{array}$	OWA STATE HIGHWAY COMMISSION
Lyon Madison Mahaska Marion Marshall	7,398.64 1,693.87 107.08* 1,203.40 4,69*	22.480.43 29.017.64 59,549.45 30,686.91	21,174 30 28,910 56 60,752,85 30,682,22	30,399,46 28.960,45 50,776,9* 31,325.86	6,225,16' 49,89' 10,015 9' 643,64*	1,547.60 945.83° 2,423.85 7,434.12	27,568.17 44,859.58 35,348,44 47,764.07	29,115.77 43,913.75 37,772.29 55,198.19	26,766.56 41,020.88 34,441.91 49,365.54	2,349,21 2,892,87 3,330,38 5,832,65	
Lyon Madison Mahaska Marion Marion Marion Marion Marion Marion Marion Marion Mitchell Montgomery Muscatine O'Brien Pota wattamie Pota wattamie Pota wattamie Sac Story Tama Van Buren Wapte Wanebago Winnebago Winnebago Winnebaike Woodbury Worth Wright	7,398.64 1,603.87 107.08* 1,203.40 4.69* 3,263.66 2,353.05 11.578.02 25,574.53 147.35 1,082.14 2,564.90 1,202.22 782.84 155.08 1,867.97 331.57 64.81 64.48 2,277.94 5,802.99' 3,081.48 2,4,876.46 4,231.21 4,865.26 60.99 444.76' 269.85 1,952.18* 1,07.65 5,344.05* 8,042.33* 2,755.69* 12,044.63* 8,524.81 3,536.28* 5,842.75	22,480,43 29,017,64 59,549,45 30,686,91 20,684,55 25,240,50 42,350,82 20,412,20 23,313,84 28,531,39 28,531,39 27,156,73 67,306,05 60,564,51 42,233,46 43,333,49 27,156,73 67,306,05 60,564,51 42,233,46 30,384,18 16,616,90 46,921,58 19,696,58 26,879,20 27,092,12 49,853,84 45,551,70 20,148,12 15,733,70 15,287,83 25,899,89 26,696,15 27,721,63 31,281,83 27,292,73 26,404,27 30,670,69 49,178,79 13,992,91 52,191,54	21,174 30 28,910 56 60,752,85 30,682.22 30,682.22 30,682.22 30,682.22 30,682.22 30,682.22 30,682.22 30,682.22 30,076.29 22,505.02 18,687.55 43,125,505.02 18,687.55 43,125,762.99 52,565.02 18,687.55 43,125,762.99 52,565.02 18,687.55 43,125,762.99 50,448.99 16,681.38 49,199.52 13,893.59 29,960.68 51,966.85 50,416.96 20,209.11 15,587.68 23,947.71 27,773.80 22,377.58 23,239.50 24,540.04 14,359.64 30,634.34 57,703.60 10,456.63 58,034.26	30,399,46 28,960,45 50,776,91 31,325,86 26,710,10 48,367,83 25,955,11 19,578,00 24,213,12 21,859,55,11 19,578,00 24,213,12 21,859,55,11 20,735,66 25,299,55 56,974,73 22,278,13 49,894,75 65,313,46 37,024,83 18,618,97 46,763,12 17,414,43 22,944,55 24,297,77 16,712,38 46,763,12 17,414,43 22,944,55 24,297,77 16,712,38 15,553,91 20,317,74 425,584,00 22,435,84 30,859,62 13,944,27 8,990,81 31,660,11 15,547,702 18,935,97 65,444,80	6,225,16° 49,80° 10,015,9° 643,64* 9,178,82 981,54 11,549,315 9,178,82 