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Cost of brick pavement constructed

William McElroy

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COST OF BRICK PAVEMENT CONSTRUCTED

BY

William McElroy

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A

T H E S I S

submitted to the faculty of the

SCHOOL OF MINES AND METALLURGY OF THE UNIVERSITY OF MISSOURI

In fulfillment of the work required for the

D E G R E E O F

ENGINEER OF MINES

Rolla, Mo.

1912

Approved by *Oliver G. Harris*

14249

July 10th, 1911.

Hon. Mayor and Council,
City of Ft. Scott, Kans.,

Gentlemen:-

Herewith are approximate estimate of the cost of improving
N. Judson street as per resolution.

TAXABLE TO CITY AND PROPERTY.

	Cu. yds.	Rate.	Amount.	No. sq. yds.	Rate?	Amount
	Earth			Paving.		
Block 67-68	285	.30		867	\$1.21	
" 26-66	290	"		867		
" 45-46	150	"		867		
Intersection Pine street	110	"		360	\$1.21	
	<u>835</u>	"	\$250.50	<u>2961</u>	"	\$3582.81
			Profit and Eng.	120/o		459.99
						<u>\$4293.30</u>

$$\frac{\$4293.30}{\text{cu. yds } 2961} = \$1.45 \text{ per sq. yd.}$$

Total cost of improvement,		
2961 sq. yds. Pavement at \$1.45 =		\$4293.30
Property 1800' curb and gutter at .51 =		918.00
City 158' curb and gutter at .51 =		80.58
		<u>\$5291.88</u>

Estimated cost of 1 sq. yard Pavement.

Grading	.085
Brick	.710
Base	.32
Cushion	.08
Laying	.05
Filler	.02
Rolling	.01
Bond Headers & water	.02
	<u>\$1.295</u>
+ 120/o	.155
	<u>1.450</u>

Respectfully,

C. R. Risher,
City Engineer,
July 10th, 1911.

Subscribed and sworn to before me this 10th
day of July, 1911.

G. N. Sanford, City Clerk.

Dec. 27th, 1911

Hon. Mayor and Council,
City of Ft. Scott, Kans.,

Gentlemen:-

Herewith a final estimate on the cost of improving N.
Judson Street from Wall Street to Elm Street as per resolutions.
Chargable to Property Owners.

Block.	No. lineal ft. curb.	Rate.	Amount	No. sq. yds. Pavement	Rate.	Amt.	Total
Block 67 & 68 City	603	.49	\$295.47	871	1.43	\$1245.53	\$1541.00
Block 65 & 66 City	602	.49	294.98	869.5	"	1243.38	1538.36
Block 45 & 46 City	602	.49	294.98	869.5	1.43	1243.38	1538.36
City at large for intersection of Pine Street.	158	.49	77.42	363.0	1.43	519.09	596.51
	<u>1965</u>	"	<u>962.85</u>	<u>2973.0</u>	1.43	<u>4251.38</u>	<u>5214.23</u>
							20.00=D
						Bond issue	\$5234.23
						Eng. less 2%	104.68
							<u>5129.55</u>

due contractor
when work is ac-
cepted.

Yours truly,

C. R. Fisher,
City Engineer.

Subscribed and sworn to before me this 27 day of December, 1911.

G. N. Sanford,
City Clerk.

We bid \$1.43 / square yard complete, brick street and 49 cts. / lineal ft. curb and gutter. We thought we could do the work for prices as follows:

Brick per square yard delivered on the job 72 cts.

Cost of brick at plant 66cts. / squareyard.

Cost of brick hauled 5⁺ cts. / square yard, or \$1.25 M.

Crushed stone- to comply with specifications was delivered on the job at \$1.25 / cubic yard; this price to include the necessary yardage of chats for the curb and gutter.

Sand- Kaw River sand f.o.b. cars at Topeka, Kansas, 15 cts. / ton with 4 cts. freight rate to Fort Scott, made sand cost 95 cts. / ton f.o.b. Fort Scott. We figured all our sand at \$1.05 / ton account of dirt weight and leakage of cars.

Cement-Hydraulic- purchased at the Ft. Scott mill at 55 cts. per bbl.

3 sacks of 88 lbs. / bbl.- Hauling we added 1 ct. / sack, but found later that 5 cts. / bbl. was more correct.

Concrete in place. 1 -2-5 concrete / cubic yard as follows:

Rock, \$1.25; rock run about 40% voids

Sand, .80

Cement .60

Mixing .35

3.00 one cubic yard to lay 9 square yards or 33 cts. /

square yard of base concrete in place.

Grading. On looking over the job we could see that most of the excavated would be moved with slips; hence bid 25 cts. per cubic yard to move.

Sand Cushion. 2" sand cushion would run 18 square yards per cubic yard delivered on job, or 9 cts. per square yard for filler and cushion.

Laying Brick. Contracted with local brick setter at 3 cts. per yard.

Rolling,- 1 ct. per yard, based on previous cost when I worked for the city.

Total per square yard.	Brick	\$.72
	Concrete base	.33
	Grading	.08
	Sand Cushion	.09
	Laying,	.03
	Rolling	.01
		<u>\$1.26</u>

to the above amount per yard must be added cost of lands and engineering or 3 cts. per yard, making a total of \$1.29 per yard, cost we added 1 ct. making it \$1.30 to cover any error; allowing 10% profit; and adding we have \$1.43 per yard which we bid.

