
Second addendum to report on Texada “goop” used on Gabriola

Chloride corrosion

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Dust vs. slipperiness

Natural soils very rarely have the qualities required for a good road surface and the surfaces require treatment. In treating unpaved roads, highway construction engineers are faced with the twin problems of controlling dust, and maintaining good cohesion on the road surface so as to provide durability, good traction, and so as to not impair braking distances.

Dust from unpaved roads is a major environmental, safety, and health concern, and its control cannot be neglected. A common technique for suppressing dust is to treat the surface of the road with some material that is hygroscopic, that is, something that attracts and retains moisture from the air.

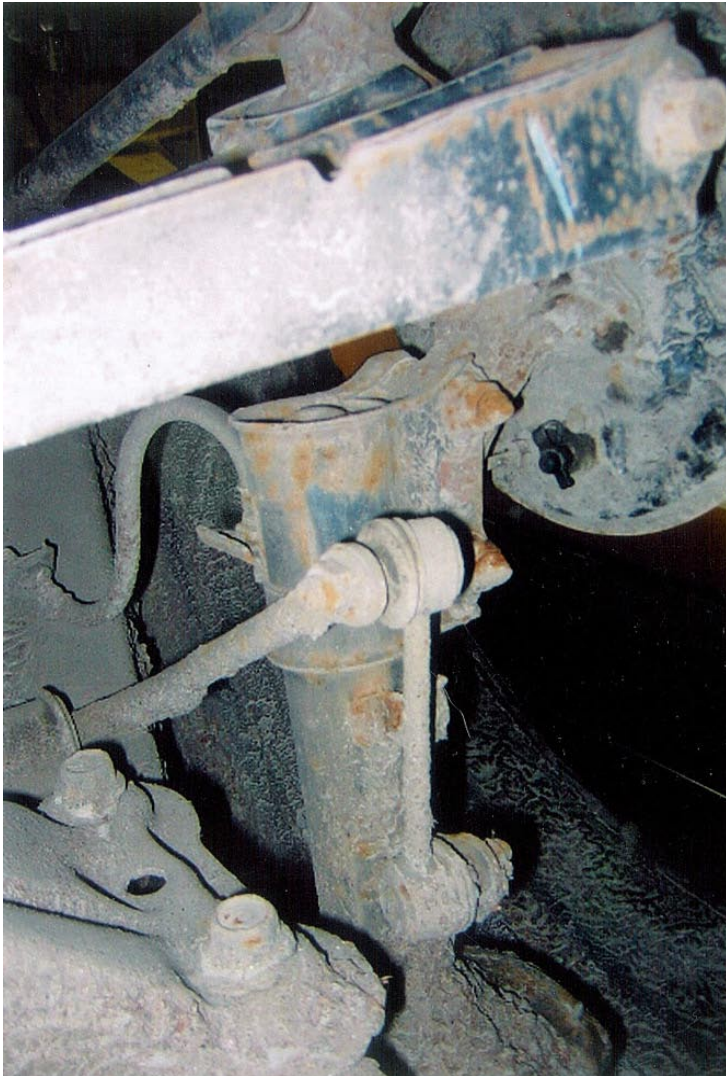
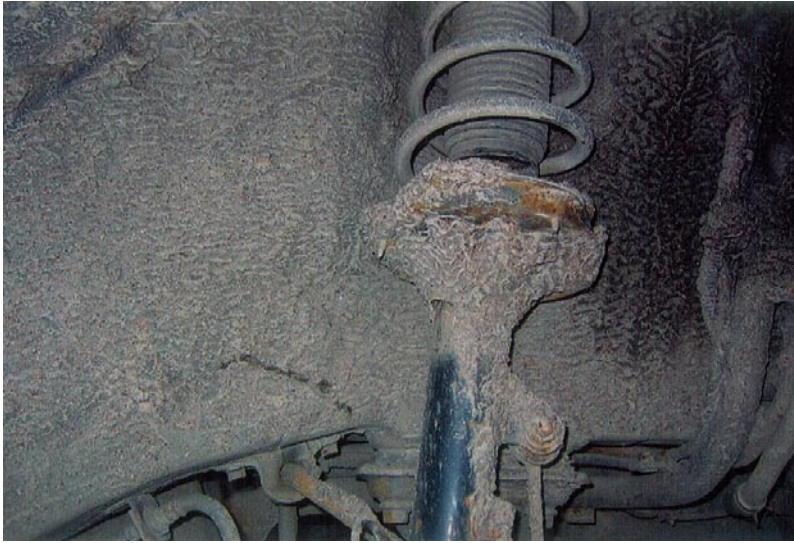
Commonly used suppressants are calcium chloride; magnesium chloride; sodium chloride (less often); and lignin derivatives, which are biodegradable. Lignin derivatives act as a dispersant, effectively (to put it simply) turning silt into clay.

