

DR. CHARLES YOKE ET AL. ROAD.

November 7, 1912.

Be it remembered that heretofore to-wit, on the 7th day of November 1912, the Auditor of Marion County filed in the office of the Auditor of Hendricks the following transcript, to-wit:

SPECIAL JOINT SESSION OF THE BOARDS OF COMMISSIONERS
OF MARION AND HENDRICKS COUNTIES, INDIANA.

BE IT REMEMBERED, that on the 17th day of September, 1912, the Boards of Commissioners of Marion and Hendricks Counties in the State of Indiana, met in special joint session.

Present: Charles Maguire, John Kitley and James Kervan, members of the Board of Commissioners of said Marion County, and James A. Downard, Harry E. Sanders and Elbert M. Murphy, members of the Board of Commissioners of said Hendricks County, also W. T. Patten and Jacob Woessner, Auditor and Sheriff respectively of said Marion County.

Said Boards of Commissioners being duly and legally in session pursuant to an order heretofore made and entered of record by the Board of Commissioners of Marion County, Indiana, and notices of such meeting heretofore served upon the Board of Commissioners of Hendricks County, Indiana, as provided by law, which said notice was duly and legally served on the said Board of Commissioners of Hendricks County, Indiana, fifteen (15) days prior to the 17th day of September 1912, the following proceedings were had, to-wit:

Dr. Charles Yoke et al.

Ex-Parte.

PETITION FOR THE IMPROVEMENT OF PUBLIC HIGHWAY ON COUNTY LINE ROAD.

Comes now the petitioners by counsel and present to the said Boards of Commissioners of said Counties their Petition asking for the improvement by grading, draining and paving with crushed stone of a certain public highway situated on the boundary line between said counties of Marion and Hendricks in said State of Indiana, the route of said highway to be so improved being described as follows, as appears by the petition filed herein, to-wit:

"Extending from and commencing at the intersection of the Rockville Free Gravel Road with the established highway on the County Line between said Marion and Hendricks Counties in the State of Indiana, at the Northwest corner of Section Nine (9) in Township Fifteen (15) North of Range Two (2) East in said Marion County, Indiana, and running thence south on and along said established highway on said County Line on the west side of said Section Nine (9) said Township and Range, Section Sixteen (16) and a part of Section Twenty-one (21) all in the Township and Range aforesaid, to its intersection with the Central Plank of National Free Gravel Road at a point in the west line of the north west quarter of said Section Twenty-one (21) in said Township and Range, a distance

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of approximately two and one fourth ($2\frac{1}{4}$) miles."

and which said petition is in the words and figures following: (H. I.)

And the said Petition being now presented to said Boards of Commissioners in said joint session assembled and said Boards having seen and examined the same and having heard the evidence and being fully advised in the premises, find for the said Petitioners, that their said petition has been duly signed by at least Seventy-five (75) resident freehold voters of the Townships of Washington in the County of Hendricks in the State of Indiana, and the Township of Wayne in the County of Marion in said State, Ten (10) of whom are resident freehold voters of each of said Townships which are the Townships and the only townships abutting on the part of the County Line Road proposed in said Petition to be improved.

It is therefore considered, adjudged, decreed and ordered by the Board of Commissioners of Marion and Hendricks Counties in the State of Indiana, in special joint session convened, that John A. Mattern, a disinterested freeholder of Hendricks County, Indiana and Fielding T. Lee, a disinterested freeholder of Marion County, Indiana, but neither of whom is a resident or taxpayer of either said Washington or Wayne Townships in said Counties, be and they are hereby appointed as Viewers and that Paul Julian, a competent surveyor and engineer is hereby appointed as Engineer, they to examine and view said proposed improvement of the highway described in said Petition filed here in and as hereinbefore set out and described.

It is further ordered by the Boards of Commissioners of said Counties that the said Viewers and the said Engineer meet at the Auditors office in the city of Indianapolis in said County of Marion, on the 21st day of September, 1912, at nine o'clock A. M. for the purpose of qualifying as such Viewers and Engineer and that after taking an oath to faithfully and impartially discharge the duties required of them, they shall take to their assistance the necessary assistants and proceed to view, examine and survey the said highway and proposed improvement thereof, locate the same, determine the public utility and convenience thereof, the width, make a profile of the grade, determine the quality and depth of the stone and anything else required to properly complete the improvement, including bridges such as Townships are authorized to make, culverts, draingae, assess damages and do all other things that may be necessary for the completion of said road.

It is further ordered by said Boards of Commissioners that said Viewers and Engineer herein shall make their report in duplicate and file one copy thereof with the Auditor of Hendricks County, Indiana, and one copy with the Auditor of Marion County, Indiana.

DR. CHARLES YOKE ET AL. ROAD.

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Said report shall be so filed on or before the 17th day of October A. D. 1912, by said Viewers and Engineer.

There being nothing further, the Boards adjourned.

Charles Maguire

James Kervan

John Kitley

Board of Commissioners of
Marion County, Indiana.

Elbert M. Murphy

Harry E. Sanders

James A. Downard

Board of Commissioners of
Hendricks County, Indiana.

The following proceedings were had, to-wit:

Board of Free Turnpike
Directors.

DR. CHARLES YOKE ET AL. ROAD.

November 7, 1912.

STATE OF INDIANA)
SS
MARION COUNTY.)

I, W. T. Patten, Auditor of Marion County, do hereby certify that the foregoing is a true and complete transcript of the proceedings of the Boards of Commissioners of Marion and Hendricks Counties, in the matter of the improvement of county line highway as petitioned for by Dr. Chas. Yoke et al., as the same appears of record in my office.

WITNESS my hand and the seal of the Board of Commissioners of Marion County,
Indiana, this 4th day of November, A. D. 1912.

W. T. Patten

(SEAL)

Auditor Marion County, Indiana.

NOVEMBER TERM, 1912.

Monday Morning, November 4, 1912.

The Board of Commissioners of Hendricks County, Indiana, met in regular session in the Commissioners Room, in the town of Danville, it being the first Monday in said month.

Present: Elbert M. Murphy, Harry E. Sanders and James A. Downard, all members of said Board.

The following proceedings were then had, to-wit:

In the matter of the petition of)
C. E. Higgins et al for the imp-)
rovement of a public highway.)

Comes now the petitioners by counsel, and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the ~~third~~ day of ~~the~~ next regular session of the this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said porposed improvement.

In the matter of the petition of)
Henry Beckley et al for the impro-)
vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the ~~third~~ day of ~~the~~ next regular session of this Board to make and file in the office of the Auditor of Hendricks County, ~~the~~ certain report in writing setting forth their deretmination in regard to the said proposed improvement.

NOVEMBER TERM, 1912.

In the matter of the petition of)
R. L. Underwood et al for the im-)
provement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of the Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

In the matter of the petition of)
H. S. Ragan et al for the impro-)
vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for the said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

NOVEMBER TERM, 1912.

In the matter of the petition of)
Amos Kersey et al for the impro-)
vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for the said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing, setting forth their determination in regard to said proposed improvement.

In the matter of the petition of)
J. W. Figg et al for the impro-)
vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

NOVEMBER TERM, 1912.

In the matter of the petition of)
Henry Hunt et al for the impro-)
vement of a public highw y.

Comes now the petitioners by counsel and come also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for the said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the ^{third}~~first~~ day of ^{this}~~the next~~ regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in writing in regard to said proposed improvement.

In the matter of the petition of)
Samuel James et al for the impro-)
vement of a public highway.

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for the said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

NOVEMBER TERM, 1912.

In the matter of the petition of)
Perry Hunt et al for the impro-)
vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for the said engineer and viewees to at this time file a report of their doings in the foregoing entitled improvement.

Therefore it is hereby ordered by the Board that said engineer and viewers be given until the ^{third}~~first~~ day of ^{this}~~the next~~ regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

In the matter of the petition of)
J. P. Christie et al for the im-)
provement of a public highway.)

Comes now the petitioners by counsel and come also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore, it is hereby ordered by the Board that said engineer and viewers be given until the ^{third}~~first~~ day of ^{this}~~the next~~ regular session of this Board to make and file in the office of the Auditor of Hendricks County their certain report in writing setting forth their determination in regard to said proposed improvement.

NOVEMBER TERM, 1912.

In the matter of the petition of)
 Wm. Harris et al for the impro-)
 vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for the said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore it is hereby ordered by the Board that said engineer and viewers be given until the ^{third} first day of ~~the~~ ^{this} next regular session of this Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

In the matter of the petition of)
 Alfred Cox et al for the impro-)
 vement of a public highway.)

Comes now the petitioners by counsel and comes also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible for said engineer and viewers to at this time file a report of their doings in the foregoing entitled improvement.

Therefore it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of the Board to make and file in the office of the Auditor of Hendricks County, their certain report in writing setting forth their determination in regard to said proposed improvement.

Albert W. Murphy

DECEMBER TERM, 1912.

Wednesday Morning, December 4, 1912.

The Board of Commissioners of Hendricks County, Indiana are met pursuant to adjournment, in the Commissioners Room in the town of Danville.

Present: Elbert M. Murphy, Harry E. Sanders and James A. Downard, all members of said Board.

The following proceedings were then had, to-wit:

In the matter of the petition of)
C. E. Higgins et al for the imp-)
rovement of a public highway.)

Come now again the petitioners in the above entitled cause and respectfully show to the Board of Commissioners of Hendricks County and State of Indiana, that pursuant to an order heretofore made and entered of record by said Board and a notice issued by the Auditor of said Hendricks County, which notice is in words and figures as follows, to-wit: (H.I), that the viewers and engineer heretofore appointed in this cause met on the 11th day of March 1912 at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribng an oath faithfully and impartially to discharge their duties as viewers and engineer in this cause and that the engineer on said date filed his bond in the sum of \$5000.00 as provided by law, which bond is in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County, Indiana, as Principal and the AMERICAN SURETY COMPANY OF NEW YORK, as Surety are held and firmly bound unto the State of Indiana in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARD, for the payment of which well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED THIS 4th day of March 1912.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That, WHEREAS, the above named and bounded JOHN O. KAIN has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the C. E. Higgins et al road.

NOW, THEREFORE, If the said JOHN O. KAIN shall well and faithfully discharge the duties of his said office of Engineer of Location of said Road, according to law, then and in that event this bond shall be void; otherwise to be and remain in full force and effect in law.

(SEAL)

John O. Kain

AMERICAN SURETY COMPANY OF NEW YORK,

By E. V. Clark

Resident Vice President

DECEMBER TERM, 1912.

C. E. HIGGINS ET AL ROAD.

Attest: Jno. J. Reinhard

Resident Assistant Secretary.

which bond was duly **approved** by the Auditor of said Hendricks County which approval duly endorsed upon said bond is in words and figures as follows, to-wit:

Approved June 3rd, 1912

Lewis W. Borders

Auditor Hendricks County, Indiana.

And now said petitioners would respectfully show to the Board that the time for the filing of the report of said Viewers and Engineer was extended to the ^{third day of the} November Term 1912 of the Board, and now come the Viewers and Engineer herein and produce and file their report on said proposed improvement, on the 6th day of November 1912, which report is in words and figures as follows, to-wit:

ORDER TO VIEW ROAD.

STATE OF INDIANA)

HENDRICKS COUNTY.)

COMMISSIONERS COURT

MARCH TERM, 1912.

To John O. Kain, Carman C. Branson and Jacob E. O'Neal.

You are hereby notified that you were appointed by the Board of Commissioners of said County, at their March Term 1912 to view a proposed improved free gravel Road at the center South of Sec. 3, Township 15, North of Range 2 west and extending thence North one (1) mile thence east about one fourth ($\frac{1}{4}$) mile thence North one (1) mile and terminating in the Danville and New Maysville free gravel road, the same being the proposed improved highway petitioned for by C. E. Higgins et al, and if said proposed improved highway will be of public utility, mark and lay out the same as prayed for in the petition in the manner prescribed by law, to the width of 30 feet.

You will meet at the office of the Auditor of Hendricks County who resides at Danville, Indiana, Monday the 11th day of March 1912, at 10 o'clock A. M., and after being duly qualified, proceed to make said view, and report at the next regular term of said Board.

I certify the foregoing to be a true copy of the Order of the Board in relation to said proposed highway. Witness my hand and official seal, this 4th day of March 1912.

Lewis W. Borders,

Auditor.

OATH OF VIEWERS.

State of Indiana)

Hendricks County)

We, John O. Kain, Carman C. Branson and J. E. O'Neal do solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the

DECEMBER TERM, 1912.

C. E. HIGGINS ET AL ROAD.

within described proposed highway to the best of our skill and ability, so help us God.

John O. Kain

Carman C. Branson

J. E. O'Neal

Subscribed and sworn to before me, this 11th day of March 1912.

Lewis W. Boarders

Auditor Hendricks County.

State of Indiana }
ss
Hendricks County)

In the Commissioners Court

December Term, 1912.

In the matter of the petition of)
C. E. Higgins et al to improve a)
public highway in Marion Township)
Hendricks County, Indiana.)

To the Honorable Board of Commissioners of Hendricks County, Indiana.

We, the undersigned Viewers and Engineer, appointed by your Honorable body, under the "Provisions of an Act of the General Assembly of the State of Indiana, approved March 8th 1905, and all amendments and supplements therof", to view and examine, make all needfull surveys of the road described in the petition of C. E. Higgins et al, and hereinafter described, determine the manner of said improvement in detail, estimate the costs thereof, and prepare profile, plans, drawings and specifications preparatory to cleaning, grubbing, grading, sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:-

That pursuant to the notice served on us, we met on the 11th day of March 1911, at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribing an oath faithfully and impartially to discharge the duties under our respective appointments, and as such Viewers and Engineer, we proceeded to the vicinity and neighborhood of said road.

That we made a careful view and examination of the route of the proposed improvement, of the locality in which said proposed improved road is located, of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys of the same together with profile, drawings, plans and specifications, and found that the material for the roadway should be first class Mitchell limestone and gravel suitable for first class road building purposes as detailed in the specifications and exemplified in the drawings entitled "CROSS SECTION OF ROADBED". We find that the proposed improvement, in accordance with the profile, drawings,

DECEMBER TERM, 1912.

C. E. HIGGINS ET AL ROAD.

plans and specifications, herewith filed, will be of a public utility and convenience and that the cost of the construction of the same will be less than the benefits derived therefrom; that we have laid out said proposed highway along the route hereinafter described and to the width of Thirty (30) feet and specified in the specifications herewith filed. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet, and that said profile drawings, plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and specifications describe in detail the sizes, materials to be used and the method of the construction of the road bed, bridges, sewers, ditches, drains, and stone required therein and likewise provide the quality and quantity of each and every kind of material, and all things necessary to make a complete macadam road. That all drawings, plans and specifications together with the profile and all figures, notes and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located:

Commencing in the center of the Danville and Rockville Free Gravel Road at a point which is the South half mile stone of Section 3, Township 15 North Range 2 West in Marion Township, Hendricks County, Indiana and running thence North 5571 feet on the center line of the already established unimproved highway, running North and South on or near the center of said Section 3 to the North half mile stone of said Section; thence running East on the North line of Section 3 aforesaid 1284 feet to the center on the South of the South East quarter of Section 34, Township 16 North Range 2 West and running thence North 5298 feet on the line running North and South through the center of the East half of Section 34 aforesaid to the North line of said Section 34 and terminating in the center of the Danville and New Maysville Free Gravel Road, all in Marion Township, Hendricks County, Indiana.

We find the total length of the proposed improved highway to be 12153 lineal feet.

We find no damage on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$13,000.00

John O. Kain

Carman C. Branson

Jacob E. O'Neal

Subscribed and sworn to before me this 1st day of November 1912.

Lewis W. Borders

Auditor Hendricks County

(Seal)

DETAIL SPECIFICATIONS.

In the Matter of the petition of)
 C. E. Higgins et al for the imp-)
 rovement of a public highway in)
 Marion Township, Hendricks County)
 Indiana.)

1. PROFILE. The profile represents the elevations of the center line of the roadway, the elevations having been taken at the end of each one hundred feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line established represents the elevations of the center line, that the roadway shall be raised or lowered to, being referred to as the sub-grade and before materials are put on.

As the profile only shows the elevations along the center line of the roadway, Bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of cutting and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications whether specifically mentioned or referred to in these specifications.

2. ROUTE. The route, length and width of this highway are as heretofore set out in the report of the Viewers and Engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty (30) feet that is fifteen (15) feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a subgrade twenty-four (24) feet wide, uniformly rounded as shown on the "CROSS SECTION OF ROADBED", the slope of the embankments to be one vertically to one and one-half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstructions and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original positions. Where shade trees do not impede travel or cause damage to the road they may be left standing at the discretion of the Engineer,

4. SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade, as shown by the plans and profile and by the stakes to be set by the Engineer. All soft and spongy places not affording a firm

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C. E. HIGGINS ET AL ROAD.

foundation shall be dug out and refilled with broken stone or gravel. The excavations for the sub-grade of the side ditches shall be made to additional depth indicated by the drawings and not deeper. The road shall be made to conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said roadbed shall be made smooth and compact before the gravel is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone or gravel thereon, unless permission is given by the Engineer for placing the same earlier. At any event immediately proceeding the placing of material thereon the sub-grade shall be smoothed and turned up and thoroughly rolled with a ten ton steam or gasoline roller and the roadbed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5. DITCHES. The side ditches provided for on the "CROSS SECTION OF ROADBED" shall be constructed as thereon indicated. The excavation of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them.

6. GRADE. The grade line (the red line) on the profile shows the elevation of the sub-grade of the roadbed, and the top or surface of the roadbed must be made to conform to said grade line, making cuts and fills of the depth and to the amount shown on the profile. However, in the case of discrepancy between the cuts and fills as shown on the profile, and the cuts and fills necessary to bring the sub-grade to the grade line established by making the required cut or fill, or whatever may be required if anything at both ends of a continuous grade, such continuous grade to be maintained between the breaks.

7. EXCAVATIONS. All cuts shall be excavated to a width of twenty-eight (28) feet at the sub-grade.

8. SEWERS. Sewers shall be constructed at the places and of the size as detailed on the profile. All sewers shall be Corrugated American Ingot Iron, or its equal and shall be tested by chemical analysis 99.84 per cent iron. All sewers to have headers of the size and dimensions detailed in the profile and shall be constructed of concrete of the quality, quantity and manner as provided for bridges.

REMOVAL OLD STRUCTURE. The contractor shall remove the old bridge in a careful and workmanlike manner, so as to preserve the integral parts thereof and place the same on the side of the highway at a point not to impede travel thereon. The same to be as compactly and uniformly stacked as the condition and shape of the material will permit. The structure and material thereof to be and remain the property of Hendricks County, Indiana.

TEMPORARY BRIDGE AND BY-PASS. The Board shall provide a right of way and shall build and maintain a temporary bridge, both sufficient for all traffic.

FOUNDATIONS. Unless otherwise indicated the abutments shall be carried three feet below the bed of the stream, or water line, as established by the profile.

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against material that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COFFER DAMS. The contractor shall design and construct coffer-dams, if necessary, as placing of concrete in water will not be allowed.

CEMENT. All cement shall be inspected. Cement may be inspected either at the place of manufacture or on the work. Any cement on the work without the stamp of the Board or Engineer shall be rejected.

General Conditions: In order to allow ample time for inspecting and testing the cement shall be stored in a suitable weather-tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of manufacturer plainly marked thereon.

(18) A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the seven day requirements may be held awaiting the results of the twenty eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee of Uniform Tests of Cement of the American Society of Civil Engineers presented to the Society January 21, 1903 and amended January 20, 1904, and January 15, 1908, with all subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements

Portland Cement: DEFINITION-- This term is applied to the finely pulverized produce resulting from the calcination fusion of an intimate mixture or properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent has been made subsequent to calcination.

Specific Gravity. The specific gravity of cement dried at 212° F. shall not be less than 3.10

Fineness. It shall leave by weight a residue not more than 8 per cent on the No.100 and not more than 25 per cent on the No. 200 sieve.

Time of Setting. It shall not develop initial set in less than thirty minutes; and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH
24 HOURS IM MOIST AIR	-----	175 lbs.
7 days (1 day in moist air, 6 days in water)		500 lbs.
28 days (1 day in moist air, 27 days in water)		600 lbs.

ONE PART CEMENT, THREE PARTS SAND.

7 days (1 day in Moist air, 6 days in water)---200lbs-

28 days (1 day in moist air, 27 days in water)--- 275lbs.

In no case shall the increase in strength be less than 20 per cent over the strength shown at 7 days.

Constancy of Volume. Pats of neat cement about three inches in diameter, one-half inch thick at the center and tapering to a thin edge shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70° F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five hours.

These pats to satisfactorily pass the requirements shall remain firm and hard and show no signs of distortion, checking, cracking or disintegration.

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent of anhydrous sulphuric acid (SO₃) not more than 4 per cent of magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from ^{all} foreign matter, uniformly graded and of size that will pass a one inch screen and be retained on a 1/4 inch screen. The fine aggregate shall be clean sharp sand, free from mica, clay, loam or other foreign matter, in excess of five (5) per cent and shall be of a graded size ranging from 1/8 inch down to that which will be retained on a No.80 Standard sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry then sufficient water added to obtain the desired consistency and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer or on the mixing board all at the same time. The mixer must produce a concrete of uniform consistency and color with the stone thoroughly mixed with water and sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under the tamping. This consistency may be varied if required by the Board or Engineer.

Re-tempering, that is mixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place all wheeling, work or walking on it must be prevented until it is sufficiently set and if the Board or Engineer shall require it, the Contractor must keep the freshly laid concrete covered with wet canvass or tarpaulins to protect it from the sun.

