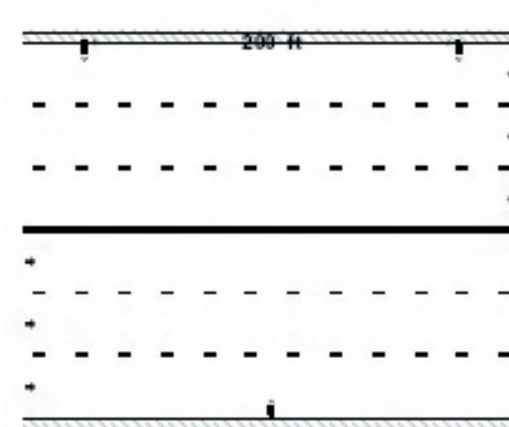
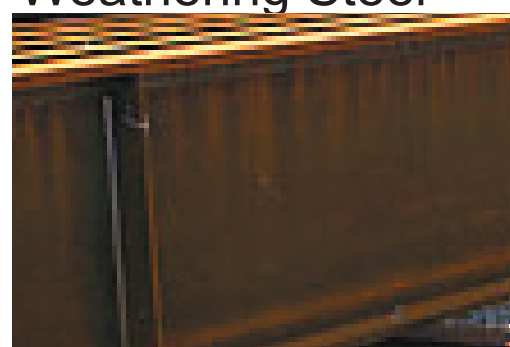
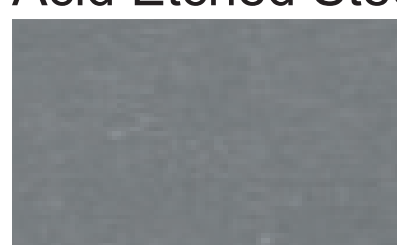
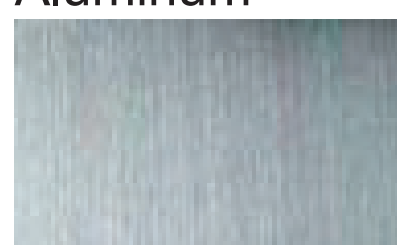
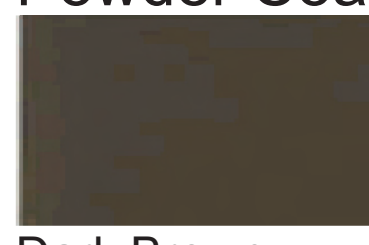
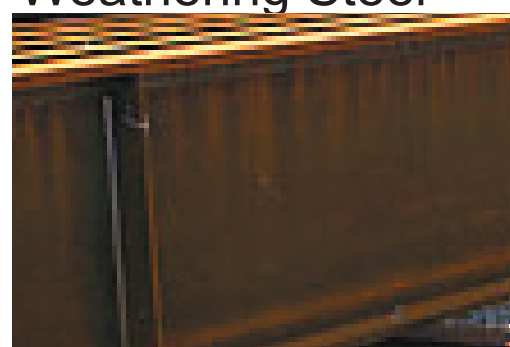
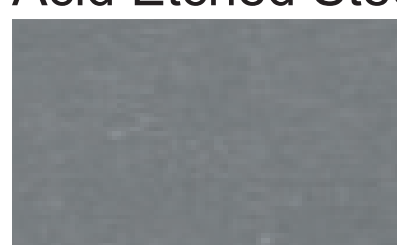
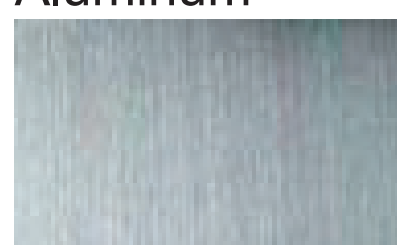
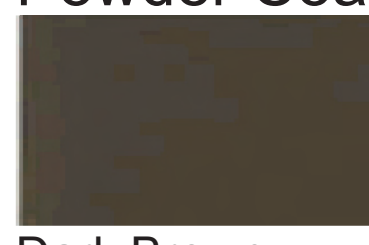
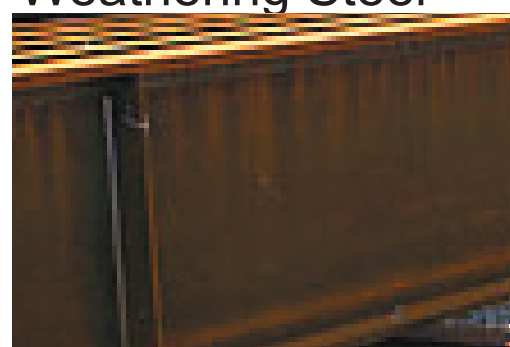
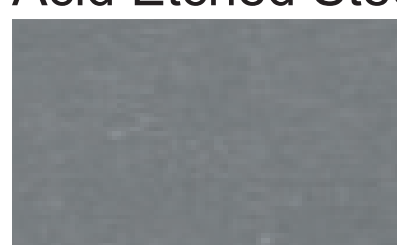
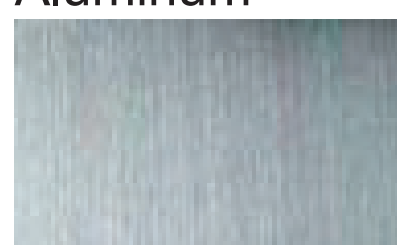
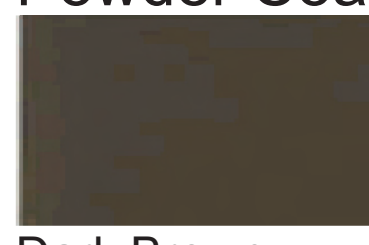


