

Steel Bridge Preparation and Painting

Scott C. Coleman, P.E., P.S.
County Engineer
Logan County Engineers Office

Introduction

The Logan County Engineer's Office has tried various rehabilitation methods over the years in an effort to find the most effective and efficient way to paint steel bridges. We hope this presentation provides you with some guidance as to the best route to take as you maintain your steel bridges.

Materials

- Rust-Oleum Metal Primer
 - TermaRust
- Devoe Bar Rust 231 with Pre-Prime 167
- Sherwin-Williams Dura-Plate 235 with Macropoxy 5000

BR T35-3.59

Used Rust-Oluem Metal Primer and an unknown topcoat on this 2008 rehab project.



BR T35-3.59



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BR C97-0.76

TermaRust was used on this 2010 rehab project that was painted by Brian Brothers Painting.



BR C97-0.76

Total cost for: Paint supplies: \$6,855.78

Brian Brothers Painting: \$16,650.00

Bridge is 91'3" X 28' which amounts to \$9.20/SF (by deck area).



Respirator



“All masks have the 3M™ Bayonet Connection System enabling connection to a broad range of twin lightweight filters to protect against gases, vapours and particulates..”

Standards/Approvals: EN 136:1998 (Class 1), CE
Approved

Sprayer

	390 PC
Maximum Tip Size	0.021
Maximum psi (bar)	3300 (227)
Maximum gpm (lpm)	0.47 (1.8)
Motor hp	5/8 DC
Weight lb (kg)	30 (14) Stand



Devoe Pre-Prime 167

“A high performance, two-component chemically-cured 100% solids epoxy penetrating sealer.” Devoe products now sold through International PC.



Devoe Bar-Rust 231

Generic: Advanced Technology Epoxy

General Description: A high performance, multi-purpose, surface tolerant, two-component chemically-cured epoxy semi-gloss coating for industrial applications. For use on properly prepared steel or masonry surfaces. Also used on concrete floors and interior primed drywall, plaster and wood surfaces. Use as a filler for open textured concrete block.

Typical Uses: Ideal for structural steel, piping, tanks, and equipment in chemical, fertilizer, power plants, petroleum refineries, pulp and paper mills, water and sewage treatment plants and mining operations.

Color: Off White (231K3501), Buff (231K1642), Haze Gray (231K2904) Oxide Red (231K7821) Aluminum (231K9100).

Finish: Semi-Gloss

Reduction Solvent: T-10 Thinner. For application over aged alkyds use T-5 Thinner or Xylene.

Clean-up Solvent: T-10 Thinner

BR T32-2.00

Used Devoe Bar-Rust 231 & Pre-Prime 167 in 2011.



BR T32-2.00



Sherwin-Williams Dura-Plate 235

“Dura-Plate 235 is a modified epoxy...formulated specifically for immersion and atmospheric service in marine and industrial environments [and it] provides exceptional performance in corrosive environment.”



Macropoxy 5000

PRODUCT DESCRIPTION

MACROPOXY 5000 is a rust-inhibitive, pigmented, ultra high solids, penetrating epoxy primer / sealer designed for use over marginally prepared steel, concrete and aged coatings. It has excellent wetting properties and penetrates concrete and tight rusted steel to provide a firm anchor for subsequent topcoats. In addition, Macropoxy 5000 can be used to overcoat aged coatings and act as barrier coat for a variety of topcoats without the need for an intermediate coat.

- A penetrating primer / sealer for tight rusted surfaces and aged coatings
- A penetrating primer / sealer for concrete and masonry surfaces
- Excellent wetting properties
- VOC less than 50 g/L
- Barrier coat for a broad range of topcoats

Sherwin-Williams Dura-Plate 235 with Macropoxy 5000

procured and charged to the appropriation of _____

08/04 20 15

Procure from SHERWIN-WILLIAMS Co.

APPROPRIATION

Address _____

2-353-1260

QUANTITY	UNIT	DESCRIPTION	ESTIMATED COST		
			PER UNIT	TOTAL	
2	gal	KYLENE	\$20.56	41	12
8	gal	DURAPLATE 235	61.11	488	08
8	gal	MACROPOXY 5000	153.88	1231	04
5	gal	REDUCER 104	42.49	212	45
				\$1,973	49

Most recent purchase (8/4/2015) of the Sherwin-Williams paint materials.

BR T178-0.14

Bridge was built in 1964 and a 2006 rehab project included new abutments, beams were cleaned & had a red oxide applied to them. The Sherwin-Williams combination was applied in 2014.