Concrete curb and gutter. Our bid of 49 cts. figured as follows:

Each linear ft. contained approximately 1.5 cubic ft. this to include all wastage and probability of freezing etc.

Concrete per cubic yard, 1-2-4 mix.

Cement	\$.87
Sand	1.00
Chats	1.25
Mixing	.50
	<u>3.62</u> or approximately 20cts.

per foot to which must be added 12 cts / foot for finishing and form setting, making 32 cts. / ft. cost ; adding 20% profit made it 48 cts. and for emergencies we added another cent and made it 49 cts. per ft.

Wages.- Cement finishers \$.50 per hour.
Concrete mixers .22 " "
Common labor .19 -.20 per hour.
Foreman .25 -.30 " "
Teams with own wagon and slips.40 -.45 " "

The above estimate in operation.

Grading.-In first block cost / cubic yard to move all dirt \$.13 1/2
In second block; dirt 18 cts. and shell rock about 66 cts./ yd.
In third block- mostly fill 10 cts. / yard.
Our estimate for entire grading \$208.00 was reduced to \$172.00 showing a profit of \$36.00. This grading also included the excavation in the rough for our curb and gutter.

Concrete.- In basing street, cost of material was same, but in mixing we used a No. 14 Coltrin Continuous Gasoline Power mixer which turned out 10 cubic yards per hour at a cost of \$2.73 labor and 2 cts. per hour oil and gasoling, or \$2.75 per cubic yard concrete in place; this gave us \$.075 per cubic yard profit or \$24.75 total.

Brick, cost as above \$.66 per square yard on the job.

Laying contract.03 " " "
Hauling .05+ " " " or total \$.72 per yard.

Rolling.- Sub-grade and brick done with a 3 ton horse roller at \$.05 per yard. Specifications call for 10 ton roller but we were allowed to use the lighter one account being unable to rent one as city engineer assured us we would be able to do.

Concrete curb and gutter.- Material cost as above, but by using our mixer we reduced the cost of mixing to 31 cts. per cubic yard. The increase of cost of mixing for curb and gutter over cost of mixing concrete for base was due to frequent stopping of men on account of being to far ahead of the finisher.

The total job contained 2973 square yards of pavement at \$1.43 per square yard and 1965 feet of curb and gutter at 49 cts. per ft. or a total of \$5214.33 to which an extra \$20.00 was added for concrete water way and from the above total \$104. 68 was subtracted to cover engineering expense per contract; leaving \$5129.55 due us.

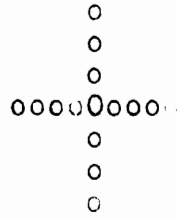
Our books show we spent \$4519.50 on this job leaving us a profit of \$610.05. In figuring our cost mark we forgot to add the cost of our Maintenance and our Indemnity bond \$750.00 and \$2000.00 costing \$12.50 and \$39.00 respectively.

We were three months doing the work, all of which was done under my direct supervision. Plans, specifications, contract, bonds, and under which our work was done are attached; also the City Engineer's approximate and final estimates of the work.

Respectfully Submitted.

Signed:-

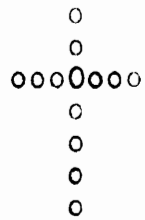
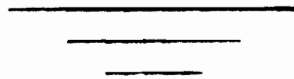




S P E C I F I C A T I O N S

NORTH JUDSON STREET

Wall St. to Elm. St.



S P E C I F I C A T I O N S.

FOR IMPROVING North Judson Street.

FROM North line of Wall Street

TO South line of Elm Street.

Requiring approximately the following quantities upon which bids must be submitted.

Resetting old curb lineal feet

Concrete Curb and gutter combined ---1958 ----- " "

Earth cutting to include all rock --- 835 ---- Cubic yards

Complete pavement with sand filler --2961 ---- square yards.

Unless otherwise specified, the price bid per square yard for complete pavement must include all cost of cutting, filling and grading that may be necessary to bring the roadway to the proper sub-grade.

FORM OF BID.

Complete pavement with sand filler \$ _____ Per Sq. yard.

Concrete combination curb and gutter \$ _____ " lineal ft.

INSTRUCTIONS TO BIDDERS.

1. Proposals under different names will not be received from one firm or association.

2. Each bidder will be required to deposit with the city clerk of the City of Fort Scott, to the credit of the said city, a certified check of deposit of five (5) per cent of the proposed contract; and in no case to be less than fifty (\$50.00) dollars, as a guarantee that he will enter into the contract if it is awarded to him, accord-

to the terms of his bid, within five (5) days after the certification of the award.

3. In all bids made by a firm, the individual names of the members of the firm must be written out and signed in full, giving the christian names. But the signers may, if they choose, in addition, describe themselves as doing business under a given name and style, as firm.

4. The place of residence of every bidder, with the county and state, must be given after his signature, which must be written in full.

5. Any one signing a proposal as the agent of another or others must file legal evidence of his authority to do so.

6. Bidders must present satisfactory evidence that they have been regularly engaged in the business of laying brick pavements, or are reasonably familiar therewith, and that they are fully prepared with the necessary capital, materials and machinery to conduct the work to be contracted for to the satisfaction of the city council.

7. Samples of paving brick and curbing shall accompany each bid; each sample shall be plainly labelled with the date of bid, name of bidder, and the place from which it was brought. Such samples will not be returned to the bidders, but will under all circumstances be retained by the city, whether bids are accepted or not. No proposals for paving or curbing will be considered or accepted if not accompanied by samples.