981,54 182,86 9,4,106,90 4,829,33 6,611,95 13,849,02 4,5651,44 17,256,18 6,616,92 2,436,40 3,520,84' 7,016,13 27,670,18' 2,436,40 3,520,84' 7,016,13 27,650,14' 1,423,44' 3,577 3,629,97 2,189,71 58,26* 7,630,12' 10,55,77' 5,368,83 1,055,77' 5,368,83 1,055,77' 2,226,58 8,479,34* 7,410,54'	1,547,60 915,81 2,423,85 7,434,12 3,037,24 4,481,28 7,434,12 1,343,79 1,222,49 359,82 8,343,13 13,429,10 5,122,22 6,878,01 17,167,06 20,603,21 16,254,25 5,382,32 1,167,26 20,603,21 16,254,25 5,382,32 1,167,26 20,603,21 16,254,25 5,382,32 1,4144,31,47 7,105,38 12,432,02 4,856,43 6,129,14 17,337,32 1,649,63 4,082,12 8,681,38 5,51,00 1,398,45 3,334,79 5,656,87 2,058,92 4,431,06 16,950,61 5,690,00 1,710,48 3,039,13 11,668,42	27,568 17 44,859 58 35,348,44 47,764.07 28,214.14 22,740.09 38,664.94 21,056.32 12,2802.47 27,484.36 37,089.48 27,018.90 39,267.34 37,676.12 43,320.06 52,572.07 45,157.37 65,1350.7 29,688,50 18,225.01 43,210.77 32,915.42 38,963.62 48,925.51 51,209.09 51,334.70 32,292.09 21,862.89 27,390.93 29,035.64 36,938.85 41,440.64 25,376.95 52,4,388.62 37,277.75 37,832.86 24,373.11 50,960.39	29,115.77 43,913.75 37,772.29 55,198.19 55,198.19 55,198.19 55,198.19 55,198.19 55,198.19 55,198.19 55,198.19 55,222 50,518.58 32,141.12 46,145.35 54,843.18 64,003.27 66,826.32 50,539.69 79,279.13 37,021.97 25,330.39 55,642.79 37,771.85 45,092.76 66,262.83 52,858.72 55,416.82 40,973.47 22,383.89 28,789.38 32,370.43 42,595.72 43,499.56 29,807.96 79,253.16 24,957.62 38,988.23 37,832.86 24,957.62 38,988.23 37,832.86 27,412.24 46,2628.81	26,766.56 41,020.88 34,441.91 49,365.54 22,428.61 38,613.56 20,816.55 20,816.55 20,816.55 38,613.56 20,816.55 20,816.55 36,772.00 23,827.36 36,689.21 42,874.21 35,739.43 48,901.28 41,449.96 64,935.17 31,321.42 18,735.52 44,279.37 29,992.29 36,540.44 40,505.75 48,586.44 40,505.75 48,586.44 40,505.75 48,586.77 50,337.41 24,551.95 56,209.83 20,009.36 37,814.85 37,832.86 21,685.67	2,349,21 2,892,87 3,330,38 5,812,65 4,758,68 4,758,68 4,792,72 1,395,17 1,462,56 2,465,07 9,244,41 13,746,58 8,313,76 9,456,14 11,968,97 28,263,84 19,925,04 9,089,73 14,343,96 5,700,55 6,594,87 11,363,42 7,775,56 8,4,271,94 4,271,94 4,438,35 10,850,38 802,69 1,907,44* 5,380,65 8,768,45 6,837,85* 5,256,01 23,043,33 4,948,26 1,173,38	ANNUAL REPORTS OF COUNTY ENGIN

.

SUMMARY TABLE NO. 26.

Bonded Indebtedness of Counties-Annual Reports of County Engineers.