All concrete facing on walls shall be finished by spading so that the largest pieces of gravel or stone will be prevented from touching the forms, thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed faces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain, markings and imperfections to be removed by rubbing with a flat emery block, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding eight inches in thickness and then tamped so that the water will flush to the surface. In all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before stopping the placing thereof. The crack or line selected shall continue entirely across the exposed part of said structure, different levels, elevations or place of stopping to be avoided. When a stop is made, before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and then slushed with pure cement. This must be done immediately in advance of the placing of the next layer thereon.

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FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor ^{form} to be absolutely rigid and not to be removed from the structure until at least twenty one days after the completion of the floor slab. Forms on exposed faces to be as provided for in the section entitled "Facing". Forms for the abutments on the faces thereof and on the stream side of the wings shall be extended to the extreme bottom of the concrete.

Forms for all exposed surfaces shall be dressed and smooth and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging or boards in contact with concrete shall be made nonabsorbant as directed by the Board or Engineer. Loose concrete, sawdust and debris must be carefully removed from the forms immediately before placing concrete.

REINFORCEMENT. All reinforcement bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint, oil or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be spaced eighteen inches on centers and shall consist of several continuous members of size and number as indicated above and shown on the plans, locked together with clamps and providing diagonal tension reinforcement.

The contractor shall place all bars in the exact position and manner as indicated on the plans and keep them in such position by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

CHAMFERED EDGES. All exposed edges shall be chamfered with 3/4 inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer and upon such written order the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following: the water, sand and gravel or stone shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its FINAL set has developed.

WATERWAY. In addition to the general cleaning up provided in Section 22 of the General Specifications the contractor shall remove all false work, dirt, sand, gravel and all materials of whatever kind down to the water line or spring line from abutment to abutment.

Stone For a width of nine (9) feet; four and one half (4½) feet on each side of the center line of road, the road shall be covered with good, hard, first class crushed lime stone, suitable for first class road building purposes and acceptable to the Engineer and Superintendent, said stone to be free from dirt and all other foreign deleterious materials and range in size as hereinafter provided. After the road bed has been prepared settled and rolled, as hereinbefore provided, six (6) inch boards are to be placed, properly lined, then stone, the largest pieces of which will pass through a two and one

half ($2\frac{1}{2}$) inch ring and shall include all sizes smaller, including dust, or what is commonly known as $2\frac{1}{2}$ crusher run, shall be placed between such boards uniformly spread and rolled with a ten ton steam or gasoline roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl.

Upon the foundation stone there shall be placed between five (5) inch board for a width of nine feet, a layer of stone five (5) inches deep entirely across such nine feet, said stone to be of a kind and quality as hereinbefore provided, the largest pieces of which will pass through a $\frac{3}{4}$ inch screen and over a $\frac{1}{4}$ screen. Said stone is to be spread to a depth of five inches after which the same will be rolled with a steam roller and to the same extent as provided for the foundation stone.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be unnecessary.

Five cubic yards of fine stone shall be placed at each road intersection under the direction of the Engineer, in addition to making easy approaches in the sub-grade to all intersecting roads.

Before the final acceptance of the road the contractor will be required to rake in the entire road, without raking in the dirt and leaving the edges of the stone in a straight line and the entire surface of the stone presenting a uniform slightly appearance, then re-rolling the same.

HAULING OVER OTHER ROADWAYS. The contractor shall be required to put public highways over which he may haul materials in as good condition as when he commenced hauling materials over them before the acceptance of the work herein provided for.

Estimates. The contractor shall be entitled to estimates as provided by the statutes and payment may be made at such times as may be ordered by the Board, provided no payment shall be made for more than eighty (80) per cent of the Engineers estimate, of the work done by the contractor nor shall the whole amount of the contract price be paid until received as complete in all its details. No part of the work will be finally received until the entire work is received and accepted as completed.

John O. Kain, Engineer

Carman C. Barnson, Viewer

Jacob E. O'Neal, Viewer.

Subscribed and sworn to before me this 6th day of November 1912.

(Seal)

Lewis W. Borders, Auditor.

For General Specifications see Page 575.

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C. E. HIGGINS ET AL ROAD.

And now again comes the viewers and engineer after the expiration of more than ten days from the day of filing their report herein, to-wit, the 2nd day of December 1912, and at the next regular term of session of said Board of Commissioners after said date and file their supplemental report herein, which report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition of)
C. E. Higgins et al for the imp-)
rovement of highway.)

We the undersigned Viewers heretofore appointed in the above cause and who as such viewers on the 6th day of November 1912 filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report, to-wit:

- We would respectfully report that the improvement of said highway in the manner set forth in our former report will not occasion any damages to the lands of any Infant, Idiot or person of unsound mind and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

John O. Kain

Carman C. Branson

Jacob E. O'Neal

Viewers.

Subscribed and sworn to before me this the 16th day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

(Seal)

And now said Board of Commissioners being fully advised and informed in the premises finds that the viewers and engineer heretofore appointed in this cause met on the 11th day of March 1912, pursuant to notice and were qualified as provided by law and that said engineer filed his bond in the sum of \$5000.00 and that the same was duly approved by the Auditor of Hendricks County and the Board further finds that pursuant to an order heretofore made and entered of record by said Board, that the time for filing the report of said viewers and engineer was extended to the third day of the November term 1912 and that said report of the viewers and engineer was filed on the 6th day of November 1912 in the office of the Auditor of Hendricks County, and that the same has remained on file in said office open to the inspection of any person since said date, and for more than ten days before the first day of the December Term 1912, of said Board and before the filing of the supplemental report herein, and the Board

having examined said report finds that it conforms to the law in all respects and that the same should be approved, that the highway described therein is less than three miles in length, that the improvement as recommended and reported in said report will be of public utility and that said improvement should be allowed and established, as recommended and provided in said report, without submitting the matter of said improvement to the legal voters of Marion Township, Hendricks County, Indiana.

And the Board further finds that the viewers and engineer filed their supplemental report on the 2nd day of December 1912, the same being the 1st day of the December Term 1912 of said Board, and more than ten days after the filing of the first report. That said supplemental report being fully examined by the Board, it finds that no injury will result to the property of any idiot or person of unsound mind or will any person sustain any damage whatever by reason of the construction of the improvement as prayed for by the petitioners; and recommended by the report of the Viewers and engineer that no person or corporation has made any written claim for damages to property by reason of said improvement and that said supplemental report is in due form of law and regular and that the same ought to be in all things approve.

It is therefore ordered by the Board that the report of viewers and engineer and also the supplemental report by them filed each be and the same are hereby in all things approved.

And the Board further finds from the examination of the said reports of said viewers and engineer that said improvement as prayed for by said petitioners should be established.

And it is therefore ordered by the Board that said improvement as prayed for by said petitioners and recommended by said viewers and engineer be made and that said highway be improved in all respects as provided in the reports of said viewers and engineer.

It is further ordered by the Board that the Auditor of Hendricks County Indiana give notice by one publication in a daily newspaper of general circulation through the State of Indiana, and by three publications in the Republican and Gazette, weekly newspapers of general circulation in Hendricks County in which road to be improved is located that up to the hour of 10 A. M. on the 28th day of December 1912 sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana at their usual place of meeting for the making of said improvement in accordance with the profile and report and the plans and specifications in said report set forth and this cause in continued.

DECEMBER TERM, 1912.

Wednesday Morning, Dec. 6, 1912.

In the matter of the Petition of .)

Henry Beckley et al for the imp-)

rovement of a Public highway in)

Marion Township, in Hendricks)

County, Indiana.)

In the Commissioners Court,
December Term, 1912.

Comes now again the petitioners in the above entitled cause and respectfully show to the Board of Commissioners of Hendricks County, Indiana, that pursuant to an order heretofore made by said Board, and to a notice issued by the Auditor of said County, which notice is in words and figures as follows, to-wit: (H.I), the viewers and engineer appointed in said cause met on the 11th day of March 1912, which date was within ten days after the appointment of said viewers and engineer, and took an oath as provided by law, for the faithful discharge of their duties as viewers and engineer in this cause, and that the engineer on said date filed his bond in the sum of \$5000.00 with the approval of said Auditor endorsed thereon, which bond and approval are in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County, Indiana, as Principal and the AMERICAN SURETY COMPANY OF NEW YORK, as Surety, are held and firmly bound unto the State of Indiana in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARS, for the payment of which, well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED THIS 4th day of March 1912.

THE CONDITIONS OF THE ABOVE OBLIGATION IS SUCH, That WHEREAS, the above named and bounded JOHN O. KAIN has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the Henry Beckley et al Road.

NOW, THEREFORE, If the said JOHN O. KAIN shall well and faithfully discharge the duties of his said office of Engineer of Location of said road, according to law, then and in that event this bond shall be void; otherwise to be and remain in full force and effect in law.

DECEMBER TERM, 1912.

HENRY BECKLEY ET AL ROAD.

JOHN O. KAIN

AMERICAN SURETY COMPANY OF NEW YORK

BY E. V. CLARK

Resident Vice President

Attest: Jno. J. Reinhard

Resident assistant Secretary.

Approved June 3, 1912

Lewis W. Borders

Auditor Hendricks County, Indiana.

And now said petitioners show to the Board that the time for filing the report of said viewers and engineer was fixed in said notice for the first day of the regular April Term 1912 of said Board and that said Board continued and extended the time for the filing of said report of said viewers and engineer, as shown by the records of said Commissioners, from Term to Term and from time to time to the third day of the November Term 1912 of said Board, and now comes the viewers and engineer herein and produce and file their report on the 6th day of November 1912, the same being the 3rd day of the said November Term 1912, of said Board, which said report is in words and figures as follows, to-wit:

ORDER TO VIEW ROAD.

STATE OF INDIANA)
) SS
 HENDRICKS COUNTY)

COMMISSIONERS COURT
 MARCH TERM, 1912.

To George Christy and Alfred S. Lininger and John O. Kain, Engineer:

You are hereby notified that you were appointed by the Board of Commissioners of said County at their March Term, 1912 to view a public highway proposed to be improved, as follows, to-wit:

Commencing in the center of the New Maysville Improved Free Gravel Road at the North West corner of Section Thirty-six, Township Sixteen North Range Two west and running thence South on and along the west line of said Section thirty-six for a distance of one mile, thence East on and along the south line of said Section Thirty-six a distance of about three quarters of a mile, thence south for a distance of one mile to the center of the Danville and New Winchester Improved Free Gravel Road.

You will meet at the office of the Auditor of said County at Danville Indiana on the 11th day of March 1912 at 10 o'clock A. M. and qualify and after being duly qualified proceed to make said view and determine whether it will be of public utility to grade, drain and pave said high-

DECEMBER TERM, 1912.

HENRY BECKLEY ET AL ROAD.

way with stone, gravel or other road paving material, and build the necessary bridges, culverts and sewers thereon, and if you find said proposed highway improvement to be of public utility you will then determine and fix the kind and character and width of said proposed improvement, including the grading, draining and paving to be done, with complete plans and specifications of such improvement, and all of the bridges, culverts and waterways required thereon, together with the estimated cost of said proposed improvement, and make report of your determination in said matter in respect to said highway to be ~~including~~ an accurate description of said highway to be graded, drained and paved, together with your recommendations in respect to the paving material to be used, and complete plans and specifications of such improvement, and the estimated cost of such improvement, and accompany said report with an accurate profile of said highway showing by proper lines and figures the elevations thereof at each 100 feet of its length and the changes to be made therein by excavations and fills, and make a complete report of your doings herein as provided by statute to the Board of Commissioners of said County, on the first day of their regular April Term 1912, the same being the 1st day of April 1912.

I certify the foregoing to be a true copy of the Order of the Board in relation to said proposed highway. Witness my hand and official seal, this 5th day of March 1912.

Lewis W. Borders

(SEAL)

Auditor.

OATH OF VIEWERS.

STATE OF INDIANA)

SS

HENDRICKS COUNTY.)

We, John O. Kain, Geo. L. Christie and Alfred S. Lineinger do solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the within described proposed highway to the best of our skill and ability, so help us God.

John O. Kain

Geo. L. Christie

Alfred S. Lineinger

Subscribed and sworn to before me, this 11th day of March 1912.

Lewis W. Borders,

Auditor.

DECEMBER TERM, 1912.

HENRY BECKLEY ET AL ROAD.

State of Indiana)
 Hendricks County) ss

In the Commissioners Court
 November Term 1912.

In the matter of the petition for)
 Henry Beckley et al for the imp-)
 rovement of a public highway in)
 Marion Township, Hendricks County)
 Indiana.)

TO THE HONORABLE BOARD OF COMMISSIONERS OF HENDRICKS COUNTY, INDIANA.

We, the undersigned viewers and engineer, appointed by your honorable Body under the provisions of an act of the General Assembly of the State of Indiana, approved March 3, 1905 and all amendments and supplements thereto, to view, examine, make all needful surveys of the road described in the petition of Henry Beckley et al and herein after described, determine the manner of said improvement in detail, estimate the cost thereof and prepare profile, plans, drawings and specifications, preparatory to cleaning, grubbing, grading, sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:-

That pursuant to notice served on us, we met on the 11th day of March 1912 at the office of the Auditor of Hendricks County, in the town of Danville Indiana, and after taking and subscribing an oath faithfully and impartially to discharge the duties under our respective appointments, and as such Viewers and Engineer, we proceed to the vicinity and neighborhood of said road.

That we made a careful view and examination of the route of the proposed improvement, of the locality in which said proposed improved road is located of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys of the same together with profile drawings, plans and specifications, and found that the material for the roadway should be first class Mitchell Limestone suitable for first class road building purposes as detailed in the specifications and exemplified in the drawings entitled "CROSS SECTION OF ROADBED". We find that the proposed improvement in accordance with the profile, drawings, plans and specification herewith filed, will be of public utility and convenience and that the costs of construction of the same will be less than the benefits derived therefrom; that we have laid out said proposed highway along the route hereinafter described and to the width of thirty feet and specified in the specifications herewith filed. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet, and that said profile, drawings, plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and

specifications describe in detail the sizes, materials to be used and the method of construction of the roadbed, bridges, sewers, ditches, drains and stone required thereon and likewise provide the quality and quantity of each and every kind of material and all things necessary to make a complete macadam road; that all drawings, plans and specifications together with the profile and all figures, notes and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located.

Commencing in the center of the New Maysville Free Gravel Road at the North West corner of Section 36 Township 16 North Range 2 West and running thence South on the West line of said Section 5324 feet thence East 3975 feet; thence South 5563 feet, and terminating in the center of the Danville and Rockville Free Gravel Road, all in Marion Township, Hendricks County, Indiana. We find the total length of the proposed improved highway to be 14860 lineal feet.

We find no damages on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$14,463.00

John O. Kain

Geo. L. Christie

Alfred S. Lineinger

Subscribed and sworn to before me this 1st day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

DETAIL SPECIFICATIONS.

In the matter of the petition of)
Henry Beckley et al to improve a)
public highway in Marion Township,)
Hendricks County, Indiana.)

1. PROFILE. The profile represents the elevations of the center line of the roadway, the elevations having been taken at the end of each one hundred feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line established represents the elevation of the center line, that the roadway shall be raised or lowered to being referred to as sub-grade and before the materials are put on.

As the profile only shows the elevations along the center line of the roadway, bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of cutting and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications, whether specifically mentioned or referred to in these specifications.

ROUTE. The route, length and width of this highway are as heretofore set forth in the report of the Viewers and Engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty (30) feet that is fifteen (15) feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a sub-grade twenty-four (24) feet wide, uniformly rounded as shown on the "CROSS SECTION OF ROADBED", the slope of the embankments to be one vertically to one and one half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstructions and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original position. Where shade trees do not impede travel or cause damage to the road they may be left standing at the discretion of the Engineer.

4. SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade as shown by the plans and profile and by the stakes to be set by the Engineer. All soft and spongy places not affording a firm foundation shall be dug out and refilled with broken stone or gravel. The excavations for the sub-grade of the side ditches shall be made to additional depth indicated by the drawings and not deeper. The road shall conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said roadbed shall be made smooth and compact before the stone is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone thereon, unless permission is given by the Engineer for placing the same earlier. At any event immediately proceeding the placing of material thereon the sub-grade shall be smooth and trued up and thoroughly rolled with a ten (10) ton steam roller and the roadbed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5. DITCHES. The side ditches provided for on the "CROSS SECTION OF ROADBED" shall be constructed as thereon indicated. The excavations of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them.

6. GRADE. The grade line (the red line) on the profile shows the elevations of the sub-grade of the roadbed, and the top or surface of the roadbed must be made to conform to said grade line, making cuts and fills of the depth and to the amount shown on said profile. However, in the case of discrepancy between the cuts and fills as shown on the profile, and the cuts and fills necessary to bring the sub-grade to the grade line established by making the required cut or fill or whatever may be required if anything, at both ends of a continuous grade, such continuous grade to be maintained between the breaks.

7. EXCAVATIONS. All cuts shall be excavated to a width of twenty eight (28) feet at the sub-grade.

8. BRIDGES. Bridges shall be constructed at the places and of the size and in the manner detailed on the profile out of re-inforced concrete, such concrete shall be of the kind of material, proportions and workmanship as hereinafter provided.

9. SEWERS. Sewers shall be constructed at the places and of the size as detailed on the profile. All sewers shall be Corrugated American Ingot Iron, or its equal, and shall test by chemical analysis 99.84 per cent iron. All sewers to have headers of the size and dimensions detailed on the profile and shall be constructed of concrete of the quality, quantity and manner as provided for bridges.

REMOVAL OLD STRUCTURE. The contractor shall remove the old bridge in a careful workmanlike manner so as to preserve the integral parts thereof and place the same on the side of the highway at a point not to impede travel thereon, The same to be as compactly and uniformly stacked as the condition and shape of the material will permit. the structure and material thereof to be and remain the property of hendricks County, Indiana.

TEMPORARY BRIDGE AND BY-PASS. The Board shall provide a right of way and shall build and maintain a temporary bridge, both sufficient for all traffic.

FOUNDATIONS. Unless otherwise indicated the abutments shall be carried three feet below the bed of the stream, or water line as established by the profile.

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against material that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COFFER DAMS. The contractor shall design and construct coffer-dams, if necessary, as placing of concrete in water will not be allowed.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work.

Any cement on the work without the stamp of the Board or Engineer shall be rejected.

General Conditions: In order to allow ample time for inspecting and testing, the cement shall be stored in a suitable weather tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of the manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland Cement shall contain 4 bags.

Cement failing to meet the seven day requirements may be held awaiting the results of the twenty eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, presented to the Society January 21, 1903 and amended January 20, 1904, and January 15, 1908 with all subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements
Portland Cement: DEFINITION--This term is applied to the finely pulverized produce resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent has been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement dried at 212°F. shall not be less than 3.10.

Fineness. It shall leave by weight a residue not more than 8 per cent on the No. 100 and not more than 25 per cent on the NO. 200 sieve.

Time of Setting. It shall not develop initial set in less than thirty minutes; and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH.
24 hours in moist air	-----	175 lbs.
7 days (1 day in moist air, 6 days in water)	-----	500 lbs.
28 days (1 day in moist air, 27 days in water)	-----	600 lbs.

ONE PART CEMENT, THREE PARTS SAND.

7 days (1 day in moist air, 6 days in water)	-----	200 lbs.
28 days (1 day in moist air, 27 days in water)	-----	275 lbs.

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HENRY BECKLEY ET AL ROAD.

In no case shall the increase in strength be less than 20 per cent over the strength shown at 7 days.

Constancy of Volume. Pats of neat cement about three inches in diameter, one-half inch thick at the center and tapering to a thin edge shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70°F. as practicable and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam above boiling water, in a loosely closed vessel for five hours.

These pats to satisfactorily pass the requirements shall remain firm and hard and show no signs of distortion, checking, cracking or disintegration.

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent of anhydrous sulphuric acid (SO_3) nor more than 4 per cent of magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement, two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from all foreign matter, uniformly graded and of size that will pass a 1 inch screen and be retained on a $\frac{1}{4}$ inch screen. The fine aggregate shall be clean, sharp sand free from mica, clay or loam or other foreign matter, in excess of five (5) per cent and shall be of graded sizes ranging from $\frac{1}{8}$ inch down to that which will be retained on a No. 30 sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry, then sufficient water added to obtain the desired consistency and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer or on the mixing board all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with water sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping. This consistency may be varied if required by the Board or Engineer.

Re-tempering, that is remixing with additional water mortar or concrete that had been partially hardened will not be permitted.

When in place all wheeling work or walking on it must be prevented until it is sufficiently set; and if the Board or Engineer shall require it the Contractor must keep the freshly laid concrete covered with wet canvass or tarpaulins to protect it from the sun.

All concrete facings on walls shall be finished by spading so that the largest pieces of gravel or stone will be prevented from touching the forms thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed faces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain markings and other imperfections to be removed by rubbing with a flat emery block, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding eight inches in thickness and then tamped so that the water will flush to the surface. IN all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before stopping the placing thereof. The crack or line selected shall continue entirely across the exposed part of said structure, different levels, elevations, or place of stopping to be avoided. When a stop is made, before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and then slushed with pure cement. This must be done immediately in advance of the placing the next layer thereon.

FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor form to be absolutely rigid and not to be removed from the structure until at least twenty one days after the completion of the floor slab. Forms on exposed faces ^{be as} provided for in section entitled "Facing." Forms for the abutments on the faces thereof and on the stream side of the wings shall extend to the extreme bottom of the concrete.