8. No bids will be accepted from any persons or firm who is in arrears to the city of Fort Scott, upon debt or contract; who is in default as security or otherwise upon any obligation to the city of Fort Scott; who has failed to comply with the requirements of the specifications and fulfill his contract.

9. No bid will be accepted which does not contain an adequate or reasonable price for each and every item named in the schedule of quantities.

10. The city council of the City of Fort Scott reserves the right to reject any or all bids, or part of bids, which may not be advantageous to the city, or to accept bids separately as to curbing, filling, grading, or paving, or to accept any bid in the aggregate.

11. All prices must be written in full as well as expressed in figures.

12. Proposals should be addressed to the City Clerk, Fort Scott, Kansas, and endorsed "Proposals for curbing, grading, and paving in the City of Fort Scott."

13. Proposals must be made in full conformity with all specifications. A failure to comply with any of the above instructions will be considered as sufficient grounds for rejecting any bid, but the right is reserved to waive such defect.

14. Unless otherwise specified, the price bid per square yard for finished pavement must include all costs of cutting, filling, and grading that may be necessary to bring the roadway to the proper sub-grade.

GRADING.

The road-bed on which the pavement is to rest shall be graded as directed by the city engineer, to the depth below the intended surface of the street, in accordance with stakes set by him.

The surface of such road-bed shall be paralled _____ (_____) inches below and shall conform to the cross section of the pavement when finished. The rough grading shall be done in any manner the contractor may choose, but the earth shall be left above the proposed sub-grade enough to allow for rolling. After this is done the city engineer will set stakes every fifty (50) feet in the center of the street, or at the curb line, and at such other places as he may deem necessary. The contractor shall then stretch lines from these several stakes as directed by the city engineer, and then proceed to dress down or fill up to a true surface as may be required by the engineer, and in case the surface after being rolled, shall be found one (1) inch below the true surface of the sub-grade then the contractor will be required to fill up to such a height as the engineer shall direct; sufficient to allow for settlement of the ground. Then it shall be rolled again, the grade stakes reset, lines again stretched as directed by the engineer, and the surface dressed down or filled up; when it shall again be rolled until the surface of the road-bed shall be true to surface and the proper sub-grade; the rolling to be done by the contractor under the direction of the engineer.

Such portions of the road-bed that cannot be reached by the roller shall be made solid by ramming, and all soft, spongy places not

affording a firm foundation shall be dug out by the contractor, who shall have the contract for grading and all trenches shall be filled with good dry earth obtained as directed.

In all places where filling is required to bring the road-bed up to the required height, it shall be done in layers not to exceed then (10) inches in depth and shall be rolled as often as the engineer may deem necessary.

All surplus material taken from the street shall be hauled by the contractor to any place the city engineer may direct, and when hauled by the contractor more than two thousand (2000) feet, the contractor shall be allowed one (1) cent per cubic yard for each one hundred (100) feet in excess of two thousand (2000). The contractor shall be required to do all the dumping and spreading of the dirt at the place of destination, and to finish dump to grade stakes if required by the engineer.

Grading will be paid for by the cubic yard at the price named in the contract. It will be measured by excavation only. The price per cubic yard shall include all trimming, shaping, refilling, picking down and surfacing, necessary to bring the surface to a complete road-bed, to include all rolling and re-rolling required to bring the sub-grade to the surface required, and to include all and every other expense for carefully stretching lines as directed by the engineer and all other expenses directly or indirectly connected with the proper performance of the work, and maintaining the same in perfect condition until the same is received by the engineer and by him turned over to the paving contractor.

When the engineer shall order an excavation made below the sub-grade for the purpose of removing mud, clay or other soft material, work so ordered shall be done by the contractor and the same filled up with dry earth, obtained where the engineer may direct, and all tamped thoroughly and made firm and secure. The excavation and filling will be paid at the price per cubic yard stated in the contract.

The contractor will bid with the express understanding that he must use all necessary precaution in preparing the sub-grade so as to support the pavement permanently, and so that the pavement shall remain at the original grade for a period of five (5) years.

This clause will not be waived on account of any trenches or holes made in the street prior to the laying of the pavement, by any corporation or private party.

No material will be at the contractor's disposal. All lumber, paving, bricks, stone flagging or drain tile composing the present cross-walks or gutters, that may in the opinion of the city engineer, be suitable for use by the city, shall by the contractor be removed and deposited uninjured within three hundred (300) feet of the place of excavation.

The contractor will be held liable for any damage to houses, fences, side-walks, curbing, trees or shrubbery, which he may in any way injure or destroy, and any damage done by the contractor shall be deducted from the estimate of the city engineer. And in case that suit for damages is brought before the final estimate is given, then the contractor and his sureties shall be held for such damages, and the city is in no way to become liable for the acts of the contractors.

CONCRETE FOUNDATION.

Upon the earth foundation as specified, a layer composed of the best grade of Hydraulic Cement, river sand and crushed limestone shall be spread to a uniform thickness of four (4) inches.

The Cement shall be of the best quality. The contractor shall state in his proposal the brand of cement he proposes to use. All cement shall be delivered on the work in original packages, bearing the name, brand or stamp of the manufacturer.

The sand shall be clean river sand, free from loam adherent to the sand grains and shall be screened when deemed necessary by the city engineer.

The crushed stone shall be sound, clean, hard limestone, free from clay dirt or other foreign matter and broken so that the greatest dimension shall not exceed two and one-half (2-1/2) inches and be not less than one-half (1/2) inch.

