

R. Alden Marshall
An Art Conservation, Gilding & Sculpture Studio
Gold Gecko Ranch Studio, 6396 State Hwy 36
Cameron, Texas 76520 Ph. 512-470-8540

April 25, 2008

Mr. Mark Hines
City of Waco
Engineering Services
401 Franklin Avenue
P O Box 2570 Waco, Texas 76701

Re: Historic Coating Color Investigation & Analysis of the
1901 Washington Avenue Bridge.

The investigation of the original coatings of the bridge started at the Texas Collections in the Carroll Library of Baylor University. With the help of Ellen Brown, curator of the collections, photographs of the bridge during and just after construction were found. Two portrait photos from 1902 with the work on the bridge in the background showed that the metal was not yet painted as is normal for hot riveted bridge construction. As well, the photos clearly displayed that the metal was uniformly oxidized. Other photographs from 1906 and 1908 were found and the bridge appears to be painted a monochrome black without decoration however the angles and details of the photos were not well suited for detecting any such embellishments. Later photos showed signs of chalking that turned the satin black a dull mottled black with dark



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An Internationally Renown Architectural Gold Leaf Studio*

*Preservation Texas Award Winner for Historic Restoration
National Trust for Historic Preservation Award Winner for Restoration
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gray streaks. The latest photos were of the aluminum paint coating that most certainly was not the original coating.

The steel used in the construction of this Pennsylvania Petit Truss Span bridge is clearly labeled “Carnegie” and “Carbon” showing that the steel came from the Carnegie Steel Company of Pittsburgh, PA.

The Carnegie Steel works was sold in 1901 to become United States Steel Corporation or US Steel. The bridge was started in 1901 and completed in 1902 and it can be surmised that the steel pre-dates 1901.

In 1901 the American industrial revolution was at its' height and the Great Pan American Exhibition was being held in Buffalo, NY. This was also the place and year when President McKinley was shot and Theodore Roosevelt became President.

After two days with the bridge I was surmised that the bridge had never really been thoroughly sand blasted and even areas of separating and cleaving mill scale were found. Some of these were found to still retain the original thin black coating and were easily removed to be examined under magnification.

At 30x and 100x the samples were clearly that of the original black phenolic coating with no other coating found under it. Mill scale is formed during the quenching of the rolled steel to cool it, a thin blued skin



forms on the steel which in modern times is removed before painting by abrasive blasting. This is done for the reason that the mill scale tends to form oxides behind it

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which later will be pushed off by this rust and peel away from the steel causing coating failure, however in 1902 blasting preparation was not practiced.

Most surfaces that were easily reached seemed to have been later blasted clean at previous treatments of the bridge. The second or next re-painting of the bridge appears to have been completed with a lead white primer on a rusty surface followed by aluminum paint. On top of that was found an orange primer followed by aluminum paint and at one time the bridge was painted with a green paint.



Black, orange, green and aluminum layers on back of plaque

For historical proposes it is recommend that a satin black coating be used to bring the landmark back to it's original 1902 color and sheen. In the photo archives the now gone light rail bridge and the Washington Avenue Bridge were nearly the same in appearance. The black paint used appears to be a phenolic drying oil with black pigment resembling a lamp black. An industrial coating system that could mock this original coating yet would be more durable to reduce future maintenance is a good idea in this case. Many of the National landmarks across America that I have been associated with and helped specify coatings have used these modern product lines from Sherwin Williams, DEVO, and Tnemec to name a few, have light energy

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resistant properties with non fading colors. In addition a sacrificial cathode anode system could be used to great effect with this bridge. The final coating however will be only as good as the painters care in preparation of the surfaces and the primer systems used.

Very truly yours,

Robert A. Marshall
Senior Conservator
R. Alden Marshall Studios

Enclosure
Mama Archival Gold DVD with this report and photographs

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Fiscal Services
City of Waco
P O Box 2570 Waco, Texas 76701

Re: PO # 136890 Historic Coating Color Investigation & Analysis of the
1901 Washington Avenue Bridge for Engineering Services, City of Waco.

Invoice # 08-04-25-001

Historic color identification; research, report and photos of the Washington Ave
Bridge.

Charge for professional services \$ 3,000.00

Please mail payment to: R A Marshall
6819 Briar Road
Azle, TX 76020

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