Forms for all exposed surfaces shall be dressed and smoothed and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging or boards in contact with concrete shall be made non-absorbent as directed by the Board or Engineer. Loose concrete or sawdust and debris must be carefully removed from the forms immediately before placing concrete.

DECEMBER TEN, 1912.

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REINFORCEMENT. All reinforcement bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint or oil or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be placed eighteen inches on center and shall consist of several continuous members of size and number as indicated above and shown on the plans, locked together with clamps and providing diagonal tension reinforcement.

The contractor shall place ^{all} bars in the exact position and manner as indicated on the plans, and keep them in such position by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

CHAMFERED EDGES. All exposed edges shall be chamfered with $\frac{3}{4}$ inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer, and upon such written order, the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following: The water, sand and gravel or stone shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its FINAL set has developed.

WATERWAY IN addition to the general cleaning up provided in Section 22 of the General Specifications, the contractor shall remove all false work, dirt, sand, gravel and all materials of whatever kind down to the water line or spring line, from abutment to abutment.

STONE. For a width of nine (9) feet, four and one half ($4\frac{1}{2}$) feet on each side of the center line of road, the road shall be covered with good hard first class crushed lime stone, suitable for first class road building purposes and acceptable to the Superintendent and Engineer, said stone to be free from dirt and all other foreign deleterious material, and range in size as hereinafter provided. After the road bed has been prepared settled and rolled as hereinbefore provided, six (6) inch boards are to be placed, properly lined, then stone, the largest pieces of which will pass through a two and one half ($2\frac{1}{2}$) inch ring, and shall include all sizes smaller, including dust, or what is commonly known as $2\frac{1}{2}$ crusher-run, shall be placed between such boards, uniformly spread and rolled with a ten ton steam roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl,

Upon the foundation stone there shall be placed between five (5) inch boards, for a width of nine (9) feet, a layer of stone five (5) inches deep, entirely across such nine feet, said stone to be of kind and quality as hereinbefore provided, the largest pieces of which will pass through a three quarter ($\frac{3}{4}$) screen and over a one quarter ($\frac{1}{4}$) inch screen. Said stone to be spread to a depth of five inches, after which the same shall be rolled with the same roller and to the same extent as provided for the foundation stone.

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HENRY BECKLEY ET AL ROAD.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be necessary.

Five cubic yards of the fine stone shall be placed at each road intersection under the direction of the Engineer, in addition to making easy approaches in the sub-grade to all intersecting roads.

Before the final acceptance of the road the contractor will be required to rake in the entire road, without raking in the dirt, and leaving the edges of the stone in a straight line, and the entire surface of the stone presenting a uniform slightly appearance, then re-rolling the same.

HAULING OVER OTHER HIGHWAYS. The contractor shall be required to put public highways over which he may haul material in as good a condition as when he commenced to haul over them before the acceptance of the work herein provided for.

ESTIMATES. The contractor shall be entitled to estimates as provided by the statutes, and payment may be made at such times as may be ordered by the Board, provided that no payment shall be made to exceed more than eighty (80%) per cent of the Engineers estimate of the work done by the contractor, nor shall the whole amount of the contract price be paid until the road shall have been received as completed in all its details. No part of the work will finally be received until the entire work is received and accepted as completed.

John O. Kain, Engineer.

Geo. L. Christie, Viewer.

Alfred S. Linsinger, Viewer.

Subscribed and sworn to before me this 1st day of November 1912.

Lewis W. Borders, Auditor.

For General Specifications see page 575.

DECEMBER TERM, 1912.

M HENRY BECKLEY ET AL ROAD.

And now come the viewers and engineer herein, after the expiration of ten days from the filing of their said report on said 6th day of November, 1912 and on the 2nd day of December 1912, the same being the first day of the regular December Term 1912 of said Board, which said Term was the next regular session of said Board after the filing of their said first report, they file with said Board their supplemental report, which supplemental report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition of)
 Henry Beckley et al for the imp-)
 rovement of highway.)

We, the undersigned Viewers heretofore appointed in the above cause, and who as such viewers, on the 6th day of November 1912 filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report, to-wit:

We, would respectfully report that the improvement of said highway in the manner set forth in our former report, will not occasion any damages to the lands of any Infant, Idiot or person of unsound mind, and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

John O. Kain

Geo. L. Christie

Alfred S. Lineinger

Viewers

Subscribed and sworn to before me this the 16th day of November 1912

Lewis W. Borders

Auditor Hendricks County.

And now said Board being fully advised in the premises finds that the viewers and engineer appointed herein met on the 11th day of March 1912 and qualified as provided by law and that said engineer filed his bond in the sum of \$5000.00 and that the same was approved by the Auditor of Hendricks County, Indiana and the Board further finds that the time for the filing of said report by said viewers and engineer was, for good and legal reasons; continued and extended to the third day of the November Term 1912, the same being the sixth day of the November 1912 and that at said Term on the 6th day of November 1912 the report of said viewers and engineer was filed in the office of the Auditor of said County, and that it remained in file in said office open

to the inspection of any and all persons for more than ten days before the first day of the next regular Term of said Board, the december Term 1912 and for more than ten days before the filing by said viewers and engineer of the supplemental report, which said supplemental report the Board finds was filed at the next regular Term of said Board after the filing of their said first report, to-wit; at the December Term 1912 of said Board, on the 2nd day of December 1912. And the Board having examined said report filed by said viewers and engineer on said 6th day of November 1912 finds that it conforms to the law in all respects and should be approved; that the public highway described therein is less than three miles in length and that the improvement of said highway will be of public utility, and that said improvement should be allowed and established in all respects as provided in said report, without submitting the matter of said improvement to the legal voters of said Marion Township, Hendricks County, Indiana, the township in which said highway is located. And the Board further finds after having examined said supplemental report filed on said 2nd day of December 1912, and being fully advised in the premises, that no injury will result to the property of any idiot or person of unsound mind nor will any person sustain any damage whatever by reason of the construction of the improvement prayed for by said petitioners; that no person or corporation has made written claim for damages because of injury to property by reason of said improvement, and that said supplemental report is in due form and regular and that the same ought to be approved in all things.

It is therefore ordered by the Board that the report and supplemental report of the viewers and engineer be, and they are now in all things fully approved.

It is also ordered by the Board that the improvement as prayed for, be made and that the same be made in all respects as provided for in said report of said viewers and engineer, and that the same be made without an election by the voters of said Marion Township.

It is also ordered by the Board that the Auditor of said County give notice by one publication in the Indianapolis Star a daily newspaper of general circulation throughout the State of Indiana, printed and published at the city of Indianapolis, Indiana, and by three weekly publications in the Republican and in The Gazette, two weekly newspapers of general circulation throughout the said County of Hendricks, in which said highway to be improved is located, that until 10 o'clock A. M. on the 28th day of December 1912, sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana, at their usual place of meeting for the work of said improvement in accordance with the profile, plans and specifications and report of said viewers and engineer herein.

DECEMBER TERM, 1912.

HENRY BECKLEY ET AL ROAD.

It is further ordered by the Board that said report of the viewers and engineer herein and the supplemental report of said engineer and viewers be spread of record in the office of the Auditor of said Hendricks County on the record book kept for that purpose.

And further proceedings herein are continued.

DECEMBER TERM, 1912.

In the matter of the Petition of)
Robert L. Underwood et al for the)
Improvement of a Public highway.)

Come now again the petitioners in the above entitled cause and respectfully show to the Board of Commissioners of Hendricks County, that pursuant to an order heretofore made by the Board and a notice issued by the Auditor, which notice is in words and figures as follows, to-wit: (H.I), that the viewers and engineer appointed in this cause, met on the 8th day of April 1912, which date was within ten days after the appointment of said viewers and engineer, and took the oath as provided by law, for the faithful discharge of their duties as viewers and engineer in this cause, and that the engineer on said date filed his bond in the sum of \$5000.00, which bond is in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County Indiana, as Principal and the AMERICAN SURETY COMPANY OF NEW YORK, as surety are held and firmly bound unto the State of Indiana in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARS, for the payment of which well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED this 1st day of April 1912.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That, WHEREAS, the above named and bounded JOHN O. KAIN has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the Robert L. Underwood et al road.

NOW, THEREFORE, If the said JOHN O. KAIN shall well and faithfully discharge the duties of his said office of Engineer of Location of said Road, according to law, then and in that event this bond shall be void; otherwise to be and remain in full force and effect in law.

DECEMBER TERM, 1912.

R. L. UNDERWOOD ET AL ROAD.

(SEAL)

John O. Kain

American Surety Company of New York,

By E. V. Clark,

Resident Vice President,

Attest: Jno. J. Rinehard

Resident Assistant Secretary.

with the approval of the Auditor endorsed thereon, which approval and endorsement are in words and figures as follows, to-wit:

Approved June 3, 1912.

Lewis W. Borders,

Auditor Hendricks County, Indiana.

And now said Petitioners respectfully show to the Board that the time for filing the report of the viewers and engineer in this cause was extended to the third day of the November Term 1912, of said Board, and now comes the viewers and engineer herein and produce and file their report on the 6th day of November 1912, which report is in words and figures as follows, to-wit:

ORDER TO VIEW ROAD.

STATE OF INDIANA)
SS
HENDRICKS COUNTY.)

COMMISSIONERS COURT

APRIL TERM, 1912.

To Alvin Woodard, Grant Martin and John O. Kain.

You are hereby notified that you were appointed by the Board of Commissioners of said County, at their April Term, 1912 to view a proposed improvement of a Highway, as follows, to-wit: Commencing at the center of the Danville and Winchester free gravel road at a point about 80 rods West of the east line of section 10 township 15 North of Range 2 West and at a point where an established highway runs South and running thence South upon and along the established highway to a point where said highway jogs West, thence West upon and along said established highway to a point where said highway again runs South, thence South upon and along said established highway to a point where said highway jogs East, thence East upon and along said established highway to a point where said highway again runs South, thence south upon and along said established highway to the township line dividing the townships of Marion and Clay in Hendricks County, State of Indiana.

- And if said proposed improvement of said highway will be of public utility, mark and lay out the same in the manner prescribed by law, to the width of 30 feet.

You will meet at the office of the County Auditor of Hendricks County, Indiana, on the 8th day of April 1912, at 9 o'clock A. M. and after being duly qualified, proceed to make said view and report at the next regular session of said Board.

DECEMBER TERM, 1912.

R. L. UNDERWOOD ET AL ROAD.

I certify the foregoing to be a true copy of the Order of the Board in relation to said proposed highway. Witness my hand and official seal, this 1st day of April 1912.

(Seal)

Lewis W. Borders,

Auditor.

OATH OF VIEWERS.

STATE OF INDIANA)

SS

HENDRICKS COUNTY)

We, Alvin Woodard, Grant Martin and John O. Kain, do solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the within described proposed highway to the best of our skill and ability, so help us God.

John O. Kain

Alvin Woodard

Grant G. Martin

Subscribed and sworn to before me, this 8th day of April 1912.

(Seal)

Lewis W. Borders,

Auditor.

State of Indiana)

ss

Hendricks County.)

In the Commissioners Court

November Term 1912.

In the Matter of the petition of)

Robert Underwood et al to improve)

a public highway in Marion Township

Hendricks County, Indiana.)

TO THE HONORABLE BOARD OF COMMISSIONERS OF HENDRICKS COUNTY, INDIANA.

We, the undersigned viewers and engineer appointed by your honorable Body, under the provisions of an act of the General Assembly of the State of Indiana, approved March 8th 1905 and all amendments and supplements thereto, to view, examine, make all needful surveys of the road described in the petition of Robert Underwood et al and herein after described, determine the manner of said improvement in detail, estimate the cost thereof, and prepare profile, plans, drawings and specifications, preparatory to cleaning, grubbing, grading, sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:-

That pursuant to notice served on us, we met on the 8th day of April, 1912 at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribing an oath faithfully and im-

DECEMBER TERM, 1912.

R. L. UNDERWOOD ET AL. ROAD.

partially to discharge the duties under our respective appointments, and as such viewers and Engineer, we proceeded to the vicinity and neighborhood of said road.

That we made a careful view and examination of the route of the proposed improvement, of the locality in which said proposed improved road is located, of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys of the same together with profile, drawings, plans and specifications, and found that the material for the roadway should be first class Mitchell limestone suitable for first class road building purposes as detailed in the specifications and exemplified in the drawings entitled "CROSS SECTION OF ROADBED". WE find that the proposed improvement in accordance with the profile, drawings, plans and specifications herewith filed, will be of public utility and convenience and that the costs of construction of the same will be less than the benefits derived therefrom; that we have laid out said proposed highway along the route hereinafter described and to the width of Thirty feet and specified in the specifications herewith filed. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet, and that said profile, drawings plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and specifications describe in detail the sizes, materials to be used and the method of construction of the roadbed, bridges, sewers, ditches, drains and stone thereon and likewise provide that the quality and quantity of each and every kind of material, and all things necessary to make a complete macadam road; that all drawings, plans and specifications together with the profile and all figures, notes and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located:

Beginning at the center of the Danville and Rockville Free Gravel Road, at a point about 80 rods West of the East line of Section 10 township 15 north of Range 2 West and at a point where an established highway runs South and running thence South meandering the center of said established highway 10882 feet to the line between Marion and Clay Townships, all in Hendricks County, Indiana. We find the total length of the proposed improved highway to be 10882 lineal feet.

We find no damage on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$10326.55

John O. Kain

Alvin Woodard

Grant G. Martin

Subscribed and sworn to before me this 4th day of November 1912.

Lewis W. Borders

Auditor of Hendricks County.

(Seal)

DETAIL SPECIFICATIONS.

In the matter of the petition of)
Robert Underwood et al to impro-)
ve a public highway in Marion Town
ship, Hendricks County, Indiana)

1. PROFILE. The profile represents the elevations of the center line of the roadway, the elevations having been taken at the end of each one hundred feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line established represents the elevations of the center line that the roadway shall be raised or lowered to, being referred to as the sub-grade and before materials are put on.

As the profile only shows the elevations along the center line of the roadway, bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of cutting and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications whether specifically mentioned or referred to in these specifications.

2. ROUTE. The route, length and width of this highway are as heretofore set forth in the report of the Viewers and Engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty (30) feet wide, that is fifteen (15) feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a sub-grade twenty-four (24) feet wide, uniformly round as shown of the "CROSS SECTION OF ROADBED", the slope of the embankments to be one vertically to one and one-half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstructions and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original positions. Where shade trees do not impede travel or cause damage to the road, they may be left standing at the discretion of the Engineer.

4. SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade, as shown by the plans and profile and by the stakes to be set by the Engineer. All soft and spongy places not affording a firm foundation shall be dug out and refilled with broken stone or gravel. The excavations for the sub-grade of the side ditches shall be made to additional depth indicated by the drawings and not deeper.

The road shall be made to conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said road bed shall be made smooth and compact before the stone is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone thereon, unless permission is given by the Engineer for placing the same earlier. At any event immediately preceding the placing of material thereon the sub-grade shall be smooth^d and trued up and thoroughly rolled with a ten ton steam or gasoline ^{road} roller and the roadbed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5.. DITCHES. The side ditches provide for on the "CROSS SECTION OF ROADBED", shall be constructed as thereon indicated. The excavation of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them.

6. GRADE. The grade line (the red line) on the profile shows the elevation of the sub-grade of the roadbed, and the top or surface of the roadbed must be made to conform to said grade line, making cuts and fills of the depth and to the amount shown on said profile. However, in the case of discrepancy between the cuts and fills as shown on the profile, and the cuts and fills necessary to bring the sub-grade to the grade line established by making the required cut or fill, or whatever may be required, if anything, at both ends of a continuous grade, such continuous grade to be maintained between the breaks.

7. EXCAVATIONS. All cuts shall be excavated to a width of twenty-eight (28) feet at the sub-grade.

8. SEWERS. Sewers shall be constructed at the places and of the size as detailed on the profile. All sewers shall be Corrugated American Ingot Iron, or its equal, and shall test by chemical analysis 99.84 per cent iron. All sewers to have headers of the size and dimensions detailed on the profile and shall be constructed of concrete of the quality, quantity and manner as provided for bridges.

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against material that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COFFER DAMS. The contractor shall design and construct coffer dams, if necessary as placing of concrete will not be allowed.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work.

Any cement on the work without the stamp of the Board or Engineer shall be rejected

General Conditions. IN order to allow ample time for inspecting and testing the cement shall be stored in a suitable weather-tight building having the floor properly

blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the seven day requirement may be held awaiting the results of the twenty-eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers presented to the Society, Jan. 21 1903, and amended Jan 20. 1904, and Jan. 15, 1908, with all subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements.

Portland Cement. DEFINITION. This term is applied to the finely pulverized produce resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent has been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement, dried at 212°F. shall not be less than 3.10.

Fineness. It shall leave by weight a residue not more than 8 per cent on the No. 100 and not more than 25 per cent on the No. 200 sieve.

Time of Setting. It shall not develop initial set in less than 30 minutes, and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH.
24 hours in moist air-----		175 lbs.
7 days (1 day in moist air, 6 days in water)-----		500 lbs.
28 days (1 day in moist air, 27 days in water)-----		600 lbs.
ONE PART CEMENT, THREE PARTS SAND.		
7 days (1 day in moist air, 6 days in water)-----		200 lbs.
28 days (1 day in moist air, 27 days in water)-----		275 lbs.

In no case shall the increase in strength be less than 20% over the strength shown at 7 days.

Constancy of Volume. Pats of port cement about three inches in diameter, one-half inch thick at the center, and tapering to a thin edge, shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70°F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five hours.

These pats, to satisfactorily pass the requirements shall remain firm and hard and show no signs of distortion, checking, cracking, or disintegration.

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent of anhydrous sulphuric acid (SO_3) nor more than 4 per cent of magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement, two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from all foreign matter, uniformly graded and of size that will pass a 1 inch screen and be retained on a $\frac{1}{4}$ inch screen. The fine aggregate shall be clean, sharp sand, free from mica, clay, loam or other foreign matter, in excess of five (5) per cent and shall be of graded sizes, ranging from $\frac{1}{8}$ inch down to that which will be retained on a No. 80 Standard sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry, then sufficient water added to obtain the desired consistency, and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer, or on the mixing board, all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with the water, sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping. This consistency may be varied if required by the Board or Engineer. Re-Tamping, that is remixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place all wheeling, work or walking on it must be prevented until it is sufficiently set; and if the Board or Engineer shall require it the contractor must keep the freshly laid concrete covered with wet canvas or tarpaulins to protect it from the sun.

All concrete facing on walls shall be finished by spading, so that the largest pieces of gravel or stone will be prevented from touching the forms, thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed faces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain markings and other imperfections to be removed by rubbing with a flat emery stone, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding 8 inches in thickness and then tamped so that the water will flush to the surface. In all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before the stopping of the placing thereof. The crack or line selected shall continued entirely across the exposed part of said structure, different levels, elevations or place of stopping to be avoided. When a stop is made before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and then, slushed with pure cement. This must be done immediately in advance of the placing the next layer thereon.

FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor forms to be absolutely rigid and not to be removed from the structure until at least 21 days after the completion of the floor slab. Forms on exposed faces to be as provided for in the Section entitled "Facing." Forms for the abutments on the faces thereof and on the stream side of the wing shall extend to the extreme bottom of the concrete.

Forms on all exposed surfaces shall be dressed and smooth and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging, or boards in contact with concrete shall be made nonabsorbant as directed by the Board or Engineer. Loose concrete, saw-dust and debris must be carefully removed from the forms immediately before placing concrete.

REINFORCEMENT. All reinforcement bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch, and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint, oil or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be spaced eighteen inches on centers and shall consist of several continuous members of size and number as indicated above and shown on the plans, locked together with clamps and providing diagonal tension reinforcement. The contractor shall place all bars in the exact position and manner as indicated on the plans and keep them in such position by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

DECEMBER TERM, 1912.

R. L. UNDERWOOD ET AL ROAD.

CHAMFERED EDGES. All exposed edges shall be chamfered with $\frac{3}{4}$ inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer and upon such written order the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following: The water, sand and gravel or stone shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its final set has developed.

WATERWAY. In addition to the general cleaning up provided in Section 22 of the General Specification, the contractor shall remove all false work, dirt, sand, gravel, and all materials of whatever kind down to the water line or spring line, from abutment to abutment.

STONE. For a width of nine (9) feet; four and one half ($4\frac{1}{2}$) feet on each side of the center line of road, the road shall be covered with good, hard, first class crushed lime stone, suitable for first class road building purposes and acceptable to the Engineer and Superintendent, said stone to be free from dirt and all other foreign deleterious material, and range in size as hereinafter provided. After the road bed has been prepared, settled and rolled, as hereinbefore provided, six (6) inch boards are to be placed, properly lined, then stone, the largest pieces of which will pass through a two and one half ($2\frac{1}{2}$) inch ring, and shall include all sizes smaller, including dust, or what is commonly known as $2\frac{1}{2}$ crusher run, shall be placed between such boards uniformly spread and rolled with a ten ton steam or gasoline roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl.

Upon the foundation stone there shall be placed between five (5) inch boards, for a width of nine feet, a layer of stone five (5) inches deep, entirely across such nine feet, said stone to be of a kind and quality as hereinbefore provided, the largest pieces of which will pass through a $\frac{3}{4}$ inch screen and over a $\frac{1}{4}$ inch screen. Said stone is to be spread to a depth of five inches, after which the same will be rolled with a ten ton steam roller and to the same extent as provided for in the foundation stone.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be necessary.

Five cubic yards of fine stone shall be placed at each road intersection under the direction of the Engineer, in addition to making easy approaches in the sub-grade to all intersecting roads.