The concrete shall be composed of one (1) volume of cement, two (2) volumes of sand and five (5) volumes of broken stone. The unit of measure in mixing being one bay of cement, weighing eighty-eight (88) pounds equalling one (1) cubic foot of loose cement. Each barrell of cement shall contain three (3) bays net weight.

The concrete shall be prepared in suitable portable boxes and shall be formed by first thoroughly mixing the proper proportions of cement and sand together dry, to which only a sufficient amount of clean water shall be added to produce a mortar of proper consistency when thoroughly worked. to this mortar the proper proportion of wet stone shall be added, and mortar and stone quickly and thoroughly mixed and turned at least twice until each stone is completely covered with mortar. The concrete

shall be promptly deposited in place upon the sub-grade and shall be rammed until the mortar flushes to the surface of the concrete, which surface shall conform to a plane parallel to five and one-half (5-1/2) inches below the finished surface of the pavement. During the progress of the work the sub-grade must be kept moist.

The concrete shall be properly protected until, in the opinion of the city engineer, it is sufficiently set, and not until such time shall a pavement be laid thereon.

Concrete shall not be laid when the temperature is such as, in the opinion of the city engineer or the city council, to injure the quality of the concrete.

The concrete shall extend close up to all openings, projections or irregularities, and be finished about the same in a neat and workman like manner.

If a machine is used for mixing the concrete, the above operation may be varied as may be required. No concrete shall be used that has been mixed more than one half (1/2) hour.

OAK HEADERS.

Between the curb lines of an intersecting street that is unpaved, and across alleys at property lines the concrete and pavement shall be finished against a white oak plank, three (3) inches thick and twelve (12) inches deep and of such lengths as the city engineer may designate, properly supported by six (6) inch split cedar posts two (2) feet in length, firmly set in the ground and spaced not more than six (6) feet to the finished surface of the street. All headers shall be constructed by the paving contractor without extra charge.

Where the new pavement adjoins any pavement already laid, the city engineer may require the contractor to remove and relay a sufficient amount of the old pavement to form a satisfactory connection between the two pavements.

SAND CUSHION.

Upon the concrete foundation shall be spread a layer of sand in such quantity as to insure, when compacted, a uniform thickness of two (2) inches.

On surfacing said layer of sand the contractor shall use such guides and templets as the city engineer may direct.

WEARING SURFACE.

Upon the layer of sand as above specified shall be placed the brick of such quality and in such manner as hereinafter specified.

QUALITY OF BRICK.

The paving must be of the best quality of Vitrified brick, of uniform dimension, true in form and especially made for street paving purposes. The Vitrified brick shall not be less in size than 2-3/8 inches by 4 inches by 8 inches with round edges of a radius of 3/8 of an inch.

Three samples of each kind of brick bid upon, duly labelled, showing names of bidder and commercial name of the brick shall accompany all bids.

The brick shall be free from lime and other impurities, shall be as nearly uniform in every respect as possible and shall be burned so as to secure the maximum hardness, so annealed as to reach the ultimate degree of toughness and thoroughly vitrified so as to make a homogenous mass.

The bricks shall be free from all laminations caused by the process of manufacture and free from fire cracks or checks of more than superficial character or extent. All bricks distorted in burning or with such prominent kiln marks as to produce an uneven pavement shall be rejected. No lot of bricks shall differ in color from that of the samples furnished.

No bats or broken bricks shall be used except at curb, where a half paving brick must be used to break joints. It is thoroughly understood that no brick which is chipped or broken shall be allowed in the contract.

The brick may be inspected at the plant, at the cars, or on the ground where the paving is to be laid, and if many brick in any load would not stand inspection, the whole load shall be moved from the contract at the contractor's expense.

The City of Fort Scott reserves the right to subject any samples of brick or any brick delivered on the street to such tests as may seem best to the city engineer or his representative. All bricks and material shall be subjected to, the approval of the city engineer and any bricks found laid in the pavement not up to the standard quality shall be taken up and removed by the contractor at his expense when required to do so by the city engineer.

METHOD OF LAYING.

All brick shall be delivered on the work in barrows, and in no case will teams be allowed on the streets before the wearing surface is rolled.

The brick shall be laid on edge, close together in straight lines across the roadway, between curbs, and at right angles to the curb and perpendicular to the street. The courses must be kept straight with a

maximum variation of two (2) inches. All joints must be broken by a lap of at least three (3) inches.

On intersections and junctions of lateral street the bricks shall be laid at an angle of forty-five (45) degrees with the line of the street unless otherwise ordered by the City engineer.

The bricks when set shall be swept clean and then shall be rolled with a steam roller, weighing not less than six (6) tons or more than ten (10) tons in accordance with the directions given by the city engineer.

After rolling, the pavement must be inspected for broken or cracked bricks, and all such removed to be replaced by sound bricks.

The pavement shall then be covered with clean sand and swept and rubbed until all joints are filled. One (1) inch of sand is to be evenly spread over the pavement and left thereon.

CONCRETE CURBING AND GUTTERING.

The curb, gutter and combined curb and gutter shall be constructed to the form and dimensions given on the plans, and heretofore approved by the city council. The curb shall be constructed in the most workman-like manner of concrete, made of one (1) part of a proved Portland cement to two (2) parts sharp, clean sand and four (4) parts of crushed limestone by volume. This mass shall be moulded in forms provided and set in place by the contractor, and shall not be rammed until all interstices are thoroughly filled. The stone shall be of sound, hard limestone, clean and free from all dust and dirt and other foreign material, and shall be crushed in a uniform size, the greatest diameter of which shall not exceed three-fourths (3/4) of an inch and not less than one-fourth (1/4) of an inch, and be acceptable to the city engineer.

