PLANS, SPECIFICATIONS AND CONTRACT

FOR THE

ROAD BED AND TRACK

OF

THE LAWRENCE ELECTRIC RAILWAY.

1905.

SPECIFICATIONS

Classification and Approximate Quantities.

The classification and approximate quantities of the work to be performed are given in the notice to contractors. Bidders are warned that a deviation to any extent either way may be made from the approximate quantities, which are stated for the purpose of showing the class of work required and as a base for determining the amount of the bid, but not to fix the amount of work to be done. The contractor will be paid for the work at the prices bid, regardless of the above approximations.

Grading.

SECTION 1. Grading shall include the work of removing all paving, concrete and macadam base to a width of nine (9) feet and the removal of all material to subgrade. It shall include also all filling, ramming, shaping, refilling, rolling, surfacing and all other work that may be required in bringing the surface of the street to subgrade and maintaining same in good condition until completion of the work.

Method of Payments.

SECTION 2. All excavation of pavement and concrete shall be paid for at the price bid per square yard.

SECTION 3. All excavation of earth and macadam shall be paid for at the price bid per cubic yard.

Disposal of Material.

SECTION 4. All material shall be at the disposal of the CONTRACTOR and he may use old concrete and macadam for filling between ties and rails if the same is first inspected and passed upon by the ENGINEER or his assistant.

Material Re-used.

SECTION 5. In case this is sanctioned by the ENGINEER, the concrete and macadam must be recrushed before using: and in case it is rejected by the ENGINEER the CONTRACTOR must supply new crushed rock.

Rejected Material.

SECTION 6. In case the old excavated material is rejected the CONTRACTOR must remove the same immediately and at all times keep the street clean and open for traffic.

Payment for Reused Material.

SECTION 7. All reused material will be paid for in excavation only, plus the price of crushing when the same is to be used as ballast.

Grout.

SECTION 8. Spaces between head and base of rail on outside shall be filled with grout flush with the line of rail head so forming even face for paving.

--CONCRETE--

Mixture of Concrete.

SECTION 9. The pavement base shall be constructed of Natural Cement Concrete mixed in the following proportions by bulk:-

Natural Cement.....One part
Sand.....Three parts
Broken Stone.....Eight parts.

SECTION 10:- Concrete shall be mixed thoroughly with

Determination of Proportions.

shovels on movable, tight platforms and in such amount as will permit of a thorough and quick mixing of the whole. the method used by the CONTRACTOR in determining the proper amount of each material used for one mixing shall be satisfactory to the ENGINEER.

Time between Mixing and Placing.

SECTION 11. The concrete shall be in place and rammed within fifteen (15) minutes after the cement is wet and any concrete material which shall have been wet more than thirty (30) minutes shall not be placed in the work.

Method of Mixing.

SECTION 12. The sand shall first be spread on the mixing platform and the proper amount of cement shall be spread evenly over the sand. The two shall then be thoroughly mixed dry, by turning with shovels, until it appears of a uniform color. Water will then be added by sprinkling and the mixing continued until the whole is a stiff mortar. The mortar shall then be spread upon the platform and the proper amount of wet stone will then be spread over the mortar and the whole shall then be turned and re-turned until each particle of stone has been completly covered with the mortar. The mixture will then be placed on the broken stone and tamped until the water flushes to the surface.

Water.

SECTION 13. None but clean water shall be used in mixing the concrete and it must not be dashed onto the mixture.

Temperature.

SECTION 14. No concrete shall be mixed or placed in the work where the temperature during the day or night falls below thirty-five (35) degrees Fahrenheit.

Addition of new Concrete.

SECTION 15. Before adding any fresh concrete to any that has been in position for an hour or more the surface of the work in position shall be thoroughly grouted with a mixture of equal parts of cement and sand.

Finish.

SECTION 16. The upper surface of the concrete shall be finished parallel to the grade and crown of the street and the proper distance below the grade of the finished pavement.

Protection of finished Base.

SECTION 17. Before the top of the finished concrete shall have become dry the entire surface shall be covered with a one inch layer of sand. The sand covering shall be kept moist for a period of five days and the concrete shall be protected from use of any kind during that time.

--PAVING--

SECTION 18. All paving done shall consist of a single course and shall be performed as follows:-

Base.

SECTION 19. All paving will be upon a concrete base constructed as required by these specifications.

Sand Cushion.

SECTION 20. Upon the top of the concrete will be spread a one inch cushion course of sand, properly shaped to crown and grade by template or other method satisfactory to the ENGINEER.

Wearing Surface.

SECTION 21. Upon the sand shall be placed a layer of vitrified paving brick which shall conform to the specifications for paving brick as are set down in the standard specifications for brick pavement in the City of Lawrence, Kansas.

Grade of Finished Work.

SECTION 22. The top of the finished pavement must conform to the grade and crown of the street as shown by the stakes of the ENGINEER.

Grout in Joints.

SECTION 23. All joints shall be filled with a Portland Cement Grout, composed of one (1) part cement and one (1) part sand. If directed by the ENGINEER the CONTRACTOR shall thoroughly wet the paving before grouting. The cement and sand shall first be mixed dry in a tight portable box, then sufficient water added to make the grout of proper fluidity when thoroughly stirred. The grout shall be transferred to the pavement by means of scoop shovels and rapidly swept into the joints with stiff brooms. The joints shall be entirely filled in two applications of the grout. The grout shall be kept thoroughly stirred and shall be mixed in small quantities.

Sand on Finished Work.

SECTION 24. When the pavement has been completed it shall be covered with a one half (1/2) inch layer of clean sand which shall be kept damp for a period of three (3) days.

Protection of Finished Work.

SECTION 25. No travel will be allowed on the completed work for a period of seven (7) days from the time of completion.

The CONTRACTOR will provide suitable barricades and at anytime when there is any danger of the barricades being removed and the paving used he shall station sufficient watchmen to prevent such use.