Before the final acceptance of the road, the contractor will be required to rake in the entire road, without raking in the dirt, and leaving the edges of the stone in a straight line, and the entire surface of the stone presenting a uniform, sightly appearance, then re-rolling the same.

HAULING OVER OTHER HIGHWAYS. The contractor shall be required to put public highways over which he may haul material in as good a condition as when he commenced hauling material over them before the acceptance of the work herein provided for.

DECEMBER TERM, 1912.

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ESTIMATES. The contractor shall be entitled to estimates as provided by the statutes, and payment may be made at such times as may be ordered by the Board, provided no payment shall be made for more than eighty (80%) per cent of the Engineers estimate of the work done by the contractor, nor shall the whole amount of the contract price be paid until received as completed in all its details. No part of the work will be finally received until the entire work is received and accepted as complete.

John O. Kain Engineer

Alvin Woodward Viewer

Grant G. Martin Viewer.

Suscribed and sworn to before me this 4th day of November 1912.

Lewis W. Borders, Auditor,

(Seal)

For General Specifications See Page 575.

DECEMBER TERM, 1912.

R. L. UNDERWOOD ET AL ROAD.

And now come the viewers and engineer, after the expiration of ten days from the filing of their report herein, on the 6th day of November 1912, and at the next regular session of said Board of Commissioners after said date, and file their supplemental report herein, which report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition of)

Roert L. Underwood et al for the)

improvement of highway.)

We, the undersigned Viewers, heretofore appointed in the above cause and who as such viewers on the 6th day of November 1912, filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report, to-wit:

We would respectfully report that the improvement of said highway in the manner set forth in our former report, will not occasion any damages to the lands of any Infant, Idiot or person of unsound mind, and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

Grant G. Martin

Alvin Woodard

John O. Kain

Viewers.

Subscribed and sworn to before me this the 16th day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

And now said Board being fully advised in the premises, finds that the viewers and engineer appointed herein met on the 8th day of April 1912, and were qualified as provided by law, and that said engineer filed his bond in the sum of \$5000.00 and that the

same was approved by the Auditor of Hendricks County, and the Board further finds that made by them, that the time for filing the report of the Viewers and Engineer was extended to the 3rd day of the November Term 1912, said Board the same being the 6th day of Nov. 1912 and that the report of the viewers, pursuant to an order heretofore filed in the office of the Auditor of Hendricks County,

Indiana, on the 6th day of November 1912 and that it has remained on file in said office open to the inspection of any person since said date and for more than ten days before the December Term of said Board 1912. and before the filing of the supplemental report herein, and the Board having examined said report finds that it conforms to the law in all respects and should be approved; that the highway described therein is less than three mile in length and that the improvement as reported in said report will be of public utility and that said improvement should be ordered and established as provided in said report, without submitting the matter of said improvement to the legal voters of Marion Township.

It is therefore ordered by the Board that the report of the engineer and viewers be and the same is now, hereby in all things fully approved. And the Board further finds that the viewers and engineer filed their supplemental report on the 2nd day of December 1912, that the same was filed at the next regular session of the Board of Commissioners after the expiration of ten days from the filing of the first report, and that said report being duly examined said Board finds that no injury will result to the property of any idiot or any person of unsound mind, or will any person sustain damage whatever by reason of the construction of the improvement prayed for by the petitioners herein; that no person or corporation has made written claims to said Viewers and engineer because of injury to property by reason of said improvement, and that said supplemental report is in due form and regular and that the same ought to be approved in all things.

It is therefore ordered by the Board that the supplemental report of the Viewers and engineer be and the same is hereby fully approved.

And the Board further finds from the examination of the reports of said viewers and engineer that said improvement prayed for by the petitioners herein, should be established.

It is therefore ordered that said improvement, as prayed for, be made, and that the same be made in all respects as provided in said report of said viewers and engineer.

It is further ordered by this Board that the Auditor of Hendricks County, give notice by one publication in the Indianapolis Star, a daily news paper of general circulation throughout the State of Indiana, printed and published at the city of Indianapolis, and by three weekly publications in The Republican and in the Gazette, two weekly newspapers of general circulation throughout the County of Hendricks, the County in which said road to be improved is located; that until the hour of 10 o'clock A. M. on the 28th day of December 1912, sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana, at their usual place of meeting, for the work of said improvement, in accordance with the profile and report and plans and specifications in said report set forth, and this cause is continued.

DECEMBER TERM, 1912.

H. S. RAGAN ET AL ROAD.

In the matter of the petition of)
 H. S. Ragan et al for the impro-)
 vement of a public highway.)

Come now again the petitioners in the above entitled cause and respectfully show to the Board of Commissioners of Hendricks County and State of Indiana, that pursuant to an order heretofore made and entered of record by said Board, and a notice issued by the Auditor of said Hendricks County, which notice is in words and figures as follows, to-wit: (H.I) that the viewers and engineer heretofore appointed in this cause met on the 8th day of April 1912 at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribing an oath faithfully and impartially to discharge their duties as viewers and engineer in this cause, and that the engineer, on said date filed his bond in the sum of \$5000.00 as provided by law, which bond is in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County, Indiana, as Principal and the AMERICAN SURETY COMPANY OF NEW YORK, as Surety, are held and firmly bound unto the State of Indiana in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARS, for the payment of which well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED this 1st day of April 1912.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That, WHEREAS, the above named and bounded JOHN O. KAIN, has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the Henry S. Ragan et al Road.

NOW, THEREFORE, If the said JOHN O. KAIN shall well and faithfully discharge the duties of his said office of Engineer of Location of said Road, according to law, then and in that event this bond shall be void; otherwise to be and remain in full force and effect in law.

(SEAL)

JOHN O. KAIN

AMERICAN SURETY COMPANY OF NEW YORK

By, E. V. Clark

Resident Vice President

Attest: Jno. J. Reinhard

Resident Assistant Secretary.

DECEMBER TERM, 1912.

H. S. RAGAN ET AL ROAD.

Which bond was duly approved by the Auditor of said Hendricks County, which approval endorsed upon said bond is in words and figures as follows, to-wit:

Approved June 3, 1912

Lewis W. Borders,

Auditor Hendricks County, Indiana.

And now said petitioners would respectfully show to the Board that the time for the filing of the report of said viewers and engineer was extended to the third day of the November Term, 1912 of said Board, and now comes said viewers and engineer herein, and produce and file their said report on said improvement, on the 6th day of November 1912, which report is in words and figures as follows, to-wit:

ORDER TO VIEW ROAD.

STATE OF INDIANA)
SS
HENDRICKS COUNTY.)

COMMISSIONER'S COURT

APRIL TERM, 1912

To JOHN O. KAIN, OSCAR BENBOW AND FRED SHIRLEY:

You are hereby notified that you were appointed by the Board of Commissioners of said County, at their April Term 1912, to view a proposed highway, as follows, to-wit: Commencing at the center of the Danville and Rockville Free Gravel road at a point about 40 rods west of the North East corner of Section 9 Township 15 North of Range 2 West and from said ^{point} South to the South line of the North East quarter of said Section 9, thence West about 40 rods; thence south to the South line of said Section 9; thence East on said South line, to the South East corner thereof; thence South on the line dividing Sections 15 and 16 Township and Range aforesaid to the Township line dividing Marion and Clay Townships of said County of Hendricks and State of Indiana and terminating at said Township line, at the South East corner of Section 16 aforesaid, and if said proposed highway will be of public utility, mark and lay out and improve the same as prayed for in the petition and in the manner prescribed by law, to the width of thirty feet.

You will meet at the office of Lew W. Borders, Auditor of Hendricks County, at Danville, Indiana on the 8th day of April 1912 at 10 o'clock A.M. and after being duly qualified, proceed to make said view, and report at the next regular term of said Board.

I certify the foregoing to be a true copy of the Order of the Board in relation to said proposed highway. Witness my hand and official seal, this 1st day of April 1912.

Lewis W. Borders,

Auditor.

(Seal)

DECEMBER TERM, 1912.

H. S. RAGAN ET AL ROAD.

OATH OF VIEWERS.

STATE OF INDIANA)
 HENDRICKS COUNTY.) SS

We, John O. Kain, Oscar Benbow and Fred Shirley do solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the within described proposed highway to the best of our skill and ability, so help us God.

John O. Kain

Oscar Benbow

Fred Shirley

Subscribed and sworn to before me, this 8th day of April 1912.

Lewis W. Borders,

Auditor Hendricks County

State of Indiana, Hendricks County, SS.

In the Commissioners Court

November Term, 1912.

In the matter of the petition of)
 H. S. Ragan et al to improve a)
 Public highway in Marion Township)
 Hendricks County, Indiana.)

TO THE HONORABLE BOARD OF COMMISSIONERS OF HENDRICKS COUNTY, INDIANA.

We, the undersigned viewers and engineer, appointed by your Honorable Body, under the provisions of an act of the General Assembly of the State of Indiana, approved March 8th, 1905, and all amendments and supplements thereto", to view, examine, make all needful surveys of the road described in the petition of H. S. Ragan et al and herein after described, determine the manner of said improvement in detail, estimate the cost thereof, and prepare profile, plans, drawings and specifications, preparatory to cleaning, grubbing, grading, sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:

That pursuant to notice served on us, we met on the 8th day of April 1912, at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribing an oath faithfully and impartially to discharge the duties under our respective appointments, and as such Viewers and Engineer, we proceeded to the vicinity and neighborhood of said road.

That we made a careful view and examination of the route of the proposed improvement, of the locality in which said proposed improved road is located, of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys of the same together with profile, drawings, plans and specifications, and found

that the material for the roadway should be first class Mitchell limestone suitable for first class road building purposes as detailed in the specifications and exemplified in the drawings entitled "CROSS SECTION OF ROADBED". We find that the proposed improvement, in accordance with the profile, drawings, plans and specifications herewith filed will be of public utility and convenience and that the costs of construction of the same will be less than the benefits derived therefrom; that we have laid out said proposed highway along the route hereinafter described and to the width of thirty feet and specified in the specifications herewith filed. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet, and that said profile, drawings, plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and specifications describe in detail the sizes, materials to be used and the method of construction of the road bed, bridges sewers, ditches, drains and stone required therein and likewise provide the quality and quantity of each and every kind of material and all things necessary to make a complete macadam road; that all drawings, plans and specifications together with the profile and all ~~figures~~ notes and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located:

Commencing at the center of the Danville and Rockville Free Gravel road at a point in the center of the already established public highway which is the center on the North of the East half of the North East quarter of Section 9 Township 15 North Range 2 West, and running thence South 2671 ^{feet} to a stone; thence west 653 feet to a stone; thence South on the line running North and South through the center of the South East quarter 2666 feet to the South line of Section 9 aforesaid; thence East 1303 feet to a stone at the North East corner of Section 16, Township and Range aforesaid; thence south on the East line of said Section 16, a distance of 5307 feet to the South East corner of said Section 16, and terminating on the line between Marion and Clay Townships, Hendricks County, Indiana.

We find the total length of the proposed improved highway to be 12600 lineal feet.

We find no damages on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$10,250.00

John O. Kain

Oscar E. Benbow

Fred G. Shirley

DECEMBER TERM, 1912.

H. S. RAGAN ET AL ROAD.

Subscribed and sworn to before me this 4th day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

DETAIL SPECIFICATIONS.

IN the matter of the petition of ,)
 H.-S. RAGAN et al to improve a)
 public highway in Marion Township)
 Hendricks County, Indiana.))

1. PROFILE. The profile represents the elevations of the center line of the road way, the elevations having been taken at the end of each one hundred feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line established represents the elevations of the center line that the roadway shall be raised or lowered to, being referred to as the sub-grade and before materials are put on.

As the profile only shows the elevations along the center line of the roadway, bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of ~~cutting~~ and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications whether specifically mentioned or referred to in these specifications.

2. ROUTE. The route, length and width of this highway are as heretofore set forth in the report of the viewers and Engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty (30) feet wide, that is fifteen (15) feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a sub-grade twenty-four (24) feet wide, uniformly rounded as shown of the "CROSS SECTION OF ROADBED", the slope of the embankments to be one vertically to one and one half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstructions and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original position. Where shade trees do not impede travel or cause damage to the road they may be left standing at the discretion of the Engineer.

4. SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade as shown by the plans and profile and by stakes to be set by the Engineer. All soft and spongy places not affording a firm foundation shall be dug out and refilled with broken stone or gravel. The excavations for the sub-grade of the side ditches shall be

made to additional depth indicated by the drawings and not deeper. The road shall be made to conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said roadbed shall be made smooth and compact before the gravel is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone or gravel thereon, unless permission is given by the Engineer for placing same earlier. At any event immediately proceeding the placing of material thereon the sub-grade shall be smoothed and trued up and thoroughly rolled with a ten ton steam road roller and the roadbed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5. DITCHES. The side ditches provided for on the "CROSS SECTION OF ROADBED" shall be constructed as thereon indicated. The excavations of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them.

6. GRADE. The grade line (the red line) on the profile shows the elevation of the sub-grade of the roadbed, and the top or surface of the roadbed must be made to conform to said grade line, making cuts and fills of the depth and to the amount shown on said profile. However, in the case of discrepancy between the cuts and fills as shown on the profile, and the cuts and fills necessary to bring the sub-grade to the grade line established by making the required cut or fill, or whatever may be required, if anything, at both ends of a continuous grade, such continuous grade to be maintained between the breaks.

7. EXCAVATIONS. All cuts shall be excavated to a width of twenty-eight (28) feet at the sub-grade.

8. SEWERS. Sewers shall be constructed at the places and of the size as detailed on the profile. All sewers shall be Corrugated American Ingot Iron, or its equal, and shall test by chemical analysis 99.84 per cent iron. All sewers to have headers of the size and dimensions detailed on the profile and shall be constructed of concrete of the quality, quantity and manner as provided for bridges.

REMOVAL OLD STRUCTURE. The contractor shall remove the old bridge in a careful and workmanlike manner so as to preserve the integral parts thereof and place the same on the side of the highway at a point not to impede travel thereon. The same to be as compactly and uniformly stacked as the condition and shape of the material will permit. The structure and material thereof to be and remain the property of Hendricks County, Indiana.

TEMPORARY BRIDGE AND BY-PASS. The Board shall provide a right of way and shall build and maintain a temporary bridge, both sufficient for all traffic.

DECEMBER TERM, 1912.

H. S. RAGAN ET AL ROAD.

FOUNDATIONS. Unless otherwise indicated the abutments shall be carried three feet below the bed of the stream, or water line, as established by the profile.

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against material that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COFFER DAMS. The contractor shall design and construct coffer-dams, if necessary as placing of concrete in water will not be allowed.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work.

Any cement ^{on the work} without the stamp of the Board or Engineer shall be rejected.

General Conditions: In order to allow ample time for inspecting and testing, the cement shall be stored in a suitable weather-tight building, having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the seven day requirements may be held awaiting the results of the twenty eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, presented to the Society January 21, 1903, and amended January 20, 1904, and January 15, 1908, with all subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements:

Portland Cement. DEFINITION-- This term is applied to the finely pulverized produce resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent had been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement, dried at 212°F., shall not be less than 3.10.

Fineness. It shall leave by weight a residue not more than 8 per cent on the No. 100 and not more than 25 per cent on the No. 200 sieve.

Time of setting. It shall not develop initial set in less than thirty minutes and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH
24 HOURS IN MOIST AIR	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	175 lbs.
7 days (1 day in moist air, 6 days in water)	- - - - -	500 lbs.
28 days (1 day in moist air, 27 days in water)	- - - - -	600 lbs.

ONE PART CEMENT, THREE PARTS SAND.

7 days (1 day in moist air, 6 days in water) - - - - - 200 lbs.

28 days (1 day in moist air, 27 days in water) - - - - - 275 lbs.

In no case shall the increase in strength be less than 20 per cent, over the strength shown at 7 days.

Constancy of Volume. Pats of neat cement about three inches in diameter one-half inch thick at the center, and tapering to a thin edge, shall be kept in moist air for a period of twenty-four hours.

(a) A pst is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70°F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above a boiling water, in a loosely closed vessel for five hours.

These pats, to satisfactorily pass the requirements, shall remain firm and hard and show no signs of distortion, checking, cracking or disintegration

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent of anhydrous sulphuric acid (SO_3), nor more than 4 per cent of magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement, Two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from all foreign matter, uniformly graded and of size that will pass a 1 inch screen and be retained on a $\frac{1}{4}$ inch screen. The fine aggregate shall be clean, sharp sand, free from mica, clay, loam or other foreign matter, in excess of five (5) per cent, and shall be of graded sizes, ranging from $1/8$ inch down to that which is retained on a No. 80 Standard sieve

MIXING. The ingredients of the concrete shall be thoroughly mixed dry, then sufficient water added to obtain the desired consistency, and then mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer, or on the mixing board, all at the same time. The mixer must produce a concrete uniform in consistency and color with the stones thoroughly mixed with the water, sand and cement. Batch mixers only may be used, continuous mixers will not be permitted.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping. This consistency may be varied if required by the Board or Engineer.

Re-tamping, that is remixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place all wheeling, work or walking on it must be prevented until it is sufficiently set; and if the Board or Engineer shall require it, the Contractor must keep the freshly laid concrete covered with wet canvas or tarpaulins to protect it from the sun.

All concrete facing on walls shall be finished by spading so that the largest pieces of gravel or stone will be prevented from touching the forms, thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed faces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain markings and other imperfections to be removed by rubbing with a flat emery block, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding eight inches in thickness and then tamped so that the water will flush to the surface. In all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before stopping the placing thereof. The crack or line selected shall continue entirely across the exposed part of said structure, different levels, elevations or place of stopping to be avoided. When a stop is made, before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and then slushed with pure cement. This must be done immediately in advance of the placing the next layer thereon.

FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor form to be absolutely rigid and not to be removed from the structure until at least twenty-one days after the completion of the floor slab. Forms on exposed faces to be as provided for in section entitled "Facing". Forms for the abutments on the faces thereof and on the stream side of the wings shall extend to the extreme

bottom of the concrete.

Forms for all exposed surfaces shall be dressed and smoothed and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging or boards in contact with concrete shall be made non-absorbant as directed by the Board or Engineer. Loose concrete, saw-dust and debris must be carefully removed from the forms immediately before placing concrete.

REINFORCEMENT. All reinforcement bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch, and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint, oil or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be spaced eighteen inches on centers and shall consist of several continuous members of size and number as indicated above and shown on the plans. locked together with clamps and providing diagonal tension reinforcement.

The contractor shall place all bars in the exact position and manner as indicated on the plans, and keep them in such position, by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

CHAMFERED EDGES. All exposed edges shall be chamfered with $\frac{3}{4}$ inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer, and upon such written order, the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following: The water, sand and gravel or stone shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its Final set has developed.

WATERWAY. In addition to the general cleaning up provided in Section 22 of the General Specifications, the contractor shall remove all false work, dirt, sand, gravel and all materials of whatever kind down to the water line or spring line, from abutment to abutment.

STONE. For a width of nine (9) feet, four and one half ($4\frac{1}{2}$) feet on each side of the center line of road, the road shall be covered with good hard, first class crushed lime stone, suitable for first class road building purposes and acceptable to the Superintendent and Engineer, said stone to be free from dirt and all other foreign deleterious material and range in size as hereinafter provided. After the road bed has been prepared, settled and rolled as hereinbefore provided, six (6) inch boards are to be placed, properly lined, then stone, the largest pieces of which will pass through a two and one ($2\frac{1}{2}$) inch ring, and shall include all sizes smaller, including dust, or what is

DECEMBER TERM, 1912.

H. S. RAGAN ET AL ROAD.

commonly known as 2 $\frac{1}{2}$ crusher run, shall be placed between such boards, uniformly spread and roller with a ten ton steam roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl.

Upon the foundation stone there shall be placed between five (5) inch boards, for a width of nine feet, a layer of stone five (5) inches deep, entirely across such nine feet, said stone to be of a kind and quality as hereinbefore provided, the largest pieces of which will pass through a three quarter ($\frac{3}{4}$) inch screen and over a one quarter ($\frac{1}{4}$) inch screen. Said stone to be spread to a depth of five inches, after which the same shall be rolled with the same roller and to the same extent as provided for the foundation stone.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be necessary.

Five cubic yards of the fine stone shall be placed at each road intersection under the direction of the Engineer, in addition to making easy approaches in the sub-grade to all intersecting roads.

Before the final acceptance of the road, the contractor will be required to rake in the entire road without raking in the dirt, and leaving the edges of the stone in a straight line, and the entire surface of the stone presenting a uniform, sightly appearance, then re-rolling the same.

USE OF HIGHWAY. The public shall in no way be barred from the use of the highway.

HAULING OVER OTHER ROADWAYS. The contractor shall be required to put public highways over which he may haul material in as good a condition as when he commenced to haul over them before the acceptance of the work herein provided for.

ESTIMATES. The contractor shall be entitled to estimates as provided by the Statutes, and payment may be made at such times as may be ordered by the Board, provided that no payment shall be made for more than 80% of the Engineers estimate of the work done by the contractor, nor shall the whole amount of the contract price be paid until the road shall have been received as completed in all its details. No part of the work will be finally received until the entire work is received and accepted as completed.

John O. Kain, Engineer

Oscar E. Benbow, Viewer.

Fred G. Shirley, Viewer.

Subscribed and sworn to before me this 4th day of November 1912.

Lewis W. Borders, Auditor.

For General Specifications See Page 575.

And now again come the viewers and engineer, after the expiration of more than ten days from the day of filing their report herein, to-wit: the 2nd day of December 1912, and being the next regular term or session of said Board of Commissioners after said date and file their supplemental report herein, which report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition of)
H. S. Ragan et al for the impro-)
vement of highway.)

