

Antigo

Rubblization – Urban/Rural/Interstate



Presented by Matt Shinnars, Antigo Construction, Inc.

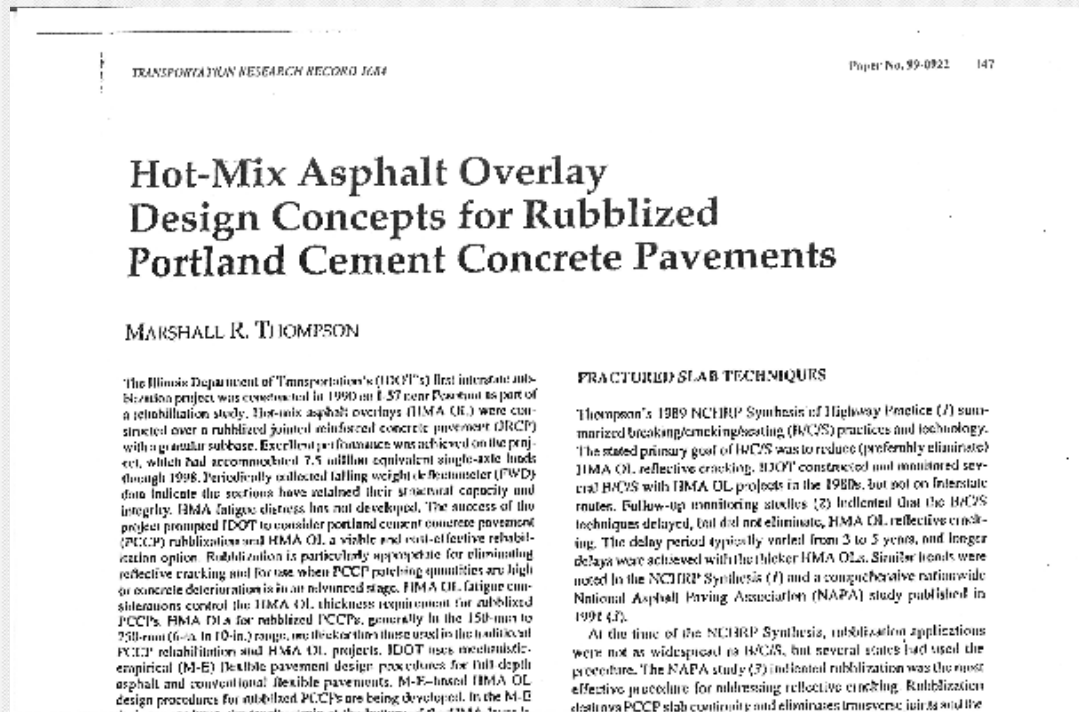
Illinois Asphalt Pavement Association Annual Meeting (March 16, 2021)

Presentation Outline

- ⇒ **What is rubblization?**
- ⇒ **Illinois Interstate rubblization**
- ⇒ **Illinois rural 2-lane rubblization**
- ⇒ **What is rubblizing in an urban environment?**

Rubblized pavement behavior

Professor Marshall Thompson's TRB Paper 99-0922



Rubblized pavement behavior

“Rubblization destroys PCCP slab continuity and eliminates transverse joints and the associated joint opening and closing that cause reflective cracking.”

“A rubblized and compacted PCCP is an assemblage of PCC segments that form a tightly keyed, interlocked, high-density material layer. A rubblized PCCP layer is fractured, lacks continuity, and cannot sustain flexural stress. However, it possesses high shear strength and rutting resistance. It is not a typical granular material.”

From “Hot-Mix Asphalt Overlay Design Concepts for Rubblized Portland Cement Concrete Pavements”, Marshall R. Thompson, Transportation Research Record 1684, Paper No. 99-0922

Rubblization intent

“The intent of rubblizing concrete pavement prior to a pavement overlay is to produce a structurally sound base which prevents reflective cracking by obliterating the existing pavement distresses and joints. . . . It is not a typical granular material and it is not an engineered material like crushed aggregate base course.”