		Road	Funds			Bridge	Funds		Total Road	
County	Bonds Out- standing Jan. 1, 1917	Bonds Issued in 1917	Bonds Paid in 1917	Bonds Out- standing Jan, 1, 1918	Bonds Out- standing Jan. 1, 1917	Bonds Issued in 1917	Bonds Paid in 1917	Bonds Out- standing Jan. 1, 1918	Bonds Out standing Jan. 1, 1918	AMOT
Adair									******	STA
Adams	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 2,000.00	\$ 0.00	\$ 2,000.00	\$ 0.00	\$ 0.00	TH
Annanoose		4,800.00		4,800.00	25,000.00	10,000.00	5,000,00	35,000.00	39,800.00	-
Audubon		*******			89,000.00	00 000 00		89,000.00	89,000.00	Ħ
Benton		6,400.00		6,400.00	25,567.02	29,000.00		55,167.02	61,567.02	GI
Black Hawk			*******		45,450.00	*******	8,000.00	37,450.00	37,450.00	AF AF
Bremer						14 001 10	*******			VA
Buchanan	21 000 00	27,426.55	*******	27,426.55	70 000 00	34,921.19	6 000 00	34,921.19	62,347.74	Y
Butler	0.00	10,000.00	0.00	10,000.00	0.00	20,000.00	0.00	20,000,00	30,000.00	0
Calhoun	40,000.00		5,000.00	35,000.00	48,000.00		7,875.00	40,125.00	75,125.00	01
Carroll		*******			95,000.00		3 000 00	95,000.00	95,000.00	AN IN
Cedar					5,000.00		5,000.00	5,000.00	5.000.00	H
Cerro Gordo		39,348.00		39,348.00		27,000.00	*******	27,000.00	66,348.00	S
Chickasaw		*******			32,394.86	67,833.19		73 000 00	100,228.05	10
Clarke		10,000.00	*******	10,000.00	22,000.00	10,000.00		32,000.00	42,000.00	Z
Clay	7,000.00	60,529.57	******	67,529.57	146,000.00	80,470.43		226,470.43	294,000.00	
Clayton	17,000.00			17,000.00	82,000.00		20,000.00	62,000.00	79,000.00	
Crawford		59,000.00		59,000,00	42,000.00	96,000.00	8,000.00	130,000.00	189,000.00	
Dallas					70,000.00	66,000.00	*******	136,000.00	136,000.00	
Davis	10 974 32	********		10.874 32	26,000.00	42,000.00	12,000.00	56,000.00	56,000.00	
Delaware	10,074,04			10,074.04				1000000		
Des Moines Dickinson	17,500,00 12,659,93	98,000.00	3,000.00	14,500.00	24,500.00	44,600.00	- 4,000.00	20,500.00	35,000.00	
Dubuque										
Emmet		47,176.69	********	47,176.69	8,560.00	188,000.00		188,000.00	188,000.00	
Floyd	17 486 40		*******	17 106 40	78,000.00	75,000.00	6,000.00	147,000.00	147,000.00	
Franklin	17,400.40		*******	17,480.49	00,234.14	52,000.00	*******	118,234.14	135,720.63	
Fremont					176,000.00	58,500.00	7,500.00	227,000.00	227,000.00	
Greene								22.12.22.12		
Guthrie		*******			30,000.00	*******	3 900 00	30,000.00	30,000.00	>
Hamilter	32,000.00	5,000.00		37,000.00	31,900.00	46,000.00	3,500.00	46,000.00	83,000,00	N
Hancock			*******					*******		F
Hardin	*******	18,000.00	*******	18,000.00			*******	*******	18,000.00	JA
Henry			*******		51,857.00	116,194.00		168,051.00	168,051.00	F
Howard		17,300.00		17,300.00	39,000.00	17.200.00		56,200,00	73,500.00	Ħ
Humboldt	*******				********		*******		*******	E
Iowa		1 463 85	*******	1 463 85	45 500.00	2000.00	7 000 00	67 200 00	60 763 95	PC
Jackson				4,400.00	125,000.00	28,800.00	7,000.00	118,000.00	118,000.00	R
Jasper	*******	11 200 000		*******	********	65,000.00		65,000.00	65,000.00	To
Johnson	8,000.00	41,368.00	*******	41,368.00	97 263 99	42,632.00	5 000 00	42,632.00	84,000.00	00
Jones				0,000	0/ 1200.00	20,000.00	5,000.00	102,263.88	110,263.88	OF
Keokuk		16,514.28		16,514.28		35,394.26		35,394.26	51,908.54	3
Lee		*******	*******	*******	171,000.00	36,500.00	6,000.00	201,500.00	201,500.00	8
Linn	*******	*******	*******					15,000.00	13,000.00	ġ
Lucas	*******				33,500.00	11111111	*******	33,500.00	33,500.00	EN
Lyon				*******	31,600.00	40,000.00	******	71,600.00	71,600.00	Y
Madison	10 10 10	*******	*******		39,068.38		2,000.00	37,068,38	37,068.38	int.
