

BRIDGE MAINTENANCE

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Because bridges generally serve for relatively long periods without maintenance, the organization for systematic maintenance of bridges, has been delayed in many cases. Now that the maintenance of roads proper has been systematized, and reduced to a rather routine procedure, a similar system for bridges is becoming a reality.

Every bridge should be subjected to a systematic examination at least once each year. The various maintenance operations necessary should be listed and the bridge checked against every one. The work deemed necessary should be carried out promptly. Procrastination in doing work plainly necessary has resulted in the loss of many bridges.

There should be a careful check of all bridges affected after every serious flood.

Some of the most important matters to be considered are the following:

FOUNDATIONS

More bridges are lost through failure of the foundations than from all other causes combined. Such failures generally come from wash-outs. To detect the danger and determine the remedy is generally not difficult, the trouble generally comes because of failure to carry out work plainly necessary. Systematic examination to detect the beginning of trouble and prompt attention after the trouble is detected will prevent almost all foundation failures.

SUPERSTRUCTURES

A properly constructed concrete superstructure requires practically no maintenance, if improperly constructed there is not much that can be done. The concrete in many of the early concrete bridges is of inferior quality, and no proper provision for expansion was made. There is no remedy for this except reconstruction.

The principal maintenance items in steel superstructures are painting and floor maintenance.

Paint is used for two purposes, to prevent rust and to improve the appearance.

Rust is the arch enemy of all steel bridges, if it were not for rust they would endure indefinitely, and the need for replacement would come about through obsolescence. The prevention of rust is therefore of prime importance. Paint applied properly, in the right places and

at the right times, is the preventive. The cost of the paint itself is only a minor item in the cost of the painting job, and it should therefore be of the best quality.

The actual damage by use is confined to limited areas, where through lack of ventilation, moisture remains in contact with the metal.

There are thousands of steel bridges that have never been painted after erection. The rusting on the well-ventilated portions of these bridges is of no appreciable effect and painting of such parts serves only to improve the appearance. But in other places, where moisture remains, the members are often rusted entirely through, and the life of the superstructure endangered.

Such places should be watched, cleaned at least once a year, and paint applied whenever the surface coat shows any sign of deterioration.

To serve any good purpose, paint must be applied to a clean, dry surface. This does not mean that the surface must be polished so that it shines, but everything that is in any way loose must be removed.

To clean and paint an entire steel bridge is expensive and much of the work is useless in prolonging the life of the structure. The essential need is to protect the points where rust attacks seriously.

It is important to use the right kind of paint, to apply the paint in the right place at the right time, and in the right way.

One of the major considerations in the design of the bridges should be the arrangement of details so as to facilitate cleaning and painting and to avoid details which will hold dirt and moisture.

TIMBER BRIDGES

In some parts of the country timber is still an important bridge material. While these bridges differ materially from those of steel and concrete the same basic considerations apply. The destruction of timber is through rot. Many bridges of untreated timber of the old covered type have been in service for fifty years or more, proving that if timber can be protected against its enemy, moisture, whether this be by shelter or thorough treatment with preservatives, it is an enduring material.

Experience has shown that bridge floors of timber can be cheaply and effectively protected against wear by bituminous wearing surfaces, or by steel traffic treads.

CONCLUSION

A bridge is supposedly the most permanent part of a highway and the proper design and construction of bridges therefore requires the most careful consideration of future maintenance, especially since the most difficult problems of maintenance arise through improper design or construction or both.

Maintenance should be built into the bridge

Foundations should be absolutely secure

No pains should be spared to insure first class concrete work. The best is none too good

Many of the failures of both steel and concrete bridges arise through lack of proper provisions for expansion. No other detail of bridge construction requires more care in design and execution.

Especial care should be exercised in designing steel bridges so as to avoid dirt and moisture collecting details

Every bridge should be subject to systematic examination at regular intervals and additional examination when unusual occurrences make it appear desirable. There should be an organization to carry out needed work promptly.

SNOW REMOVAL AND SNOW REMOVAL EQUIPMENT

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Snowfall was greater than normal for the winter 1926-27 in many of the high elevations of the western states and also along the northern border of the country from the western lake region westward, as well as in most places in the northern Ohio valley area, from the central lake region, and in Atlantic coast districts from Pennsylvania northward, elsewhere quite generally east of the Rocky Mountains there was less than normal snowfall, the deficiencies being especially large in the Missouri and middle and upper Mississippi valleys, the upper Ohio valley and the middle Atlantic area

Snow removal for states and smaller subdivisions that have heretofore been actively engaged in this class of work over their main highways require no further promotion, open roads for winter traffic in those localities have been sold to the taxpayers and users of the highways, and they now look upon the cleared highway during the snow season as a matter of fact and expect such open roads to exist the same