From “Rubblizing Concrete Pavement” section of WisDOT Construction & Materials Manual

Concrete pavement in need of rehabilitation



Reflective cracking in asphalt overlay



A video is worth a million words

https://www.youtube.com/watch?v=Q_bN3kx5fm4&t=1s



I-70, Clark County, IL, 2003

Marshall to Martinsville

Antigo rubblized 263,000 square yards of 8" CRCP

Howell Asphalt and Champaign Asphalt JV: 550,000 tons, 17.5-inch HMA, 30-year Extended Life Pavement

Antigo

I-70, Clark County, IL, 2003



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I-70, Clark County, IL, 2003

Charles Weinrank, P.E., IDOT, at 2019 IAPA Annual Meeting:
2018 CRS=8.0, IRI=48, Rutting=0.11 in., and
centerline deterioration is only recorded CRS distress



Monticello Road, Piatt County, IL, 2016

Monticello city limits to Champaign County line

Existing pavement: 5" JPCP whitetopping on 3" asphalt

1st rubblization of whitetopping (Oreo design?)

Antigo rubblized 62,204 square yards in 4 days

Open Road Paving: 5" asphalt overlay

Monticello Road, Piatt County, IL, 2016



Monticello Road, Piatt County, IL, 2016



Monticello Road, Piatt County, IL, 2016



Monticello Road, Piatt County, IL, 2016



Antigo Rubblization Projects in IL, 1996 to 2020

Interstate: 36 projects, 4.6 million square yards

Rural 2-Lane: 18 projects, 0.5 million square yards

Airport: 7 projects, 0.3 million square yards

Urban Streets: 9 projects, 0.035 million square yards

Urban Streets – Everywhere: 3.7 million square yards

What is rubblizing in an urban environment?

Rubblizing while meeting additional challenges.



Rubblizing while meeting additional challenges



Rubblizing near homes & other buildings

Rubblizing while meeting additional challenges



Rubblizing over and near utilities

Rubblizing while meeting additional challenges



Rubblizing over a weak subgrade

Rubblizing while meeting the challenges



Rubblizing while maintaining existing curb and gutter

Washington Ave, City of Racine, 2002

West Blvd to Marquette St

Paving contractor: Payne & Dolan, Inc.

Sawing Pavement, Full Depth: 32,671 linear feet

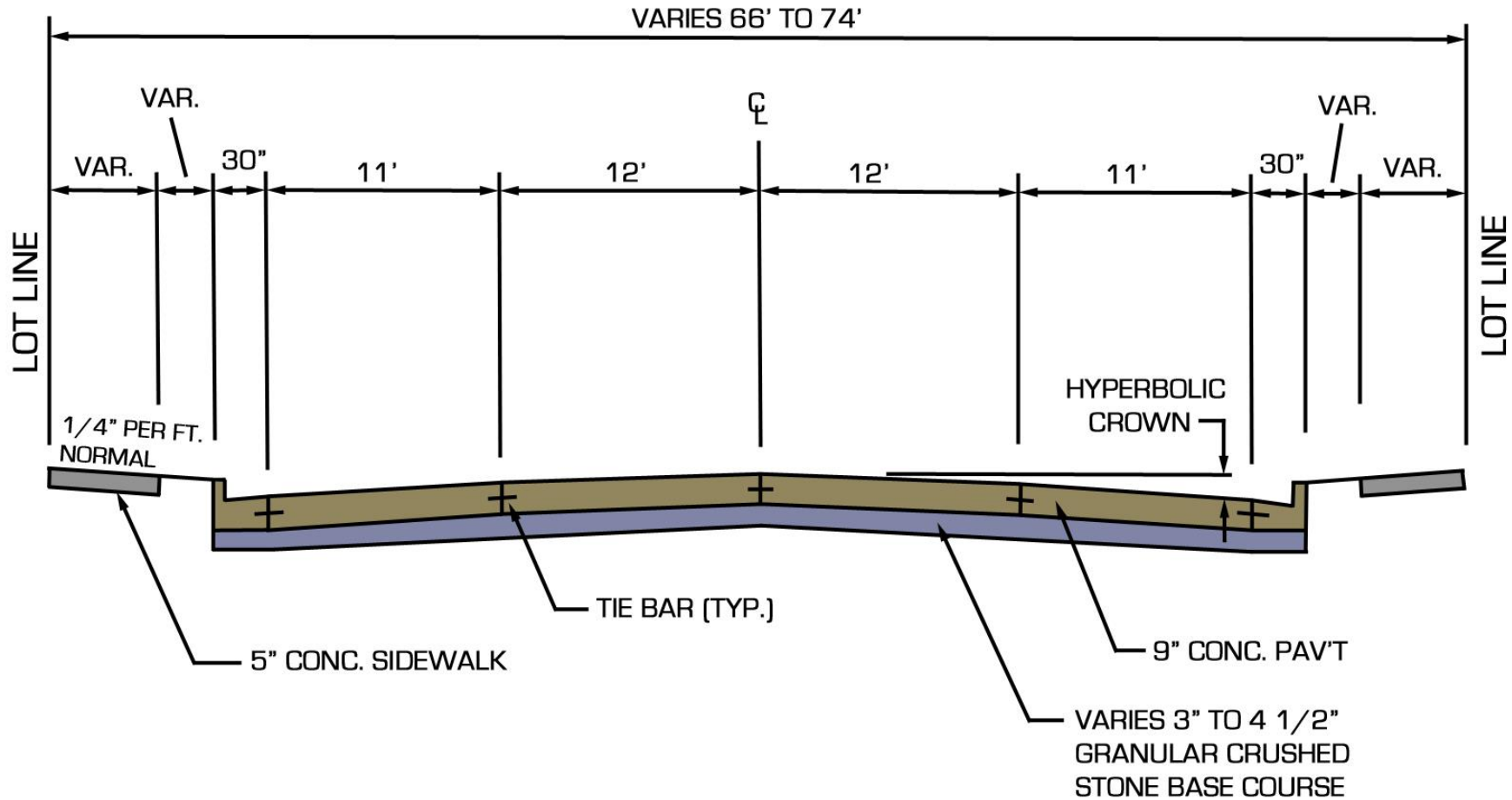
Removing Concrete Surface, Partial Depth (2"): 53,583 square yards