--TRACK WORK--

SECTION 26. The ties shall be placed thirty-nine (39) inches between centers, except at the joints, where a tie shall be placed under the joint, with another on each side of it and eight (8) inches from it.

Ties.

SECTION 27. The rails shall be laid four (4) feet eight and one half (8-1/2) inches between gauge lines, and at turn outs where there is a double track, the distance between gauge lines of the inside rails shall be thirteen (13) feet. The rails shall be fastened to the ties by two hook headed spikes at each point where a rail crosses a tie. The center of the track shall correspond with the center of the street unless otherwise directed. The ties shall be securely tamped until the rail is at the proper grade and the track shall be carefully lined and surfaced. Both rails shall be laid level by means of a straight edge and level.

Track.

SECTION 28. Wherever possible, joints shall be placed opposite one another. The angle-bars shall first be placed on the joints so that the track may be tamped, lined and sur-

Joints.

faced. After all the bolts in the angle-bars are drawn up as tightly as possible, one man shall strike the head of the bolt with a spiking maul, while another draws up on the nut with a wrench. This operation shall be repeated with each bolt until the nut cannot be turned. The tightening of these nuts shall be the last operation before the track is filled in.

SECTION 29. Special work shall be laid according to measurements given on the drawings and must be made to line in neatly with the straight track. At turn outs, the CONTRACTOR shall furnish special ties, long enough to support the switches, mates, frogs and curved rails. In laying special work the directions as already given shall be followed, except that in laying curves, not in the pavement, the outside rail shall be laid three fourths (3/4) of an inch higher than the inside rail.

Special Work.

SECTION 30. Each joint shall be bonded with a four-naught stranded bond placed beneath the joint plate. The bonds shall be of a type approved of by the ENGINEER. The two rails of the track shall be cross-bonded every three hundred (300) feet by four-naught bonds of the same type. At turn outs, the four rails shall be cross-bonded twice. If the holes for the bonds are punched at the rail mill, they must be reamed out before the bonds are inserted.

Bonds.

SECTION 31. For the road bed, an excavation nine (9) feet wide and fifteen (15) inches deep from station 0-plus-0.0 to station 76-plus-29.5 and twelve (12) inches deep from station 76-plus-29.5 to station 120, shall be made. Into this, shall be placed the track. Between the ties, where the pavement has been removed, and to a depth of four (4) inches above the sub-grade crushed stone shall be placed and tamped until solid. On this stone the concrete base will be placed and pavement completed as specified above. In macadam streets, the stone which is taken from the street may be used as filler between the ties. Where there is a surplus of stone in the street, it shall be moved forward to such points as needed. All surplus dirt shall be hauled away by the CONTRACTOR and the street left in a neat condition. After completing the track, the road bed, where there is no pavement, shall be filled with broken stone to the top of the rail. For this purpose the CONTRACTOR may use the concrete base which was removed from the pavement and which, previous to its use for this purpose, has been crushed.

Road Bed.

SECTION 32. The rails shall be as specified under the heading "Steel Specifications" below. The ties shall be of creosoted white pine, sawed, six (6) by eight (8) inches in section and eight (8) feet long. Four-hole angle-bars fitting this section of rail are to be used at rail joints. All other material used in this work shall be of standard design and shall be subject

Materials.

to the approval of the ENGINEER.

SECTION 33. Within the City limits, the top of the rail shall conform to the established City grade of the street. Outside of the City limits, the grade shown on the profile

Grading. will be followed. Where necessary, grade stakes to guide the CONTRACTOR will be set by the ENGINEER. Where the track is either above or below the surface of the roadway, the roadway for four (4) feet outside of the rail shall be graded to slope to the ends of the ties.

--TEE RAIL BRIDGE--

SECTION 34. A Tee Rail Bridge will be constructed at location shown on profile and according to the accompanying plans.

SECTION 35. The abutments will be of Portland Cement

Abutments. Concrete to be mixed according to specifications for Concrete above.

SECTION 36. Paving to be a six (6) inch course of dry

Paving. rubble laid as shown in the plans.

SECTION 37. Tee Rails not to weigh less than forty-eight

Tee Rails. (48) pounds per yard. And to be joined at each end by three (3) one (1) inch wrought iron rods.

SECTION 38. Over the Tee Rails will be placed six (6) inches

Ballast Deck. of broken stone upon which the track will be laid, and the space between the ties filled with broken stone, as shown in the plans.

--STEEL--

SECTION 39. Steel may be made by the Bessemer or Open-hearth process.

SECTION 40. The entire process of manufacture and testing shall be in accordance with the best standard current practice and special care shall be taken to conform to the following instructions.

Process of Manufacture.

(a) Ingots shall be kept in a vertical position in pit heating furnaces.
(b) No bled ingots shall be used.
(c) Sufficient materials shall be discarded from the top of the ingots to insure sound rails.

SECTION 41. The rails used shall conform to the following limits in chemical composition.

Chemical Composition.

Carbon,.....	0.45 to 0.55
Phosphorous shall not exceed,.....	0.10
Silicon shall not exceed,.....	0.80 to 1.10

SECTION 42. One drop test shall be made on a piece of rail not more than six (6) feet long selected from every fifth blow of steel. This test piece shall be taken from the top of the ingot. The rail shall be placed, head upward, on the supports and subjected to an impact test of a drop of nineteen (19) feet. If any rail breaks when subjected to this test, two additional tests will be made from the same blow of steel and if either of these fail to meet the requirements, the entire blow will be rejected; but if they both fulfill the test the entire blow will be accepted. If the rails from the test-

Drop Test.

ed blow shall be rejected for failure to meet the requirements of the drop test as specified above, two other rails will be subjected to the same test, one from the blow next preceeding and one from the blow next succeeding the rejected blow. In case the first test taken from the preceeding or succeeding blow shall fail, two additional tests shall be taken from the same blow of steel, the acceptance or rejection of which shall be determined as specified above and if the rails of the preceeding or succeeding blow shall be rejected, similar tests may be taken from the previous or following blows, as the case may be, until the entire group of five blows is tested if necessary. The acceptance or rejection of all rails from any blow will depend upon the results of the tests thereof.

