

HOUSE No. 543

The Commonwealth of Massachusetts.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The undersigned, the county commissioners of the county of Essex, herewith submit a report relative to the construction of a new bridge, with suitable approaches, over the Merrimac River in the city of Lawrence, to be located east of the Duck bridge, so called, in accordance with the provisions of chapter 154 of the Resolves of the year 1910.

MOODY KIMBALL,
JAMES C. POOR,
J. M. GROSVENOR, JR.,

County Commissioners of the County of Essex.

SALEM, Jan. 14, 1911.

REPORT BY THE COUNTY COMMISSIONERS OF
ESSEX COUNTY RELATIVE TO THE CON-
STRUCTION OF A NEW BRIDGE, WITH SUIT-
ABLE APPROACHES, OVER THE MERRIMAC
RIVER IN THE CITY OF LAWRENCE, IN
ACCORDANCE WITH THE PROVISIONS OF
CHAPTER 154 OF THE RESOLVES OF THE
YEAR 1910.

CHAPTER 154, RESOLVES OF 1910.

RESOLVE TO PROVIDE FOR AN INVESTIGATION AND A REPORT BY THE
COUNTY COMMISSIONERS OF THE COUNTY OF ESSEX AS TO A
NEW BRIDGE OVER THE MERRIMAC RIVER IN THE CITY OF LAW-
RENCE.

Resolved, That the county commissioners of the county of Essex are hereby authorized and directed to investigate the construction of a new bridge, with suitable approaches, over the Merrimac river in the city of Lawrence, to be located east of the Duck bridge, so-called, to make surveys and to procure plans and estimates for the said bridge and approaches, and to report to the next general court on or before the second Saturday of January, nineteen hundred and eleven, with copies of said plans and estimates and the recommendations of the commissioners in regard to said new bridge. For this purpose the commissioners may expend a sum not exceeding fifteen thousand dollars, and the commissioners are hereby authorized to borrow said sum on the credit of said county and to issue the note or notes of the county therefor, payable not later than the first day of January, nineteen hundred and twelve, with interest not exceeding four and one half per cent per annum, payable semi-annually. As soon as is practicable, said commissioners shall certify to the treasurer of the city of Lawrence the sum which has been expended by them under authority of this resolve, and prior to the first day of December, nineteen hundred and eleven, the city shall pay to the treasurer of the county of Essex sixty per cent of said expense, with interest thereon from the date of the note or notes of the county issued for meeting the expense; and if the city

neglects or refuses to pay its said proportion, the said commissioners shall, after due notice to the city, issue a warrant for its proportion, with interest and the cost of the notice and warrant, and the same shall be collected and paid into the treasury of said county to be applied in payment of the expense aforesaid. [*Approved June 15, 1910.*]

In accordance with the provisions of the above resolve the commissioners have made a thorough investigation. It was apparent at the outset that under the directions of the General Court there was but one location available for the south end of the bridge, as the 60-foot right of way laid down between the storehouse of the Wood Mill and the new plant of the Pacific Mill is the only open space remaining within the limits of the city of Lawrence east of the Duck bridge. The question of a suitable north approach for a bridge located here is complicated by the existence of the plant of the American Fiber Matting Company, and by the difference in elevation between Merrimac Street on the south and Marston Street on the north, the latter being some 22 feet higher than the former.

Surveys were made by the engineering department of the county and several locations studied. Designs and estimates have been made for the substructure and approaches in the location indicated on the plan submitted herewith. Specifications for the superstructure have been submitted to the Boston Bridge Works, who have prepared a plan, with estimates of the cost of construction, as shown in their communication, a copy of which is appended hereto. These plans have been submitted to Prof. George F. Swain of Boston and a copy of his approval is also appended. Borings have been taken at the sites of the proposed piers and abutments, the Charles R. Gow Company of Boston being employed to do the work.

From an engineering point of view the best location for the bridge is in a direct extension northerly from the right of way before referred to on the south to Marston Street on the north, crossing the river at right angles to the current. This involves extensive damage to the plant of the American Fiber Matting Company, as the proposed location passes

through their main mill, boiler house, chimney and office. It is possible to very materially reduce the damage to this plant by making an angle at the river bank on the south side, crossing the river on a skew, and approaching Marston Street through the easterly end of the property of this company, thus avoiding the more important buildings of their plant. While the damage to property is less by this route, the grade of the north approach would be steeper, and there is not an opportunity to secure so good an entrance into Marston Street. Moreover, the angle at the south end of the bridge is not desirable if it can be avoided. The estimates as hereinafter given are for construction by the first plan, that is, in direct extension of the right of way, so as to form a straight highway from Merrimac Street on the south side to Marston Street on the north side. It is not believed that there would be any material difference in the total cost of construction under either of these plans. The estimates as given include the cost of removing the two storehouses at the junction of Marston and Canal streets, on the south side of the street, and of widening the bridge over the Spicket River so as to do away with the reverse curve in the roadway at this point, and to reduce the present steep grade to a grade of a maximum of 3 per cent., in order to provide a suitable approach from the west.