Rubblizing 7" JRCP: 50,741 square yards

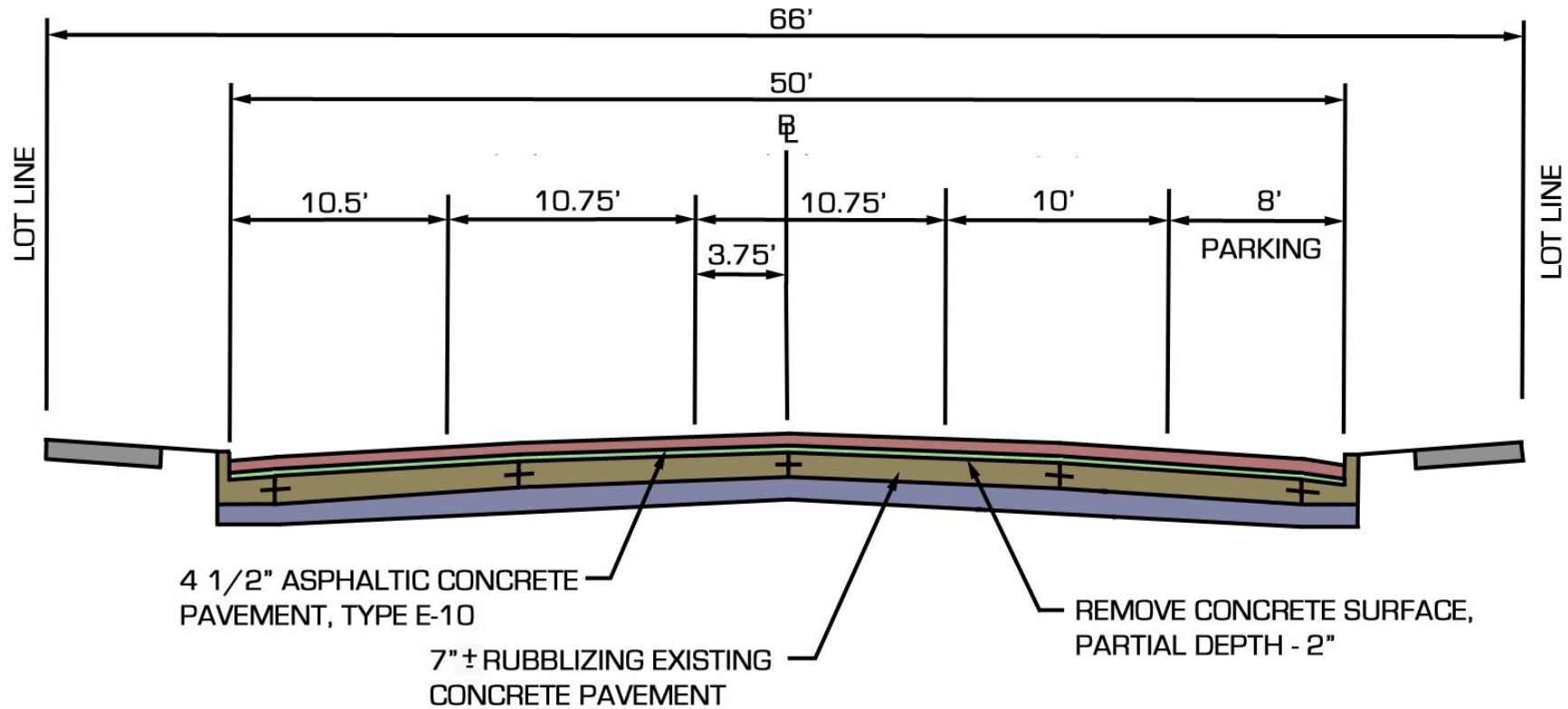
Asphaltic Concrete Pavement, Type E-10: 12,639 tons