Testing Machine.

SECTION 43. The test machine shall have a tup of two thousand (2000) pounds weight, the striking face of which shall have a radius of not more than five (5) inches and the test rail shall be placed , head upwards, on solid supports three (3) feet apart. The anvil block shall weigh at least twenty thousand (20000) pounds, and the support shall be a part of, or firmly secured to the anvil.

Finish.

SECTION 44. The section of the rail to be used to the end of the pavement shall conform to the section shown by the accompanying drawing and after leaving the pavement the

section shall be the ordinary tee rail section as recommended by the American Society of Civil Engineers, both sections to weigh ninety-five (95) pounds per yard. A variation in height of one-sixty-fourth (1/64) inch less and one thirty-second (1/32) inch greater than the specified height will be permitted, although a perfect fit of the angle-bars shall be maintained.

Variation in Weight.

SECTION 45. The weight of rails shall be maintained as nearly as possible to the specified weight, although a variation of one half (1/2) of one per cent will be allowed. The rails will be accepted and paid for according to actual weights.

Length of Rails

SECTION 46. The standard length of rails shall be sixty (60) feet to the end of the pavement and thirty (30) feet the remainder of the distance. A variation of one-fourth (1/4) inch in length from that specified will be allowed.

Holes for Angle-bars.

SECTION 47. Circular holes for angle-bars shall be drilled in accordance with the specifications of the purchaser. The holes shall accurately conform to the drawing and dimensions furnished in every respect and must be free from burrs.

Ends of Rails.

SECTION 48. Rails shall be sawed square at ends and, prior to shipment, shall have the burr occasioned by the saw

cutting removed, and the ends made clean.

SECTION 49. The inspector representing the purchaser shall have all reasonable facilities afforded him by the manufacturer to satisfy him that the finished material is furnished in accordance with these specifications. All tests and inspection shall be made at the place of manufacture, prior to shipment. The manufacturer shall furnish the inspector, daily, with carbon determinations of each blow and a complete chemical anaylsis every two (2) hours, representing the average of the other elements contained in the steel. These analyses shall be made on drillings taken from a small test ingot.

Inspection.

--GENERAL SPECIFICATIONS--

SECTION 50. Whenever the word ENGINEER is used in these specifications it shall be held to mean the ENGINEER of the Lawrence Electric Railway Company, who will superintend the construction of this work, or his duly authorized agent.

Engineer.

SECTION 51. Whenever the word COMPANY is used in these specifications it shall be held to mean the Lawrence Electric Railway Company (Incorporated).

Company.

SECTION 52. Whenever the word CONTRACTOR is used in these specifications it shall be held to mean any CONTRAC-

Contractor.

TOR or firm of CONTRACTORS undertaking any of the work under these specifications.

Stakes.

SECTION 53. The work to be done will be staked out by the ENGINEER and the CONTRACTOR will be required to carefully preserve all stakes.

Liquidated Damages.

SECTION 54. Should the CONTRACTOR fail to complete the work, as herein specified, within the time named in his contract he shall be liable for the wages of the ENGINEER from such time as was specified for the completion of the work until final completion and acceptance of the same; and the amount of such wages shall be deducted from any money which may be due the CONTRACTOR, and in addition the CONTRACTOR hereby especially agrees to forfeit to the COMPANY the sum of fifty (50) dollars per day for the same period, estimated as liquidated damages to the said COMPANY for failure to complete the said work in the time specified unless the said COMPANY shall grant and extension of time for the completion of said work.

Suspension of Work.

SECTION 55. Work may be suspended at anytime when in the opinion of the ENGINEER the weather is not suitable for doing the work; in case of any such suspension the time in which the CONTRACTOR is to complete the work shall be extended by as many days as the same was thus suspended.

Obstructions.

SECTION 56. The CONTRACTOR will be required to remove, at his own expense, all obstruction of whatsoever kind from the street.

Approval of Material.

SECTION 57. All the material used in the construction of any part of the work shall be subject to the approval and acceptance of the ENGINEER, and no material of any kind shall be used until it has been examined and approved by the ENGINEER, and any material that may be defective and condemned by the ENGINEER shall be removed immediately from the vicinity of the work; in case the CONTRACTOR shall refuse or neglect to remove defective and condemned material within twenty-four (24) hours after notice, the ENGINEER may cause all such material to be removed at the expense of the CONTRACTOR.

Condemned Work.

SECTION 58. All work condemned by the ENGINEER shall be immediately rebuilt or the defect otherwise remedied as the ENGINEER may direct, and in case the CONTRACTOR shall refuse or neglect to remedy such defect, as ordered then the ENGINEER may cause the condemned portions to be removed, rebuilt or repaired at the expense of the CONTRACTOR.

Disposal of Material.

SECTION 59. Material delivered on the street shall be neatly and compactly piled up along the roadway so as to cause the least possible inconvenience to property owners and public and in no case within ten (10) feet of any fire hydrant; all

shade trees and other public or private improvements shall be protected from damage.

Buildings.

SECTION 60. Shanties or other buildings shall not be erected in the streets without special permission of the ENGINEER.

Life and Property.

SECTION 61. The CONTRACTOR shall erect and maintain at all points open to public travel, sufficient guards and fences and maintain red lights from sun-set and sun-rise to prevent accident to person and property.

Order.

SECTION 62. Whenever the CONTRACTOR is not present on the work, directions or orders given by the ENGINEER to any superintendent or overseer, who may have charge of any part of the work, shall be received and obeyed the same as if given to the CONTRACTOR.

Interpretation.

SECTION 63. If any question arises as to the meaning of these specifications or any part thereof, the interpretation of the same shall be made by the ENGINEER, and such interpretation shall be taken and received by the CONTRACTOR with the same force and effect as though originally made a part hereof. In any case of omission to state or specify in the contract or specifications any work which may be fairly implied as intended to be done thereunder (of which fact said ENGINEER shall judge) the same shall be executed by the CONTRACTOR the same in all respects as if fully stated and specified.

