

# The Canadian Engineer

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## The Canadian Engineer

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### CONTENTS OF THIS ISSUE.

Editorial:	Page.
The Traction Engine and the Highway	655
Mixing of Concrete	656
Editorial Notes	656
Leading Articles:	
Drainage of Soft Spots in a Roadbed	657
Painting Steel Bridges	660
A New Road Pavement	660
Question of Preservation	663
Shearing Values of Stone and Concrete	665
C.P.R. Annual Report	656
Legal Notes:	
Contractors' Liability	661
Duty of Owner	661
Interpretation of Contract	661
Drainage	661
Nuisance	662
Society Notes	662
Construction News	667
Market Conditions	670

## THE TRACTION ENGINE AND THE HIGHWAY.

The heaviest load the rural culvert or bridge is called upon to carry is that imposed by the traction engine, and, as in other modes of transportation, so in this, the growth in size and weight of engines and size and weight of loads drawn has been great. Ten years ago provision had to be made for a 12 horse-power engine with the greatest load on any wheel of 5,000 pounds. To-day the same district will require a 32 horse-power engine, putting a load of 11,000 pounds on each rear wheel. Ten years ago the traction engine was only expected to look after itself; to-day the engine is required to haul a wheel load of from three to five tons.

This more than doubling of the load has been very destructive of culverts and bridges. Many of these structures built for the lighter load would under that load be good for ten years more, and it is not reasonable to expect the municipalities to at once rebuild them. But they should designate in some way the weak structures, so that persons owning and operating engines of great weight might be required to lay down plank of sufficient width and thickness to fully protect the flooring and covering of all bridges and culverts.

Having done this, they should not be allowed to leave undone those repairs and improvements which, carried on at little cost, will strengthen weak bridges or culverts. Many culverts are in a depression, and another foot or two of gravel placed over them would distribute the load more uniformly and increase the factor of safety many times. Sometimes, at very little expense and without taking from its usefulness, the culvert may be lowered, and thus without increasing the road grade a good cushion over the structure is secured. There are times when these methods are not practical—then require the engine owner to protect the culvert.

With bridges it is usually a question of additional material, new material, or both. To what extent the corporation engineer should advocate rebuilding so as to provide for this increase in weight of one particular line of traffic it is hard to say. It is largely a question of service. There are certain roads that receive all, or nearly all this traffic. Were these roads defined and fitted for the heavy loads they would relieve the necessity of repair or rebuilding of the structures on all roads.

Every municipality would be justified in passing a resolution to the effect that all owners of traction engines file with the clerk of the municipality, in which the machine is to operate, a statement of the engine's weight, both when empty and when supplied with fuel and water, wheel loads and main dimensions. In this way only can the county engineer keep informed of conditions.

The engineer in designing new structures should not only calculate on the present loads with sufficient margin for a large factor of safety, but he should allow for large increases in this load.

The demand each year is for more powerful engines. With the various blowing devices and feeders the present power is always fully taxed. There may not be in the coming decade the same increase in weight as there has in the present, but the engineer who does not provide for at least a very large increase will not be doing his whole duty.