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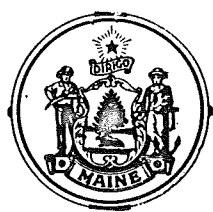
BRIDGES

Maine

1967

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MACHIASPORT AND EAST MACHIAS
BRIDGE STUDY
MACHIAS RIVER BRIDGE



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Prepared by the
MAINE STATE HIGHWAY COMMISSION.
Bridge Division January 1967

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CHIEF ENGINEER

Maine State Highway Commission

AUGUSTA, MAINE 04330

January 11, 1967

To the Honorable Senate and
House of Representatives of the
One Hundred and Third Legislature

Transmitted herewith is a report entitled "Machiasport and
East Machias Bridge Study".

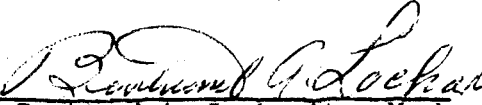
This report is being submitted in accordance with the
provisions of the Resolves of the One Hundred and Second
Legislature, Chapter 53, a copy of which is included and made
a part of this report.

The report was prepared by the Maine State Highway Commission,
Bridge Division.

Respectfully,

MAINE STATE HIGHWAY COMMISSION


David H. Stevens, Chairman


Bertrand A. Lacharite, Member


Steven D. Shaw, Member

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Sketches for Low Level Trestle & Swing Span - Estimate #3 have been omitted.	

SUMMARY

In compliance with a resolve passed by the 102nd Legislature, the Maine State Highway Commission has prepared this report based on engineering aspects of a highway bridge across the Machias River to replace the existing structure.

The need for a new bridge, designed for present day and foreseeable future traffic, becomes evident when the condition of the existing bridge is considered.

The existing bridge is a multiple short span trestle type structure with a hand operated swing span for water traffic, built in 1907. It is of wooden construction entirely, except for the swing span steel trusses, floor beams and stringers. Due to the number of years this bridge has been in service it has deteriorated in such a manner that it is difficult to keep the swing span in operation because of settlement of the pivot and rest piers. Because the swing span is operated by hand, considerable time is consumed in opening and closing it, thus creating a frustrating delay for the vehicular highway traffic.

Maintenance of the bridge, due to the type of construction, has become increasingly expensive and even if it is maintained adequately in its present condition, it is not capable of supporting modern heavy truck traffic and is posted for a gross load of 4 tons. The average annual cost of maintenance and operation for the past 10 years has been about \$4,200.00, and major repairs will be necessary in the near future if the bridge is to remain in service.

Highway traffic using the bridge at the present time and traffic projected for a twenty year period is as follows:

Year 1966 - Estimated Average Daily Traffic in 24 hour period 450 vehicles
Year 1986 - Estimated Average Daily Traffic in 24 hour period 630 vehicles

About five per cent (5%) of all vehicles would be trucks.

The average number of openings per year of the swing span for regular boat traffic during the past 10 years is about 60 with 94 in the first 10 months of 1966.

The Bridge Division of the Maine State Highway Commission has prepared an estimate of cost for three types of bridges as follows:

Estimate No. 1 - High Level 3-Span Bridge	\$1,004,000.00
Estimate No. 2 - High Level 7-Span Bridge	822,000.00
Estimate No. 3 - Low Level with Swing Span	997,000.00*

*This figure is the estimated cost of construction. It does not include the operators estimated annual salary of \$5,500.00.

While the bridge is in relatively poor condition it carries a small amount of traffic and reconstruction costs are high.

The priority of the proposed project must be determined by comparing its necessity with other highway needs throughout the state and funds available for such work.

It should also be noted that upon petition by the towns of Machiasport and East Machias reconstruction of the bridge could be considered under the provisions of the Bridge Act.

With the present state's valuation of the towns of East Machias and Machiasport the division of cost of a bridge estimated at \$800,000.00 would be:

State of Maine	\$548,750.00
County of Washington	240,000.00
Town of East Machias	7,250.00
Town of Machiasport	<u>4,000.00</u>
	\$800,000.00

Each town would pay $\frac{1}{2}$ of 1% of the state's valuation of the town toward the construction and would be responsible for acquiring any necessary right-of-way within its own borders. Under the terms of the Bridge Act these figures represent the maximums the towns are required to pay, so, if the bridge cost exceeds \$800,000.00 the county would pay 30% and the state the remainder of the excess.