SECTION 64. The Lawrence Electric Railway Company reserves the right to make any changes, through the ENGINEER, in the lines, grades, form, amount or dimensions of the work herein contemplated, either before or at anytime during the progress of the work. If such changes shall diminish the quantity of the work to be done, they shall not constitute a claim for damage or for anticipated profits on the work dispensed with, but if such changes shall increase or decrease the quantity or cost of the work to the CONTRACTOR, such difference shall be added to or substracted from the price or prices stipulated for such work in the contract.

Changes in Plans.

SECTION 65. The CONTRACTOR shall not transfer, assign or sublet this contract or any part of the work embraced in it, without the written consent of the ENGINEER and the Lawrence Electric Railway Company, but such consent and approval, if given, shall in no way relieve the CONTRACTOR or his sureties from the obligations and penalties of this contract.

Sub-letting.

SECTION 66. To prevent disputes and litigation the ENGINEER shall in all cases determine the quantity of the several kinds of work which are to be paid for under these specifications and he shall (with the approval of the Lawrence Electric Railway Company) decide all questions which may arise under the contract, and his estimates and decisions shall be final and conclusive.

Disputes.

SECTION 67. Partial payments under these specifications shall be made as follows:- at the end of each calendar month an estimate shall be made by the ENGINEER, of all the material furnished and labor performed, and on or before the tenth (10) day of the succeeding month payment shall be made of the amount due the CONTRACTOR for the work done as shown by the estimate of the ENGINEER, less fifteen (15) per cent of the amount due the CONTRACTOR on each monthly estimate. This fifteen (15) per cent of each monthly estimate will be retained by the COMPANY and no settlement made thereof until the expiration of thirty (30) days after the completion and final acceptance of the work by the ENGINEER, when final settlement shall be made, provided that, at the expiration of the said thirty (30) days, the work done and material furnished shall have proven to be such as is provided for in these specifications; and provided further, that the work shall have been completed in the time specified; and provided further, that said CONTRACTOR shall prove to the satisfaction of the ENGINEER that all bills for material furnished and for labor performed, which may be a lien against the said Lawrence Electric Railway Company, shall have been paid by said CONTRACTOR and such lien discharged.

Partial Payments.

SECTION 68. These specifications approved and adopted at a regular meeting of the Directors of the Lawrence Electric Railway Company on the first (1st) day of May 1915

E. McFarrin

President

V. Beckett

Secretary

CONTRACT

This agreement, made and entered into this first (1st) day of June 1905 between the Lawrence Electric Railway Company (Incorporated under the laws of Kansas), by the President and Secretary of said COMPANY, and Kansas Valley Construction Company. hereinafter called the CONTRACTOR:

WITNESSETH: That the said CONTRACTOR having been awarded contract for the work of grading, track laying, repaving and construction of all the waterways and drains and for the furnishing of all materials and labor, in accordance with the proposal therefor and for and in consideration of the premises and of the covenants and agreements and of the payments herein specified, to be made and performed by the COMPANY, hereby covenants and agrees to and with the COMPANY to undertake and execute all of the said named work, in a good, substantial and workmanlike manner, and to furnish all the materials and all the tools and labor necessary to properly perform and complete the said work, ready for use, in strict accordance with the attached specifications and the penalty expressed in the attached bond, bearing even date herewith which are hereby declared and accepted as essential parts to this agreement and to accept as full compensation therefor the rates named for the work and materials.

What the contract price includes.

SECTION 1. The prices named in the schedule are for the completed work of each class, and include the furnishing of all materials, and all labor, tools and appliances, and all expense, direct or indirect, connected with the proper execution of the work, and in accordance with the specifications for the respective classes of work, and of maintaining the same until it is accepted by the ENGINEER.

Extra Work.

SECTION 2. The CONTRACTOR shall do such extra work, in connection with the work herein contracted to be done, as the ENGINEER may direct, and if it shall be of a nature for which no price is fixed in the schedule, then the price thereof shall be fixed by the ENGINEER. But no allowance for extra work of any kind will be made unless such work shall have been ordered in writing by the ENGINEER. The claims for such extra work, when so ordered, shall be presented on or before the fifteenth (15) day of the month following that in which said extra work was done, otherwise such claims during that month will be forfeited and waived.

Inspection.

SECTION 3. All materials furnished by the CONTRACTOR shall be subject to the inspection and approval of the ENGINEER at anytime during the progress of the work, and until final completion of the same, and shall be delivered by the CONTRACTOR a sufficient length of time in advance of the work to enable the ENGINEER to make the proper tests

and inspection, and as soon as the materials are tested and inspected, the CONTRACTOR shall remove all rejected material from the work, and to such a point distant therefrom that the ENGINEER may require. No materials shall be used before being inspected and approved by the ENGINEER, but the failure or neglect on the part of said ENGINEER to condemn or reject inferior materials or works shall not be construed to imply an acceptance of the same should their inferiority become evident at anytime prior to the final acceptance of the work. The CONTRACTOR shall furnish at his own expense such labor as may be required to enable a thorough inspection and culling of all materials. 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 contractor will relieve the CONTRACTOR from this responsibility, or be considered as grounds for claim against the COMPANY.

Conformity of the Work.

SECTION 4. The work shall be done in strict conformity to the plans and specifications and to the exact lines and grades as fixed by the ENGINEER and with such written instructions as shall from time to time be given by the ENGINEER.

SECTION 5. Immediately upon the completion of the

work the CONTRACTOR shall, at his own expense, clean up and remove all refuse material of every kind resulting from the work; and upon failure to do so within twenty-four (24) hours after having been notified by the ENGINEER, the work may be done by the ENGINEER and the cost thereof charged to the CONTRACTOR and deducted from the amount of his final estimate.

