

Evaluation of An International Barrier Corporation Barrier

**Final Report for
Iowa DOT Project HR-532**

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Final Report
for
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Project HR-532

EVALUATION
OF AN
INTERNATIONAL BARRIER CORPORATION BARRIER

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DISCLAIMER

The contents of this report reflect the views of the author and do not necessarily reflect the official views of the Iowa Department of Transportation. This report does not constitute a standard, specification or regulation.

ABSTRACT

In 1986, the Iowa DOT installed 700 feet of International Barrier Corporation (IBC) barrier between the I-235 eastbound off ramp and the adjacent eastbound loop on ramp at 8th Street in West Des Moines. It is a 3 foot 6 inch high sand-filled galvanized sheet metal barrier. The bid price on this project was \$130 per lineal foot.

It was evaluated annually for four years. During this time, there have been no severe accidents where vehicles hit the barrier. There are scrapes and dents indicating minor accidents. The barrier has performed very well and required no maintenance. Due to its initial cost, the IBC barrier is not as cost-effective as portland cement concrete barrier rails.

INTRODUCTION

In recent years, substantial progress has been made in reducing the number of annual traffic fatalities. There are many factors which contribute to this, but all are part of a continuing emphasis on improved traffic safety. Barrier rails are used to reduce head to head traffic conflicts. The concrete Jersey barrier has been widely accepted across the United States. Its shape redirects vehicles that have departed from the designated vehicle lane.

The IBC introduced a light gauge, sand filled, energy absorbing metal barrier rail as an alternate to the concrete Jersey rail.

OBJECTIVE

The objective of this study is to compare the cost and performance of the IBC barrier with that of the concrete Jersey barrier.

PROJECT LOCATION AND CONTRACTOR

The IBC barrier was constructed on Polk IR-235-2(180)79--12-77 to separate the I-235 EB off ramp to 8th Street (in West Des Moines) traffic from the traffic entering I-235 EB by an adjacent ramp (Figure 1). This project was let December 17, 1985. The successful bidder was Cramer Brothers Construction Company of Des Moines, Iowa.

CONSTRUCTION

The IBC barrier was a model MK-7 assembled from sidewall sections 11' 6" long. The total length of the barrier was 700' on a curved alignment. Construction began July 30, 1986, and was completed August 30, 1986. It was constructed on a 10' wide 6" deep PC concrete pad. There were some problems due to the curved alignment. The sidewall holes were punched for straight line construction. The holes were modified during erection on one side by redrilling the holes to allow shortening on the inside of the curve. After this slight modification, there were very few installation problems. The barrier approximately 3'6" high (Figures 2 through 6) is sand filled with diaphragms spaced at 10' 6" intervals. A concrete sand of the following gradation was used:

<u>Sieve</u>	<u>% Passing</u>
3/8	100
#4	90-100
#8	70-100
#200	0.1.5

COST

The unit bid price for the IBC barrier was \$130 per lineal foot while PC concrete median barrier on this project was bid at \$23.50 per lineal foot.

PERFORMANCE

The barrier has been evaluated for four years by an annual field review. The winters during this evaluation have been relatively mild with predominately below normal precipitation.

There have been periods of freezing rain causing icy conditions. There have been no severe accidents where vehicles have struck the metal barriers. There is evidence of four incidents where vehicles have struck and scraped or dented the barrier. None of these have punctured or torn the metal skin.

There was substantial concern by Iowa DOT maintenance personnel of how to repair it if a severe accident would tear a hole in it. No panel sections were kept in stock for this situation. This situation has not occurred and no maintenance has been necessary in four years. The performance has been very good.

There has been no opportunity to evaluate the redirecting of a vehicle that has struck the barrier as no severe accidents have occurred at this location.

CONCLUSIONS

This research of an IBC barrier supports the following conclusions:

1. The IBC barrier has given good performance and required no maintenance.
2. Due to its initial cost, the IBC barrier is not as cost-effective as portland cement concrete barrier rails.