MACHIAS RIVER - BRIDGE STUDY

INTRODUCTION

The State of Maine Legislature, meeting in 102nd regular session, enacted a resolve authorizing and directing the State Highway Commission to study the desirability of replacing the existing bridge across the Machias River between the towns of Machiasport and East Machias and to report the results of the study to the next regular session of the Legislature. A full copy of the resolve follows.

- - - - -

Chapter 53 - Resolves, 1965

RESOLVE, Authorizing State Highway Commission to Study
Desirability of Bridge Across Machias River

Bridge across Machias River, study authorized. Resolved: That the State Highway Commission be, and is, authorized and directed to make a study of the need and cost of a highway bridge across the Machias River between the Towns of Machiasport and East Machias, in the County of Washington, with necessary highway approaches thereto; and be it further

Resolved: That the Commission shall report the results of its study at the next regular session of the Legislature.

- - - - -

In response to the above Resolve, the State Highway Commission has conducted a study based on need, traffic service and engineering aspects of a bridge across the Machias River.

Bridge Location and Engineering Aspects

Figure 1, Page 8 is a Location Map of the general vicinity showing the site of the proposed bridge.

The site of the proposed bridge would be at approximately the same location as the existing bridge. However, the alignment would be downstream from the existing structure a sufficient distance so that the bridge and approaches would be on a line which would eliminate the sharp curves on both of the existing approaches. It would also allow the existing structure to be used for the maintenance of traffic while the new bridge is being constructed.

Three preliminary estimates of cost have been prepared. All three estimates are based on the same alignment, but due to the type of structure the grades vary from high level to low level.

Since the Machias River is navigable at the proposed bridge location an underclearance of 28' above mean high water has been considered in both high level structures. Preliminary information regarding the size and type of boats using the channel indicates that this clearance should prove satisfactory.

The low level bridge with the movable span would provide unlimited vertical clearance and 50 foot horizontal clearance. The horizontal clearance is about 5 feet more than provided by the existing bridge.

Any revision of the present clearances would be subject to the approval of the Department of the Army, Corps of Engineers.

Any required clearances greater than those used in the estimates would increase the cost of the structure involved.

Estimate No. 1

Estimate No. 1 is for a high level bridge consisting of a three-span, continuous, composite, welded plate girder type having span lengths of 187'-6" - 250'-0" - 187'-6". The deck would be reinforced concrete and would have a 28' clear roadway width, 1'-6" clear curbs, bituminous concrete wearing surface and a two-bar metal bridge rail.

The approaches would consist of a 22' wide bituminous concrete pavement with 6 feet of usable shoulders.

The south approach would be about 610' long and the north approach about 470', the total length of the bridge and approach would be about 1710 feet.

Figure 2, Page 9 shows a Plan and Profile sketch of the Proposed Bridge and Approaches and Figure 3, Page 10 shows a sketch of the Plan, Elevation and Transverse Section of the proposed bridge.

The estimated cost of the project as outlined in Estimate No. 1 is as follows:

Bridge Structure	\$ 833,000.00
Approaches	108,000.00
Removal of Existing Bridge	38,000.00
Right-of-Way	<u>25,000.00</u>
Total	\$1,004,000.00

Estimate No. 2

Estimate No. 2 is for a high level bridge consisting of a seven-span, continuous composite, welded plate girder type, having span lengths of 76'+ - 95' - 95' - 95' - 95' - 95' - 76'+ (total about 627 feet). The deck would be reinforced concrete and would have a 28' clear roadway width, 1'-6" clear curbs, bituminous concrete wearing surface and a two-bar metal bridge rail.

Due to the shorter lengths of spans, the depth of the bridge will be less than that required for the structure in Estimate No. 1. This allows the finished grade to be lower and still keep a 28' underclearance.

This lower finished grade is reflected in the estimated cost of the approaches.