We, the undersigned Viewers heretofore appointed in the above cause, and who as such viewers on the 6th day of November 1912 filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report, to-wit:

We would respectfully report that the improvement of said highway in the manner set forth in our former report, will not occasion any damages to the lands of any Infant, Idiot or person of unsound mind, and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

John O. Kain

Oscar E. Benbow

Fred G. Shirley

Viewers.

Subscribed and sworn to before me this the 16th day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

And now said Board of Commissioners being fully advised and informed in the premises, finds that the viewers and engineer heretofore appointed in this cause, met on the 8th day of April 1912, pursuant to notice and were qualified as provided by law and that said engineer filed his bond in the sum of \$5000.00 and that the same was duly approved by the Auditor of Hendricks County, and the Board of Commissioners further finds that pursuant to an order heretofore made and entered of record by said Board, that the time for filing the report of said viewers and engineer was extended to the 3rd day of the November Term 1912 the same being the 6th day of ~~xx~~ November 1912, and that said report was filed on the 6th day of November 1912, in the office of the Auditor of Hendricks County, and that it has remained on file in said office open to inspection of

DECEMBER TERM, 1912.

H. S. RAGAN ET AL. ROAD

any person since said date and for more than ten days before the first day of the December Term 1912, of said Board and before the filing of the supplemental report herein, and the board having examined said report, finds that it conforms to the law in all respects and that the same should be approved, that the highway described therein is less than three miles in length, that the improvement as recommended and reported in said report, will be of public utility and that said improvement should be allowed and established as recommended and provided in said report, without submitting the matter of said improvement to the legal voters of Marion Township, Hendricks County, Indiana.

And the Board further finds that the viewers and engineer filed their supplemental report on the 2nd day of December 1912, the same being more than ten days after the filing of their report and being on the 1st day of the December Term 1912 of said Board. That said supplemental report being examined and the board being fully advised and informed in the premises, finds that no injury will result to the property of any idiot or person of unsound mind or will any person sustain any damages whatever by reason of the construction of the improvement as prayed for by petitioners and recommended by the report of said Viewers and engineer, that no person or corporation had made any written claim for damages to property by reason of said improvement and that said supplemental report is in due form of law and regular and that the same ought to be in all things approved.

It is therefore ordered by the Board that the report of said viewers and engineer and also the supplemental report by them filed each be and the same are hereby confirmed and in all things approved.

And the Board, further finds from the examination of said reports that said improvements as prayed for by said petitioners should be established.

It is therefore ordered by the Board that said improvement as prayed for by said petitioners and recommended by said viewers and engineer as shown in their reports herein filed be made and that said highway be improved in all respects as provided and set out in the reports of said viewers and engineer.

It is further ordered by the Board that the Auditor of Hendricks County, Indiana give notice by one publication in a daily newspaper of general circulation throughout the State of Indiana, and by three publications, one each week, in the Republican and Gazette, weekly newspapers of general circulation in Hendricks County, in which said road to be improved is located, that until the hour of ten o'clock A. M. on the 28th day of December 1912 sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana, at their usual place of meeting, for the making of said improvement, in accordance with the profile and report and the plans and specifications in said report set forth, and this cause is continued.

In the matter of the petition of)
Amos Kersey et al for the impro-)
vement of a public highway.)

Come now again the petitioners in the above entitled cause and respectfully show to the Board of Commissioners of Hendricks County, that pursuant to an order heretofore made by the Board and a notice issued by the Auditor, which notice is in words and figures as follows, to-wit: (H.I.), that the Viewers and Engineer, appointed in this cause, met on the 8th day of April 1912, which date was within ten days after the appointment of said viewers and engineer, and took the oath as provided by law, for the faithful discharge of their duties as viewers and engineer in this cause; and that the engineer on said date filed his bond in the sum of \$5000.00, which bond is in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County, Indiana, as Principal and the AMERICAN SURETY COMPANY OF NEW YORK, as Surety, are held and firmly bound unto the State of Indiana, in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARS, for the payment of which, well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED this 1st day of April 1912.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That, WHEREAS, the above named and bounded JOHN O. KAIN, has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the Amos Kersey et al Road.

NOW, THEREFORE, If the said JOHN O. KAIN shall well and faithfully discharge the duties of his said office of Engineer of Location of said Road, according to law, then and in that event this bond shall be void; otherwise to be and remain in full force and effect in law.

DECEMBER TERM, 1912

AMOS KERSEY ET AL ROAD.

JOHN O. KAIN

(SEAL)

AMERICAN SURETY COMPANY OF NEW YORK

BY, E. V. Wlark

Resident Vice President

Attest: Jno J. Reinhard

Resident Assistant Secretary.

with the approval of the Auditor endorsed thereon, which approval and endorsement are in words and figures as follows, to-wit:

Approved June 3, 1912

Lewis W. Borders,

Auditor Hendricks County, Indiana.

And now said petitioners respectfully show to the Board that the time for filing the report of the viewers and engineer was extended to the third day of the November Term 1912 of said Board, and now comes the Viewers and engineer herein and produce and file their report on the 6th day of November 1912, which report is in words and figures as follows, to-wit:

ORDER TO VIEW ROAD.

STATE OF INDIANA)

SS

HENDRICKS COUNTY.)

COMMISSIONERS COURT

APRIL TERM, 1912

To Loyd Holtsclaw, John E. Parger and John O. Kain.

You are hereby notified that you were appointed by the Board of Commissioners of said County, at their April Term 1912 to view a proposed improvement on a public highway, as follows, to-wit:

Beginning at the township line dividing Marion and Clay townships in Hendricks County, State of Indiana, at the center North of Section 22, Township 15 North of Range 2 West and running thence South upon and along the established public highway for a distance of about $2\frac{1}{4}$ miles to a point where said highway turns East; thence East upon and along said established highway about 400 feet and to a point where an established highway runs south; thence South upon and along said established highway about 80 rods to a point where said highway terminates in the Amo and Coatesville Free Gravel Road, the same being the public highway running East and West through the center of Section 34, said township and range: and if said proposed improvement on the above highway will be of public utility, mark and lay out the same in the manner prescribed by law, to the width of 30 feet.

You will meet at the office of the County Auditor on the 8th day of April 1912, at 9 o'clock A. M. and after being duly qualified, proceed to make said view, and report at the next regular term of said Board.

DECEMBER TERM, 1912.

I certify the foregoing to be a true copy of the Order of the Board in relation to said proposed highway. Witness my hand and official seal, this 2nd day of April 1912.

(Seal)

Lewis W. Borders, Auditor.

OATH OF VIEWERS.

STATE OF INDIANA)
SS
HENDRICKS COUNTY)

We, Loyd Holtsclaw, John E. Parker and John O. Kain do solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the within described proposed highway to the best of our skill and ability, so help us God.

Loyd C. Holtsclaw

John E. Parker

John O. Kain

Subscribed and sworn to before me this 8th day of April 1912

(SEAL)

Lewis W. Borders, Auditor

State of Indiana)
SS
Hendricks County.)

In the Commissioners Court
October Term, 1912.

In the matter of the petition of)
Amos Kersey et al to improve a)
public highway in Clay Township)
Hendricks County, Indiana.)

To the Honorable Board of Commissioners of Hendricks County, Indiana.

We, the undersigned Viewers and engineer, appointed by your Honorable Body, under the "Provisions of an Act of the General Assembly of the State of Indiana, approved March 8th 1905, and all amendments and supplements thereto", to view, examine, make all needful surveys of the road described in the petition of Amos Kersey et al, and hereinafter described, determine the manner of said improvement in detail, estimate the costs thereof, and prepare profile, plans, drawings and specifications preparatory to cleaning, grubbing, grading, sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:

That pursuant to the notice served on us, we met on the 8th day of April 1912 at the office of the Auditor of Hendricks County, in the town of Danville Indiana, and after taking and subscribing an oath faithfully and impartially to discharge the duties under our respective appointments, and as such Viewers and Engineer, we proceed to the vicinity and neighborhood of said road.

Said Report is endorsed on back as follows:
Filed: Nov 6-1912 - Lewis W. Borders, Auditor

DECEMBER TERM, 1912

AMOS KERSEY ET AL ROAD.

That we made a careful view and examination of the route of the proposed improvement, of the locality in which said proposed improved road is located, of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys for the same together with profile, drawings, plans and specifications, and found that the material for the roadway should be first class Mitchell limestone and gravel suitable for first class road building purposes as detailed in the specifications and exemplified in the drawing entitled "CROSS SECTION OF ROADBED". We find that the proposed improvement, in accordance with the profile, drawings, plans and specifications, herewith filed, will be of public utility and convenience and that the cost of construction of the same will be less than the benefits derived therefrom; that we have laid out said proposed highway along the route hereinafter described and to the width of thirty (30) feet and specified in the specifications herewith filed. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet, and that said profile, drawings, plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and specifications described in detail the sizes, materials to be used and the method of construction of the roadbed, bridges, sewers, ditches drains and stone required therein and likewise provide the quality and quantity of each and every kind of material, and all things necessary to make a complete macadam road. That all drawings, plans and specifications together with the profile and all figures, notes and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located:

Commencing on the Township line dividing Marion and Clay Townships, Hendricks County, Indiana, at the center on the North of Section 22, Township 15 North Range 2 West and running thence South 11936 feet; thence East on the South line of said Section 409 feet; thence South 1286 feet to the line running East and West through the center of Section 34, Township 15 North Range 2 West and terminating in a Free Gravel Road, all in Hendricks County in the State of Indiana. We find the total length of the proposed improved highway to be 13,631 feet.

We find no damage on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$11,000.00

John O. Kain

John E. Parker

Lloyd C. Holtsclaw

Subscribed and sworn to before me this 4th day of September 1912.

Lewis W. Borders

Auditor Hendricks County.

Seal

DETAIL SPECIFICATIONS.

IN the matter of the petition of)
Amos Kersey et al to improve a)
public highway in Clay Township,)
Hendricks County, Indiana.)

1. PROFILE. The profile represents the elevations of the center line of the roadway, the elevations having been taken at the end of each 100 feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line established represents the elevations of the center line, that the roadway shall be raised or lowered to, being referred to as the sub-grade and before materials are put on.

As the profile only shows the elevations along the center line of the roadway, bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of cutting and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications whether specially mentioned or referred to in these specifications.

2. ROUTE. The route, length and width of this highway are as heretofore set forth in the report of the Viewers and Engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty (30) feet, that is fifteen (15) feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a sub-grade twenty-four (24) feet wide, uniformly rounded as shown on the "CROSS SECTION OF ROADBED", the slope to the embankment to be one vertically to one and one-half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstruction and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original positions. Where shade trees so not impede travel or cause damage to the road they may be left standing at the discretion of the Engineer.

4. SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade, as shown by the plans and profile and by the stakes to be set by the Engineer. All soft and spongy places not affording a firm foundation shall be dug out and refilled with broken stone or gravel. The excavations for the sub-grade of the side ditches shall be made to additional

depth indicated by the drawings and not deeper. The road shall be made to conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said road bed shall be made smooth and compact before the gravel is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone thereon, unless permission is given by the Engineer for placing the same earlier. At any event immediately proceeding the placing of material thereon the sub-grade shall be smoothed and trued up and thoroughly rolled with a ten ton steam roller and the roadbed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5. DITCHES. The side ditches provided for on the "CROSS SECTION OF ROADBED" shall be constructed as thereon indicated. The excavation of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them-

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against material that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COFFER DAMS. The contractor shall design and construct coffer dams, if necessary, as placing concrete in water will not be allowed.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work.

Any cement on the work without the stamp of the Board or Engineer shall be rejected.

General Conditions: In order to allow ample time for inspecting and testing, the cement shall be stored in a suitable weather tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the Contractor and a period of at least 12 days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the 7 day requirements may be held awaiting the results of the 28 day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, presented to the Society January 21, 1903 and amended January 20, 1904 and January 15, 1908, with all

subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements

Portland Cement. DEFINITION. This term is applied to the finely pulverized produce resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent has been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement, dried at 212°F. shall not be less than 3.10

Fineness. It shall leave by weight a residue not more than 8 per cent on the No. 100 and not more than 25 per cent on the No. 200 sieve.

Time of Setting. It shall not develop initial set in less than thirty minutes, and must develop hard set in not less than one hour nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH.
24 hours in moist air-----		175 lbs.
7 days (1 day in moist air, 6 days in water)-----		500 lbs.
28 days (1 day in moist air, 27 days in water)-----		600 lbs.

ONE PART CEMENT, THREE PARTS SAND.

7 days (1 day in moist air, 6 days in water)-----	200 lbs.
28 days (1 day in moist air, 27 days in water)-----	275 lbs.

In no case shall the increase in strength be less than 20 per cent over the strength shown at 7 days.

Constancy of Volume. Pats of neat cement about three inches in diameter, one-half inch thick at the center, and tapering to a thin edge, shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70° F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five hours.

These pats to satisfactorily pass the requirements shall remain firm and hard and show no signs of distortion; checking, cracking, or disintegration.

Sulphuric Acid And Magnesia. The cement shall contain no more than 1.75 per cent of anhydrous sulphuric acid (SO₃) nor more than 4% of Magnesia (MgO)

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement, two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from all foreign matter uniformly graded and of size that will pass a 1 inch screen and be retained on a $\frac{1}{4}$ inch screen. The fine aggregate shall be clean, sharp sand, free from mica and clay, loam or other foreign matter, in excess of five (5) per cent, and shall be of graded sizes, ranging from $\frac{1}{8}$ inch down to that which will be retained on a No. 80 Standards sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry, then sufficient water added to obtain the desired consistency, and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer or on the mixing board, all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with the water, sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping. This consistency may be varied if required by the Board or Engineer.

Re-tamping, that is remixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place all wheeling, work or walking on it must be prevented until it is sufficiently set; and if the Board or Engineer shall require it, the Contractor must keep the freshly laid concrete covered with wet canvas or tarpaulins to protect it from the sun.

All concrete facing on walls shall be finished by spading, so that the largest pieces of gravel or stone will be prevented from touching the forms, thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed faces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain markings and other imperfections to be removed by rubbing with a flat emery block, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding eight inches in thickness and then tamped so that the water will flush to the surface. IN all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before stopping the placing thereof. The crack or line selected shall continue entirely across the exp-

sed part of said structure, different levels, elevations or place of stopping to be avoided. When a stop is made, before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and slushed with pure cement. This must be done immediately in advance of the placing the next layer thereon.

FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor form to be absolutely rigid and not to be removed from the structure until at least twenty one days after the completion of the floor slab. Forms on exposed faces to be as provided in section entitled "Facing". Forms for the abutments on the faces thereof and on the stream side of the wings shall extend to the extreme bottom of the concrete.

Forms for all exposed surfaces shall be dressed and smooth and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging, or boards in contact with concrete shall be made non-absorbant as directed by the Board or Engineer. Loose concrete, saw-dust, and debris must be carefully removed from the forms immediately before placing concrete.

REINFORCEMENT. All reinforcing bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint, oil, or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be spaced eighteen inches on centers and shall consist of several continuous members of size and number as indicated above and shown on the plans, locked together with clamps and providing diagonal tension reinforcement.

The contractor shall place all bars in the exact position and manner as indicated on the plans, and keep them in such position, by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

CHAMFERED EDGES. All exposed edges shall be chamfered with $\frac{3}{4}$ inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer, and upon such written order, the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following: The water, sand and gravel or stone shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its FINAL set has developed.

DECEMBER TERM, 1912.

AMOS KERSEY ET AL ROAD.

WATERWAY. In addition to the general cleaning up provided in Section 22 of the General Specifications, the contractor shall remove all false work, dirt, sand, gravel and all materials of whatever kind down to the water line or spring line, from abutment to abutment.

STONE. For a width of nine feet (9) , four and one half ($4\frac{1}{2}$) feet on each side of the center line of road, the road shall be covered with good, hard first class crushed lime stone, suitable for first class road building purposes and acceptable to the Superintendent and Engineer, said stone to be free from dirt and all other foreign deleterious materials and range in size as hereinafter provided. After the road has been prepared, settled and rolled as hereinbefore provided, six (6) inch boards are to be placed properly lined, then stone, the largest pieces of which will pass through a two and one-half ($2\frac{1}{2}$) inch ring, and shall include all sizes smaller, including dust, ~~or what~~ is commonly known as " $\frac{1}{2}$ " crusher run, shall be placed between such boards, uniformly spread and rolled with a ten ton steam roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl.

Upon the foundation stone there shall be placed between five (5) inch boards, for a width of nine feet a layer of stone five (5) inches deep, entirely across such nine feet, said stone to be of kind and quality as hereinbefore provided, the largest pieces of which will pass through a three quarter ($\frac{3}{4}$) inch screen and over a one quarter ($\frac{1}{4}$) inch screen. Said stone to be spread to a depth of five inches, after which the same shall be rolled with the same roller and to the same extent as provided for the foundation stone.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be necessary.

Five cubic yards of the fine stone shall be placed at each road intersection under the direction of the engineer, in addition to making easy approaches in the sub-grade to all intersecting roads.

Before the final acceptance of the road, the contractor will be required to rake in the entire road without raking in the dirt and leaving the edges of the stone in a straight line, and the entire surface of the stone presenting a uniform, slightly appearance, then re-rolling the same.

HAULING OVER OTHER ROADWAYS. The contractor shall be required to put public highways over which he may haul material in as good a condition as when he commenced to haul over them before the acceptance of the work herein provided.

ESTIMATES. The contractor shall be entitled to estimates as provided by the Statutes, and payment may be made at such times as may be ordered by the Board, provided that no payment shall be made for more than 80 per cent of the Engineers estimate of the work done by the contractor, nor shall the whole amount of the contract price be paid until the road shall have been received as completed in all its details. No part

of the work will be finally received until the entire work is received and accepted as completed.

John O. Kain

John E. Parker

Lloyd C. Holtsclaw

Subscribed and sworn to before me this 4th day of November 1912.

Lewis W. Borders, Auditor.

For General Specifications See Page 575.

DECEMBER TERM, 1912.

AMOS KERSEY ET AL ROAD

And now come the viewers and engineer, after the expiration of ten days from the filing of their report herein, on the 6th day of November 1912, and at the next regular session of said Board of Commissioners after said date, and file their supplemental report herein, which report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition)
of Amos Kersey et al for the)
improvement of highway.)

We, the undersigned Viewers, heretofore appointed in the above cause, and who as such viewers, on the 4th day of November 1912, filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report, to-wit:

We would respectfully report that the improvement of said highway in the manner set forth in our former report, will not occasion any damages to the lands of any Infant, Idiot or person of unsound mind, and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

John O. Kain

John E. Parker

Lloyd C. Holtsclaw

Viewers.

Subscribed and sworn to before me this the 16th day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

And now said Board being fully advised in the premises finds that the viewers and engineer appointed herein, met on the 8th day of April 1912 and were qualified as provided by law, and that said engineer filed his bond in the sum of \$5000.00 and that the same was approved by the Auditor of Hendricks County, and the Board further finds that pursuant to an order heretofore made by them, that the time for filing the report of the viewers and engineer was extended to the third day of the November Term, 1912, the same being the 6th day of November 1912, and that the report of the viewers and engineer was filed in the office of the Auditor of Hendricks County, Indiana, on the 6th day of November 1912, and that it has remained on file in said office open to the inspection of any person since said date and for more than ten days before the December Term of said Board, 1912, and before the filing of the supplemental report herein, and the Board having examined said report, finds that it conforms to the law in all respects, and should be approved, that the highway, described therein is less than three miles in length, and that the improvement as reported in said report will be of public utility

Said Supplemental Report is endorsed on back as follows: Filed Dec 2-1912 Lewis W. Borders Auditor

and that said improvement should be ordered and established, as provided in said report, without submitting the matter of said improvement to the legal voters of Clay Township.

: It is therefore ordered by the Board that the report of the engineer and viewers be, and the same is now, hereby in all things fully approved. And the Board further finds that the viewers and engineer filed their supplemental report on the 2nd day of December 1912, that the same was filed at the next regular session of the Board of Commissioners after the expiration of ten days from the filing of the first report, and that said report being fully examined said Board finds that no injury will result to the property of any idiot or any person of unsound mind, or will any person sustain any damage whatever by reason of the construction of the improvement prayed for by the petitioners herein; that no person or corporation has made written claims to said viewers and engineer because of injury to property by reason of said improvement and that said supplemental report is in due form and regular and that the same ought to be approved in all things.

It is therefore ordered by the Board that the supplemental report of the viewers and engineer be and the same is hereby fully approved.

And the Board further finds from the examination of the reports of said viewers and engineer that said improvement prayed for by the petitioners herein should be established.

It is therefore ordered that said improvement as prayed for be made, and that the same be made in all respects as provided in said report of said viewers and said engineer.

It is further ordered by this Board that the Auditor of Hendricks County, give notice by one publication in the Indianapolis Star, a daily newspaper of general circulation throughout the State of Indiana, printed and published at the city of Indianapolis, and by three weekly publications in The Republican and in The Gazette, two public weekly newspapers of general circulation throughout the County of Hendricks, the County in which said road to be improved is located; and that until the hour of 10 o'clock A. M. on the 28th day of December 1912, sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana, at their usual place of meeting, for the work of said improvement, in accordance with the profile and report and plans and specifications in said report set forth, and this cause is continued.

DECEMBER TERM, 1912.

JOHN W. FIGG ET AL ROAD

In the matter of the petition of)
 John W. Figg et al for the imp-)
 rovement of a public highway.)

