

ANOTHER SLAG SUCCESS STORY

THE
ALL-PURPOSE
CONSTRUCTION
AGGREGATE

SLAG SPECIFIED FOR IMPORTANT HIGHWAY PROJECT

Compatibility of slag with steel piling in wet conditions is demonstrated by the use of air-cooled blast-furnace slag as fill immediately behind steel sheetpiling, forming a dockwall in Lake Michigan at Chicago.

The dockwall consists of approximately 3,200 lineal feet of 60-foot-long, high-strength, corrosion-resistant PA 38, Grade 50 steel sheetpiling. The sheetpile wall is supported by 95-foot-long batter-piles (14 HP 73) on 6-foot centers. After the batter-pile/wale/sheetpiling wall was installed and connected, a 165,000-cubic-yard berm, 30 feet wide, of crushed and graded air-cooled blast-furnace slag was placed directly behind the wall. In addition, 27,245 cubic yards of pit-run blast-furnace slag were used to stabilize general backfill behind the berm to permit easy movement of construction equipment.

This work was a part of a \$130 million project to eliminate Chicago's biggest traffic congestion caused by two 90-degree turns in Lake Shore Drive near the Chicago River. The use of piling permitted the construction of a new gentle "S" curve at this location, permitting 45 mph traffic.



General Location of Project between A and B. Bulkhead Piling - C

(Photo courtesy of Case International Co.)

The design and construction were under the direction of the Chicago Department of Public Works. The design and specifications were prepared by Alfred Benesch and Company.

Crushed air-cooled blast-furnace slag was specified for the area immediately behind the sheetpiling to reduce pressure on the piling. Corrosion was not considered to be a potential problem. Slag was "specified" because of its successful use on two similar bulkhead projects. In 1965 about 90,000 cubic yards were used behind a bulkhead at the lake shore as a part of the connection of Lake Shore Drive to the Stevenson Expressway (I-55), and in 1968 about 250,000 cubic yards were used in a lake bulkhead backfill during the reconstruction of McCormick Place after the fire. Water quality at the McCormick Place project has been monitored and has remained within acceptable limits.

The specifications required "a compact weight (AASHTO T19) of not more than 85 pounds per cubic foot" (actual weight was 68 #/ft³) and the following gradation:

" Sieve Size	% Passing	"
6"	100	
4"	90-100	
3"	40-95	
1"	0-50	
#4	0-20	
#200	0-6	"

Other specification requirements included:

"The slag shall have a pH of between 7 and 10 as determined by pulverizing a sample of slag, immersing the pulverized sample for 48 hours in demineralized water having a pH of 6.5 and testing the water covering the slag at this time for pH. Also, the slag shall have a sulfur content of less than 2%."

"The Commissioner will obtain samples of each day's shipment at the rate of one sample for every 1,000 tons or less placed per day. The Contractor shall pay to have these samples tested at a laboratory, approved by the Commissioner, to verify that the pH and sulfur are within the specified ranges."



Photo 2
Typical Slag Fill Behind Bulkhead
(Photo by Patrick Stack)



Photo 3
Bulkhead and Finished Backfill
(Photo by Patrick Stack)