Cleaning Up.

SECTION 6. The CONTRACTOR, shall employ suitable mechanics for every kind of mechanical work. If any person employed by the CONTRACTOR is incompetent, disorderly or disobedient to the ENGINEER, he shall be discharged immediately upon the request of said ENGINEER, and shall not again be employed upon the work without the consent of said ENGINEER.

Men Employed.

SECTION 7. The CONTRACTOR upon being so directed by the ENGINEER, shall remove or reconstruct, or make good without charge any work which the ENGINEER may consider to be defectively executed.

Execution of Work.

SECTION 8. The CONTRACTOR shall commence work at such point or points as said ENGINEER may direct, and shall conform to his direction as to the order and time in which different parts of the work shall be done.

Defective Work.

SECTION 9. In all operations in connection with the

work embraced in the contract, the CONTRACTOR will be held responsible for any failure to respect, adhere to, and comply with all local ordinances and laws controlling or limiting in anyway the actions of those engaged upon the work, or affecting the material or the transportation or disposition of them. And the CONTRACTOR hereby assumes all liability for and agrees to indemnify the COMPANY against all loss, cost or damage for or by reason of any claim for damages or materials or to premises or from laborers or others, and from any damage arising from injuries sustained by workmen or other persons by reason of accident or otherwise, and from damages sustained by depositing materials to public injury or to the injury of any person or corporation, or resulting from the use of any patented material, implement or process which may be employed in executing the work under this contract, including cost and expenses of defence: provided, that he shall be notified of the bringing of suit in such cases, he is to leave his address on file with the City Clerk for that purpose, and he shall be permitted to defend the same and it shall be lawful to withhold final payment on this contract so long as it shall seem necessary for the indemnity of the COMPANY.

Litigations.

Prosecution of Work.

SECTION 10. If at anytime during the existence of this contract it shall appear to the COMPANY or ENGINEER that the force employed, the appliances provided, or the character or progress of the work or materials furnished are not such as will insure the completion of the work under this contract in the time specified, or are not in accordance with specifications for such work, they may serve a written notice on the CONTRACTOR, to at once supply the increase of force, appliances or tools, or to make such improvements in the character of the work or materials, as is requisite to make the same conform to the stipulations of the contract, and if, on the expiration of two (2) days after service of such written notice upon the CONTRACTOR, personally, or by leaving the same with some person at his office or place of business, or with the foreman in charge of the work, the CONTRACTOR refuses or fails to remedy the specified deficiencies, said COMPANY may enter upon and take possession of said work, or any part thereof with the tools, materials and appliances and may hold the same as security for any or all damages or liabilities that may arise by reason of the non-fulfillment of the contract within the time herein stipulated: and said COMPANY may employ said tools,

materials and appliances in any way they may deem proper to complete the work, at the expense of the CONTRACTOR.

Referee.

SECTION 11. Any questions differences, or controversies which may arise between the COMPANY and the CONTRACTOR, under or in reference to this agreement and these specifications, or in reference to the performance or non-performance of the work to which they relate, shall be referred to the ENGINEER and his decision shall be final and conclusive to both parties.

SECTION 12. All acts to be performed by the COMPANY may be performed by their duly authorized agents or employees. The said CONTRACTOR further agrees that preference shall be given to bona fide residence of the City of Lawrence, Kansas, for employment upon the work, and that all laborers employed upon the work shall be paid every two weeks. This contract with all its forms, specifications and stipulations shall be binding upon the heirs, executors, administrators or assigns of said CONTRACTOR, and upon the successors or assigns of said COMPANY, as much so as if each and all of them had been specifically mentioned.

IN WITNESS WHEREOF, the President and Secretary of the Lawrence Electric Railway Company have made and executed this contract on behalf of said COMPANY, and caused

the seal of said COMPANY to be hereto affixed, and the CONTRACTOR has hereunto set his hand and seal the day and the year first above written.

THE LAWRENCE ELECTRIC RAILWAY COMPANY.

C. M. Harris (Seal)
President

W. J. Beckett (Seal)
Secretary

THE KAW VALLEY CONSTRUCTION COMPANY.

B. F. Peterson (Seal)
President

M. A. Church (Seal)
Secretary

ESTIMATE

Removal of Material.

8498.7	Sq.	Yds.	Brick	at	$0.18	per Sq.	Yd.....	$1529.78
6330.0	"	"	Concrete	"	0.15	" "	".....	949.50
781.2	Cu.	"	Macadam	"	0.75	" Cu.	".....	585.90
1441.4	"	"	Earth	"	0.50	" "	".....	720.70
								$3785.88

Paving and Filling.

8498.7	Sq.	Yds.	Brick.....	at	$0.82	per Sq.	Yd....	$6978.92
8498.7	"	"	Concrete.....	"	0.31	" "	"	2634.60
1307.5	Cu.	"	Concrete, crushed	"	0.35	" Cu.	"	457.63
225.0	"	"	Sand	"	0.50	" "	"	112.25
								$10183.40

Track

407.5	Tons of Rails at $32.50 (including freight)...	$13284.50
	Hauling Rails 75¢ per Ton.....	305.63
1200	Tie Rods at 25¢.....	300.00
3628	Creosoted Ties at 75¢.....	2721.00
6	Sets Switch Ties at $25.00 per set.....	150.00
552	Pairs Angle Bars at 30¢ per pair.....	165.60
15125	Spikes at $2.00 per hundred	302.50
776	Tie Plates at $3.90 per hundred.....	30.26
2475	Bolts at $3.75 per hundred.....	93.00
12000	Feet of Track Laid at 15¢ per ft.....	1800.00
6	Switches (including frogs and switch rails at $45.00 per switch.....	270.00
		$19422.49

Tee Rail Bridge.

2.43	Tons of Rails at $78.00 (including frt.&hauling)...	$ 43.75
3.00	Cu. Yds. Broken Stone at 90¢. per Cu. Yd.....	2.70
213.	" " Portland Cement Concrete at $3.24 per Cu Yd.	690.12
1.8	" " Paving at $2.00 per Cu. Yd.....	3.60
		$740.17

Totals.