Lighting and Signage Materials

Lighting	Design objectives : - Lighting must maximize energy conservation, and minimize light pollution, glare and light trespass from public rights-of-way. - Lighting levels should be the minimum prescribed by the Illuminating Engineering Society of North America. If a particular situation requires higher lighting levels, the design levels should be the minimum necessary to meet the need. - The daytime appearance of the fixture and standard should be compatible in scale (form and line), color (the fixture, the standard, and the light quality) and texture (the materials used for the standard) with the context within which it is being placed. - Care should be taken to compare the difference between higher poles with brighter lamps versus more frequently spaced, lower poles with less output. - Fixture and standard colors and styles should complement sign standards as well as other roadway details in other sections of the project. Simplicity is preferred. - Where possible, pole and light structures should be integrated into retaining, barrier and sound walls lining the roadway.	Design concepts : Mongoose ® lights offer a modern alternative to the typical cobrahead shape, but still focus light towards the roadway with minimal light pollution. Light poles should consist of steel, aluminum or weathering steel. The chosen material should be used throughout the project and should be consistent with other design elements of the roadway. Pole treatments are outlined below in the signage section. Materials can be weathered, powder coated, painted or galvanized to achieve an effect of darker colors like brown and green to blend with the surroundings. Pole shapes can be either straight, tapered or have a slight cantilevered arch with the use of a davit arm. Solar panels can also be incorporated into the design of larger structural elements to assist in powering the lighting. Poles  Example of dark brown anodized aluminum lighting poles with Mongoose ® head lights at a 45° tilt.  Examples of cobrahead lights added to a steel or aluminum pole with a davit arm.  Solar panels can be designed into roadway structures to help power lights and signage.  Roadway lighting to be located every 200' in a staggered configuration. See diagram at left. Fixtures  A Mongoose ® Lighting fixture from Holophane ® with drop glass and a 45° tilt.  A Mongoose ® Lighting fixture from Holophane ® with flat glass and a 0° tilt.  Cutoff Style Cobrahead: Roadway: Series 115 from American Electric Lighting.  Cutoff Style Cobrahead: Roadway: Series 125 from American Electric Lighting. *All lighting fixtures to be full cut off* Integration  Example of light pole integrated into expansion joint in a retaining wall approaching the tunnel.  Example of lighting integrated into retaining wall at Dulles International Airport. Light fixtures are tilted to cover roadway allowing the fixtures to be incorporated within the wall structure.  Example of Mongoose ® lighting incorporated into concrete median barrier.																									
Signage	Design objectives : - Simplify the visual complexity of the roadway. - Visually blend the post supports for roadway regulatory and directional signs with the light poles. - The backs of all signs should be treated to further complement the overall family of sign details.	Design concepts : Cantilever supports should be used in place of overhead span truss supports using a monopole design. The monopole should have a similar style and color as the light poles and other roadway appurtenances. Post supports should be treated in the same manner as light poles and cantilever supports (dark brown or black) The backs of all signs should be painted dark brown or black to further complement the overall family of sign details. Pole Surface Treatments <table><tr><td>Weathering Steel</td><td>Acid Etched Steel</td><td>Galvanized Steel</td><td>Satin Brushed Aluminum</td><td>Powder Coating</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td>Dark Brown</td></tr><tr><td></td><td></td><td></td><td></td><td>Charcoal Gray</td></tr><tr><td></td><td></td><td></td><td></td><td>Dark Green</td></tr></table> Pole Configurations  Haunched sign span on the Delaware River Bridge.  Modified curved, tubular signal post from Universal Industrial  Cantilevered sign post from Burgess Engineering Inc.  Cantilevered sign post along Baltimore-Washington Parkway.  Orthogonal overhead sign with message board at the Cumberland Gap Tunnel.  Curved overhead sign from Highway Safety Corp.	Weathering Steel	Acid Etched Steel	Galvanized Steel	Satin Brushed Aluminum	Powder Coating										Dark Brown					Charcoal Gray					Dark Green
Weathering Steel	Acid Etched Steel	Galvanized Steel	Satin Brushed Aluminum	Powder Coating																							
																											
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