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LEE W. MAURER



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A REINFORCED CONCRETE
ARCH BRIDGE MODEL

Thesis for the Degree of B. S.

Lee W. Maurer

1927

THESIS

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New York, N.Y.

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A REINFORCED CONCRETE ARCH BRIDGE MODEL

A THESIS

SUBMITTED TO THE FACULTY OF THE MICHIGAN
STATE COLLEGE OF AGRICULTURE AND APPLIED
SCIENCE.

BY

LEE W. MAURER

CANDIDATE FOR THE DEGREE
OF BACHELOR OF SCIENCE.

JUNE 1927.

THE UNIVERSITY OF CHICAGO

PH.D.

THESIS

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The writer at this time wishes to express his thanks to Mr. Miller and Mr. L. V. Rothgery of the C. E. Department and also Mr. A. P. Krentel and Mr. Pesthums of the E. E. Department, as well as the M. E. Department for the use of machines and tools.

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GENERAL DISCUSSION

In the past few years, persons engaged in the teaching profession, have been materially aided with the advent of the movies and the radio. Things are accomplished by means of these two agencies which would otherwise take days or even weeks to complete.

The use of movies in our larger High Schools, and practically all our Colleges and Universities, is universal. Much time is saved, and what is vastly more important, especially in our Engineering classes, a clearer and more sharply defined picture is left in the mind of the student.

However, movies also have their disadvantages, due to the fact that the professor is forced to teach his classes in a more or less blind fashion. He cannot "look his class in the face" on account of the absence of light in the class room. Therefore, it is reasonable to believe that the interest and attention of a class would be harder to hold when movies are used.

When a professor is teaching a subject which deals with the designing of buildings, dams, and bridges, he has the choice of one of three methods:

1. Instructing the class with the aid of movies, pictures and designs.
2. Using no movies, but simply pictures and designs. (This is the usual procedure)
3. Using a "Working Model" of the subject at hand in conjunction with pictures and designs.

The writer believes that the last method mentioned is best adaptable to classes that have the design of bridges and structures. With this method, the disadvantages of the movies are eliminated, and what is more important, the student may examine closely the parts, the construction, and the position of reinforcements in a working model. It was, therefore, with this in view that the writer constructed the "Model of a Reinforced Concrete Arch Bridge."

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1. 2000年12月1日以前，在《中国注册会计师》杂志上公开发表过有关文章，且文章主题与注册会计师行业有关，并得到过有关方面肯定或奖励者。

the 1990s, the number of people in the world who are undernourished has declined from 1.1 billion to 800 million. The number of people who are malnourished has declined from 1.5 billion to 1 billion. The number of people who are obese has increased from 100 million to 300 million. The number of people who are overweight has increased from 100 million to 300 million. The number of people who are obese and overweight has increased from 100 million to 300 million. The number of people who are obese and overweight has increased from 100 million to 300 million.

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GENERAL SPECIFICATIONS

(Scale 1 inch - 2 feet)

Span - 65 feet.

Roadway Width (Small) - 15 feet.

Roadway Width (Large) - 25 feet.

Sidewalks - Two 6 foot walks to be
supported on arch ring.

Abutment Width - 8 feet.

Overall Length of Bridge - 97 feet.

Rise - $14\frac{1}{2}$ feet.

Arch Ring at Crown - $1\frac{1}{2}$ feet.

Arch Ring at Springing - 3 feet.

Total Width of Bridge at Crown - 42 feet.

Total Width of Bridge at Ends - 52 feet.

Four Street Lights - 4 to 5 feet high.

Balustrade - 3 feet 2 inches high.

RELATIONSHIP

(1961-1962)

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In order to break the monotony of a plain bridge, it was decided to curve the spandrel walls from the springing line outward to make the approaching roadway 25 feet wide.

METHOD OF CONSTRUCTION

In constructing this model Homesote wall board three-eighths of an inch in thickness was used throughout. This wall board is a very good color imitation of concrete and is much lighter. The reinforcing steel which is shown in all sections is in reality one-sixteenth inch copper buss bar, which to the scale of the model (one inch equals two feet) actually would show as one and one-half inch bars, which is about a quarter of an inch over standard bars. However, in most cases the above scale was strictly adhered to.

The abutments were made and placed in position first. A templet of the arch ring and an abutment was made and the proper number of characteristic shapes were sawed out on the band saw. These strips were glued and nailed together.

in order to prevent the spread of disease
and to protect the health of the community.
The following measures are recommended:
1. Isolation of cases.

MEASURES TO BE TAKEN

The following measures should be taken to
prevent the spread of disease and to protect
the health of the community. These measures
are based on the principles of public health
and are designed to be simple and practical.
1. Isolation of cases. Cases of disease
should be isolated from the community as soon
as possible. This can be done by placing
them in a separate room or by placing
them in a separate building. 2. Disinfection
of the environment. The environment should
be disinfected to prevent the spread of
disease. This can be done by using
disinfectants and by cleaning the
environment. 3. Hygiene. Good hygiene
practices should be followed to prevent the
spread of disease. This includes washing
hands frequently and using clean water.

These measures are designed to be simple and
practical and are based on the principles
of public health. They are designed to be
easy to follow and to be effective in
preventing the spread of disease. It is
important to remember that these measures
are only a part of the overall effort to
prevent the spread of disease. It is also
important to remember that these measures
are only a part of the overall effort to
protect the health of the community.

Fifty-six to fifty-eight of them were required to give the proper width. A large heavy rasp was used to smooth both the arch ring and the abutments. When this was finished the arch ring was placed in position upon the abutments and the two spandrel walls were glued and nailed into position. To represent the water level a strip of tin was nailed in place under the arch ring, following the course of the river on each side of the bridge. The river banks were now nailed and glued in place and later trimmed and chiseled down to a smooth surface. This surface was given coat of glue and Home-sote sawdust sprinkled over it to give it a rough finish. The counterforts and curtain walls were now placed and then the sidewalks and roadway. The balustrade was modeled directly after those used in practice, with the exception of the spindles and lamp posts, which were made of wood. In finishing the model, the outside boxing or casing was painted grey, the river banks "blind green" and the roadway given a coat of black asphaltic paint. The river surface was given a coat of navy blue Duco which was mixed with clear lacquer.

[illegible]

The sections are arranged in the following order: The roadway comes out first, showing the inside construction of the bridge. One sidewalk is next removed to allow the section of the arch ring to be withdrawn. At this point sections of a curtain wall, a counterfort and the arch ring are visible, all showing reinforcement. Last a section of the abutment may be removed. All important parts of the bridge are now visible.

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