In all other respects the approaches for Estimate No. 2 are the same as for Estimate No. 1.

Figure 4, Page 11 shows a Plan and Profile sketch of the Proposed Bridge and Approaches and Figure 5, Page 12 shows a sketch of the Plan, Elevation and Transverse Section of the proposed bridge.

The estimated cost of the project as outlined in Estimate No. 2 is as follows:

Bridge Structure	\$670,000.00
Approaches	89,000.00
Removal of Existing Bridge	38,000.00
Right-of-Way	<u>25,000.00</u>
Total	\$822,000.00

Estimate No. 3

Estimate No. 3 is for a low level bridge consisting of four 65' spans, one 150' swing span and four 60' spans, which would be about 656 feet total length of bridge required.

The 65 and 60 foot spans would be steel stringers with a reinforced concrete deck.

The swing span would be of structural steel with open grid steel flooring, filled with concrete where necessary to protect the swing span operating machinery. A house for the operator and for enclosing the electrical control equipment would be constructed.

The clear roadway width would be 28'.

The approaches would be the same as for Estimate Nos. 1 and 2 except for finished grade which would be the lowest of all three.

Sketches of the proposed project for Estimate No. 3 have been omitted.

The estimated cost of the project as outlined in Estimate No. 3 is as follows:

Bridge Structure	\$866,000.00
Approaches	68,000.00
Removal of Existing Bridge	38,000.00
Right-of-Way	<u>25,000.00</u>
Total	\$997,000.00

PROPOSED MACHIAS RIVER BRIDGE

The following information indicates the comparative estimated cost for each of the proposed structures based on a life expectancy of sixty years.

Preliminary Estimate No. 1 (High Level 3-spans)

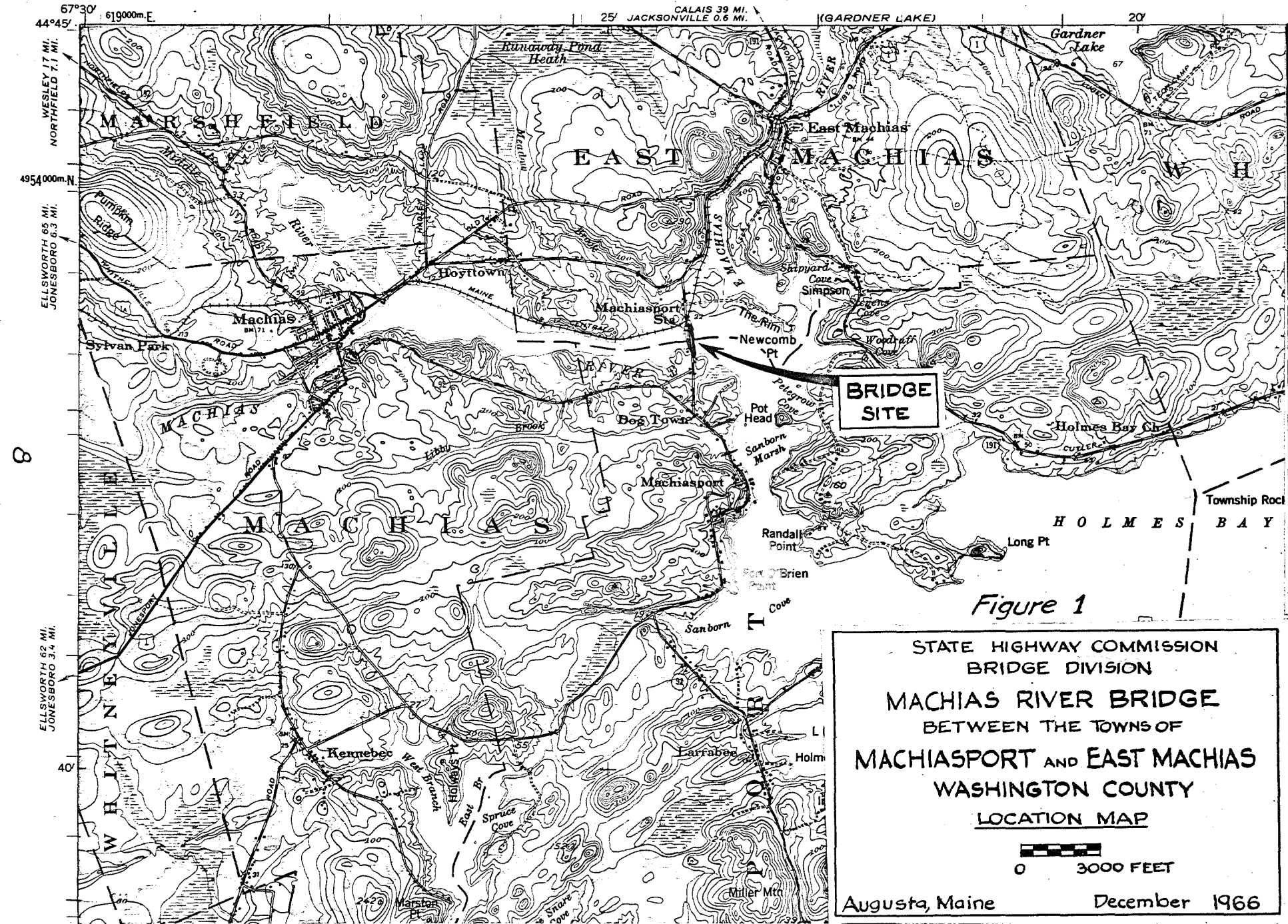
Estimated Construction Cost = \$1,004,000.00
Life of Structure 60 years
Maintenance cost on yearly basis . . \$2,500.00 x 60 yrs. = 150,000.00
Total Cost for 60 years = \$1,154,000.00