Crack & Damage Survey: Lump Sum \$35,000 (114 buildings)

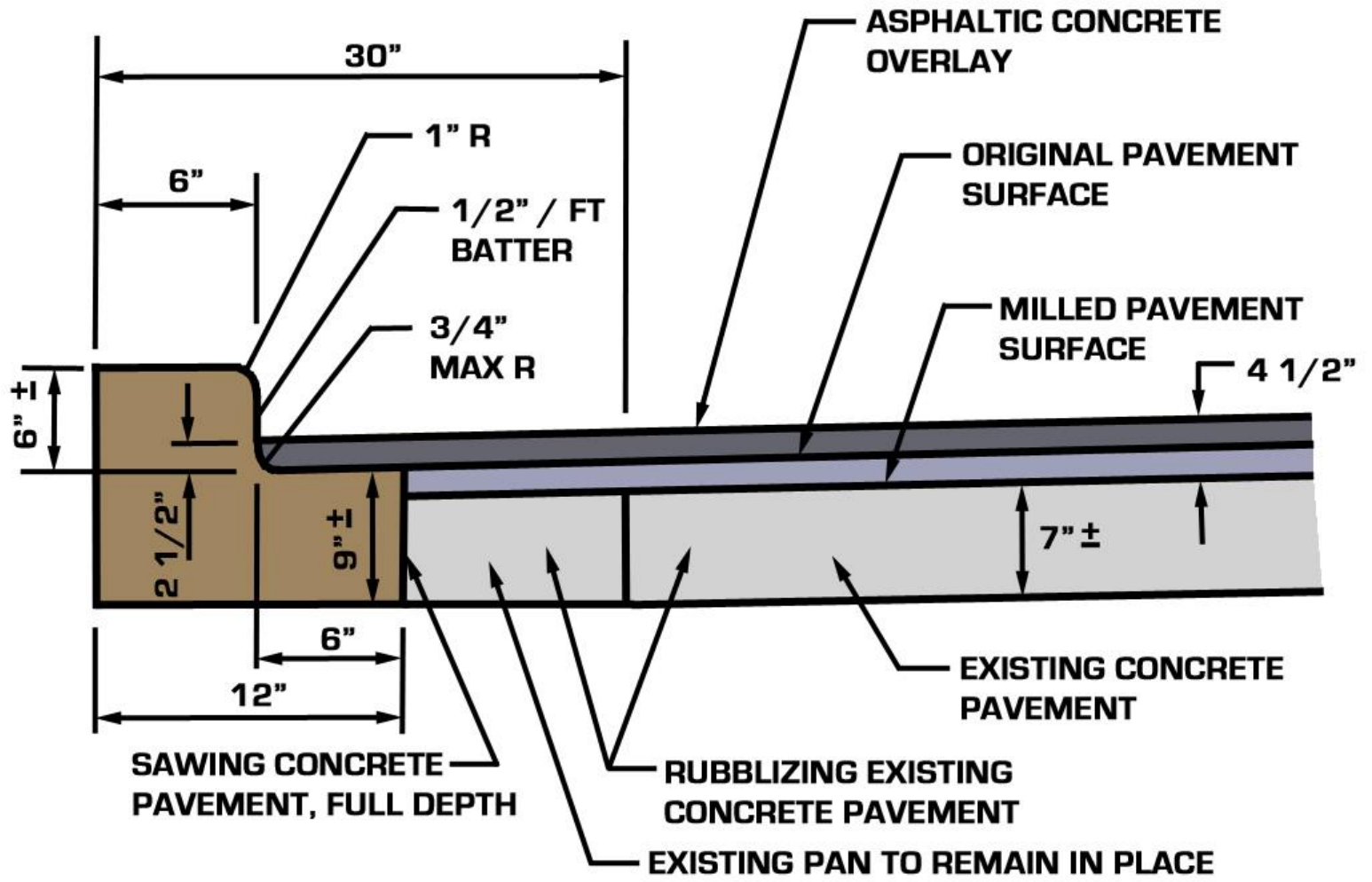
Typical Existing Section



Proposed Typical Section



Curb & Gutter Detail



Construction Staging

Stage 1 – Complete saw cuts, mill off 2" of concrete surface

Stage 2 – Rubblize 2 inner lanes and overlay with asphalt (1" leveling and 2-1/4" binder)

Stage 3 – Rubblize 2 outer lanes and overlay with asphalt (2-1/4" base)

Stage 4 – Pave 2" asphalt surface

Meeting the challenge

***“Crack and Damage Survey, Item 90004A
This survey shall consist of two parts. The first part, performed prior to construction activities, shall include a visual inspection, photographs, and a written report describing the existing defects in the buildings being inspected. The second part, performed after the construction activities, shall also include a visual inspection, photographs, and a written report describing any change in the building’s condition.”***

From Special Provisions for Project # 2440-03-70.

Rubblizing near homes & other buildings

Meeting the challenge Depth of water mains

Valve #	Location	Depth
2854	938 Washington Ave.	4'
222	hyd. @ 10th & Washington Ave.	4'-3"
502	w/line 10th & Washington Ave.	31"
725	w/line 10th & Washington hyd. Valve	4'-3"
2859	1028 Washington hyd. Valve	3'-11"
521	n/line Washington & 11th	2'-4"
523	e/line Washington & 11th	2'-1"
