DATE: February 27, 1996

FROM: Minnesota Fatality Assessment and Control Evaluation (MN FACE) Program
Minnesota Department of Health

SUBJECT: MN FACE Investigation 95MN05001
Bridge Inspector Dies After Falling From Seawall

SUMMARY

A 56-year old bridge inspector drowned after falling from a seawall. The victim and a coworker were inspecting a highway bridge over a waterway that connected two bays of a large lake. Although life vests were available in the inspectors vehicle, they were not being worn at the time of the incident. The bridge inspectors were working at ground level on one side of the waterway. A concrete seawall existed along the edge of the waterway. The top of the seawall was wet and slippery due to waves striking it and due to the growth of algae in the water. The inspectors were looking for evidence of structural deterioration in the concrete portions of the bridge. After inspecting the underside of the bridge furthest from the waterway, the victim walked to the edge of the water while the coworker remained in an area away from the waterway. The victim stepped onto the seawall and stood on it with his back toward the water. He was wearing a pair of general purpose "tennis" type shoes. The coworker did not see the victim fall from the seawall but heard the victim strike the water. The coworker rushed to the edge of the water and briefly saw the victim in the water before he disappeared beneath the surface. Rescue personnel were called to the scene and located the victim under water. Resuscitation efforts were performed as the victim was transported to a local hospital where he was pronounced dead a short time later. MN FACE investigators concluded that to reduce the likelihood of similar occurrences, employers should:

- ensure that personal flotation devices are available and used when employees work near or over water where the danger of drowning exists; and

- ensure that footwear appropriate for the work environment is available and worn by employees.

INTRODUCTION

On September 12, 1995, MN FACE investigators were notified of a work-related fatality that

occurred on September 11, 1995. A site investigation was conducted by MN FACE investigators on September 29, 1995. On December 1, 1995, an employer interview was conducted by MN FACE investigators.

The victim was a Senior Professional Engineer/Bridge Inspector at the time of the incident and had been employed for 29 years. He had worked for more than 25 years in various capacities as a bridge inspector. Approximately 75% of his work time was spent in his office and approximately 25% was spent "in the field" conducting bridge inspections. The victim was an experienced inspector and through informal training and on-the-job training, was familiar with the hazards associated with inspecting bridges. He was also trained in the use of personal protective equipment including fall protection equipment and personal flotation devices.

INVESTIGATION

On the day of the incident, the victim and a coworker were conducting an annual inspecting of a highway bridge over a waterway that connected two bays of a large lake. The weather was sunny with a temperature about 70 degrees Fahrenheit and light winds were blowing. The victim was wearing a pair of general purpose "tennis" type shoes. Life vests were available in the workers vehicle but neither worker wore a vest while inspecting the bridge.

The bridge was approximately 200 feet long and 60 feet wide. The concrete bridge deck was supported by steel I-beams that rested on concrete bridge piers that were 18 feet tall. The base of the bridge pier in the vicinity where the incident occurred, (Figure 1) was 12 feet from a concrete seawall that existed along the edge of the waterway. The bridge inspectors were working at ground level on one side of the waterway. A level area, approximately 60 feet square directly under the bridge and adjacent to the seawall was dry and provided a safe work area for the inspectors. The concrete seawall was 14.5 inches wide and the top of it was approximately 12 inches above the water. The top of the seawall was wet and slippery due to waves striking it. The growth of algae in the water also caused the top surface of the seawall to be more slippery than if it were just wet.

The two workers were looking for evidence of spalling[1] in the concrete portions of the

[1]Spalling: Significant structural deterioration of concrete or stone due to chipping, crumbling or fragmentation.