With the consent of the city engineer, a mixture of Joplin chats may be substituted for the above mixture of limestone, the Joplin chats to contain by measure four (4) parts clean Joplin chats, two (2) parts clean sharp sand, one (1) part approved Portland cement. The concrete shall be prepared in suitable boxes and shall be formed by first thoroughly mixing the proper proportion of cement and sand together dry, to which only a sufficient amount of clean water shall be added to produce a mortar of proper proportion to wet chats or limestone shall be added, and mortar and chats of stone quickly and thoroughly mixed and turned at least three times until the chats or stone is completely covered with mortar. Particular care must be taken that the concrete is well rammed and consolidated, and be entirely satisfactory to the city engineer.

Before the concrete of the curb and gutter has thoroughly set, on the exposed surface of the curb and gutter shall be spread, to the depth of one-half ($1/2$) inch, as shown in the plans, a cement mortar composed of one (1) part Portland cement and one and one-half ($1-1/2$) parts clean sharp sifted sand, the sand and cement shall be thoroughly mixed dry and enough water added to make a mortar of proper consistency. This coat of mortar shall be trowled to a uniform and even finish. Great care must be taken to have the surface lines true to the line of the grade and cross section indicated upon the plans. The curb and gutters shall be constructed to the true line and grade as established by the City engineer. The contractor must protect the line and grade staked and will be held responsible for any defective work occasioned by his negligence in this regard. The curb shall be laid continuous stones, each section to be about six (6) feet in length, as may be ordered, each stone to be en-

tirely separated from the neighboring stones at the joints by steel templets three sixteenths $3/16$ of an inch thick, and of the same length and depth as the stone is wide and thick, so that any one stone may be removed from the work without injury to itself or to the adjacent stones.

The Joints shall be smooth, straight, as small as practicable, shall be plump throughout their depth and at right angles to the line of work,

Any spalling or splitting off whatever of the finished surface of the gutter or curb either at the joints or in the body of the stone will be sufficient cause for rejection and any rejected stone must be removed and replaced by a new one immediately. No patching of any character will be allowed.

The contractor must protect the work during its construction and until the contract is completed, against the elements, or damage from any cause. The contractor agrees to allow a steam roller, weighing ten tons or more, to travel within six (6) inches of the edge of the gutter ten days after the same has been built, and to permit said roller to compace the pavement next to said gutter within twenty days after its completion, and to replace any stone that may be injured by said rolling.

The contractor hereby guarantees that said gutter and curb shall be of such perfect material and workmanship as to endure for a period of three years after the completion and acceptance of such work without showing settlement, cracks, or any other defects, and said contractor shall during the time of said guarantee remove such pieces of stone as may show any defects and substitute new stones therefor when called upon to do so by the City of Fort Scott, Kansas, and shall complete such

work of replacing defective stones within fifteen days after the issue of written notice so to do, and such new work shall, in every respect, conform to these specifications.

The contractor will be permitted to use such methods of moulding the curb into shape as may be best fitted to the work, but all fees for any patented invention, article or agreement that may be used upon or in any manner connected with said work, or any part thereof embraced in this contract or these specifications or their appurtenances, shall be included in the price stipulated in this contract for said work and the contractor must protect and hold harmless said City of Fort Scott, Kans., against any and all such fees or claims.

The corners of the curb shall be placed as directed by the city engineer. All curbs will be measured by the actual linear feet along their outer and upper edge. No extra allowance will be made for corner work or the placing of catch basins.

All curb stone set on the street that may be accepted by the City engineer that is not in line or to grade must be reset to the proper position and recut where necessary to conform to these specifications.

GENERAL STIPULATIONS.

IT IS FURTHER EXPRESSLY AGREED between the parties hereto that this contract is made subject to the conditions and stipulations which follow:-

1. The contractor will be required to know that all estimates, grades and stakes are correct, and no error on the part of the engineer, or any previous engineer, will relieve any contractor from his responsibility or to be considered as grounds for claims against the city or property or street.

2. All work herein specified, which may be fairly implied as included in this contract, of which the city council shall be the judge, shall be done by the first party without extra charge. The first party shall also do such extra work in connection with this contract as the city council may especially direct, and if it shall be of a kind for which no price is stated in this contract, such price will be fixed by the city council. But no claims for extra work will be allowed, unless the same was done in pursuance of special written orders as aforesaid, and the claims presented as soon as practicable after the work is done and before the final estimate.

3. The first party shall not assign or transfer this contract nor sublet any of the work embraced in it.

4. The first party shall commence work at such points as the city council or city engineer may direct, and shall conform to their directions as to the order of time which the different parts of the work shall be done, as well as to all their other instructions as to the mode of doing the same.

5. Whenever the contractor is not present on the work, orders will be given to the Superintendents of Overseers in immediate charge thereof, and shall be received and obeyed; and if any person employed on the work shall refuse or neglect to obey the instructions of the city engineer, or his duly authorized agents, in anything relating to the work, or shall appear to the city engineer to be incompetent, disorderly or unfaithful, the city engineer may report the same to the mayor and council

and if ordered by them, he shall be at once discharged and not again be employed on any part of the work.