Marion	25,423,89	18.50		28,523.81	90,872.77	81 440 00	*******	90,872.77	119,396.58	Z
Marshall	*******	*******		60,998.07	234,000,00	97,000.00	*******	315,448,88	97.000.00	GI
Mills	10,000.00			10,000.00	56,000.00	30,000.00	10,000.00	76,000.00	86,000.00	Z
Monona	0,550.00	*******	********	6,556.00	22,444.00	*******		22,444.00	29,000.00	DE
Monroe	0.00	27,500.00	0.00	27,500.00	10,000.00	0.00	0.00	10,000.00	37,500.00	R
Muscatine.	40,545.71		*******	40,545.71	30,409.29		*******	30,409.29	70,955.00	0
O'Brien					*******		*******	*******	*******	
Osceola					23,000.00	24,000.00	*******	47,000.00	47,000.00	
Palo Alto	25,000.00			25,000.00	88,260.00	11 000 00		88,260.00	113,260.00	
Plymouth		······			2.839.14	31,500,00		2,839 14	2 839 14	60
Pocahontas					54,000.00	60,000.00	3,000.00	111,000.00	111,000.00	07

SUMMARY	TABLE	NO. 3	26-Continued	4
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		Road B	unds				Total Road and Bridge		
County	Bonds Out- standing Jan. 1, 1917	Bonds Issued in 1917	Bonds Paid in 1917	Bonds Out- standing Jan. 1, 1918	Bonds Out- standing Jan. 1, 1917	Bonds Issued in 1917	Bonds Paid in 1917	Bonds Out- standing Jan. 1, 1918	Bonds Out- standing Jan. 1, 1918
Polk Pottawattamie Ringgold Soott	65,000.00 16,000.00	12,500.00		65,000.00 28,800.00	339,000.00 75,000.00 16,000.00 12,000.00	150,000.00 50,000.00 23,200.00	6,000.00	333,000.00 225,000.00 50,000.00 14,080.00 35,200.00	333,000.00 290,000.00 50,000.00 14,080.00 64,000.00
Story					40,500.00	60,000.00	10,000.00	100,500.00	100,500.00
Union	37,000.00	12,000.00		49,000.00	147,500,00 45,000.00	23,000.00 42,500.00	7,000.00	163,500.00 87,500.00	212,500.00 87,500.00
Washington Wayne	*******	930.30	*******	930.20	********	18,388.40	*******	18,385.40	19,318.60
Winnebago. Winneshiek.		*******			162,000.00 45,000.00	75,000.00	18,000.00	237,000.00 27,000.00	237,000.00 27,000.00
Worth Wright					101,000.00	23,500.00	5,000.00	119,500.00	119,500.00
Totals	\$ 476,570.15	\$ 624,975.64	\$ 8,000.00	\$1,054,645.79	\$3,894,384.29	\$2,565,952.06	\$ 191,195.00	\$6,308,041.35	\$7,362,687,14

SUMMARY TABLE NO. 27.

Total Indebtedness of Counties for Road and Bridge Work, January 1, 1918-Annual Reports of County Engineers.

			Road Fu	nds				Bridge Funda				
County	Outstand- ing Bills	Warrants Issued and Stamped by Treasurer	Warrants Issued and Not Presented for Pay- ment	Bonds Out- standing	Total	Outstand- ing Bills	Warrants Issued and Stamped by Treasurer	Warrants Issued and Not Presented for Pay- ment	Bonds Out- standing	Total	Total Indebted- ness of County	
dair	\$ 486.98	\$ 1,943.00	\$ 40.69		\$ 2,470.67	\$ 830.00	\$ 5,064.85	\$ 60.97		\$ 5,965.82	\$ 8,436.49	