Preliminary Estimate No. 2 (High Level 7-spans)

Estimated Construction Cost = \$822,000.00
Life of Structure 60 years
Maintenance cost on yearly basis . . \$2,500.00 x 60 yrs. = 150,000.00
Total Cost for 60 years = \$972,000.00

Preliminary Estimate No. 3 (Low Level with Power Operated Swing Span)

Estimated Construction Cost = \$997,000.00
Life of Structure 60 years
Maintenance cost on yearly basis:
Maintenance = \$3,500.00
Operators Salary = 5,500.00
\$9,000.00 x 60 years = 540,000.00
Total cost for 60 years = \$1,537,000.00



(WESLEY)

67°30' 44°45'

WESLEY 17 MI.
NORTHFIELD 7.1 MI.

8

ELLSWORTH 65 MI.
JONESBORO 6.3 MI.

40°

ELLSWORTH 62 MI.
JONESBORO 3.4 MI.

25' CALAIS 39 MI.
JACKSONVILLE 0.6 MI. (GARDNER LAKE) 20'

BRIDGE SITE

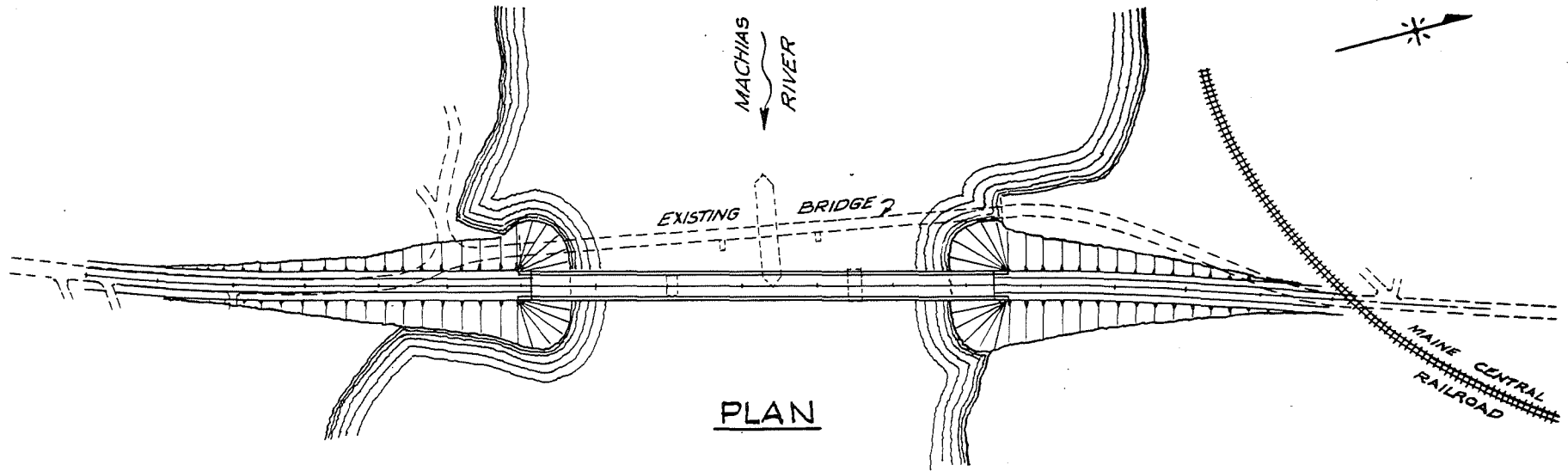
Figure 1

STATE HIGHWAY COMMISSION
BRIDGE DIVISION
MACHIAS RIVER BRIDGE
BETWEEN THE TOWNS OF
MACHIASPORT AND EAST MACHIAS
WASHINGTON COUNTY
LOCATION MAP

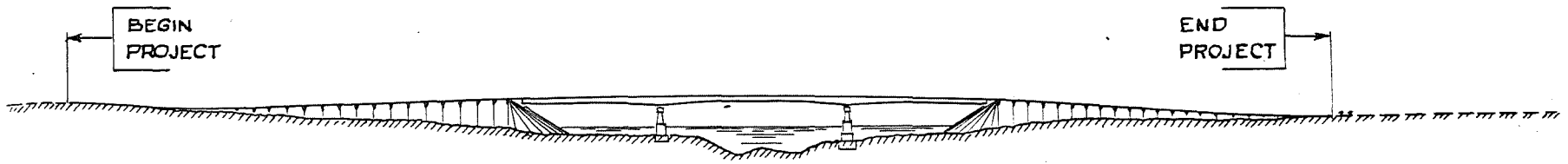
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Augusta, Maine December 1966

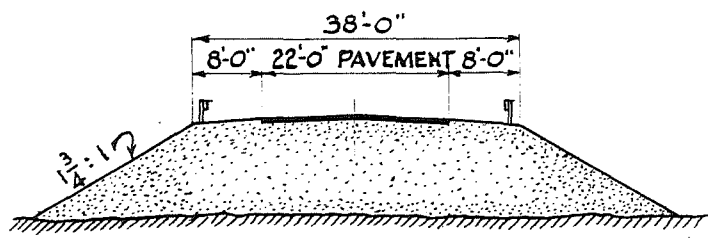
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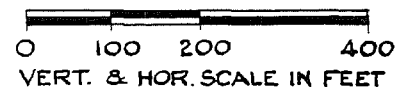
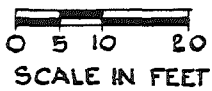
PLAN