Come now again the petitioners in the above entitled cause and respectfully show to the Board of Commissioners of Hendricks County, that pursuant to an order heretofore made by the Board and a notice issued by the Auditor, which notice is in words, and figures as follows, to-wit: (H.I.), that the viewers and engineer, appointed in this cause met on the 8th day of April, 1912, which date was within ten days after the appointment of said viewers and engineer, and took the oath as provided by law, for the faithful discharge of their duties as viewers and engineer in this cause, and that the engineer on said date filed his bond in the sum of \$5000.00 which bond is in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County, Indiana, as principal, and the AMERICAN SURETY COMPANY OF NEW YORK, as Surety, are held and firmly bound unto the State of Indiana, in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARS, for the payment of which, well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED this 1st day of April 1912.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That, WHEREAS, the above named and bounded JOHN O. KAIN has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the John W. Figg et al Road.

NOW, THEREFORE, If the said JOHN O. KAIN shall well and faithfully discharge the duties of his said office of Engineer of Location of said road, according to law, then and in that event this bond shall be void, otherwise to be and remain in full force and effect in law.

(SEAL)

JOHN O. KAIN

AMERICAN SURETY COMPANY OF NEW YORK,

by, E. V. Clark

Resident Vice President

Attest: Jno. J. Reinhard

Resident Assistant Secretary.

with the approval of the Auditor endorsed thereon, which approval and endorsement are in words and figures as follows, to-wit:

Approved June 3rd, 1912.

Lewis W. Borders,

Auditor Hendricks County, Indiana.

And now said petitioners respectfully show to the Board that the time for filing the report of the viewers and engineer in this cause was extended to the third day of the November Term, 1912, of said Board, and now comes the Viewers and engineer herein and produce and file their report on the 6th day of November 1912, which report is in words and figures as follows, to-wit:

STATE OF INDIANA)
SS
HENDRICKS COUNTY.))

COMMISSIONER'S COURT
APRIL TERM, 1912.

To John O. Kain, Charles Miller and John H. Free.

You are hereby notified that you were appointed by the Board of Commissioners of said County at their April Term 1912, to view a ~~proposed~~ improvement of a public highway, as follows, to-wit: Beginning at the center North of Section 23, township 15 North of Range 2 West and on the township line dividing the townships of Clay and Marion in Hendricks County, Indiana, and running thence South upon and along the established public highway to the south line of said section 23; thence west upon and along the established public highway to a point where said established ^{public} highway runs South; thence South upon and along said established public highway to a point where said established highway running south terminates in a free gravel road, running East and West upon and along the South line of Section 26, township and range aforesaid; and if said proposed improved public highway will be of public utility, mark and lay out the same in the manner prescribed by law, to the width of 30 feet.

You will meet at the office of County Auditor on the 8th day of April, 1912 at 9 o'clock A. M. and after being duly qualified, proceed to make said view, and report at the next regular term of said Board.

I certify the foregoing to be a true copy of the Order by the Board in relation to said proposed highway. Witness my hand and official seal, this 2nd day of April 1912.

Lewis W. Borders, Auditor.

(Seal)

DECEMBER TERM, 1912.

JOHN W. FIGG ET AL ROAD.

OATH OF VIEWERS.

STATE OF INDIANA)

SS

HENDRICKS COUNTY.)

We, John O. Kain, Charles Miller and John H. Ferree do solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the within described proposed highway to the best of our skill and ability, so help us God.

John O. Kain

Chas. Miller

J. H. Ferree

Subscribed and sworn to before me, this 8th day of April 1912.

Lewis W. Borders

Auditor.

State of Indiana)

ss

Hendricks County.)

In the Commissioners Court

October Term, 1912.

In the matter of the petition of)

J. W. Figg et al to improve a)

public highway in Clay Township,)

Hendricks County, Indiana.)

The the Honorable Board of Commissioners of Hendricks County, Indiana.

We the undersigned Viewers and Engineer, appointed by your Honorable Body, under the "Provisions of an Act of the General Assembly of the State of Indiana, approved March 8th 1905, and all amendments and supplements thereto", to view, examine, make all needful surveys of the road described in the petition of J. W. Figg et al, and hereinafter described, determine the manner of said improvement in detail, estimate the costs thereof, and prepare profile, plans, drawings and specifications preparatory to cleaning, grubbing, grading sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:

That pursuant to the notice served on us, we met on the 8th day of April 1912, at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribing an oath faithfully and impartially to discharge the duties under our respective appointments, and as such Viewers and Engineer, we proceed to the vicinity and neighborhood of said road.

That we made a careful view and examination of the route of the proposed improvement, of the locality in which said proposed improved road is located, of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys of the same together with profile, drawings, plans and specifications, and found that the material for the roadway should be of first class Mitchell limestone

and gravel suitable for first class road building purposes as detailed in the specifications and exemplified in the drawings entitled "CROSS SECTION OF ROADBED". We find that the proposed improvement, in accordance with the profile, drawings, plans and specifications, herewith filed, will be of public utility and convenience and that the costs of the construction of the same will be less than the benefits derived therefrom; that we have laid out said proposed highway along the route hereinafter described and to the width of Thirty five (35) feet and specified in the specifications herewith filed. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet, and that said profile, drawings, plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and specifications describe in detail the sizes, materials to be used and the method of construction of the roadbed, bridges, sewers, ditches, drains and stone required therein and likewise provide the quality and quantity of each and every kind of material, and all things necessary to make a complete macadam road, that all drawings, plans and specifications together with the profile and all figures, notes and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located:

Commencing on the Township line dividing Clay and Marion Townships in Hendricks County, Indiana, on the center line of the roadway at the subway across and under the Big Four Rail Road, West of the center on the North of Section 23, Township 15 North Range 2 West and running thence South 18 degrees East 148 feet; thence South 5159 feet on the line running North and South through the center of said Section 23, Township 15 North Range 2 West to the South half mile stone of said Section 23, thence West on the South line of said Section 23, a distance of 1086 feet, thence South 27 degrees West 307 feet, thence South 17 degrees West 100 feet; thence South 10 degrees North 257 feet; thence South 4662 feet on the line running North and South through the center of the west half of Section 26, Township 15 North Range 2 West, and terminating at the center on the South of the South West quarter of Section 26, Township 15 North Range 2 West, which is a point in a Free Gravel Road, all in Hendricks County, State of Indiana. We find the total length of the proposed improved highway to be 11,719 lineal feet.

We find no damage on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$10,068.90

John O. Kain

Chas. Miller

John H. Ferree

DECEMBER TERM, 1912.

JOHN W. FIGG ET AL ROAD.

Subscribed and sworn to before me this 4th day of November 1912.

(Seal)

Lewis W. Borders

Auditor Hendricks County.

DETAIL SPECIFICATIONS.

In the matter of the petition of)

J. W. Figg et al to improve a)

public highway in Clay Township)

Hendricks County, Indiana.)

1. PROFILE. The profile represents the elevation of the center line of the road way, the elevations having been taken at the end of each one hundred feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line, established represents the elevations of the center line, that the roadway shall be raised or lowered to, being referred to as the sub-grade and before materials are put on.

As the profile only shows the elevations along the center line of the roadway, bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of cutting and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications whether specifically mentioned or referred to in these specifications.

2. ROUTE. The route, length and width of this highway are as heretofore set forth in the report of the Viewers and engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty five feet, that is seventeen and one half feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a sub-grade twenty-eight feet wide, uniformly rounded as shown on the "CROSS SECTION OF ROADBED", the slope to the embankment to be one vertically to one and one-half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstruction and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original positions. Where shade trees do not impede travel or cause damage to the road they may be left standing at the discretion of the Engineer.

SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade as shown by the plans and profile and by the stakes to be set by the Engineer. All soft and spongy places not affording a firm foundation shall be dug out and refilled

with broken stone or gravel. The excavations for the sub-grade of the ditches shall be made to additional depth indicated by the drawings and not deeper. The road shall be made to conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said road-bed shall be made smooth and compact before the stone is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone thereon, unless permission is given by the Engineer for placing the same earlier. At any event immediately proceeding the placing of material thereon the sub-grade shall be smoothed and trued up and thoroughly rolled with a ten ton steam road roller and the road-bed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5. DITCHES. The side ditches provided for on the "CROSS SECTION OF ROADBED" shall be constructed as thereon indicated. The excavations of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them.

6. GRADE. The grade line (The red line) on the profile shows the elevation of the sub-grade of the roadbed, and the top or surface of the roadbed must be made to conform to said grade line, making cuts and fills of the depth and to the amount shown on said profile. However, in the case of discrepancy between the cuts and fills as shown on the profile, and the cuts and fills necessary to bring the sub-grade to the grade line established by making the required cut or fill, or whatever may be required, if anything, at both ends of a continuous grade, such continuous grade to be maintained between breaks.

7. EXCAVATIONS. All cuts shall be excavated to a width of twenty-eight (28) feet at the sub-grade.

8. BRIDGES. Bridges shall be constructed at the places and of the size and in the manner detailed on the profile out of re-inforced concrete, such concrete shall be of the kind of material, proportions and workmanship as hereinafter provided.

9. SEWERS. Sewers shall be constructed at the places and of the size as detailed on the profile. All sewers shall be corrugated American Ingot Iron or its equal, and shall test by chemical analysis 99.84 per cent iron. All sewers to have headers of the size and dimension detailed on the profile and shall be constructed of concrete of the quality, quantity and manner as provided for bridges.

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against mater-

ial that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COFFER DAMS. The contractor shall design and construct coffer-dams, if necessary, as placing of concrete in water will not be allowed.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work.

Any cement on the work without the stamp of the Board or Engineer shall be rejected.

General Conditions. In order to allow ample time for inspecting and testing, the cement shall be stored in a suitable weather-tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the seven day requirements may be held awaiting the results of the twenty-eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, presented to the Society, January 21, 1903 and amended January 20, 1904 and January 15, 1908, with all subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements:

Portland Cement. DEFINITION. This term is applied to the finely pulverized product resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent has been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement dried at 212°F. shall not be less than 3.10.

Fineness. It shall leave by weight a residue not more than 8 per cent, on the No. 100 and not more than 25 per cent on the No. 200 sieve.

Time of Setting. It shall not develop initial set in less than thirty minutes; and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH
24 hours in moist air - - - - -	- - - - -	175 lbs.
7 days (1 day in moist air, 6 days in water) - - - - -	- - - - -	500 lbs.
28 days (1 day in moist air, 27 days in water) - - - - -	- - - - -	600 lbs.
ONE PART CEMENT, THREE PARTS SAND.		
7 days (1 day in moist air, 6 days in water) - - - - -	- - - - -	200 lbs.
28 days (1 day in moist air, 27 days in water) - - - - -	- - - - -	275 lbs.

In no case shall the increase in strength be less than 20 per cent over the strength shown at 7 days.

Constancy Of Volume. Pats of neat cement about three inches in diameter, one half inch thick at the center, and tapering to a thin edge, shall be kept in moist air for a period of twenty four hours.

(A) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70° F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five hours.

These pats to satisfactorily pass the requirements shall remain firm and hard and show no signs of distortion, checking, cracking, or disintegration.

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent of anhydrous sulphuric acid (SO₃) nor more than 4 per cent of Magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement, two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6 It shall be free from all foreign matter, uniformly graded and of size that will pass a 1 inch screen and be retained on a $\frac{1}{4}$ inch screen. The fine aggregate shall be clean sharp sand free from mica, clay, loam or other foreign matter, in excess of five per cent, and shall be of graded sizes, ranging from $\frac{1}{8}$ inch down to that which will be retained on a No. 80 Standard sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry then sufficient water added to obtain the desired consistency, and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer or on the mixing board all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with the

DECEMBER TERM, 1912.

JOHN W. FIGG ET AL ROAD.

water, sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping.. This consistency may be varied if required by the Board or engineer.

Re-tempering that is remixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place all wheeling, work or walking on it must be prevented until it is sufficiently set; and if the Board or Engineer shall require it, the Contractor must keep the freshly laid concrete covered with wet canvas or tarpaulins to protect it from the sun.

All concrete facing on walls shall be finished by spading, so that the largest pieces of gravel or stone will be prevented from touching the forms, thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed faces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain markings and other imperfections to be removed by rubbing with a flat emery block, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding eight inches in thickness and then tamped so that the water will flush to the surface. In all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before stopping the placing thereof. The crack or line selected shall continue entirely across the exposed part of said structure, different levels, elevations or place of stopping to be avoided. When a stop is made, before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and then slushed with pure cement. This must be done immediately in advance of the placing of the next layer thereon.

FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor form to be absolutely rigid and not to be removed from the structure until at least twenty-one days after the completion of the floor slab. Forms on exposed faces to be as provided for in section entitled "Facing". Forms for the abutments on the faces thereof and on the stream side of the wings shall extend to the extreme bottom of the concrete.

Forms for all exposed surfaces shall be dressed and smoothed and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging or boards in contact with concrete shall be made nonabsorbent as directed by the Board or Engineer. Loose concrete, saw-dust and debris must be carefully removed from the forms immediately before placing concrete.

REINFORCEMENT. All reinforcing bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch, and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint, oil or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be spaced eighteen inches on centers and shall consist of several continuous members of size and number as indicated above and shown on the plans, locked together with clamps and providing diagonal tension reinforcement.

The contractor shall place all bars in the exact position and manner as indicated on the plans, and keep them in such position, by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

CHAMFERED EDGES. All exposed edges shall be chamfered with $\frac{3}{4}$ inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer, and upon such written order, the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following; the water, sand and gravel or stone, shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its FINAL set has developed.

WATERWAY. In addition to the general cleaning up provided in Section 22 of the General Specification, the contractor shall remove all false work, dirt, sand, gravel and all materials of whatever kind down to the water line or spring line, from abutment to abutment.

STONE. For a width of nine (9) feet, four feet and one half on each side of the center line of road, the road shall be covered with good, hard, first class crushed lime stone, suitable for first class road building purposes and acceptable to the Engineer and Superintendent, said stone to be free from dirt, and all other foreign deleterious materials, and range in size as hereinafter provided. After the roadbed has been prepared, settled and rolled, as hereinbefore provided, six (6) inch boards are to be placed, properly lined, then stone, the largest pieces of which will pass through a two and one-half ($2\frac{1}{2}$) inch ring, and shall include all sizes smaller, including the dust, or what is commonly known as $2\frac{1}{2}$ crusher run, shall be placed between such boards, uniformly spread and rolled with a ten ton steam roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl.

Upon the foundation stone, there shall be placed between five (5) inch boards, for a width of nine feet, a layer of stone five (5) inches deep, entire-

DECEMBER TERM, 1912

JOHN W. FIGG ET AL ROAD.

ly across such nine feet, said stone to be of a kind and quality as hereinbefore provided, the largest pieces of which will pass through a three quarter ($\frac{3}{4}$) inch screen and over a one quarter ($\frac{1}{4}$) inch screen. Said stone is to be spread to a depth of five inches, after which the same will be roller with a steam roller and to the same extent as provided for the foundation stone.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be necessary.

Five cubic yards of fine stone shall be placed at each road intersection under the direction of the Engineer, in addition to making easy approaches in the sub-grade to all intersection roads.

Before the final acceptance of the road, the contractor will be required to rake in the entire road, without raking in the dirt, and leaving the edges of the stone in a straight line, and the entire surface of the stone presenting a uniform, slightly appearance, then re-rolling the same.

USE OF HIGHWAY. The public shall in no way be barred from the use of the highway.

HAULING OVER OTHER ROADWAYS. The contractor shall be required to put public highways over which he may haul material in as good a condition as when he commenced to haul over them before the acceptance of the work herein provided for.

ESTIMATES. The contractor shall be entitled to estimates as provided by the Statutes, and payment may be made at such times as may be ordered by the Board, provided that no payment shall be made for more than eighty (80%) per cent of the Engineer's estimate of the work done by the contractor, nor shall the whole amount of the contract price be paid until the road shall have been received as completed in all its details. No part of the work will be finally received until the entire work is received and accepted as completed.

John O. Kain, Engineer

Chas. Miller, Viewer

John H. Ferree, Viewer.

Subscribed and sworn to before me this 4th day of November 1912.

Lewis W. Borders, Auditor.

Seal

For General Specifications See Page 575.

DECEMBER TERM, 1912.

JOHN W. FIGG ET AL ROAD.

And now come the viewers and engineer, after the expiration of ten days from the filing their report herein, on the 6th day of November 1912, and at the next regular session of said Board of Commissioners after said date, and file their supplemental report herein, which report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition of)
 John W. Figg et al for the impro-)
 vement of highway.)

We, the undersigned Viewers, heretofore appointed in the above entitled cause, and who as such viewers, on the 4th day of November 1912 filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report, to-wit:

We would respectfully report that the improvement of said highway in the manner set forth in our former report will not occasion any damages to the lands of any Infant, Idiot or person of unsound mind, and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

John O. Kain

Chas. Miller

John H. Ferree

Viewers.

Subscribed and sworn to before me this the 16th day of November 1912.

Lewis W. Borders

Auditor Hendricks County.

Seal

And now said Board, being fully advised in the premises finds that the viewers and engineer appointed herein met on the 8th day of April 1912, and were qualified as provided by law, and that said engineer filed his bond in the sum of \$5000.00 and that the same was approved by the Auditor of Hendricks County, and the Board further finds that pursuant to an order heretofore made by them that the time for filing the report of the viewers and engineer was extended to the third day of the November Term 1912 of said Board, and that the report of the viewers and engineer was filed in the office of the Auditor of Hendricks County, Indiana, on the 6th day of November 1912, the same being the ^{Term} third day of November 1912, has remained on file in said office open to the inspection of any person since said date and for more than ten days before the

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JOHN W. FIGG ET AL ROAD

December Term of said Board 1912, and before the filing of the supplemental report herein and the Board having examined said report, finds that it conforms to the law in all respects, and should be approved; that the highway therein described is less than three miles in length and that the improvement as reported in said report will be of public utility and that said improvement should be ordered and established, as provided in said report, without submitting the matter of said improvement to the legal voters of Clay Township.

It is therefore ordered by the Board that the report of the engineer and viewers be, and the same is now hereby in all things fully approved. And the Board further finds that the viewers and engineer filed their supplemental report on the 2nd day of December 1912, that the same was filed at the next at the next regular session of the Board of Commissioners after the expiration of ten days from the filing of the first report, and that said report being fully examined, said Board finds that no injury will result to the property of any idiot or any person of unsound mind, or will any person sustain any damage whatever by reason of the construction of the improvement prayed for by the petitioners herein; that no person or corporation had made written claims to said viewers and engineer because of injury to property by reason of said improvement and that said supplemental report is in due form and regular and that the same ought to be approved in all things.

It is therefore ordered by the Board that the supplemental report of the Viewers and engineer be and the same is hereby fully approved.

And the Board further finds from the examination of the reports of said viewers and engineer that said improvement prayed for by the petitioners herein should be established.

It is therefore ordered that said improvement as prayed for be made and that the same be made in all respects as provided in said report of said Viewers and engineer.

It is further ordered by this Board that the Auditor of Hendricks County, give notice by one publication in the Indianapolis Star, a daily newspaper of general circulation throughout the State of Indiana, printed and published at the city of Indianapolis, and by three weekly publications in The Republican and in the Gazette, two public weekly newspapers of general circulation throughout the County of Hendricks, the County in which said road to be improved is located; that until the hour of 10 o'clock A. M. on the 28th day of December 1912, sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana, at their usual place of meeting, for the work of said improvement, in accordance with the profile and report and plans and specifications in said report set forth, and this cause is continued.

In the matter of the petition of)
 Henry Hunt et al to improve a pub-)
 lic highway in Marion Township,)
 Hendricks County, Indiana.)

Come now again the petitioners in the above entitled cause and respectfully shows to the Board of Commissioners of Hendricks County, Indiana, that pursuant to an order heretofore made by said Board and entered of record and pursuant to a notice issued by the Auditor of said County, which notices is in words and figures as follows, to-wit: (h. I) the viewers and engineer appointed in said cause met on the 11th day of May 1912, which date was within ten days after the appointment of said viewers and engineer, and took an oath as provided by law, for the faithful discharge of their duties as viewers and engineer in this cause, and that the engineer on said date filed his bond on the sum of Five Thousand Dollars with the approval of said Auditor endorsed thereon, which bond and approval indorsed thereon are in words and figures as follows, to-wit:

KNOW ALL MEN BY THESE PRESENTS, That we, JOHN O. KAIN, of Hendricks County, Indiana, as Principal, and the AMERICAN SURETY COMPANY OF NEW YORK, as Surety are held and firmly bound unto the State of Indiana, in the penal sum of FIVE THOUSAND (\$5000.00) DOLLARS, for the payment of which, well and truly to be made and done, we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally, firmly by these presents:

SEALED AND SIGNED this 7th day of May 1912.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, That, WHEREAS, the above named and bounded JOHN O. KAIN has been appointed by the Board of Commissioners of Hendricks County, Indiana, as Engineer of Location on the Henry Hunt et al Road.

NOW, THEREFORE, If the said JOHN O. KAIN Shall well and faithfully discharge the duties of his said office of Engineer of Location of said road, according to law, then and in that event this bond shall be void: otherwise to be and remain in full force and effect of law.

DECEMBER TERM, 1912.

HENRY HUNT ET AL ROAD.

JOHN O. KAIN

American Surety Company of New York,

by E. V. Clark

Resident Vice President

Attest: Jno. J. Reinhard

Resident Assistant Secretary.

Approved June 3, 1912.

Lewis W. Borders,

Auditor Hendricks County, Indiana.