dams	25.00	ANTRESS	4.10		29.10	100.00	23,517.05	219,40		21,836.45	23,865,55	
Ilamakee	********	10,729.26	102.73		10,831,99	and the second	10,753.72	35.50	\$126,000.00	136,789.22	147,621.21	
ppanoose	900.00	4,748.10	ALCONT	\$ 4,800.00	10,448.16	3,100.00	9,434,64	analahat.	35,000,00	47,534.64	57,982.80	
Edubon	1.614.41	1 000 00	25,00	6.400.00	100.00	200,00	40,282,24	50.00	55,167,02	129,532.24	129,632.24	
Inch Hawk	1,019.41	1,425,30	654.87	0,400.00	12,069,28	2,290,10	37,736.91	1.049.91	33,167.02	32,214.09	40,083.37	
done	1,500,00	4.007.93	180.70	*******	\$ 507.90	1000.00	21,590.09	1,040.02	37,450,00	60.520.12	46,117.07	
remer	1 715 97	4,007.00	49419411	100000	1 715 97	112.63	0 728 56		er, 100.00	9 871 18	11 567 15	
uchanan	633.81			27,426.55	28.060.36	719 87	19.671.45		34,921,19	54,812,51	82,872,87	
uena Vista	500.00	67,476.37	674,15	130,500.00	199,150.52	500.00	51,674,21	6.450.07	273,000.00	332,024.28	\$11,174.80	
letter	600.00	17,041.10	150.00	10,000.00	27,791.10	1,100.00	51,794.07	80.00	20,000.00	72,974.07	100,765.17	
385 witter.		58,060.27		35,000.00	93,060.27	********	49,060.92		40,125.00	89,305.92	182,266.19	
arroll	5,000.00	(payanese)	200.10	********	5,100.10	5,000.00	41,422.52	1,307.05	95,000.00	142,729.57	147,829.67	
alboun		12,770.51	ani calat	********	12,770,51	540.00		********	71,000.00	71,540.09	84,310.51	
edar.	707.08	10,271.93	35.05	10.200.000	11,014.06	167.46	4,811.09	22.25	M000.00	10,000.80	21,014.86	
barokan	*******	14,175.54	*******	357,348.00	33,343.04	*******	19,564.62	444733.575	27,000.00	46,564.62	100,088,16	
hickensu	*******	21,004.31	166.74	1100000	166.74		132,189,18		73,000,00	232,412,23	254,100.54	
larke.	\$11.07		TOULTA	10,000,00	10 811 97	017.26	4,766.90	*******	72,000,00	17,708,30	41 741 21	
lay.	OLL.N.	41,000,00	804.14	67 539 57	111 311 21	101.00	17 000 00	7.044.00	236,470,43	276 515 11	187 849 04	
Invton	\$10.19		142.79	17 000.00	17,952.98	101.17	17.446.90	46 77	62 000,00	74 996 91	07.540.01	
finton	3,403.08		155.84		3,555,84	6.000.00	10,000,00	119.41	107.000.00	113,119,41	116 475 25	
rawford.t	2,000.00	116,771.80	385.60	59,000.00	178,157,60	2,000.00	131,917.65	2,878.36	130,000.00	265 795 01	444.951.63	
allas	3,000,00	1,669.72	300.00		4,960.72	1,000.00	15,662.29		136,000.00	152.662.29	157,632.01	
bris	262.08	Income.	387.05		649.13	1,607.33	9,176.66	793.50	\$6,000.00	67,667,49	68,316.62	
lecatur	150.00	9,749.97	199.22	10,874.32	20,973.51	50.00	44434415	265.03	51,585.99	51,901.02	72,874.53	
Jelaware	395.44	1,746.93	4,742,45	********	7,084.82	430.92	5,153.70	181.00		5,765.62	12,850.44	

IOWA STATE HIGHWAY COMMISSION

SUMMARY TABLE NO. 27-Continued.