6. The first party shall, upon being so directed by the city council remove, rebuild or make good, at his own cost, any work which the latter shall decide to be defective and any omission to condemn any work at the time of its construction shall not be construed as an acceptance of any defective work, but the first party shall correct any imperfect work, whenever discovered before the final acceptance of the work,

7. The first party will be required to observe all city ordinances in relation to the obstruction of streets, maintaining signals, keeping open passage way and protecting same when exposed, and to generally obey all laws and ordinances controlling or limiting those engaged on the work; and the said first party hereby expressly bind themselves to indemnify to save harmless the city of Fort Scott from all suits or actions of any description brought against said city for or on account of any injuries or damages received or sustained by any party or parties by or from the acts of the said contractor, or his servants in doing the work herein contracted for, or by or in consequence of any negligence in guarding the same, or any improper material used in its obstruction, or by or on account of any act or omission of the said first party or his servants or agents.

8. The first party further agrees that he will pay for all work and labor of all laborers, teamsters teams and wagons, employed on the work and for all material used therein.

9. In performing the work done under any contract of which these specifications may be a part, the contractor will be governed by the laws of the State of Kansas, and the Ordinances of the City of Fort Scott, Kansas, fixing eight (8) hours as a days work, and no contractor shall work his employees more than eight hours in twenty-four (24) hours.

10. All work shall be executed in the best and most workmanlike manner, and no improper materials shall be used, but all materials of every kind shall fully answer the specifications, or if not particularly specified, shall be suitable for the place where used and satisfactory to the City council.

11. All fees for any patented invention, article or arrangement or other appurtenance that may be used upon, or in any manner connected with the construction, erection or maintenance of the work or any part thereof embraced in the contract and these specifications shall be included in the price stipulated in the contract for said work and the contractor or contractors must protect and hold harmless the city of Fort Scott against any and all demands for such fees or claims.

12. The contractor or contractors shall bid with the express understanding that the work to be performed under these specifications shall be commenced not later than thirty (30) days from the time of awarding the contract for same, unless otherwise agreed upon and shall be completed on or before _____, and that since said time is an essential part of the contract which this contract may be a part, the contractor will forfeit to the city of Fort Scott the sum of twenty

(~~\$~~20.00) dollars per day as liquidation damages ~~for~~ each and every day after the ~~exp~~iration of the time limit fixed in the contract until said work is fully completed. Provided, however, that if the contractor or contractors is, or are, delayed by the city of Fort Scott, Kansas, in the commencement of the work, or if the work is suspended by order of the city authorities then the time of such delay or suspension shall be added to the time for the completion of this contract.

13. All losses or damage arising out of the nature of the work done, of from any detention or other unforeseen or unusual obstruction, or from the action of the elements, shall be sustained by the contractor or contractors, who will be required to replace all pavements, etc., without cost to the city of Fort Scott.

14. The contractor or contractors will be held responsible for any damage to water, gas or drain pipes in addition to the penalty prescribed by ordinance.

15. No final estimate or final payment shall be made herein by the council of Fort Scott, or any of its officers or agents, until the contractor ~~and~~ contractors shall deliver to the council of Fort Scott, a statement in writing, setting out fully the amount, kind and quality of the ~~several~~ materials delivered upon, used and incorporated into the work herein required to be done; said statement to be sworn to by said contractor or contractors before a Notary Public, or other officer authorized to administer oaths. It is further agreed that the city council shall have reasonable time in which to verify the accuracy of

such sworn statement before such estimate or final payment is made.

16. In the interpretation of these specifications the city council of Fort Scott, shall be final.

CONTRACTORS' BOND.

\$2000.00

MISSOURI FIDELITY AND CAUSUALTY
COMPANY

No. 8 - 427.

On Behalf of
MARTAIN AND MCELROY
TO
CITY OF FORT SCOTT AND
STATE OF KANSAS

DATED AUGUST 23d,
1911.

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C O N S T R U C T I O N A N D M A I N T E N A N C E B O N D .

XX

FOR

**CONTRACT FOR PAVING AND CURBING THAT PORTION OF JUDSON STREET WITHIN
THE CITY OF FORT SCOTT, KANSAS, BEGINNING AT THE NORTH
LINE OF WALL STREET AND EXTENDING NORTH TO THE
SOUTH LINE OF ELM STREET.**

XX

No. S-427.

KNOW ALL MEN BY THESE PRESENTS: That F. D. Martin and Wm. McElroy, both of Fort Scott, Kansas, doing construction contract business under the firm name of **Martin & McElroy**, hereinafter called the principal, and the MISSOURI FIDELITY AND CASUALTY COMPANY of SPRINGFIELD, MISSOURI, hereinafter called the Surety, are held and firmly bound unto the the City of Fort Scott, Kansas, hereinafter called the obligee, in the following obligation, to-wit:-

"OBLIGATION" (1) In the full and just sum of Two Thousand (\$2000.00) Dollars lawful money of the United States of America.

"OBLIGATION" (2) In the full and just sum of Seven Hundred and Fifty (\$750.00) DOLLARS, lawful money of the United States of America:

The respective payments of which sums and amounts, well and truly to be made, the said principal bind themselves, their heirs, administrators, their executors or assigns, and the surety binds itself its successors and assigns, jointly and severally, firmly by these presents.

SIGNED, SEALED AND DELIVERED THIS the 23d, day of August, 1911.