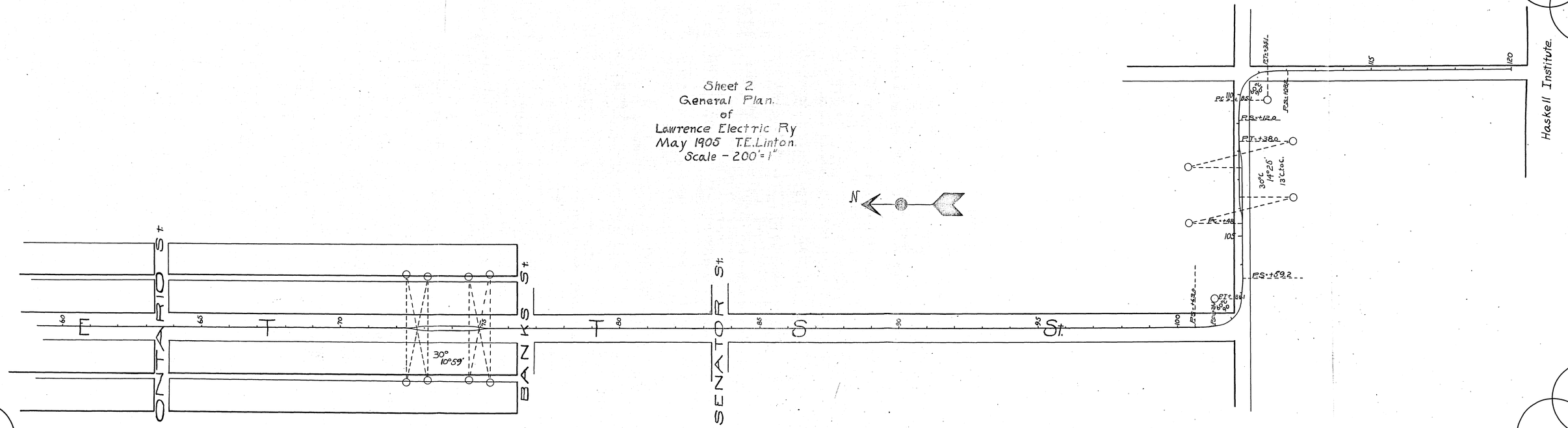
Removable of Material	$ 3785.88
Paving and Filling	10183.40
Track	19422.49
Tee Rail Bridge	740.17
	$34131.94

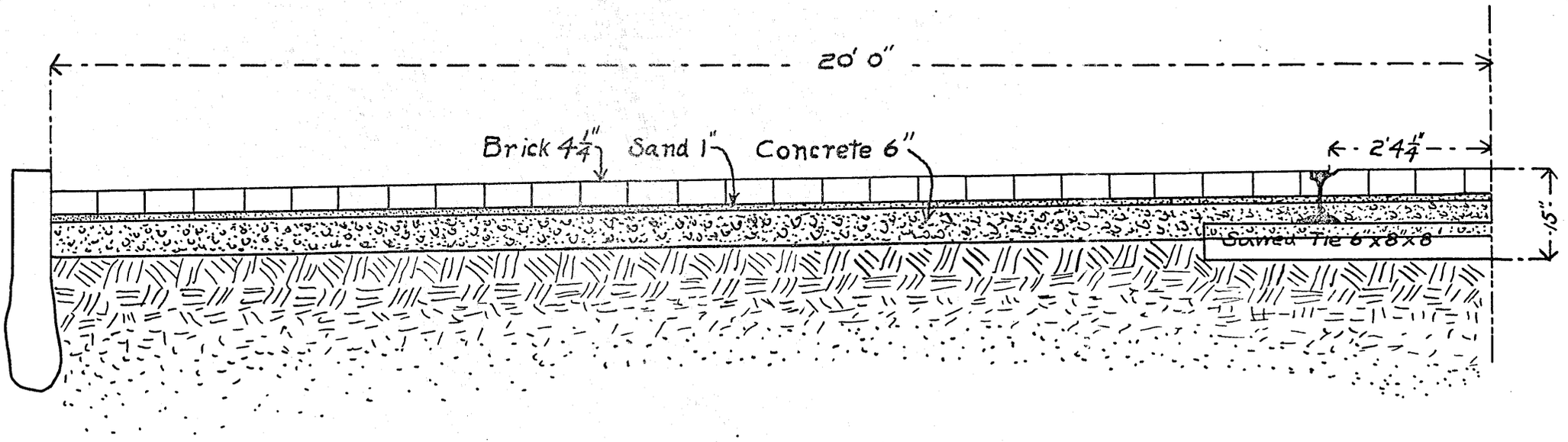
2.27 Miles of Track Laid

Average per Mile	$15036.09

Sheet 1
General Plan
of
Lawrence Electric Ry.
May 1905 T.E.Linton.
Scale - 200'=1"
N
MASSACHUSETTS
WINTHROP St.
HENRY St.
WARREN St.
BERKLEY St.
QUINCY St.
PARK St.
CITY PARK
CITY PARK
PARK St.
LEE St.
ADAMS St.
MORRIS St.
EUCLID AVE.
30°24'C
10° 11'

Sheet 2
General Plan
of
Lawrence Electric Ry
May 1905 T.E.Linton
Scale - 200'=1"