And now said petitioners show to the Board that the time for filing the report of said viewers and engineer was fixed in said notice for the 1st day of the regular June Term, 1912 of said Board, and that said Board continued and extended the time for the filing of said report of said viewers and engineer as shown by the record of said Commissioners, from term to term, and from time to time until the third day of the November Term 1912, of said Board, and now comes the viewers and engineer herein and produce and file a report on the sixth day of November 1912, the same being the 3rd day of said November Term 1912 of said Board, which said report is in words and figures as follows, to-wit:

ORDER TO VIEW ROAD.

STATE OF INDIANA

SS

HENDRICKS COUNTY.)

COMMISSIONERS COURT

MAY TERM, 1912.

To Ed Mills and Wilbur Hadley, Viewers, John O. Kain, Engineer:

You are hereby notified that you were appointed by the Board of Commissioners of said County, at their May Term, 1912 to view a proposed Highway, as follows, to-wit: Beginning on the Danville and New Winchester Free Gravel Road at the South half mile stone on the South line of Section 2, Township 15 North of Range 2 West; and running thence North 1 mile in the center of said section 2 to the North line thereof; thence West on the North Line of said section 2, one half mile and continuing thence West on the North line of section 3, said township and Range, one fourth of a mile, the same being on a line dividing a portion of said sections 2 and 3 on the South from a portion of said sections 34 and 35, Townships 16 North of Range 2 West on the North; thence North across the center of the East half of said Section 34 to the North line thereof and connecting with the Danville and New Maysville Improved Free Gravel Road, and if said proposed highway will be of public utility, mark and lay out the same in the manner prescribed by law, to the width of ----- feet.

You will meet at the office of the Auditor of Hendricks County, at the Court House of Hendricks County, Indiana on the 11th day of May 1912 at 9 o'clock A. M. and after being duly qualified, proceed to make said view, and report at the next regular term of said Board.

DECEMBER TERM, 1912.

HENRY HUNT ET AL. ROAD.

I certify the foregoing to be a true copy of the Order of the Board in relation to said proposed highway. Witness my hand and official seal, this 9th day of May. 1912.

(Seal)

Lewis W. Borders, Auditor.

OATH OF VIEWERS.

STATE OF INDIANA)
SS
HENDRICKS COUNTY)

We, Ed Mills and Wilbur Hadley, viewers, John O. Kain so solemnly swear that we will faithfully and impartially discharge the duties assigned us as viewers on the within described proposed highway to the best of our skill and ability, so help us God.

John O. Kain

Edward Mills

Wilbur Hadley

Subscribed and sworn to before me, this 11th day of May 1912.

Lewis W. Borders

Auditor Hendricks County.

State of Indiana, Hendricks County, SS:

In the Commissioners Court

November Term, 1912.

In the matter of the petition of)
Henry Hunt et al to improve a pub)
lic highway in Marion Township,)
Hendricks County, Indiana.)

To the Honorable Board of Commissioners of Hendricks County, Indiana.

We, the undersigned Viewers and engineer, appointed by your Honorable Body, under the provisions of an Act of the General Assembly of the State of Indiana, approved March 8, 1905, and all amendments and supplements thereto, to view, examine, make all needful surveys of the road described in the petition of Henry Hunt et al and hereinafter described, determine the manner of said improvement in detail, estimate the cost thereof, and prepare profiles, plans, drawings, and specifications preparatory to cleaning, grubbing, grading, sewerage, ditching, draining and surfacing said proposed improvement of said highway, respectfully report:

That pursuant to the notice served on us, we met on the 11th day of May 1912 at the office of the Auditor of Hendricks County, in the town of Danville, Indiana, and after taking and subscribing an oath faithfully and impartially to discharge the duties under our respective appointments, and as such Viewers and engineer, we proceed to the vicinity and neighborhood of said road.

DECEMBER TERM, 1912.

HENRY HUNT ET AL ROAD

That we made a careful view and examination of the route of the proposed improvement of the locality in which said proposed improved road is located, of the needs of the public for this proposed improvement as a facility for travel, and did make the necessary surveys of the same together with profile, drawings, plans and specifications, and found that the material for the roadway should be first class Mitchell limestone suitable for first class road building purposes as detailed in the specifications and exemplified in the drawings entitled "CROSS SECTION OF ROADBED". We find that the proposed improvement, in accordance with the profile, drawings, plans and specifications herewith filed, will be of public utility and convenience and that the costs of construction of the same will be less than the benefits derived therefrom, that we have laid out said proposed highway along the route hereinafter described and to the width of thirty feet and specified in the specifications herewith filed. However we report that no improvement is to be made from station 95 plus 54 feet to the northern terminus. That the aforesaid profile shows the elevations of the center line of said proposed road, at the end of each one hundred feet and that said profile, drawings, plans and specifications provide for all the details of the improvement of said road. Said profile, drawings, plans and specifications describe in detail the sizes, materials to be used and the method of construction of the roadbed, bridges, sewers, ditches, drains and stone required therein likewise provide the quality and quantity of each and every kind of material, and all things necessary to make a complete macadam road; that all drawings, plans and specifications together with the profile and all figures, notes, and requirements thereon are made by us and herewith filed and made a part of this report.

The following is a description of the route over and upon which said improvement is to be located.

Commencing at the center of the Danville and Rockville Free Gravel Road at the South half mile stone of section 2 Township 15 North Range 2 West and running thence North 5561 feet; thence West 1289 feet; thence North 81 degrees 28 minutes west 100 feet; thence West 2604 feet; thence North 5299 feet to the New Maysville Free Gravel Road, all in Marion Township, Hendricks County, Indiana.

We find the total length of the proposed improved highway to be 14853 lineal feet.

We find no damage on account of the construction of the foregoing described highway will accrue to anyone.

We estimate the total cost of the proposed improvement to be \$3719.95

John O. Kain

Wilbur Hadley

Edward Mills

Subscribed and sworn to before me, this 1st day of November 1912.

Lewis W. Borders,

Auditor Hendricks County.

(Seal)

DETAIL SPECIFICATIONS.

IN the matter of the petition of)
 Henry Hunt et al to improve a pub)
 lic highway in Marion Township,)
 Hendricks County, Indiana.)

1. PROFILE. The profile represents the elevations of the center line of the roadway, the elevations having been taken at the end of each one hundred feet, with a certain number of plus stations, from the point of beginning to the terminus. The grade line established represents the elevation of the center line that the roadway shall be raised or lowered to, being referred to as the sub-grade and before the materials are put on.

As the profile only shows the elevations along the ^{center} line of the roadway, bidders and contractors shall carefully examine the roadway and determine for themselves the elevations of the sides of the roadway and the amount of cutting and filling necessary to reduce them to the grade line.

All drawings, figures, notes, directions, explanations and any and all things indicated or shown on the profile are a part of the specifications, whether specifically mentioned or referred to in these specifications.

2. ROUTE. The route, length and width of this highway are as heretofore set forth in the report of the Viewers and engineer and according to the plans and specifications herewith filed.

3. ROADWAY. The right of way of said road shall be thirty (30) feet that is fifteen (15) feet on either side of the center line of said highway and measured at right angles thereto, except at such places as such right of way is insufficient to preserve a sub-grade twenty four (24) feet wide, uniformly rounded as shown on the "CROSS SECTION OF ROADBED", the slope of the embankments to be one vertically to one and one half horizontally, at such places as fills are required to an amount that the foregoing exception applies, at all such places the right of way shall be sufficiently wide to permit the construction of the sub-grade as aforesaid.

The right of way shall be grubbed its entire width of all obstructions and the same entirely removed, except in the case of landmarks or witness trees, which shall be carefully protected in their original positions. Where shade trees do not impede travel or cause damage to the road they may be left standing at the discretion of the Engineer.

4. SUB-GRADE. The roadway shall be graded to a true and smooth surface and to the sub-grade as shown by the plans and profile and by the stakes set by the Engineer. All soft and spongy places not affording a firm foundation shall be dug out and refilled with broken stone or gravel. The excavations for the sub-grade of the side ditches shall be made to additional depth indicated by the ^{drawings and not de} The road shall be made to conform to the profile and drawings entitled "CROSS SECTION OF ROADBED", and said roadbed shall be made

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HENRY HUNT ET AL ROAD.

smooth and compact before the gravel is placed thereon. After the completion of the grading the same shall be allowed to settle for four weeks before placing stone and gravel thereon, unless permission is given by the Engineer for placing the same earlier. At any event immediately proceeding the placing of material thereon the sub-grade shall be smoothed and trued up and thoroughly rolled with a ten (10) ton steam roller and the roadbed shall be solid and compact and shall be kept smooth and compact while placing material thereon.

5. DITCHES. The side ditches provided for on the "CROSS SECTION OF ROADBED" shall be constructed as thereon indicated. The excavation of such ditches deeper for the purpose of obtaining dirt for fills will not be allowed.

All ditches now in said road shall be filled up and made so compact and solid that the water will not follow or wash them.

6. GRADE. The grade line (the red line) on the profile shows the elevations of the sub-grade of the roadbed, and the top or surface of the roadbed must be made to conform to said grade line, making cuts and fills of the depth and to the amount shown on said profile. However, in the case of discrepancy between the cuts and fills as shown on the profile, and the cuts and fills necessary to bring the sub-grade to the grade line established by making the required cut or fill, or whatever may be required, if anything, at both ends of a continuous grade, such continuous grade to be maintained between the breaks.

7. EXCAVATIONS. All cuts shall be excavated to a width of twenty-eight (28) feet at the sub-grade.

8. BRIDGES. Bridges shall be constructed at the places and of the size and in the manner detailed on the profile out of re-inforced concrete, such concrete shall be of the kind of material; proportions and workmanship as hereinafter provided.

9. SEWERS. Sewers shall be constructed at the places and of the size as detailed on the profile. All sewers shall be Corrugated American Ingot Iron, or its equal, and shall test by chemical analysis 99.84 per cent iron. All sewers to have headers of the size and dimensions detailed on the profile and shall be constructed of concrete of the quality, quantity and manner as provided for bridges.

REMOVAL OLD STRUCTURE. The contractor shall remove the old bridge in a careful and workmanlike manner, so as to preserve the integral parts thereof and place the same on the side of the highway at a point not to impede travel thereon. The same to be as compactly and uniformly stacked as the condition and shape of the material will permit. The structure and material thereof to be and remain the property of Hendricks County, Ind.

TEMPORARY BRIDGE AND BY-PASS. The Board shall provide a right of way and shall build and maintain a temporary bridge, both sufficient for all traffic.

FOUNDATION. Unless otherwise indicated the abutments shall be carried three feet below the bed of the stream, or water line, as established by the profile.

EXCAVATIONS. Excavations shall be carried to the depth required by the plans and the Board or Engineer shall be given an opportunity to inspect the foundations before placing concrete. Excavations for abutments shall be so constructed that the back of the abutment shall bear directly against material that has not been disturbed. If sheeting is required to sustain the embankment at the heel of the abutment, it must be left in the work.

COPPER DAMS. The contractor shall design and construct coffer dams, if necessary, as placing of concrete in water will not be allowed.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work. Any Cement on the work without the stamp of the Board or Engineer shall be rejected.

General Conditions: In order to allow ample time for inspecting and testing the cement shall be stored in a suitable weather-tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every Facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags ^{or barrels} with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the seven-day requirements may be held awaiting the results of the twenty-eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers presented to the Society, January 21, 1903, and amended January 20, 1904 and January 15, 1908, with all subsequent amendments thereto except that the specific gravity shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements:

Portland Cement. DEFINITION-This term is applied to the finely pulverized produce resulting from the calcination to incipient fusion of an ultimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent has been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement dried at 212°F. shall not be less than 3.10

Fineness. It shall leave by weight a residue not more than 8% on the No. 100 and not more than 25 % on the No. 200 sieve.

Time of Setting. It shall not develop initial set in less than thirty

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minutes, and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

AGE	NEAT CEMENT	STRENGTH.
24 HOURS IN MOIST AIR - - -	- - - - -	175 lbs.
7 days (1 day in moist air, 6 days in water) - - - -	- - - - -	500 lbs.
28 days (1 day in moist air, 27 days in water) - - - -	- - - - -	600 lbs.
ONE PART CEMENT, THREE PARTS SAND.		
7 days (1 day in moist air, 6 days in water) - - - -	- - - - -	200 lbs.
28 days (1 day in moist air, 27 days in water) - - - -	- - - - -	275 lbs.

In no case shall the increase in strength be less than 20 per cent over the strength shown at 7 days.

Constancy of Volume. Pats of neat cement about three inches in diameter, one-half inch thick at the center, and tapering to a thin edge, shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70° F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five hours.

These pats, to satisfactorily pass the requirements, shall remain firm and hard and show no signs of distortion, checking, cracking, or disintegration.

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent of anhydrous sulphuric acid (SO_3) nor more than 4 per cent of magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one part Portland Cement, two parts fine aggregate and three parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from all foreign matter, uniformly graded and of size that will pass a 1 inch screen and be retained on a $\frac{1}{4}$ inch screen. The fine aggregate shall be clean, sharp sand, free from mica, clay, loam or other foreign matter in excess of five per cent, and shall be of graded sizes, ranging from $\frac{1}{8}$ inch down to that which will be retained on a No. 80 Standard sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry, then sufficient water added to obtain the desired consistency, and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement, and each particle of the coarse aggregate is thoroughly coated with mortar.

All material must be proportioned dry and then deposited in the mixer or on the

mixing board. all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with water, sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping. This consistency may be varied if required by the Board or Engineer.

Re-tempering, that is remixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place, all wheeling, work or walking on it must be prevented until it is sufficiently set; and if the Board or Engineer shall require it, the Contractor must keep the freshly laid concrete covered with wet canvas or tarpaulin to protect it from the sun.

All concrete facing on walls shall be finished by spading, so that the largest pieces of gravel or stone will be prevented from touching the forms, thus securing a smooth face without plastering, coating or cement washing.

FACINGS. Forms on exposed surfaces shall be absolutely smooth and evenly matched so that no unevenness or timber markings will appear, other than the natural grain of the timber. The natural grain markings and other imperfections to be removed by rubbing with a flat emery block, or other like suitable substance. No plastering, coating or cement washing will be allowed.

PLACING. The concrete shall be placed in layers not exceeding eight inches in thickness and then tamped so that the water will flush to the surface. In all cases after the starting of the placing of concrete, whenever a stop is necessary for a period of time sufficient to allow of the initial setting of the concrete, the concrete shall be made level with a joint or crack between boards in the forms before stopping the placing thereof. The crack or line selected shall continue entirely across the exposed part of the structure, different levels, elevations or place of stopping to be avoided. When a stop is made, before commencing again the placing of concrete, the bonding section in place shall be thoroughly wet and then slushed with pure cement. This must be done immediately in advance of the placing the next layer thereon.

FORMS. Rigid forms shall be provided to receive the concrete and hold it in place until firmly set. The floor form to be absolutely rigid and not to be removed from the structure until at least twenty one days after the completion of the floor slab. Forms on exposed faces to be as provided for in the section entitled "Facing." Forms for the abutments on the faces thereof and on the stream side of the wings shall extend to the extreme bottom of the concrete.

Forms for all exposed surfaces shall be dressed and smoothed and the surface carefully matched. Upright forms must be securely wired to prevent bulging and braced to maintain alignment.

The lagging or boards in contact with concrete shall be made non-absorbent

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HENRY HUNT ET AL ROAD

as directed by the Board or Engineer. Loose concrete, saw-dust and debris must be carefully removed from the forms immediately before the placing of concrete.

REINFORCEMENT. All reinforcing bars shall be medium steel having an elastic limit exceeding 32,000 pounds per square inch and an ultimate tensile strength of at least 60,000 pounds per square inch. All bars shall be free from rust, scales, paint, oil or grease and shall in all cases be imbedded to a depth of at least one inch.

Unit trusses shall be spaced eighteen inches on centers and shall consist of several continuous members of size and number as indicated above and shown on the plans, locked together with clamps and providing diagonal tension reinforcement.

The contractor shall place all bars in the exact position and manner as indicated on the plans and keep them in such position, by wiring and blocking until the concrete is in place. Care to be taken that no blocks become imbedded in the concrete.

CHAMFERED EDGES. All exposed edges shall be chamfered with $\frac{3}{4}$ inch chamfered strips or mouldings to present a neat appearance and to prevent chipping.

FROST PROTECTION. No concrete shall be placed in freezing weather without a written order from the Board or Engineer and upon such written order, the Contractor shall not proceed unless he is absolutely able to comply with and carry out the following: The water sand and gravel or stone shall be warmed immediately before mixing and the temperature of the concrete maintained above freezing until its final set has developed.

WATERWAY. In addition to the general cleaning up provided in Section 22 of the General Specifications, the contractor shall remove all false work, dirt, sand, gravel and all materials of whatever kind down to the water line or spring line from abutment to abutment.

STONE. For a width of 9 feet, four and one half feet on each side of the center line of road, the road shall be covered with good hard, first class crushed lime stone, suitable for first class road building purposes and acceptable to the Engineer and Superintendent, said stone to be free from dirt and all other foreign deleterious materials, and range in size as hereinafter provided. After the roadbed has been prepared, settled, rolled as hereinbefore provided, 6 inch boards are to be placed properly lined, then stone, the largest pieces of which will pass through a $2\frac{1}{2}$ inch ring and shall include all sizes smaller, including dust, or what is commonly known as $2\frac{1}{2}$ crusher run, shall be placed between such boards, uniformly spread and rolled with a ten ton steam roller, such rolling to be done to the satisfaction of the Engineer and Superintendent, which will be sufficient to compact such foundation stone until the same does not creep or crawl.

Upon the foundation stone there shall be placed between five inch boards, for a width of 9 feet a layer of stone 5 inches deep, entirely across such nine feet, said stone to be of kind and quality as hereinbefore provided, the largest pieces of which will pass through a $\frac{3}{4}$ inch screen and over a $\frac{1}{4}$ inch screen. Said stone to be spread to a depth of 5 inches, after which the same will be rolled with the same roller and to the same extent as provided for the foundation stone.

The placing of the stone shall be commenced and carried out so as hauling over the finished road will not be necessary.

Five cubic yards of the fine stone shall be placed at each road intersection under the direction of the Engineer, in addition to making easy approaches in the sub-grade to all intersecting roads.

Before the final acceptance of the road, the contractor will be required to rake in the entire road, without raking in the dirt, and leaving the edges of the stone in a straight line, and the entire surface of the stone presenting a uniform, slightly appearance, then re-rolling the same.

HAULING OVER OTHER ROADWAYS. The contractor shall be required to put public highways over which he may haul material in as good condition as when he commenced to haul over them before the acceptance of the work herein provided for.

ESTIMATES. The contractor shall be entitled to estimates as provided by the Statutes, and payment may be made at such times as may be ordered by the Board, provided that no payment shall be made for more than eighty (80%) per cent of the Engineers estimate of the work done by the contractor, nor shall the whole amount of the contract price be paid until the road shall have been received as completed in all its details. No part of the work will be finally received until the entire work is received and accepted as completed.

John O. Kain, Engineer

Wilbur Hadley, Viewer

Edward Mills, Viewer

Subscribed and sworn to before me this 6th day of November 1912.

Lewis W. Borders, Auditor.

(For General Specifications See page 575.)

And now comes the viewers and engineers hereinafter the expiration of ten days from the filing of their said report on the 6th day of November 1912, and on the 2nd day of December 1912, the same being the first day of the regular December Term, 1912, of said Board, which said term was the next regular session of said Board, after the filing of their said report, they filed with the said Board their supplemental report, which supplemental report is in words and figures as follows, to-wit:

SUPPLEMENTAL REPORT OF VIEWERS.

TO THE HONORABLE BOARD OF COMMISSIONERS:

In the matter of the petition of Henry Hunt)
et al for the improvement of highway.)

We, the undersigned Viewers heretofore appointed in the above cause, and who as such viewers on the 6th day of November 1912 filed our report in the above cause as ordered by you in your order appointing us, and ten days having expired since the filing of the same, now file this as our supplemental report to-wit:

We would respectfully report that the improvement of said highway in the manner set forth in our former report, will not occasion any damages to the

DECEMBER TERM 1912.

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lands of any Infant, Idiot or person of unsound mind, and that no person, firm or corporation has made any written claims for damages on account of said proposed improvement.

Respectfully submitted,

John O. Kain

Wilbur Hadley

Edward Mills,

Viewers.

Subscribed and sworn to before me this 15th day of November 1912.

Lewis W. Borders,

Auditor Hendricks County.

And now said Board being fully advised in the premises find that the engineer and viewers appointed herein met on the 11th day of May 1912 and qualified as provided by law, and that said engineer filed his bond in the sum of Five Thousand Dollars, and that the same was approved by the Auditor of said Hendricks County, Indiana, and the Board further finds that the time for filing of said report by said viewers and engineer was, for good and legal reasons, continued and extended to the third day of the November Term, 1912 of said Board, and that at said Term on the 6th day of November 1912, the report of said viewers and engineer was filed in the office of the Auditor of said County, and that it remained on file in said office ^{open to the inspection of any and all persons for} more than ten days before the first day of the next regular session of said Board, the same being the December Term 1912 and for more than ten days before filing by said viewers and engineer of their supplemental report, which supplemental report the Board finds was filed at the next regular term of said Board, after the filing of their said first report, to-wit: At the December Term 1912 of said Board on the 2nd day of December 1912. And the Board having examined said report filed by said viewers and engineer on the 6th day of November 1912, finds that said report conforms to the law in all respects and should be approved; that said public highway described there in is less than three miles in length and that the improvement of said highway will be of public utility, and that said improvement should be allowed and established ^{in all respects as provided in said report} without submitting the matter of said improvement to the legal voters of said Marion Township, Hendricks County, the Township in which said highway is located, and the Board further finds after having examined said supplemental report filed on said 2nd day of December 1912, and being fully advised in the premises that no injury will result to the property of any idiot, or person of unsound mind, nor will any person sustain any damage whatever by reason of the construction of the improvement prayed for by said petitioners, that no person or corporation has made written claim for damages because of injury to property by reason of said improvement, and that said supplemental report is in due form and regular and that the same ought to be approved in all things.