WHEREAS, SAID Principal did on the 7th day of August, 1911, enter into a contract with the said Obligee, for the grading, paving and curbing of that portion of Judson Street within the City of Fort Scott,

Kansas, beginning at the North line of Wall Street, and extending North to the South line of Elm Street, as set forth in said contract, which contract is hereto attached and made a part hereof:

WHEREAS, under said contract it was agreed between the said principal and said obligee that the said principal should execute a bond for the sum of Two Thousand (\$2000.00) Dollars to be approved by the Mayor and Councilmen of the City of Fort Scott, Kansas, binding said Principal to fully complete the work set forth in said contract in accordance with the specifications thereof, on or before the 15th day of October, 1911, saving, however, to said principal the benefit of any delay which may become necessary unavoidable and beyond the control of said principal and binding said principal to indemnify said City of Fort Scott, Kansas, against any and all damages that may arise on account of negligence or failure of said principal to properly guard or barricade said work, or in not placing proper danger signals at dangerous places on the line of said work, and against any and all damages of any kind and nature, which might be sustained by said City, by reason of any neglect or default, of whatsoever kind or nature, on the part of said principal in the performance of said contract, and,

WHEREAS, it is agreed in said contract between the said principal and said Obligee that said principal shall execute a bond for the sum Seven Hundred and 50/100 (\$750.00) Dollars, said bond conditioned that said principal for a period of five years from and after the date of the acceptance of said work, shall make all repairs upon the paving, curbing and guttering therein provided for which may become necessary

by reason of any imperfection in said work or material or poor or defective workmanship in putting down said material.

NOW THEREFORE THE CONDITION OF THIS OBLIGATION is as follows, to-wit:-

FIRST, That if the said principal shall faithfully perform all of the duties and obligations to be performed by it under said contract, and shall faithfully build and construct said improvement in accordance with the terms, covenants and conditions of said contract, and shall pay for all labor and material had and furnished in the building of said streets and shall indemnify the City of Fort Scott, Kansas, against any and all damages to any person or persons or corporations that may arise on account of any negligence or default of whatsoever kind, degree or extent of said principal, then the payment of Two Thousand (\$2000.00) Dollars designated in this bond as "Obligation 1", shall become void and of no effect; otherwise said obligation to remain in full force and effect.

SECOND, That if the said principal shall, for the period of five years from and after the date of acceptance of the work of building and constructing said improvements, promptly make all repairs upon the paving, curbing and guttering, so constructed under said contract, which may become necessary by reason of any imperfection in said work or material, or poor or defective workmanship in putting down said material, then the payment of Seven Hundred and 50/100 (\$750.00) Dollars, known and designated in this bond as "Obligation 2", shall become void and of no effect; otherwise to remain in full force and effect.

Provided, however, that in the event of any default on the part of said principal in the performance of any of the terms, covenants or conditions of said contract, written notice thereof with a verified statement of the particular fact, showing such default and the date thereof, shall within thirty days after such default comes to the notice of said obligee be delivered to the Missouri Fidelity & Casualty Company, at its Home Office in the City of Springfield, Missouri.

IN TESTIMONY WHEREOF, said principal has caused these presents to be signed and said Missouri Fidelity & Casualty Company, has caused these presents to be sealed with its corporate seal and attested by the signature of its duly authorized officers the day and year first above written.

MARTIN AND MCELROY. (Principal)

BY F. D. Martin
Wm. McElroy.

Attest.

G. M. Sanford,
City Clerk.

Missouri Fidelity & Casualty Co. (Surety)

BY W. L. Garrett,
President.

Attest.

Keith McLean
Secretary.

Approved as to form.

Hubert Lardner.
City Attorney.

CONTRACT FOR PAVING AND CURBING THAT PORTION OF JUDSON STREET WITHIN
THE CITY OF FORT SCOTT, KANSAS, BEGINNING AT THE NORTH LINE
OF WALL STREET AND EXTENDING NORTH TO THE SOUTH LINE
OF ELM STREET.

XX

This contract, made and entered into this 7th day of August, 1911,
by and between Martin & McElroy, as party of the first part and the
City of Fort Scott, Kansas, party of the second part.

WITNESSETH: That, whereas, the said party of the first part has
become and is considered the lowest responsible bidder for grading and
paving with vitrified brick and curbed and guttered with combination
concrete curb and gutter, according to the plans and specifications
hereto attached, and made a part hereof, upon and along that portion
of Judson Street, within the City of Fort Scott, Kansas, beginning at
the north line of Wall Street and extending north to the south line
of Elm Street.

NOW THEREFORE, the said party of the first part for the consider-
ation hereinafter mentioned, covenants and agrees to construct and
complete in a good and substantial and workmanlike manner, and in
conformity with the specifications which are hereto attached and made
a part hereof, out of good and substantial material, to be furnished
in accordance with the said specifications, the following improve-
ment to-wit:-

To grade, concrete, pave with vitrified brick and curb and gutter

that portion of Judson Street within the City of Fort Scott, Kansas, which extends from the North line of Wall Street north to the south line of Elm Street in said city.

That said party of the first part further covenants and agrees that said work shall be commenced within 10 days from the date of this contract, and that such work shall be constantly and vigorously prosecuted, and that the same shall be fully completed to the entire satisfaction of the City Engineer, the Mayor and Councilmen, and in accordance with the plans and specifications hereto attached, and made a part hereof, and the written and verbal orders and directions of said City Engineer in all respects on or before the 15th day of October, 1911, saving however, to the party of the first part the benefit of any delay which may be unavoidable and beyond the control of said party of the first part.

