



FEDERAL LANDS HIGHWAY MATERIALS TECH BRIEF — RUSTIC PAVEMENT —



“Providing Context Sensitive Pavements to Client Agencies”

The Problem

Meet the aesthetic requirements of a high profile project and provide a durable pavement that satisfies the design engineering properties.

To improve the aesthetics in front of the White House on Pennsylvania Avenue from concrete barriers and worn pavement, a landscape design was developed by Michael Van Valkenburgh Associates to transform the avenue in front of the White House into a pedestrian plaza that harmonizes with it’s surroundings.

A major portion of the design is the paving material that would surface Pennsylvania Avenue. The original concept was to have the surface of Pennsylvania Avenue covered with a loose granular material. This in itself posed a serious maintenance problem. Eastern Federal Lands (EFL) was charged with finding a paving material that would satisfy the criteria of being aesthetically pleasing and have acceptable engineering properties for anticipated traffic loading.

Based on some preliminary work performed with a transparent, amber colored synthetic binder produced by Neville Chemical Co. that could be placed using conventional Hot Mix Asphalt paving techniques, it was decided to explore the use of the binder with selected aggregates to try to achieve the “look” that was required for the landscape design. The synthetic binder has been used by designers in Europe with pigments to produce colored asphalt to delineate intersections, busways, bicycle paths, historic landmarks, and roundabouts. However, the use of pigment would mask the aggregate color and texture, which was unacceptable.

The Solution

The solution developed by EFL was to let the candidate aggregates interact with the binder without the use of pigment to allow the aggregate color and texture to be visible. This gave a “rustic” or old look to the pavement — so the end product would be a “rustic pavement”.

Designing the Product

To develop a product that would satisfy all the criteria for long term durability and aesthetics, EFL investigated various aggregate sources and job mix formula combinations with the various sources. NMSA size was varied from 19mm to 9.5 mm in an effort to match the granular surface originally proposed for Pennsylvania Avenue. Various types of pavements such as Superpave and Stone Matrix Asphalt (SMA) were designed and reviewed for aesthetics.



*image above —
Finished, 9.5mm
Superpave Test Strip,
Rock Creek Park,
Washington DC*

*image left —
Finished, Pennsylvania
Avenue in front of the
White House*

Product Evaluation

A field test at National Park Service — Richmond National Battlefield Park outside of Richmond, VA served to test paving methods and equipment. The job utilized local gravel aggregates similar to a chip seal that had been placed to give the road a more historic look. The brown gravel chip seal was failing in the wheel paths and the goal was to replace the chip seal with a more durable but aesthetically pleasing surface course. The field test confirmed that aesthetically pleasing rustic pavement could be placed using standard equipment and techniques.



*Richmond National Battlefield Park
Rustic Pavement Test Strip —
Clockwise:
Gravel Aggregates Used,
Paving With 9.5mm Tan Gravel,
Paving with 12.5mm Brown Gravel,
Synthetic Binder*

For Pennsylvania Avenue, a 9.5 mm Superpave mix design containing granite and quartzite aggregates was selected. To confirm mix durability, an extensive study by FHWA's Turner Fairbank Highway Research Center was conducted looking at rut resistance, weathering susceptibility, and binder properties. Based on recommendations from the study, slight modifications to the synthetic binder were made prior to a field test at Rock Creek Park in Washington, DC to verify mix properties and the mix aesthetics. Mix volumetrics, plant production quality control, logistics, paving techniques, and aesthetics were confirmed for the 9.5 mm Superpave mix during the field test.



*Paving Operations — 9.5 mm
Superpave Field Test, Rock Creek Park,
Washington, DC.*

Paving in front of the White House on Pennsylvania Avenue was completed in October. Pennsylvania Avenue was reopened to the public by The First Lady, Mrs. Bush on November 9, 2004.



*Paving Operations — Pennsylvania
Avenue in front of the White House*

The Future of Rustic Pavement

Eastern Federal Lands continues to explore the use of synthetic binder emulsion based systems, and other approaches to further the options available to our client agencies for Context Sensitive Pavements.

For more information, please contact:

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