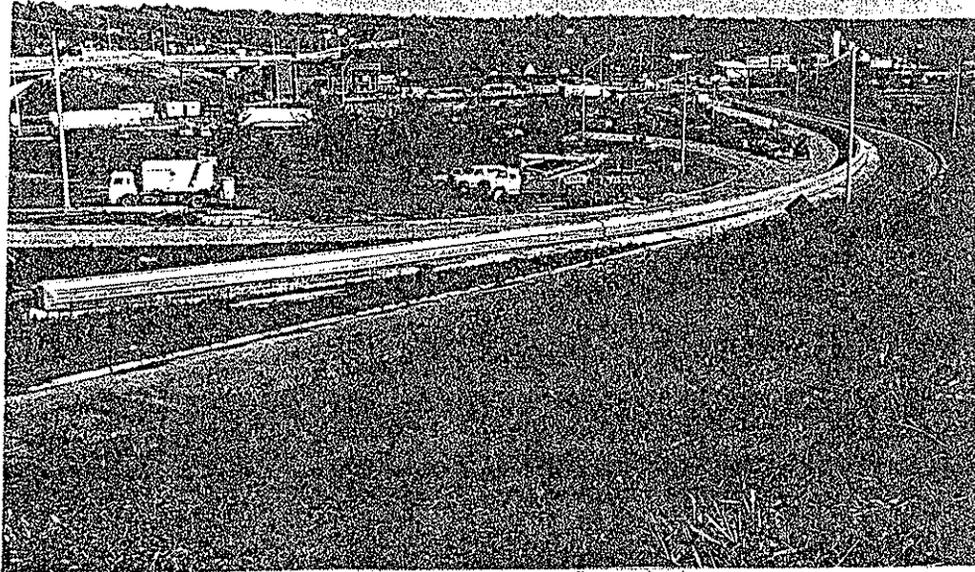


Figure 2 - IBC Barrier Overview

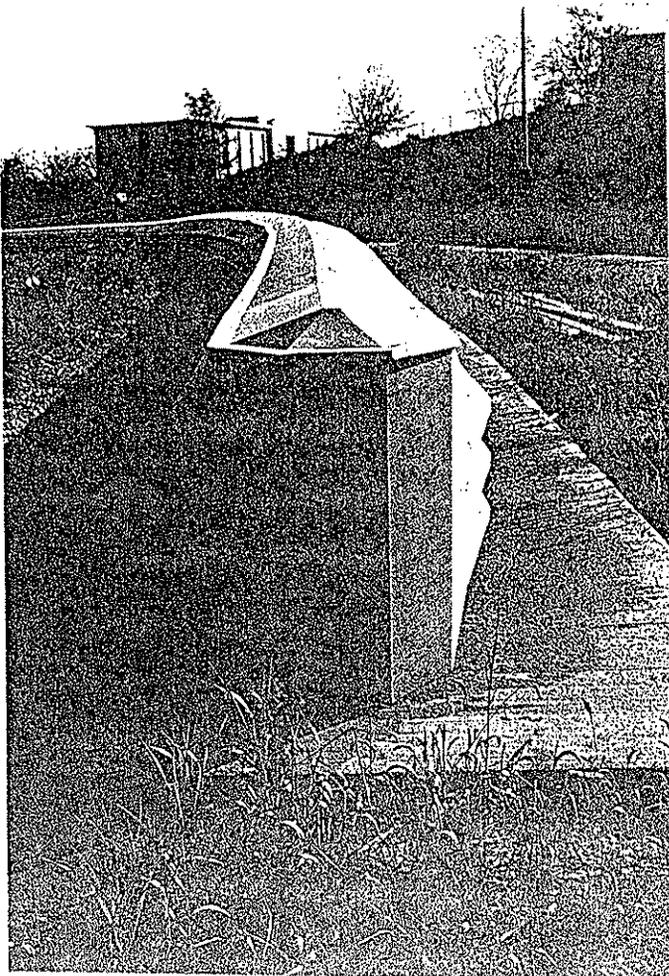


Figure 3
End View of the IBC Barrier

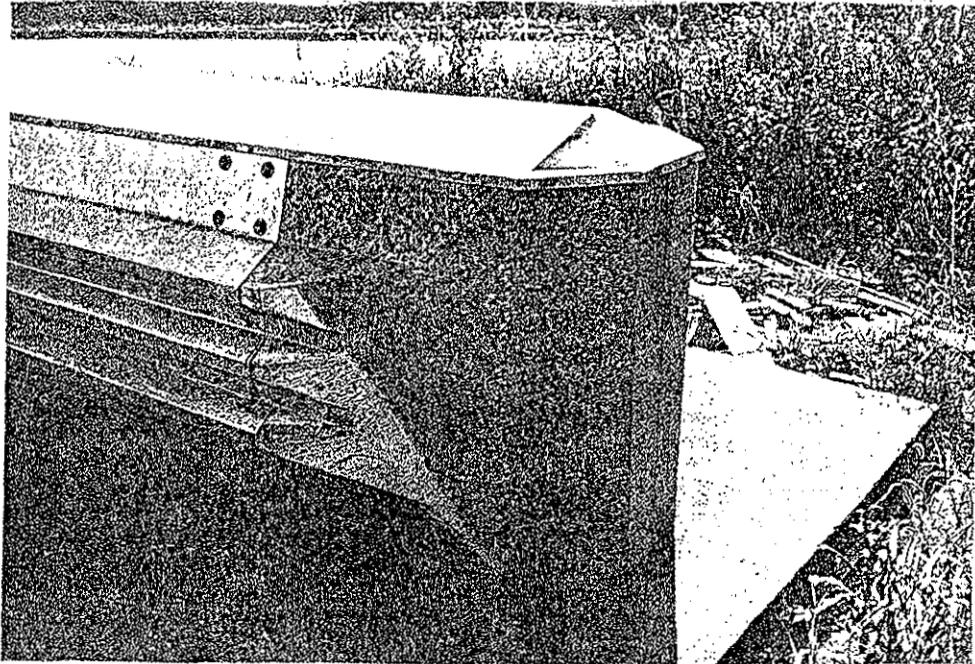