It is agreed and understood that the delivering of brick, curbing or other material upon and along this street to be used in the construction of said improvement, shall be construed to mean the commencement of work under this contract.

It is further agreed and understood by and between the parties hereto that the party of the first part shall forfeit and pay to the City Treasurer of the City of Fort Scott, Kansas, the sum of \$20.00 for each and every day said work is not completed after the 15th day of October, 1911.

In consideration for said work the said party of the second part promises and agrees to pay unto the said party of the first part the sum of \$1.43 per square yard for grading, concreting and paving with

vitriified brick all of that protion of Judson Street described and set out, and the sum of 49 cents per linear foot for concrete combination curb and gutter.

Provided however, that from the sum total cost of said work as shall be determined by computation in accordance with Engineer's estimate and the above schedule, an amount equal to two per cent of said total cost shall be deducted from the amount due to said party of the first part under this contract, which amount so deducted shall be retained by the party of the second part as compensation to said second party for engineering and other expenses incidental to said work.

It is expressly understood and agreed by the parties hereto that the work described as grading and paving shall be construed to include all excoavations and other work in connection with putting in concrete and placing said vitriified brick and sand and other material in place.

It is further agreed and understood by the parties to this contract that the City Engineer shall have the right at his option to stop temporarily the putting in place of any concrete at any such time or times as he shall deem in his judgment, or the weather or elements render it unsuitable for the putting in of said concrete.

Upon the completion of the entire contract and the work of this improvement, it shall be the duty of the City Engineer within 10 days therefrom to approve such work, or report to the Mayor and Councilmen the condition of such completion and improvement, and upon the said City Engineer approving said work as completed and performed under the terms of this contract, and the specifications hereto attached, and

When the Mayor and Councilmen of the City of Fort Scott have accepted such approval made by the City Engineer, and the said Mayor and Councilmen have accepted the work as completed and performed, the said party of the first part shall be paid in five per cent. Internal Improvement bonds as provided by law, the Mayor and Councilmen reserving the right to sell said bonds and pay the contractor in cash for said work.

Partial estimates, based upon the contract price, shall be made on the first of each month, certified by the said City Engineer, of the amount of work done since any previous estimate, and within 10 days after the completion of the whole work, it shall be the duty of the City Engineer to make a final estimate of the work done, and upon its approval by the Mayor and Councilmen of the said city, said party of the second part shall pay, and said party of the first part shall receive the amount thereof as full and complete compensation for the work performed under this contract.

And it is further agreed and understood by and between the said parties, that the party of the first part will be solely responsible for any and all damages and injuries sustained by any and all persons during the building and completion of said work herein provided for, that may be occasioned from, or on account of any act or default or neglect of said party of the first part, and that said party of the first part will be responsible unto the party of the second part for all costs and damages which said party of the second part may legally incur by reason of such injuries or damages.

The party of the first part covenant and agree and guarantee that the work herein mentioned shall be constructed out of such material, and in such a manner that the same will endure without need of repair for a period of 5 years from and after the date of the acceptance of the work under this contract.

Before said party of the second part shall be bound to pay any sum whatever under this contract, the said party of the first part shall execute a bond of \$750.00 to be approved by the Mayor and Councilmen, said bond conditioned that said party of the first part for a period of 5 years, from and after the date of the acceptance of such work, shall promptly make all repairs upon the payment herein provided for, or any other part of the work provided for herein, which may become necessary by reason of any imperfections in said work or material, or poor or defective workmanship in grading or putting down said materials.

Provided, however, that said party of the first part shall not be held responsible for any damage that may occur to said paving or this improvement by reason of any person being permitted to take up the same for the purpose of laying water or gas pipes, or for any other purpose whatsoever.

And whereas, said party of the first part has deposited with the City Clerk of said city a certified check for the sum of \$265.00 payable to the City Treasurer of said City;

Now if said party of the first part shall not within 10 days from the date of this contract, file with the City Clerk a good and sufficient bond, such bond to be guaranteed by a good and reliable Surety Company, in the sum of \$2000.00 additional, to be approved by

by the Mayor and Councilmen, binding said party of the first part to fully complete the work set forth and specified in the foregoing contract, and the specifications hereto attached and made a part hereof, on or before the 15th day of October, 1911, as above provided for, and binding said party of the first part to indemnify said city against any and all damages that may arise on account of the negligence or failure of said party of the first part in not properly guarding and barricading said work: in placing proper danger signals at dangerous places along the line of said work; and to indemnify said city against any and all damages by reason of any negligence of whatsoever kind on the part of said party of the first part, or employees of the said party of the first part in the performance of said work; then this check shall be forfeited to the said City of Fort Scott; otherwise said check shall be returned to said party of the first part.

IN WITNESS WHEREOF, the said party of the first part has hereunto set its hadn and seal, and the party of the second part has caused this instrument to be executed by its Mayor and attested by its Clerk with its corporate seal attached, in accordance with a resolution of the Mayor and Councilmen of said City, duly adopted on the 7th day of August, 1911.

Party of the first part,

Martin & McElroy,

F. D. Martin,
Wm. McElroy

Party of the second part,
The CITY OF FT. SCOTT, KANSAS,
By W. E. Brooks,
Mayor of the city of Ft. Scott, Kan.,

Attest:

G. N. Sanford,
Clerk of City of Ft.
Scott, Kansas.