BR T178-0.14

Since the red oxide was on the beams no needling was done in 2014, only powerwashing with a 3500 psi tip.



BR T45-1.01

Rehabbed the beams of this 1969 bridge during the summer of 2012.



BR T45-1.01

Total Cost for labor, equipment, and material: \$4,080.30.
Bridge is 58'6" X 28' which amounts to \$2.49/SF (by deck area).



BR C11-6.69

Began to use the following beam restoration process which is now standard for us: needle, powerwash, prime, and then apply the epoxy coating.



BR C11-6.69

Total cost for labor, equipment, and material:
\$9,387.63 Bridge is 66'4" X 24' which amounts to
\$5.90/SF (by deck area).



BR C11-6.69

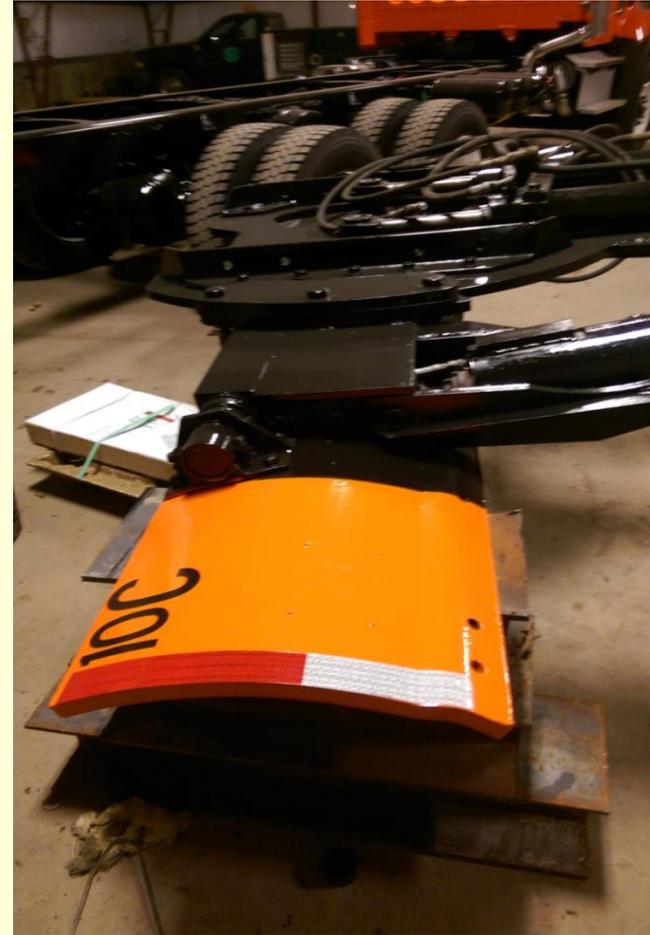


Worst section in 2016

Dustless Glass Blasting



Dustless Glass Blasting

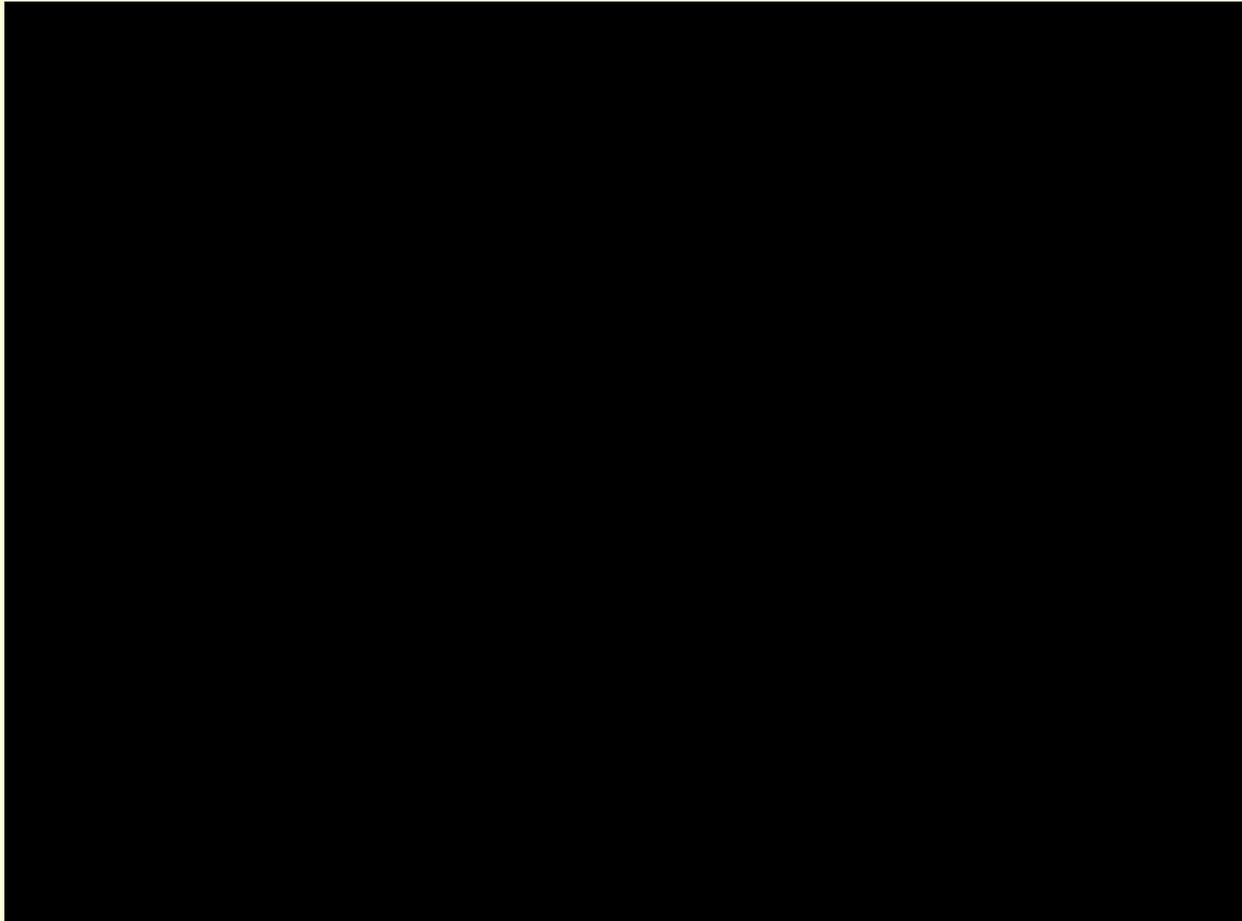


Hardin County belly plow restoration

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Dustless Glass Blasting

Removing asphalt from an Auglaize County bridge:



Dustless Glass Blasting



Dustless Glass Blasting

Testing how long the metal lasted without flash rusting while covered in plastic. Photo on right is two weeks later when it was uncovered.



Dustless Glass Blasting



Dustless Glass Blasting

Scaffolding set-up for easy access to beams and to prevent paint particles from entering water.



Dustless Glass Blasting



Dustless Glass Blasting



Dustless Glass Blasting



Dustless Glass Blasting