PROFILE



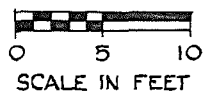
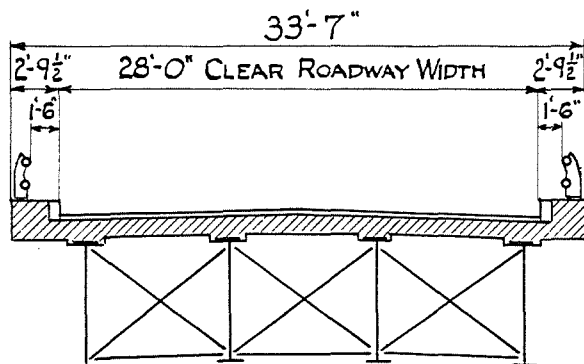
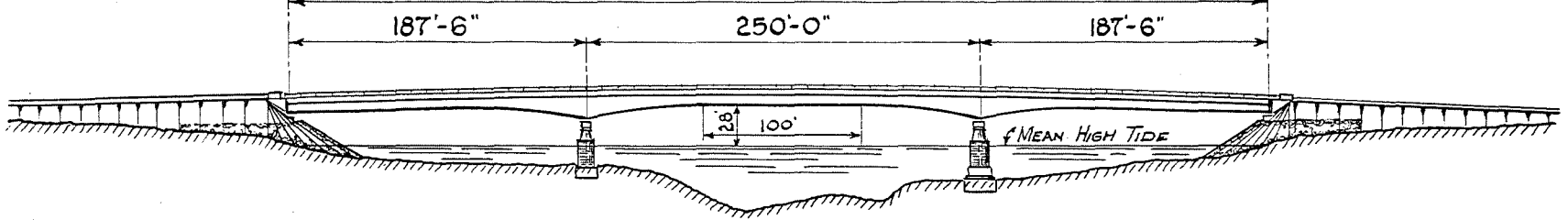
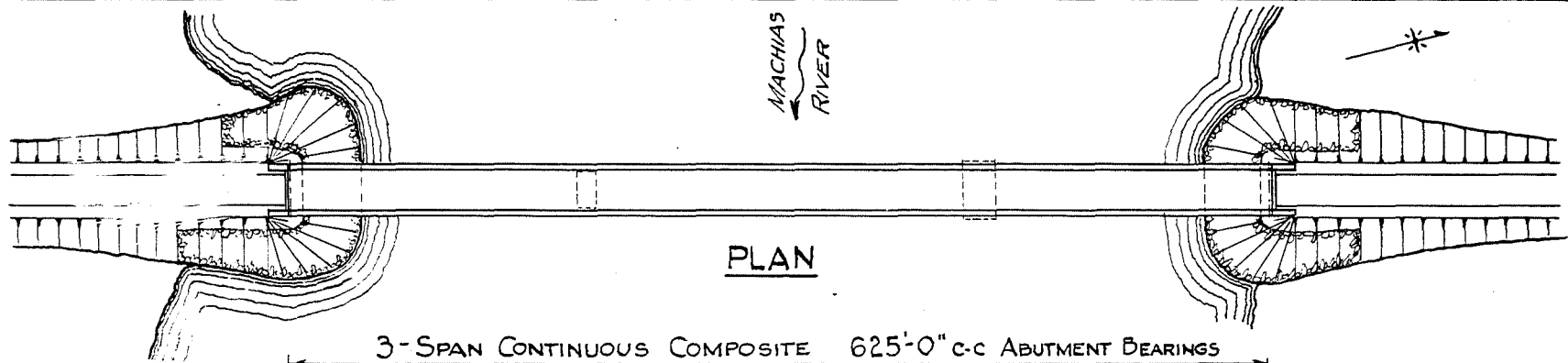
APPROACH SECTION



STATE HIGHWAY COMMISSION
BRIDGE DIVISION
MACHIAS RIVER BRIDGE
BETWEEN THE TOWNS OF
MACHIASPORT AND EAST MACHIAS
WASHINGTON COUNTY