	Road Funds				. Bridge Funds							
County	Outstand- ing Bills	Warrants Issued and Stamped by Treasurer	Warrants Issued and Not Presented for Pay- ment	Bonds Out- standing	Total	Outstand- ing Bills	Warrants Issued and Stamped by Treasurer	Warrants Issued and Not Presented for Pay- ment	Bonds Out standing	Total	Total Indebted- ness of County	IOWA
Des Moines Dickinson Dubuque Emmet Fayette Floyd Franklin Fremont Greene Grundy Guthrie Hamiltor Hamiltor Hamiltor Hamiltor Hancock Hardin Harrison Henry Howard Humboldt Jakson Jakson Jakson Jakson Johnson Jones Kookuk Koosuth Lee Linn	4,267.52 237.28 700.00 500.00 199.36 2,69.56 2,555.65 450.00 2,000.00 1,264.31 1,403.17 140.13 59.00 5,000.00 42.40 500.00 137.15 6,028.81 1,000.00 137.05 500.00 600.00 830.64 1,300.00	9,938.59 78,137.92 20,087.18 3,981.91 8,187.03 9,628.68 8,199.52 30,000.00 14,534.90 11,313.87 	104.36 360.53 1,291.57 5,271.83 1,198.20 94.22 94.22 175.00 88.28 69.00 275.87 62.75 138.31 1,377.15 1,377.15 1,377.15 1,377.15 1,377.15 1,377.15	14,500.00 110,659.93 47,176.69 17,486.49 	$\begin{array}{c} 14,604.36\\ 124,866.04\\ 73,375.20\\ 67,963.87\\ 860.53\\ 18,977.42\\ 9,253.74\\ 8,456.59\\ 2,555.65\\ 11,276.88\\ 10,199.52\\ 67,094.22\\ 15,799.21\\ 29,313.87\\ 1,578.17\\ 228.41\\ 17,605.77\\ 5,000.00\\ 1,691.85\\ 18,744.89\\ 4,003.37\\ 54,502.20\\ 53,792.77\\ 8,100.00\\ 6,701.83\\ 17,014.28\\ 1,977.15\\ 4,752.93\\ 4,215.94\\ 1,500.00\\ \end{array}$	3,971.64 400.00 1,000.00 722.01 1,509.66 2,595.71 850.00 8,000.00 1,223.65 1,549.00 62.73 1,317.23 2,271.86 3,512.42 3,000.00 1,245.46 3,512.42 3,000.00 1,245.46 3,000.00 1,245.46 3,000.00 1,245.46 3,000.00	20,397.05 77,808.89 5,071.20 32,558.52 252.80 4,850.70 27,559.35 7,306.85 93,278.35 30,000.00 22,743.99 17,670.37 4,879.62 27,499.79 23,150.22 3,287.04 93,160.56 14,635.03 18,129.85 38,426.20	50.90 457.11 165.39 2,033.49 3,360.96 157.23 170.27 42.49 272.00 1,657.37 1,115.00 1,657.37 1,115.00 1,657.37 1,115.00 1,857.92 600.00 1,857.92 600.00 1,600.23 1,000.00 642.23	20,500.00 62,600.00 18,800.00 20,307,53 147,000 00 118,234.14 26,500.00 227,000.00 30,000.00 28,000.00 46,000.00 46,000.00 168,051.00 16,500.00 56,200.00 16,500.00 67,300.00 42,632.00 102,263.88 35,394.26 201,500.00 15,000.00 33,5500.00	20,550.90 82,997.05 269,780.53 25,778.73 181,015.63 119,374.34 33,384.19 259,429.97 2,595.71 38,314.08 129,278.35 76,170.27 1,223.65 22,786.48 187,542.37 18,220.10 63,511.85 29,771.65 26,662.64 73,737.04 215,476.04 90,771.95 62,861.85 102,363.88 40,262.87 38,394.26 202,817.16 15,300.23 19,282.39 49,628.59	35,155.26 207,863.09 348,155.73 93,742.60 181,876.16 138,351.76 42,637.93 267,886.56 5,151.36 49,590.96 139,477.87 143,264.49 17,022.86 52,100.35 189,120.54 34,971.65 28,354.49 92,481.93 219,479,41 145,274.15 116,654.62 110,463.88 46,994.70 55,408.54 20,053.16 23,498.33 51,128.98	STATE HIGHWAY COMMISSION.
