

Antigo

Concrete Rubblization Techniques for Pavement Reconstruction



Presented by Matt Shinnars, Antigo Construction, Inc.

at AGCMO/MoDOT Co-Op Meeting 12/04/2025

Presentation Outline

- ⇒ Introduction to Antigo Construction Family of Companies
- ⇒ Concrete Rubblization – the basics
- ⇒ Antigo's rubblization projects in Missouri
- ⇒ MHB Badger Breaker: from Rubblization to Crack & Seal
- ⇒ Questions & answers

Antigo Construction Family of Companies

- ⇒ Based in Antigo, WI
- ⇒ Operate guillotine-style drop hammers and multi-head breakers
- ⇒ Began manufacturing Badger Breakers in 1989
- ⇒ Additional offices in Boise, ID, and Oxfordshire, England
- ⇒ Operate as a subcontractor across the U.S. and Canada and several other countries every year

Antigo

WAKE UP!!



T8600 Badger Breaker – Guillotine-Style



Antigo Construction Family of Companies Completed Square Yards by Type of Breaking 1982 to 2024

Type Of Work	Pavement Type	Highways	Airports	City Streets	Other	Total
Break Concrete for Removal	JRCP	49,732,167	7,051,107	6,156,737	7,705,465	70,645,476
	JPCP	48,607,982	34,985,675	5,987,806	5,914,166	95,495,630
	CRCP	17,759,371	1,035,570	396,855	1,964,573	21,156,370
Break Concrete for Removal Subtotal		116,099,520	43,072,353	12,541,399	15,584,204	187,297,476
Break Asphalt for Removal	N/A	1,885,729	268,950	242,660	67,793	2,465,133
Break Asphalt for Removal Subtotal		1,885,729	268,950	242,660	67,793	2,465,133
Crack & Seat Concrete	ALL	72,171,418	2,574,971	11,902,095	576,593	87,225,077
Break & Seat Concrete	ALL	7,473,427	211,145	356,599	107,168	8,148,339
Crack/Break & Seat Concrete Subtotal		79,644,845	2,786,116	12,258,694	683,761	95,373,417
Rubblize Concrete	JRCP	24,592,219	498,813	2,344,120	116,704	27,551,856
	JPCP	19,828,393	5,438,690	1,444,148	424,542	27,135,773
	CRCP	5,180,620	21,742	118,342	0	5,320,704
Rubblize Concrete Subtotal		49,601,232	5,959,245	3,906,610	541,246	60,008,333
Report Total		247,231,327	52,086,665	28,949,363	16,877,004	345,144,358
Created January 2025						

345,144,358 SY = 49,026 12'-wide lane miles = 6.2 times around the earth's equator

Reflective Cracking of Asphalt Overlay



Before rubblization



After rubblization



MHB Badger Breaker



Z-Grid Roller



PTR & Smooth Vibratory Rollers



HMA Overlay



Concrete Overlay



Concrete Overlay



Antigo Rubblization Projects in Missouri

Antigo#	Year	Contractor	Location	Project Limits	County	Pvmt Type	Thickness	Square Yards	Overlay
2258	2001	City of Lee's Summit	Lakewood Way, Lee's Summit		Jackson	JPCP	08"	10,987	5" asphalt overlay.
2752	2004	Jefferson Asphalt Company	I-44 WB, Waynesville		Pulaski	JRCP	08"	13,368	12" asphalt overlay.
6496	2018-19	Radmacher Brothers Excv	N Oak Trafficway, Kansas City	NE 32nd Ave - Indianola Dr.	Clay	JRCP	08-10"	15,924	6" asphalt overlay.
6734	2019	Jokerst Paving & Contracting	Fountain City Rd, e/o De Soto	West junction Hwy 110 - east junction Hwy 110.	Jefferson	JPCP	05-8"	37,252	3" crushed aggregate base course and 5" asphalt overlay.

I-70, Columbia to Kingdom City

First Improve I-70 project.



I-70, Columbia to Kingdom City

Break to nominal 9" size to prepare for an overlay with an aggregate layer and a concrete pavement.



From Rubblization to Crack & Seat

⇒ The MHB Badger Breaker's operating parameters of hammer lift height and impact spacing can be adjusted to perform a wide range of concrete pavement fracturing from full rubblization (small particles) to crack & seat (hairline cracks).

Full rubblization



Modified rubblization – significant spalling



Modified rubblization – occasional spalling



Clearly visible cracks



Antigo's Modified Rubblization Spec

Description

(1) This section describes modified rubblization and the rolling and seating of existing concrete pavement to create a stable construction platform for a pavement overlay either with or without an intermediate base layer.

General

(1) Use a self-contained, self-propelled multi-head breaker. Use 10-ton or heavier rollers and roll at 6 feet per second or slower. Run vibratory rollers at an engineer-approved frequency and amplitude. A roller pass is defined as down and back in the same path.