Half Section

Massachusetts Street Pavement

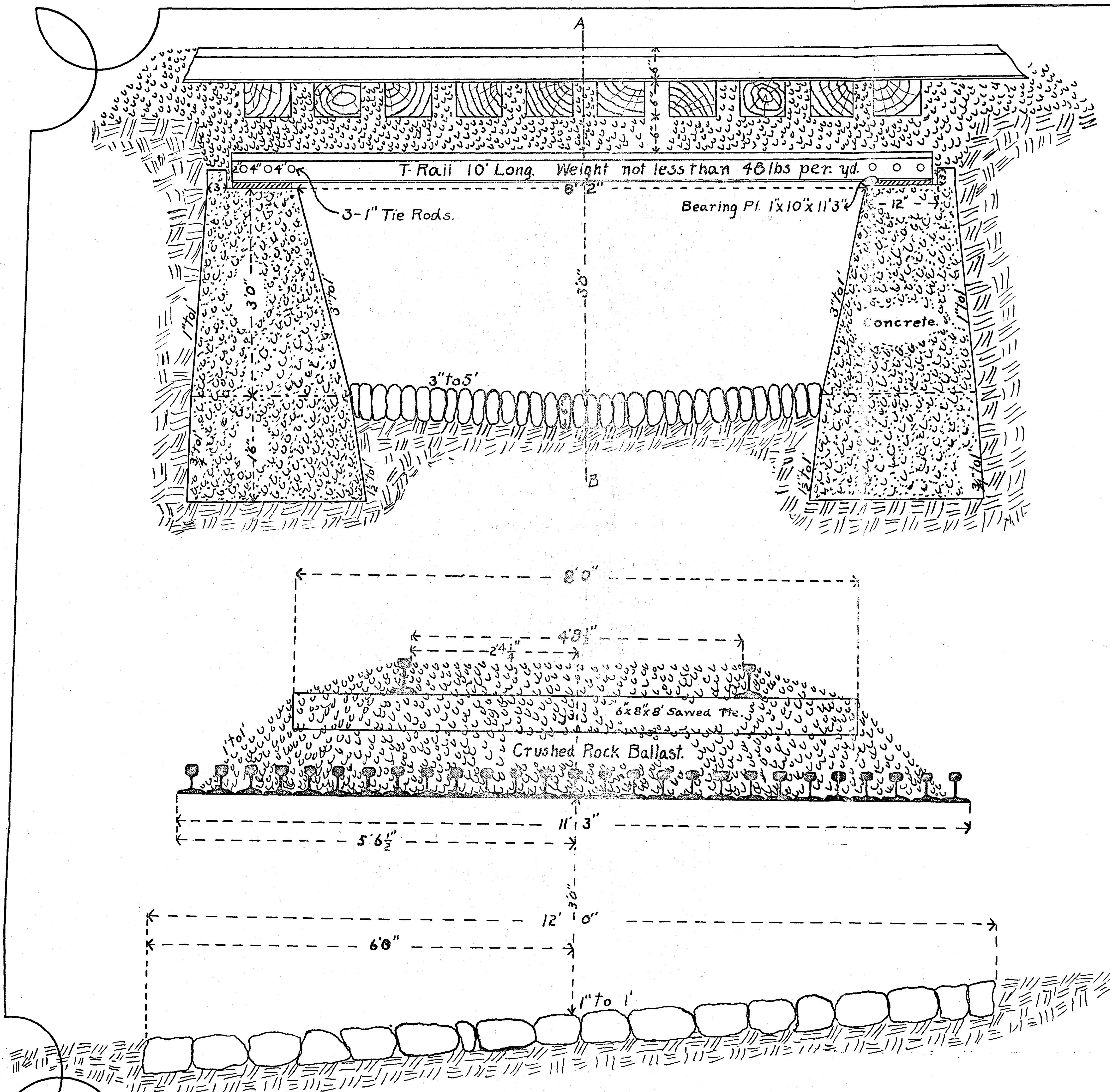
May 1905 T.E. Linton.

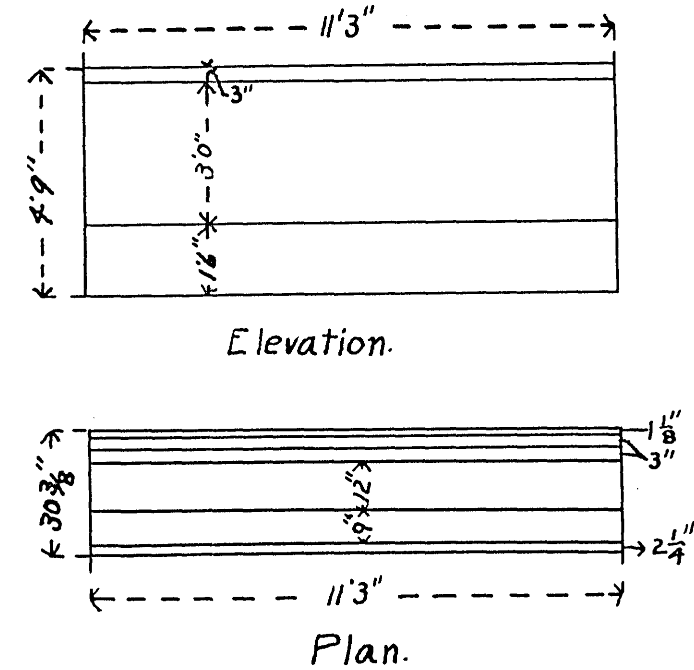
Scale 2' = 1"

Note:-

From Sta. 0+0.0 to Sta. 20+00 the base is 6" of macadam.