PROPOSED BRIDGE AND APPROACHES
Estimate No. 1.
Augusta, Maine December 1966

Figure 2



STATE HIGHWAY COMMISSION
BRIDGE DIVISION

MACHIAS RIVER BRIDGE

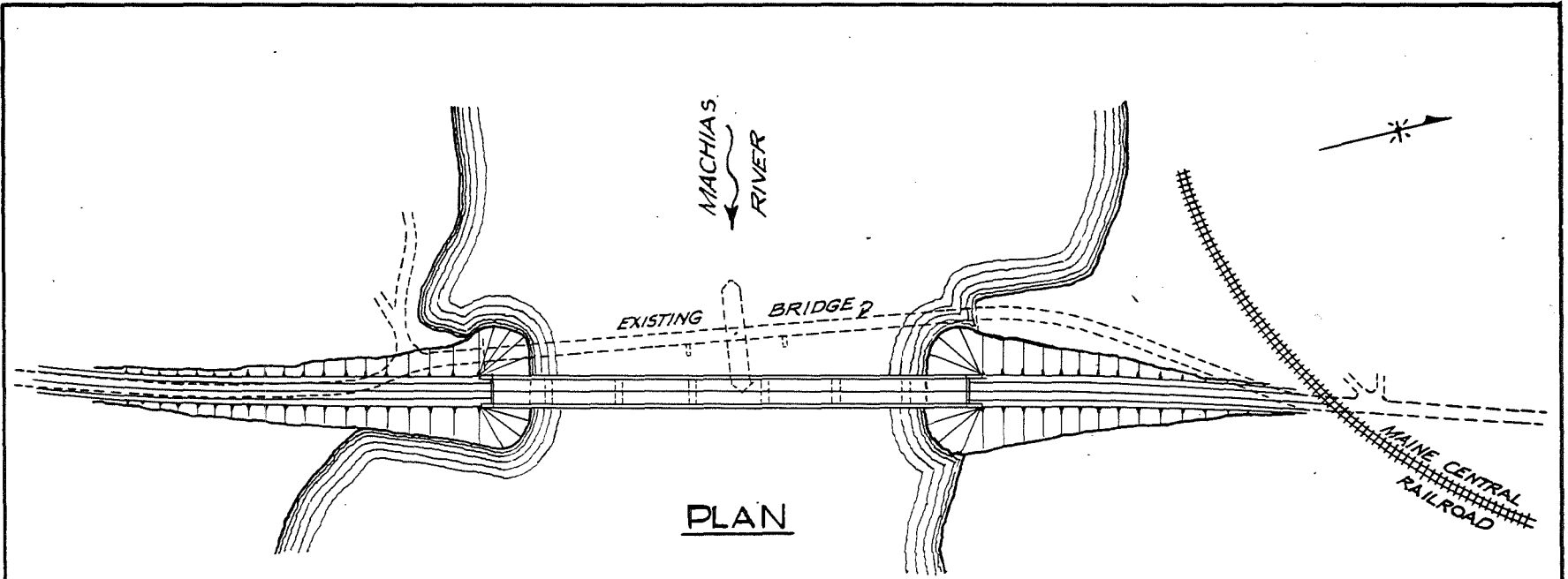
BETWEEN THE TOWNS OF
MACHIASPORT AND EAST MACHIAS
WASHINGTON COUNTY

PROPOSED BRIDGE
Estimate No. 1.

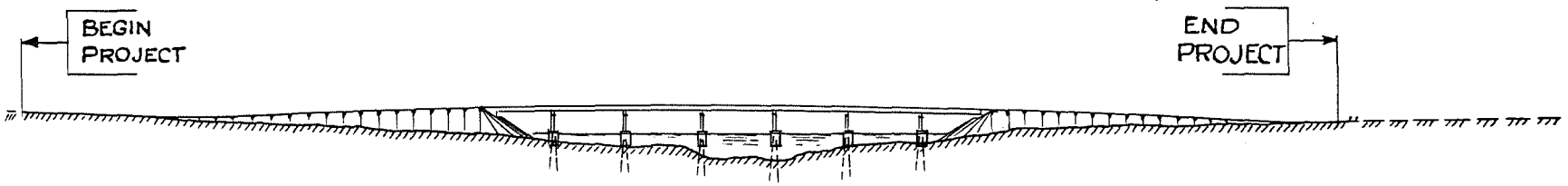
Augusta, Maine December 1966

Figure 3

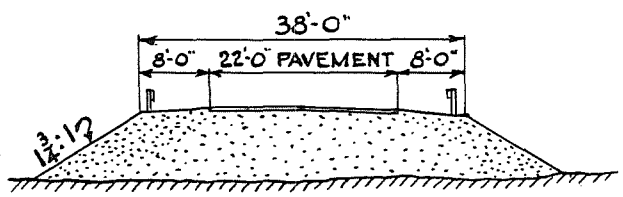
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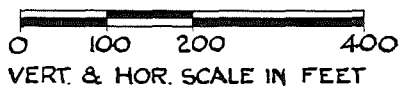
PLAN



PROFILE



APPROACH SECTION



STATE HIGHWAY COMMISSION
 BRIDGE DIVISION
MACHIAS RIVER BRIDGE
 BETWEEN THE TOWNS OF
MACHIASPORT AND EAST MACHIAS
 WASHINGTON COUNTY

PROPOSED BRIDGE AND APPROACHES
Estimate No. 2.