It is therefore ordered by the Board that the report and supplemental report of the viewers and engineer be, and they are in all things fully approved.

It is further ordered by the Board that the improvement as prayed for be made and that the same be made in all respects as provided for in said report of said viewers and engineer, and that the same be made without an election by the voters of said Marion Township.

It is further ordered by the Board that the Auditor of said County give notice by one publication in the Indianapolis Star a daily newspaper of general circulation throughout the State of Indiana, printed and published in the City of Indianapolis Indiana, and by three weekly publications in the Republican, and The Gazette, two weekly newspapers of general circulation throughout the said County of Hendricks, in which said highway proposed to be improved is located, that until 10 o'clock A. M. on the 28th day of December 1912, sealed proposals will be received by the Board of Commissioners of Hendricks County, Indiana, at their usual place of meeting, *in accordance with the profile, plans and specifications* for the work of said improvement, and report of said viewers and engineer herein.

It is further ordered by the Board that said report of the viewers and engineer herein and the supplemental report of said viewers and engineer be spread of record in the office of the Auditor of said Hendricks County, on the record book kept for that purpose.

And further proceedings herein are continued.

DECEMBER TERM, 1912.

ALFRED COX ET AL ROAD.

In the matter of the petition of)
Alfred Cox et al for the impro-)
vement of a public highway.)

Comes now the petitioners by counsel, and come also the engineer and viewers and it appearing to the satisfaction of the Board that it is impossible to, at this time make a report of their doings in the in the foregoing entitled improvement.

Therefore, it is hereby ordered by Board that said engineer and viewers be given until the first day of the next regular session of this Board to make and file in the office of the Auditor of said Hendricks County, Indiana, their certain report in writing setting forth their determination in regard to said proposed improvement.

In the matter of the petition)
of Samuel Janes et al for the)
improvement of a public high-)
way.)

Comes now the petitioners by counsel, and come also the engineer and viewers and it appearing to the satisfaction of the Board, that it is impossible to, at this time make a report of their doings in the foregoing entitled improvement.

Therefore it is hereby ordered by the Board that said engineer and viewers be given until the first day of the next regular session of this Board to make and file in the office of the Auditor of Hendricks County, Indiana, their certain report in writing setting forth their determination in regard to said proposed improvement.

SPECIFIC SPECIFICATIONS.
PROFILE.

The profile represents the elevations of the center line of the roadway, elevations having been taken at the end of each one hundred (100) feet, with a certain number of plus stations, from the point of beginning. A tabulated showing is made on the profile of the elevations of the curbs opposite the center line station. Also a like showing is made of the finished road elevations at the same points and are designated as "Right" and "Left" sides. The grade line established and indicated on the profile by straight lines represents the elevations of the finished surface on the center line, at the same points of the elevations, that the roadway shall be raised or lowered to.

Along the entire length of the proposed improvement where the edges of the roadway is defined by curbs on one or both sides, a tabulated showing is made, as aforesaid, of the finished surface elevations, and the sub-grade shall be so made as to conform to the center finished surface grade elevations and also the "right" and "left" curb line finished surface grade elevations.

Bidders and Contractors shall carefully examine the roadway and determine for themselves the amount of cutting and filling necessary to reduce the roadway to the finished surface grade line established as indicated by the "Center", "Right" and "Left" finished surface grade elevations, and the length of all hauls.

ROUTE.

The route, length and width of this road are as heretofore set forth in the report of the viewers and according to the plans herewith submitted.

ROADWAY.

The right of way of said road shall be thirty-six (36) feet wide, except where cuts and fills require a greater width, at all such places the right of way shall be sufficiently wide to preserve a subgrade thirty (30) feet wide at such places as the roadbed is not limited by curbs and to allow the banks or sides of cuts and fills to be on the slope as the same is herein specified.

The center line of the right of way shall follow along and coincide with the center line of the road as described in the report, except as above provided for in case of change of location of road. All angles shall be turned as provided for in the diagram on the profile and in accordance with the directions of the Engineer.

ROADBED.

The roadbed shall be thirty (30) feet wide, measured at right angles to the center line of right of way, except where the same is defined by curbs where the same shall be from curb to curb, and shall conform as nearly as practical to said center line. The road shall be made to conform to the profile and drawings entitled "Cross Section of Roadbed with Curbs" and "Cross Section of Roadbed without Curbs", and said roadbed shall be made smooth and compact before the macadam is placed thereon, by rolling with a twelve (12) ton steam or gasoline road roller until the

shall be subject and subject to the acceptance of the Engineer.

STONES.

Stones shall be selected along both sides of the center line of road where there are no water or hole stones, unless otherwise directed by the Engineer at specific points. The depth as set out to be laid shall not exceed, measured from the top of the grade, and wherever there are no water or hole stones, the depth of the stones shall be not less than 12 inches. All stones shall present a regular and uniform appearance. The fall of the stones shall conform to the general slope of the roadway and shall be so constructed as to lead all of the water from the road to the nearest outlet, unless otherwise provided by the profile and directed by the engineer.

WALK.

The grade line (the red line) of the profile shows the grade of the finished surface grade of the roadbed, and the top or finished surface of the roadway shall be built to conform to said grade line and to the sub-grade line, setting into and filling of the ditches shown on said profile. However, at the rate of discrepancy between the rate and fall as shown on the profile, and the rate and fall necessary to bring the finished surface grade to the grade line established by setting the required cut or fill, as whatever may be required, if anything, at both ends of a continuous grade, such continuous grade to be established between the breaks. After the grading is completed the roadbed shall be rolled with a roller (12) ton stone or portable road roller until the same is well and subject to the acceptance of the Engineer. All cuts or springs shown on said grade to be excavated and filled with gravel or stones and rolled until the sub-grade is well and subject and conform to the sub-grade.

The surface of the sub-grade shall agree and conform to the various cross sections shown on the profile and drawings to be constructed with sub-grade. The sub-grade to be eight and one-half (8 1/2) inches below the finished surface of the roadway when completed.

As the finished surface shall agree with the tabulated grade as shown on the profile, if in excavating or rolling the stone the same be greater or less than the sub-grade additional stone shall be placed. However, sufficient to bring the finished surface to the finished surface grade as shown on the profile.

The construction shall complete the grade and the same shall be rolled and accepted by the engineer before material is placed on, or any part thereof and the Contractor shall keep the roadbed perfectly smooth and subject to the acceptance of the Engineer.

CONCRETE.

All work shall be completed to a width of twenty (20) feet at the sub-grade. The slopes of all work shall be one (1) to one (1).

CONCRETE.

All sub-structure on right shall be twenty (20) feet at the sub-grade and the width shall have a slope of one (1) to one and one-half (1 1/2). The Contractor shall make every application to all surrounding highways, and shall replace all structures

intersections or cross overs where those already in place have to be raised or lowered.

An allowance of ten per cent must be made for shrinkage on all fills of more than twelve (12) inches.

SURPLUS DIRT.

The Contractor will be required to haul all surplus dirt to the hollow at the East end of Marion Street in Danville, Indiana, or to any other points on public highways of like distances as the Engineer may direct.

RETAINING CURBS.

Concrete retaining curbs shall be constructed 24 inches deep and 6 inches thick to hold the Macadam in place at all places where the roadway is not bounded by curbs. Said curbs to be flush with the finished surface of the roadway and rounded with the same radius as the roadway. Expansion joints to be placed at such intervals as directed by the Engineer. The grade at the sides of the retaining curbs shall be rounded off to a distance of six feet from such curbs.

The Concrete shall be as hereinafter provided.

CEMENT. All cement shall be inspected.

Cement may be inspected either at the place of manufacture or on the work.

Any cement on the work without the stamp of the Board or Engineer shall be rejected.

General Conditions: In order to allow ample time for inspecting and testing, the cement shall be stored in a suitable weather-tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment.

Every facility shall be provided by the contractor and a period of at least twelve days allowed for the inspection and necessary tests.

Cement shall be delivered in paper bags or barrels with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain 94 pounds of cement net. Each barrel of Portland cement shall contain 4 bags.

Cement failing to meet the seven-day requirements may be held awaiting the results of the twenty-eight day tests before rejection.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, presented to the Society, January 21, 1903, and amended January 20, 1904, and January 15, 1908, with all subsequent amendments thereto except that the specific gravity of the cement shall be taken in a pycnometer.

The acceptance or rejection shall be based on the following requirements:

Portland Cement. **DEFINITION**—This term is applied to the finely pulverized produce resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials, and to which no addition greater than 3 per cent. has been made subsequent to calcination.

Specific Gravity. The specific gravity of the cement, dried at 212° F., shall not be less than 3.10.

Fineness. It shall leave by weight a residue not more than 8 per cent. on the No. 100, and not more than 25 per cent. on the No. 200 sieve.

Time of Setting. It shall not develop initial set in less than thirty minutes; and must develop hard set in not less than one hour, nor more than ten hours.

Tensile Strength. The minimum requirements for tensile strength for briquettes one inch square in section shall be the following, and shall show no retrogression in strength within the periods specified.

Age	Neat Cement	Strength
24 hours in moist air	- - - - -	175 lbs.
7 days (1 day in moist air, 6 days in water)	- - - - -	500 lbs.
28 days (1 day in moist air, 27 days in water)	- - - - -	600 lbs.

One part Cement, three parts Sand

7 days (1 day in moist air, 6 days in water)	200 lbs.
28 days (1 day in moist air, 27 days in water)	275 lbs.

In no case shall the increase in strength be less than 20 per cent. over the strength shown at 7 days.

Constancy of Volume. Pats of neat cement about three inches in diameter, one-half inch thick at the center, and tapering to a thin edge, shall be kept in moist air for a period of twenty-four hours.

(a) A pat is then kept in air at normal temperature and observed at intervals for at least 28 days.

(b) Another pat is kept in water maintained as near 70° F. as practicable, and observed at intervals for at least 28 days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five hours.

These pats, to satisfactorily pass the requirements, shall remain firm and hard and show no signs of distortion, checking, cracking, or disintegration.

Sulphuric Acid and Magnesia. The cement shall not contain more than 1.75 per cent. of anhydrous sulphuric acid (SO_3), nor more than 4 per cent. of magnesia (MgO).

CONCRETE. In preparing the concrete, the cement and aggregate shall be measured separately, volume loose, and then mixed in such proportions that the resulting concrete shall contain one (1) part Portland Cement, two (2) parts fine aggregate and three (3) parts coarse aggregate. The coarse aggregate shall be sound gravel or broken stone having a specific gravity of not less than 2.6. It shall be free from all foreign matter, uniformly graded and of size that will pass a 1-inch screen and be retained on a 1-4 inch screen. The fine aggregate shall be clean, sharp sand, free from mica, clay, loam or other foreign matter, in excess of five (5) per cent, and shall be of graded sizes, ranging from 1-8 inch down to that which will be retained on a No. 80 Standard sieve.

MIXING. The ingredients of the concrete shall be thoroughly mixed dry, then sufficient water added to obtain the desired consistency, and the mixing continued until the materials are uniformly distributed and each particle of the fine aggregate is thoroughly coated with cement and each particle of the coarse aggregate is thoroughly coated with mortar.

All materials must be proportioned dry and then deposited in the mixer, or on the mixing board, all at the same time. The mixer must produce a concrete of uniform consistency and color with the stones thoroughly mixed with the water, sand and cement. Batch mixers only may be used, continuous mixers will not be allowed.

The materials shall be mixed to produce a concrete of such consistency that the water will flush to the surface under tamping. This consistency may be varied if required by the Board or Engineer. Re-tempering, that is, remixing with additional water, mortar or concrete that has partially hardened will not be permitted.

When in place, all wheeling, work or walking on it must be prevented until it is sufficiently set; and, if the Board or Engineer shall require it, the Contractor must keep the freshly laid concrete covered with wet canvas or tarpaulins to protect it from the sun.

MACADAM.

First class Mitchell limestone shall be placed on said road from curb to curb, unless a concrete retaining curb is provided on the profile and drawings and in the event of an additional curb being provided to narrow the part thereof to be permanently improved from such retaining curb to that on the opposite side. At such parts of the highway as no curbs are now thereon the macadam shall be 18 feet wide bounded by concrete retaining curbs, provided by these specifications.

FOUNDATION STONE.

The foundation or bottom course shall be six (6) inches thick, after being compressed with a 12 ton steam or gasoline road roller, composed of crusher run first class Mitchell limestone passing a 2 1/2 inch ring and not less than 70 % must pass through a 2 1/2 ring and be retained on a 1 inch ring. The stone shall be evenly spread upon the road-bed, so that after it has been thoroughly rolled and made to conform to the Cross Sections it will be 2 1/2 inches below the finished surface grade, and the top surface of the foundation or bottom course shall be smooth, even and parallel with the finished surface. The foundation or bottom course shall be "puddled" while being rolled, and as much screenings added as is necessary to fill all voids.

WEARING SURFACE.

The wearing surface or top course shall be first class Mitchell limestone 2 1/2 inches thick, after being compressed with a 12 steam or gasoline road roller, composed of crushed stone passing a 2 1/2 inch ring mixed with that passing a 1 inch ring, as they leave the screen, by being run into the same bin as both sizes come from the crusher. No water to be used in this layer. Fine stone chips, or screenings free from dust, shall be scattered in this layers with shovels on top of this 2 1/2 surface, rolling at the same time so the chips will settle into the larger voids, thus making a firmer surface.

BINDING MATERIAL.

On the wearing surface, which must be perfectly dry, there shall then be applied the binding and waterproof material known as "Pioneer" Road Asphalt produced by The

American Asphaltum & Rubber Company of Chicago, Ill. (or an asphalt or any other binder equal thereto), Should an asphalt binder be used the same shall conform to the analysis given below, poured at a temperature between 300° F. and 325° F. and Two (2) gallons of asphalt to the square yard shall be used. When the asphalt has been applied for a distance of about 25 feet, fine stone chips or screenings free from dust, shall be spread thinly over the hot asphalt and immediately followed by rolling with a 12 ton roller. Two men with brushes or brooms shall follow the roller and sweep the loose screenings onto places where the asphalt shows through, until the asphalt has taken up all the screenings it will hold. The portion of roadway, thus finished any one day may be opened up to traffic the following morning. No asphalt shall be applied when the weather is below 32° F.

ASPHALT ANALYSIS.

The asphalt must conform to the following analysis: Specific gravity at 60° F., not lighter than .965. Bitumen soluble in carbon bisulphide not less than 99.0 per cent. Petrolene soluble in petroleic ether from 75 to 82 per cent. Inorganic matter or ash less than 1 per cent. Fixed carbon by ignition not over 10 per cent. Weight per gallon approximately 8 lbs. It shall not be brittle at 32° F. Penetration at 77° F., 100 grams, No. 2 needle, 5 seconds, from 200 to 250 degrees Dow Machine; at 32° F., 100 grams No. 2 needle, 5 seconds, not less than 45 degrees Dow Machine. After evaporation test referred to below, character of residue shall be smooth. As per tests recommended by the American Society of Civil Engineers, it shall also meet the following requirements:— Loss at 350° F., for 7 hours, not over 4 per cent. Melting point not over 150° F. Paraffine, not over 3 per cent.

HEATING AND POURING APPARATUS.

A 500-gallon "Pioneer" Road Asphalt heater and four ordinary sprinkling cans with spouts having a circular opening 1 inch in diameter shall be used, or such other apparatus as the Engineer may approve.

ESTIMATES.

The Contractor will be entitled to estimates as provided by the statute, and payment will be made at such time as may be ordered by the Board, provided that no payment shall be made for more than eighty per cent of the Engineers estimate of the work done by the Contractor, nor shall the whole amount of the contract price be paid until the road shall have been received as complete in all its details.

GENERAL SPECIFICATIONS

Public Work for Hendricks County in the State of Indiana

1. INTENTION. It is intended that the specifications and the accompanying drawings shall provide for a complete and finished improvement of the kind contemplated in every particular. These General Specifications shall be used in connection with, and be considered a part of, all detail specifications; and the specifications shall be considered a part of the contract or obligation.

2. BOARD. The word "Board" as used in these specifications, refers to the Board of Commissioners of Hendricks County, Indiana, the representative in this contract of the County of Hendricks. Whenever the words "The Board" are used in the specifications, they shall be understood as referring to the aforesaid Board of Commissioners.

3. ENGINEER. Wherever the word "Engineer" is used in these specifications, it shall be understood as referring to the County Civil Engineer of the County of Hendricks. In case of the absence of the Engineer, or in case he shall so direct, the powers and duties herein assigned to him will devolve upon his assistants or inspectors, duly appointed by the Board of Commissioners.

4. CONTRACTOR. Wherever the word "Contractor" is used it shall be understood as referring to the person, firm or corporation who shall enter an agreement to execute and perform the work, or any part thereof, as herein specified and contemplated, or to the authorized representative of said person, firm or corporation.

5. MEANING OF SPECIFICATIONS. In case the specifications or drawings are deficient in any part, or not clearly expressed, bidders desiring to submit propositions shall apply to the Engineer for information before submitting their propositions. Bidders must examine for themselves the location of the proposed work, and exercise their own judgment as to the nature and amount of work to be done. If it be found that anything has been omitted or misstated, which is necessary for the proper performance and completion of any part of the work contemplated, in accordance with the spirit of the plans and specifications, the contractor will be required to execute and perform the same, as though fully and correctly stated, and the correction of any error or omission shall not be deemed to be in addition to, or deviation from, the work herein contracted for. The contract for this work comprises the formation, construction, completion, and maintenance of the several works referred to in the plans, profiles, drawings, and specifications. The several parts of this contract shall be taken together to explain each other, and to make the whole consistent.

6. DISAGREEMENT. Should any discrepancies appear or misunderstanding arise as to the meaning of the contract or of the Specifications, Plans, Profiles or Drawings, or as to the quality or quantity of the materials, or as to the proper execution of the work, or as to the measurements or valuation of any works executed or to be executed under the contract, or as to extras thereupon or deductions therefrom, the same shall be determined by the Engineer or Board; and the contractor shall immediately, when ordered by the Board or Engineer, proceed with and execute the work according to such decision, and with such additions to or deductions from the contract price as are provided for under Section 26 of the General Specifications.

7. STAKING OUT WORK. The work to be done under this contract will be staked out by the Engineer or his assistants. The Contractor shall give the Engineer at least thirty-six hours' notice in writing before requiring stakes to be set on any portion of the work, and he shall clearly state in such notice the exact locality or localities where such stakes are needed for immediate use. He shall also give the same notice to all authorized Inspectors, Superintendents, or other persons in charge. Any work done contrary to the provisions of this section must be taken up and rebuilt immediately upon the order from the Board or Engineer. The Contractor must satisfy himself before commencing work as to the meaning and correctness of all stakes and marks, and no claim will be entertained by the county for or on account of any alleged inaccuracies, or for alterations subsequently rendered necessary on account of such alleged inaccuracies, unless the Contractor notifies the Engineer thereof in writing before commencing to work therefrom. The Contractor will be held responsible for the preservation of all such stakes and marks in their proper positions, and in case any of them are lost or destroyed after having once been given, he shall at once notify the Engineer in writing, and all expenses incurred by the County in replacing the same shall be charged against the Contractor, and the Engineer shall report the same to the Board for collection, and it shall be paid by the Contractor before completion and final acceptance of his work. As the stakes and marks will not in all cases represent all the grades, lines and angles and changes of surface in the finished work, the Contractor must be careful to see that they are taken in connection with the Plans, Details, Specifications and Engineer's directions, except when he may discover errors in the same, in which case he shall at once discontinue work thereon until such errors are rectified, but no claim shall be made or allowed on account thereof, or on account of any delay occasioned thereby.

8. ASSISTANCE. The Contractor is to furnish the Engineer or any of his assistants with any reasonable assistance which he or they may require at any time, to help in driving stakes, or in laying out the work. He shall also furnish the said parties or any of the Inspectors with all required assistance to facilitate thorough inspection or culling over or removing defective materials, or for thorough examination into any of the work performed, or for any other purpose required in the discharge of their respective duties, for which service no additional allowance will be made.

9. INSPECTION. The Board of Commissioners may appoint such Inspectors as it may deem necessary, who shall be paid by the County of Hendricks and who shall be on the work at all times and report to the Board.

Whenever the Contractor fails to complete the work herein specified within the time named he shall pay the wages of such Inspectors at the rate of \$2.50 per day for each Inspector from the above specified time to the completion of the work, and said amount shall be paid to the County of Hendricks before the final acceptance by the Board.

10. INCOMPETENT OR DISORDERLY PERSONS. Inspectors are required to see that all the provisions of the contract and specifications are faithfully adhered to, and to report to the Board or Engineer any failure on the part of the Contractor so to do. The Board or Engineer shall have the authority to dismiss from the work any superintendent, workman or other person, employed by the Contractor, who shall refuse or neglect to obey the instructions of the Board or Engineer in anything relating to the work, or who shall perform his work in any manner contrary to the specifications or directions of the Engineer, or who shall be deemed by the Board or Engineer incompetent or unfaithful. The Contractor shall also, on the demand of the Board or Engineer, discharge from the work any drunken, disorderly, insolent, or otherwise disagreeable person, and shall not again employ him on the work without the consent of the Board or Engineer.