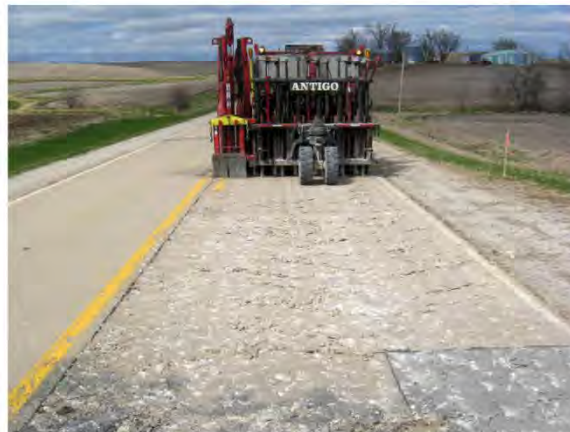
(2) Before rubblizing, saw full-depth joints and completely sever load transfer devices to isolate the rubblized area from areas not to be rubblized. Saw jointed pavements at an existing transverse joint. Do not damage adjacent pavement during rubblization. Repair damage to the adjacent pavement caused by contractor operations as the engineer directs.

Modified Rubblization

(1) Fracture the concrete full-depth and uniformly across the pavement width. The engineer will designate one of the two categories of modified rubblization as described below:

Modified Rubblization—significant spalling

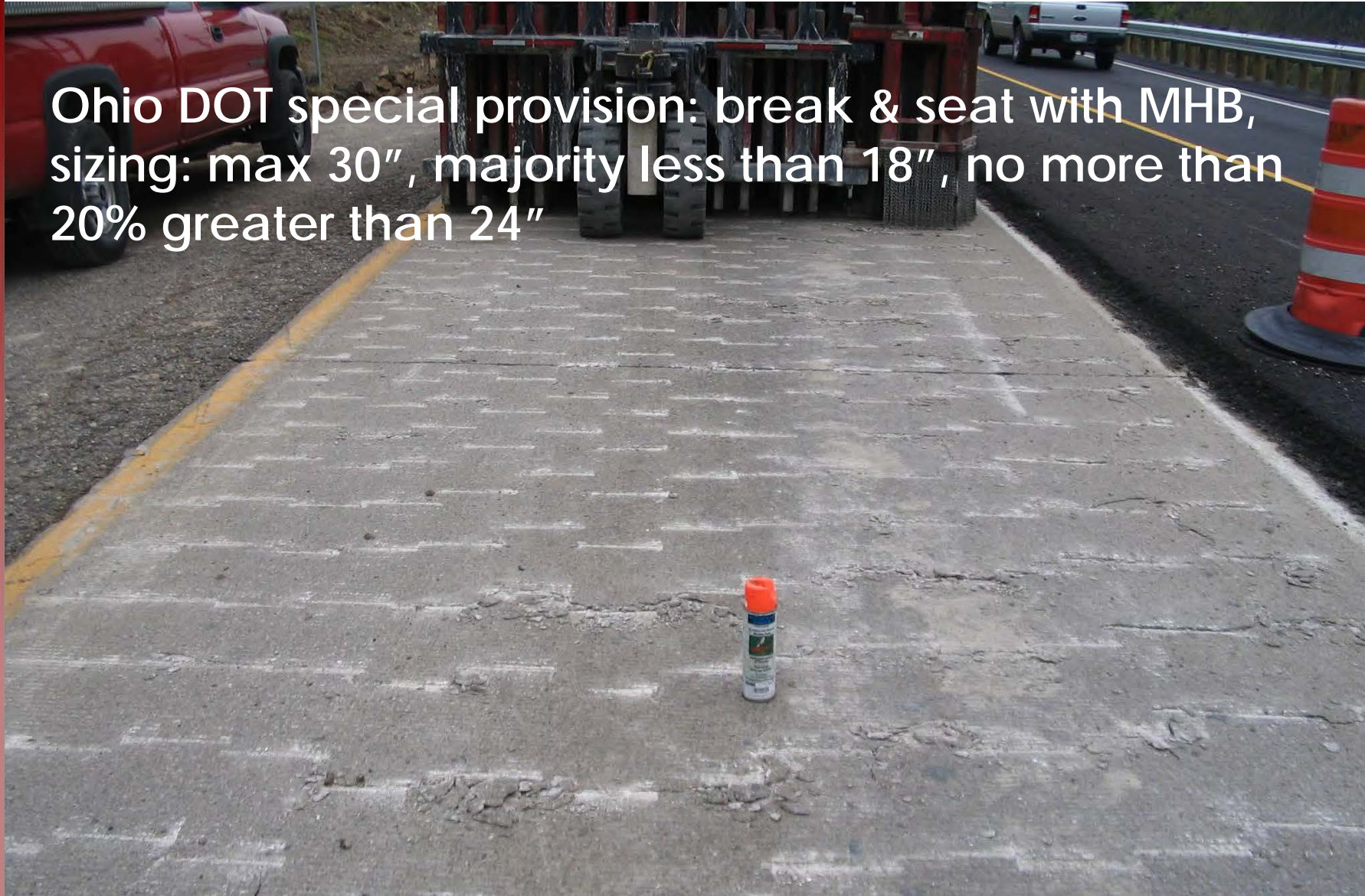
Achieve 12-inch minus size particles at the surface, significant surface spalling, and a surface appearance that ranges from smooth to pulverized. 75% of the pieces at the bottom of the slab shall be 15" minus in size. The pavement surface should look similar to the surface in the following two pictures:



Modified Rubblization—significant spalling

Break & seat with MHB – Ohio DOT

Ohio DOT special provision: break & seat with MHB, sizing: max 30", majority less than 18", no more than 20% greater than 24"



Antigo

Crack & seat with MHB – Iowa Counties



Questions & Answers



Antigo Construction Family of Companies

715-627-2222

ac@antigoconstruction.com
www.antigoconstruction.com

2520 Clermont St
Antigo, WI 54409
USA