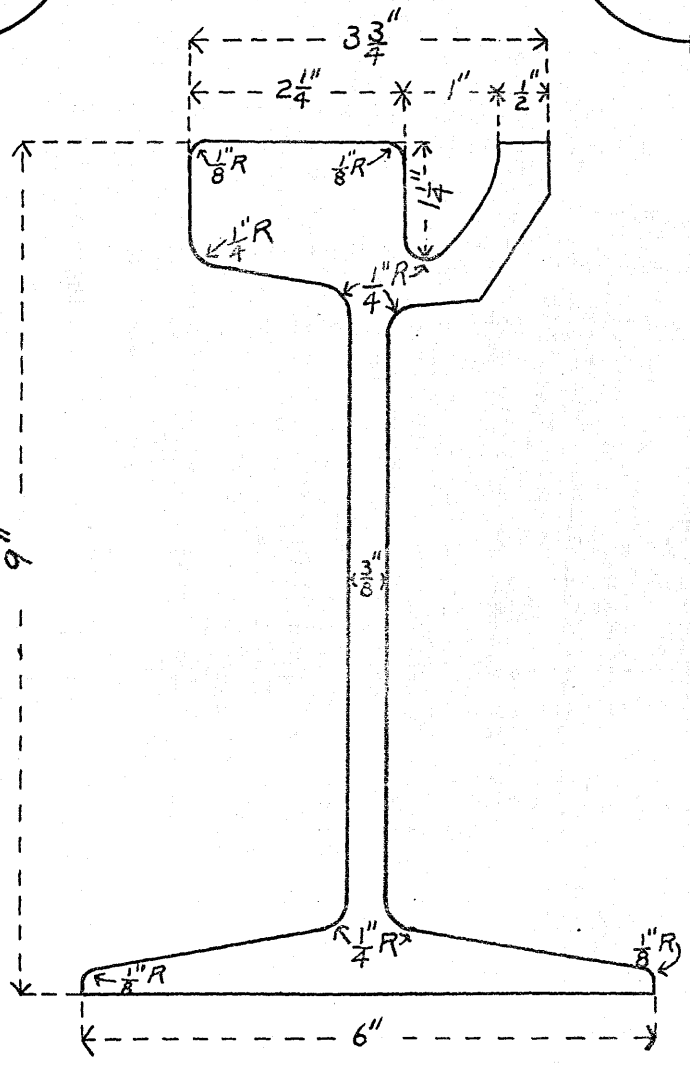
" " 20+00 " " 76+29.5 " " " 6" " concrete.





ABUTMENT.
SCALE ¼"=1'

Ballast Deck
Tee Rail Bridge
at
Sta 88+97.0
Scale ¾"=1'
May 1905 T.E. Linton.



Rail Section
to be used
From Sta. 0+00 to Sta 76+29.5
Weight 95 lbs per yd.
May 1905 T.E.Linton
Scale 1" = 2"

Construction Profile
of
The Lawrence Electric Ry
From Sta. 0+00 - To Sta. 120+00
May 1905.
T.E. Linton.

Note:-
Red refers to subgrade
Black " " top of rail.
Change of Subgrade at
Sta 76+29.5

0.0 South Line Winthrop St 143.15 1444 B.M. 146 64 Top Hydrant

00 +0.0 144.4 - 143.15
143.9 - 142.65
+0.0 142.1 - 140.85

North Line Henry St.

-2.9967

10 +0.0 126.7 - 125.45
124.6 - 123.35
123.0 - 121.75
+80. North Line Warren St. 121.9 - 120.65
122.9 - 121.65
+0.0 124.6 - 123.35

+1.5452

20 +60. North Line Berkley St +60.0 131.8 130.55
+40.0 132.1 130.85

+0.375
+0.7813

+80. Centre Quincy St. +80.0 137.1 - 135.85 B.M. 139.82 Top of Hydrant

+0.151

30 +45. Centre Park St. +45.0 137.5 - 136.25

+0.4467

+80. Centre Park St.

40 +42. Centre Lee St. +42.0 142.4 - 141.15

-0.9245

+02.0 Centre Adams St. +02.0 136.1 - 134.85 B.M. 139.15 Top Hydrant

+0.1839

50 +37. Centre. Morris St. +37.0 136.9 - 135.65
+00 - 137.0 - 135.75
+00 - 137.1 - 135.85
+00 - 137.2 - 135.95
+00 - 136.9 - 135.65
+00 - 136.2 - 134.95
+00 - 135.9 - 134.65

+80. Centre Euclid Ave. +0.0 136.0 - 134.75

+1.00

60 +50 Centre Ontario St. +00 141.0 - 139.75

+0.5728

70 +82.0 144.7 - 143.45
+82.0 144.7 - 143.45

-0.442

+29.5 North Line Banks St = South End Pavement. +29.5 142.4 B.M. 142.38 End Curb East Side of Street.
141.15
141.4

80

-0.7333

+97.0 - Cen. T Rail Bridge.

+29.5 - 141.44 - 140.44
+29.5 - 141.75 - 140.75
+29.5 141.3 +29.5 - 141.05 - 140.05
140.3 +29.5 - 142.35 - 141.35
+29.5 - 142.66 - 141.66

+0.7727

B.M. 144.76 Top of stake 50 ft east Sta 96+00

+29.5 - 146.04 - 145.04
+ " - 146.59 - 145.59

90 +63.0 = P.S.
+36.1 = P.C.
90°
+86.1 = P.T.
+59.2 = P.S.

100 +29.5 147.4 - 146.4 + " - 147.14 - 146.14
+ " - 147.69 - 146.69
+ " - 148.24 - 147.24

+0.4207

+0.0 - 148.96 - 147.96
+ " - 151.09 - 150.09
148.8 149.8 + " - 153.21 - 152.21 B.M. 150.73 Top Stake 50 ft north Sta 106+0.0
+ " - 155.24 - 154.24
+ " - 157.27 - 156.27

+1.73984

+80.0 - 161.01 - 160.01
+80.0 164.0 + " - 162.5 - 161.5
1630
+ " - 164.0 - 163.0 +00 - 164.0 - 163.0
+0.0 164.0 - 163.0 + " - 162.38 - 161.38
+ " - 160.75 - 159.75

+12.0 = P.S.
+85.1 = P.C.
90°
+35.1 = P.T.
+08.1 = P.S.

110 +00 - 157.5 - 156.5
+ " - 155.7 - 154.7
151.0 - 150.0 + " - 153.91 - 152.91
+ " - 152.12 - 151.12
+ " - 150.33 - 149.33 +0.0 - 150.33 - 149.33
150.0 - 149.0 + " - 151.09 - 150.09
151.8 - 150.8 + " - 151.8 - 150.8

-0.3334

+1.846

120