City Engineer's Office

Cambridge Mar. 24, 1868.

To the Joint Standing Committee on Roads and Bridges

Gentlemen

Directed by you, under the request contained in the recommittal of an order passed in Common Council Mar. 17th inst. "with instructions to procure the opinion of the City Engineer upon the plan proposed and report the same", I respectfully submit the following:-

The sketches or plans referred to in the order, without any estimate of cost, were furnished by me to illustrate faithfully and definitely the ideas of the Committee. Previous to giving my views upon them, I beg leave to express my surprise that members of the Committee should state that the City Engineer "did not in Committee disapprove" of the principle for the improvement proposed, or that he by implication, even, "stated to them his opinion that the plans would accomplish all the Committee expected of them", unless their expectations fell far short of what the public desire in regard to it. When the Committee declared in favor of the plans referred to in their report, it then became my duty to adopt them, and I did, making "one or two suggestions in regard to some unimportant details", as, if carried out, I shall be pleased to offer others. But I have distinctly stated that

"I disclaimed all desire for credit attending the success of this design and asked relief from responsibility in case of failure." If the order referred to and loss of argument arising from it in the Council had not placed the design submitted upon the City Engineer, who is not entitled to the least part of the credit therefor, this explanation would not have appeared to me necessary.

My opinion from the first consideration of the matter has been that it would be injudicious to make an outlay of any considerable amount upon this old structure. But without opening that question I do not recommend the proposed plan for these reasons.

1st It does not raise the track out of the water. The track bed of the turntable at its present elevation, subject to frequent submersion in salt water, has been and is a serious objection to the present draw, nor can it be raised with this structure unless the road bed of the street proper is raised correspondingly

2nd It does not make the draw foundation independent of the pier. The present pier, though in all probability of sufficient strength to sustain any weight that may be placed upon it, yet from the manner of its construction is unstable. I consider it inadequate for the pier foundation of a 100 ton pivot draw,

exceed over tide waters, and one of the causes which have necessitated frequent repairs.

3d It does not reduce the size of the turn table and will not materially reduce the time of working. A random observation the past week gives 3 minutes for opening and 5 minutes for closing. I expect the proposed plan might reduce the time to not less than 2 minutes for either operation, while the ordinary time of a narrow draw, with small table, is one minute for the same

4th It is deficient in stiffness. The present gallows frame possesses, longitudinally, very decided advantages, inasmuch as it admits of the adjustment of either end of the bridge without affecting the condition of the other end, affording rigidity which cannot, by the proposed plan, be secured

5th The principle of bussing above and across the roadway is objectionable if not dangerous. It is a simple means of holding in suspension a great weight, but I deem it of uncertain stability. I know of no instance where such a mode of application is in use and very much doubt if it ever obtain results expected from it. Transversely, the design proposes that the weight of the bridge, or whatever portion of it shall be thrown upon its pivot, be elevated to a height of 34 ft. above the bridge surface, there poised for transmission, by the central

post, to the bridge proper 40 ft. below.

6th The draw must be taken to pieces to get in piles for a new pivot. I do not propose or wish to dictate to the Committee the course that should be determined on by them, but will suggest that the proposed plan will probably involve the necessity of removing the present draw from its position entire, and re-erecting it after "strengthening the foundation under the centre by driving additional piles." This process will require a considerable sum of the anticipated cost. From such treatment of a structure of the kind, erected about 13 years ago, it will become necessary to replace all decayed timber with new material and for the purpose of obtaining at best but partial improvement. If I am correctly informed, this draw cost in 1855 - $10,000.00. The cost of repairing at the present time, with the requisite supply of new material, was probably fully considered in the estimate submitted by the Committee.

7th It does not diminish but increases the weight of the draw. Our present draw is cumbrous and unwieldly. The extra weight of about 8 tons is necessary to gain the very important advantage of making an entire revolution when desired. This commendable feature of the proposed plan, will probably form a part of any scheme of improvement adopted, as it gains time for the roadway travel. It is,

however, a consideration against perpetuating the present draw that, to get the additional length requisite, we must add weight to an already too weighty construction.

In my opinion, an alteration made in the manner proposed would be an improvement not of long duration, would not obliterate the necessity for a new draw, nor do I deem it economy or advisable to bestow an outlay upon the present draw of a larger sum than $2000.00 New running gear and track may be substituted for this amount or the present running gear may be retained, in which case $1200.00 will place the structure in condition, for perhaps a couple years longer, as it has been operated in the past. Its present condition demands that something must be done. If by way of improving the old draw I would not recommend the futile effort to convert it into a modern affair.

Permit me to add regret that I am limited by the order and your direction to the consideration of the "proposed plan" and thereby debarred giving the subject that full expression I otherwise should by recording my views on this plan and the present draw, in comparison with other structures of this kind. Statistics relating to draw bridges in use in our own section, as well as the operation and mode of construction for like

means, to accommodate public travel over navigable waters, adopted in other cities within recent periods, the comparative durability of the same, and the yearly Expenditure for care and repair, are points that may profitably be investigated before deciding to continue, for several years, any of the inconveniences of the present bridge.

J. G. Chase
City Engineer

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Report of City Engineer —

Same. W. Bard. Bridge

March 31. 1868.