In view of the not excessive difference in the estimates of the cost of a bridge carrying a wooden floor and one carrying a concrete floor with brick pavement, the commissioners are of the opinion that the latter should be adopted, as their experience with other bridges in their care leads them to believe that this would result in an ultimate saving, due to the lessened cost of maintenance.

The plan as presented calls for a bridge of four steel through truss spans, supported by three piers and two abutments of granite masonry with concrete backing, the distance from center to center of piers being 168 feet. The roadway floor, 34 feet wide in the clear, is a reinforced concrete slab supporting a vitrified brick pavement, with provisions for a possible street railway track, and the sidewalks, each 8 feet



Fold out to come

Foldout to be

removed by

Archivist

wide in the clear, are reinforced concrete slabs with a granolithic finish. The width of bridge between outside railings is 55 feet, and the entire structure is proportioned in accordance with the requirements of the Massachusetts Railroad Commission for bridges carrying electric railways, as revised August, 1908, and for the class of loading prescribed for city bridges.

Estimate of Cost of Construction of Proposed Bridge and Approaches.

South approach (from Merrimac Street to the river),	\$13,437 50
Piers and abutments,	79,970 00
Superstructure complete, including brick pavement,	105,872 00
North approach (from the river to Marston Street),	49,330 00
Alterations in Marston, Prospect and Canal streets,	67,481 00
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Total,	\$316,090 50
15 per cent.,	47,413 57
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Total plus 15 per cent.,	\$363,504 07

No land or grade damages are included in this estimate.

The county commissioners recognize the fact that the city of Lawrence is inadequately provided with accommodations for highway travel across the Merrimac River. A very large proportion of the operatives employed in the mills on the south side live on the north side of the river. This, together with the establishment of new freight yards on the south side, and the consequent necessary teaming of freight, has greatly increased the congestion on both the existing highway bridges, particularly on the Union Street or Duck bridge. The congestion on this latter bridge will be further greatly increased with the completion of mills now under construction, so that the need of added bridge facilities is apparent.

It is for the General Court to decide whether that need shall be met at this time.

The commissioners feel, however, that the projected bridge will be largely a city bridge, more so than in any case where

the county of Essex has shared in the expense of construction, and for this reason they are of the opinion that the share of the expense to be borne by the county in this case should be limited to the sum of \$100,000.

MOODY KIMBALL,
JAMES C. POOR,
J. M. GROSVENOR, JR.,

County Commissioners of the County of Essex.

SALEM, JAN. 14, 1911.

ESTIMATES OF COST OF CONSTRUCTION.

THE BOSTON BRIDGE WORKS (INC.),
47 WINTER STREET, CORNER TREMONT STREET,
BOSTON, MASS., Jan. 7, 1911.

Mr. ROBERT R. EVANS, *Essex County Engineer, Salem, Mass.*

DEAR SIR:—Confirming telephone conversation of this date, would say that we have estimated the cost to be as follows for furnishing the superstructure for the proposed highway bridge to be built over the Merrimac River at Lawrence, Mass., consisting of four spans of 165 feet each, with 34-foot roadway and two 8-foot walks, in accordance with design prepared by us, blue-print copy of which has already been submitted you:—

Concrete Floor Design.

For the steel work erected in place,	\$80,810
For the concrete slab on roadway and sidewalks, with granolithic finish on latter, laid in place,	20,490
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Total estimate for the superstructure erected complete above foundations (except brick paving on roadway),	\$101,300

Plank Floor Design.

For the steel work erected in place,	\$70,180
For the 4-inch creosoted H. P. plank for roadway and 2½-inch H. P. plank for sidewalk, laid in place,	11,820
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Total estimate for the superstructure erected complete above foundations (except wood block paving on roadway),	\$82,000

Our estimates on the steel material are based on the present prices of unfabricated steel shapes and plates, which is \$1.40 per cwt. f.o.b. cars Pittsburg.

Yours truly,

The BOSTON BRIDGE WORKS INC.,
(Signed) J. G. ANDREWS,
Contracting Engineer.

HARVARD UNIVERSITY, CAMBRIDGE, MASS.,
Jan. 11, 1911.

Mr. R. R. EVANS, *County Engineer, Salem, Mass.*

MY DEAR SIR:—I beg leave to state that, as requested by you, I have examined the plan prepared by the Boston Bridge Works for superstructure for proposed bridge across the Merrimac River at Lawrence, and the estimates for the same. I consider the plan a good one, and the estimates reasonable, and believe that the structure could be built for the sum stated.

Yours very truly,

(Signed) GEO. F. SWAIN.