										-		
Lucas Lyon, Madison, Marshall, Mitchell, Mitchell, Mitchell, Mitchell, Mitchell, Monroe, Monroe, Mongomery, Mongomery, Muscatine, O'Brien, Sac, Sac, Sac, Sac, Sac, Sac, Story, Tama, Taylor, Union, Wayne, Wayne, Winneshiek, Woodbury, Worth, Wright, Taria,	1,800,00 222,80 422,22 325,00 1,000,00 3,827,80 921,90 1,200,00 208,75 1,000,00 208,75 1,000,00 4,345,39 902,70 1,000,00 2,000,00	1,966,31 9,171,27 4,518,35 452,21 5,967,40 19,435,98 20,560,23 20,560,23 3,853,96 38,148,16 113,590,18 27,220,46 11,688,74 10,851,75 5,245,20 27,242,50 31,386,85 12,666,29 9,085,16 17,168,56 6,037,25 2,915,00 52,534,20 6,783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67 10,128,85 (-783,67) (-79,128,128) (-79,128) (340,40 12.90 1,060.70 1,060.70 1,060.70 114.30 200.00 1,826.21 1,235.61 207.14 360.00 865.00 537.41 10.00 12.00 5537.41 10.00 12.00 563.71 392.63 	28,523.81 25,442.39 10,000.00 6,556.00 27,500.00 40,545.71 25,000.00 65,000.00 28,800.00 28,800.00 49,000.00 930.20	3,766,31 9,393,57 422,22 33,707,56 26,891,60 3,840,70 10,921,90 7,616,70 110,921,90 7,616,70 110,921,90 110,921,90 110,921,90 111,852,88 94,085,46 12,688,74 40,339,16 655,00 114,852,88 94,085,46 12,688,74 40,339,16 655,00 114,852,88 94,085,46 12,668,74 33,1,873,88 12,662,99 58,848,87 592,63 17,168,56 6,967,45 3,615,00 52,5134,20 7,312,64 13,729,55 2,619,01	900.00 1,959.94 243.86 4,590.00 4,500.00 540.01 1,227.53 5,000.00 651.70 5,000.00 464.01 500.00 3,564.63 500.00 464.01 500.00 669.49 2,500.00 6,000.00 500.	37,268.95 65,755.68 26,545.71 12,270.28 78,029.09 11,639.04 14,526.38 26,110.64 23,496.16 6,788.95 42,680.36 19,837.97 8,208.66 66,277.96 69,016.56 66,277.96 69,016.56 62,866.42 1,394.43 38,013.19 1,150.56 1,394.43 38,013.19 1,150.56 1,394.43 38,013.19 1,150.56 1,394.43 38,013.19 1,150.56 1,394.43 38,013.19 1,150.56 1,394.43 38,013.19 1,150.56 1,394.43 36,471.35 22,149.73 55,514.77 34,955.87 53,060.15 14,873.09 12,803.32 8,532.10 33,306.09 27,901.32 8,532.10 1,418.03 1,418.03	7.15 57.18 14,656.30 38.66 24.72 200.00 2.770.45 789.32 1,200.00 .2.770.45 789.32 1,200.00 .2.770.45 789.32 1,200.00 .2.772 31.16 	71,600.00 37,068.38 90,872.77 315,448.89 97,000.00 76,000.00 22,444.00 10,000.00 30,409.29 47,000.00 28,260.00 67,000.00 2,839.14 111,000.00 333,000.00 225,000.00 50,000.00 14,080.00 35,200.00 100,500.00 99,000.00 100,500.00	109,768,95 67,715,62 37,312,24 122,015,63 332,219,16 175,626,28 88,936,57 51,626,68 88,936,57 51,626,68 88,936,57 51,626,68 88,936,57 51,626,68 88,936,57 58,77,33 12,141,45 54,498,95 91,494,46 110,969,68 26,177,11 123,599,85 91,494,46 110,690,68 26,177,11 123,599,85 91,494,46 116,866,129 125,474,43 73,354,28 661,16 1,650,56 2,609,47 158,542,88 661,16 1,650,56 2,609,47 158,345,48 39,661,29 127,149,73 55,914,77 199,586,90 88,546,28 53,060,15 33,261,49 133,003,32 8,5322,10 271,460,71 58,379,99 133,226,72 89,975,315,44 133,267,71 58,379,99 133,296,72 89,975,315,44 133,296,72 133,296,72 134,296,72 144,29 144,20 144,20 144,20 144,20 144,20 144,20 144,20 144,20 144,45 145,20 147,40 146,20	113.535.26 77.109.19 37.734.46 155.723.19 359.113.76 179,466.98 99,858.47 59,243.38 32,310.64 43,467.40 114,538.84 42,120.96 15,820.70 76,265.18 118,529.42 116,159.25 26,177.11 166,300.54 514,800.33 301,802.02 131,555.16 15,474.43 113,663.60 	ANNUAL REPORTS OF COUNTY ENGINEERS

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