Dustless Glass Blasting

Total cost for labor, equipment, and material: \$55,752.34. This includes \$12,356.00 for H2O Dustless Glass Blasting services. Bridge is 70' X 24' which amounts to \$33.19/SF.



Summary

Depending on the structure and its condition, we will continue alternating between prepping and cleaning bridges ourselves or using Dustless Glass Blasting. We will continue evaluating the efficacy of the paints and primers we use and make changes as we see fit.

Links

Links to featured materials:

- http://solutions.3m.com/wps/portal/3M/en_EU/PPE_SafetySolutions_EU/Safety/Product_Catalogue/~/_/3M-Full-Face-Mask-Respirator-6000-Series?N=5551860+3294361910+3294857473&rt=rud
- <http://www.graco.com/us/en/products/contractor/390-pc.html>
- <http://www.sherwinindustriesinc.com/sherwin/virtuemart/326.html>
 - <http://protective.sherwin-williams.com/detail.jsp?A=sku-26141%3Aproduct-6830>
 - <http://www.termarust.com/>
 - <https://protective.sherwin-williams.com/detail.jsp?A=sku-41645%3Aproduct-12094>
- <http://www.international-pc.com/products/info/Miscellaneous/Pre-Prime-167.aspx>
 - <http://www.termarust.com/>
 - <http://www.h2odustlessglassblasting.com/>

Questions?

For more information please contact:

**Todd Bumgardner, Administrative Coordinator
PH: 937.592.2791**

**Shane Hites, H2O Dustless Glass Blasting LLC
PH: 352.445.1933**

**This presentation can be found online at:
www.loganco.co.logan.oh.us/engineer/**