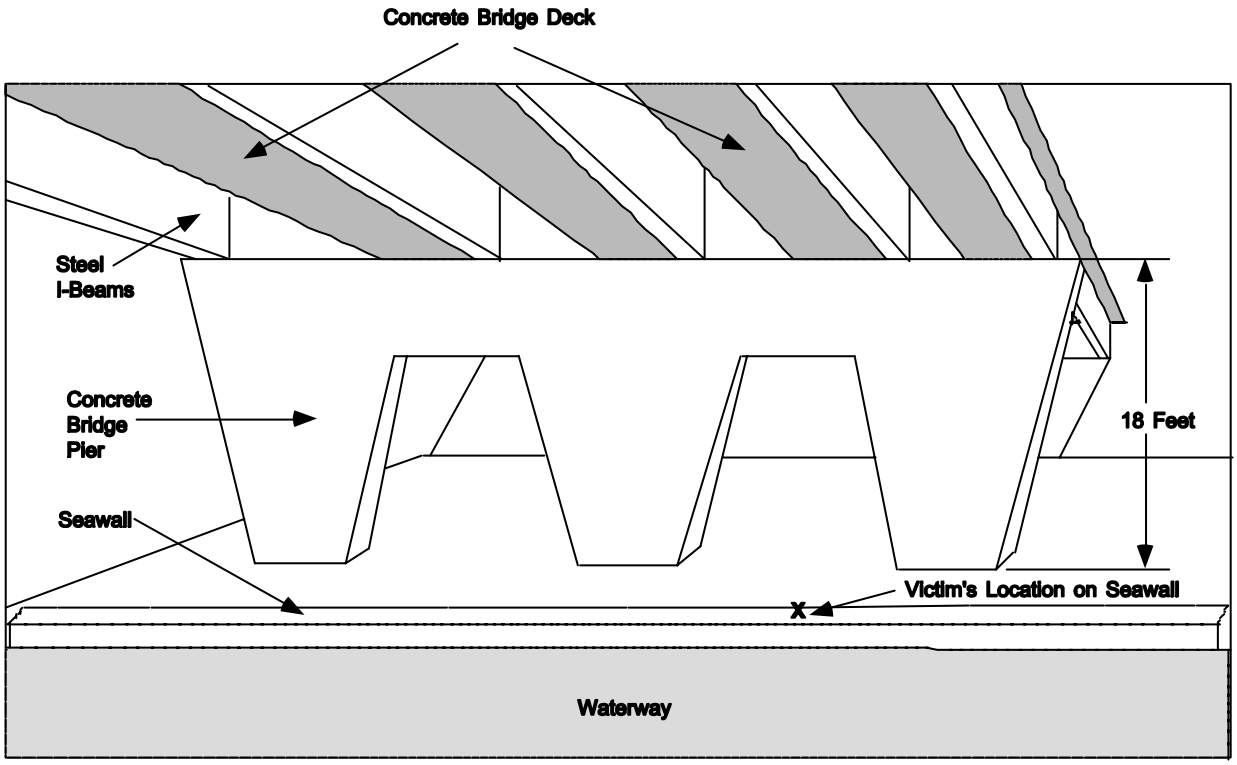

Figure 1. Bridge Inspection and Incident Site
Not To Scale

1bridge versus small cracks that do not affect the structural safety of the bridge. After inspecting the underside of the bridge in an area further from the waterway, the victim walked to the edge of the water. The coworker remained in an area approximately 40-50 feet from the waterway. The victim stepped onto the seawall and stood on it with his back toward the water. He was wearing a pair of general purpose "tennis" type shoes. From this position he apparently looked up to inspect the underside of the bridge deck that was directly above him. The coworker did not see the victim fall from the seawall but heard the victim strike the water. The coworker rushed to the edge of the water and briefly saw the victim in the water before he disappeared beneath the surface. Rescue personnel were immediately called to the scene and located the victim under water. After removing him from the water, resuscitation efforts were performed as the victim was transported to a local hospital where he was pronounced dead a short time later.

CAUSE OF DEATH

The cause of death listed on the death certificate was drowning.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Ensure that personal flotation devices are available and used when employees work near or over water where the danger of drowning exists.

Discussion: Whenever employees are working over or near water where the danger of drowning exists, a U.S. Coast Guard approved life jacket or buoyant work vest should be worn. In this incident, the victim fell a distance of approximately 12 inches from a seawall that served as a boundary between the shore and the waterway. When he quickly disappeared beneath the surface of the water, he could not be seen nor could an attempted rescue be made by his coworker. If he had been wearing an approved personal flotation device, he probably would have remained at the surface of the water and been safely rescued by either his coworker or by emergency personnel who were called to the scene.

Recommendation #2: Ensure that footwear appropriate for the work environment is available and worn by employees.

Discussion: In this case, the victim was wearing a pair of general purpose "tennis" type shoes. Although they may have provided adequate traction while the victim walked on the ground beneath the bridge, they may not have been appropriate for walking or standing on the seawall. The top of the seawall was slippery due to being wet and due to the growth of algae in the lake water that kept the seawall wet. Shoes with soles that are designed to reduce the risk of slipping should be worn whenever workers are required to walk or stand on surfaces where there may be an increased danger of slipping.

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