524	s/line Washington & 11th	2'-7"
1407	w/line Washington & 11th	2'-1"
2857	Hyd. Valve @ 1124 Washington	4'
557	w/line Washington & 12th	4'-2"
556	e/line Washington & 12th	4'-2"
2843	Hyd. @ Washington & 12th	3'-9"
2852	s/line Washington & 12th	2'-6"
8821	1228 Washington 4" service	4'-6"
2833	hyd. @ 1228 Washington	4'
2848	main line valve @ 1228 Wash.	2'-7"
4" service	1236 Washington Ave.	4'
6766	hyd. @ 13th & Washington Ave.	3'-9"
1302	w/line Washington & 13th	4'-10"

Rubblizing over and near
utilities

Meeting the challenge

“Another way to compensate for a weak subgrade is to modify the rubblizing pattern to produce larger particle sizes which maintain more of the existing concrete pavement’s structural support. Experience has shown that segments of twelve to eighteen inches in the lower half of the slab are still effective for eliminating reflective cracking.”

From draft “Rubblizing Concrete Pavement” section of WisDOT Construction & Materials Manual

Rubblizing over a weak subgrade

Meeting the challenge



Rubblizing while maintaining existing curb and gutter

Meeting the challenge



Rubblizing while maintaining existing curb and gutter

Washington Ave Today



2018: 2.25" mill & fill – urban perpetual?

Questions & Answers



Antigo

Antigo Construction, Inc.

715-627-2222

**2520 Clermont St
Antigo, WI 54409**



www.antigoconstruction.com

mshinners@antigoconstruction.com