Figure 4 - Side View of the End of the IBC Barrier

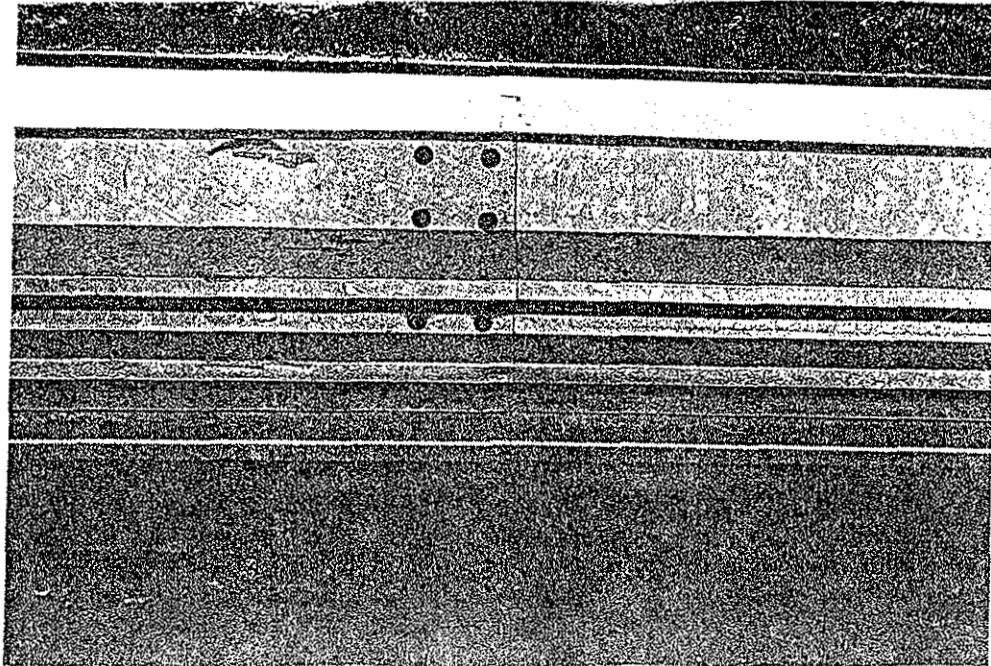


Figure 5 - Connection of IBC Sidewall Sections



Figure 6 - Top View of IBC Lid Panel