Augusta, Maine December 1966

Figure 4

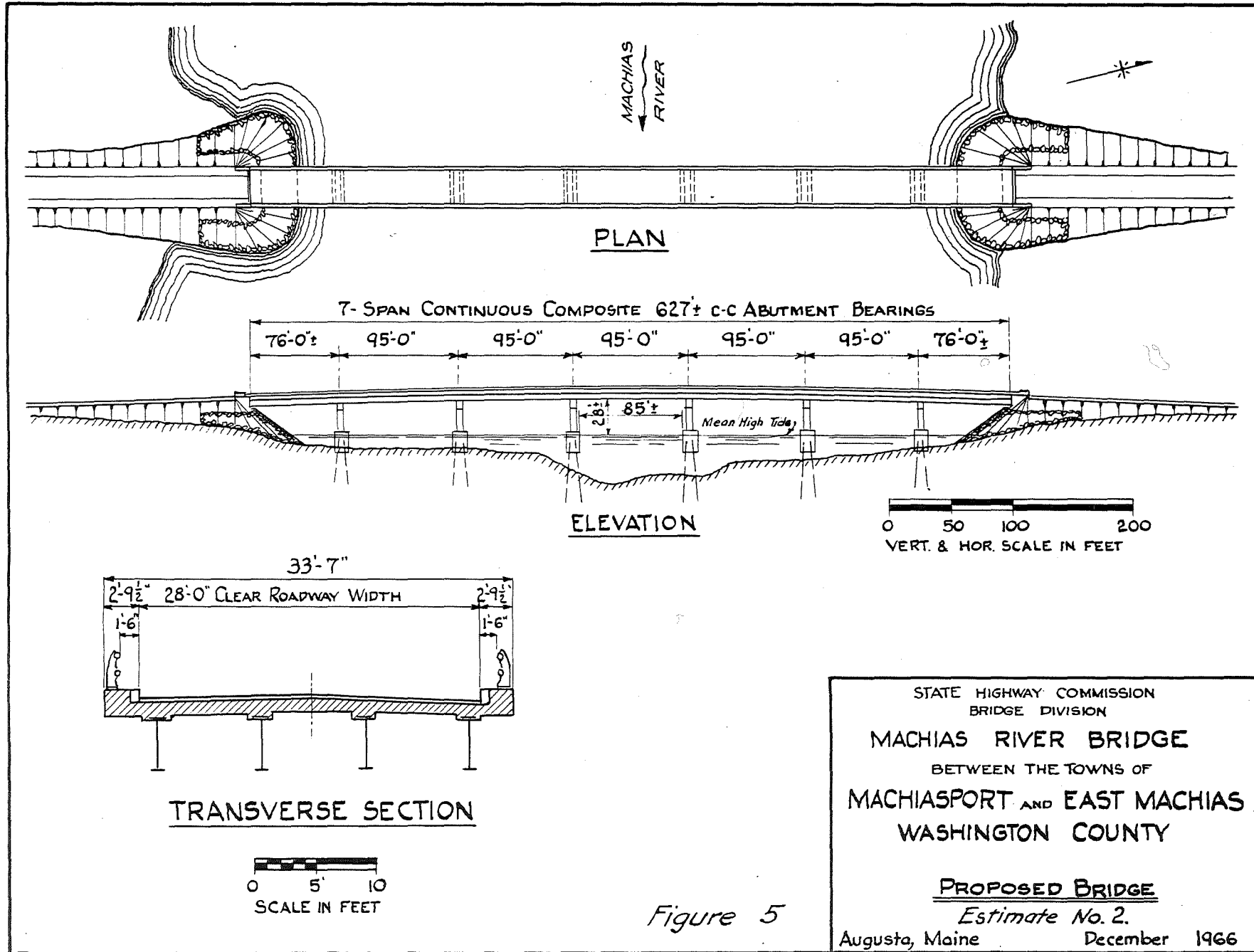


Figure 5

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