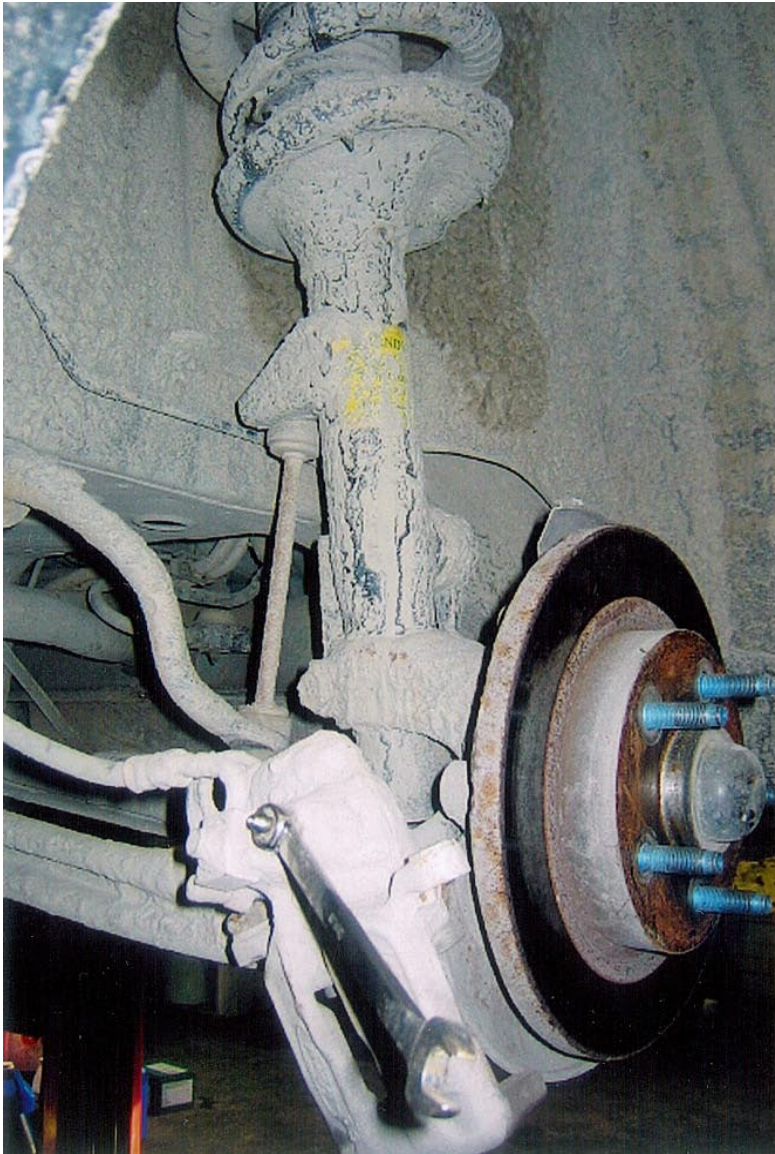
Unfortunately, the very properties that make a material a good dust suppressant are those that can make the surface very slow to dry out in very wet conditions. Taking advantage of the properties of clay, which retains moisture and which is often mildly hygroscopic, is thus extolled in areas of the continent where dust is the major concern in summer; and decried in areas of the continent where the slipperiness of the roads when wet is the major concern in winter. Again unfortunately, the Gulf Islands, with their wet winters and dry summers, fall into both camps and finding an optimal mix of treatments is a difficult balancing act.

Corrosion

All of the chemicals used for dust control, with the exception of the lignin derivatives, are corrosive.

Calcium chloride is slightly corrosive to steel and highly corrosive to aluminium and its alloys.





Magnesium chloride in concentrated solutions is very corrosive to steel and is the main corrosive agent in seawater.

Sodium chloride is moderately corrosive to steel in dilute solutions, but not increasingly so as the concentration increases.

To avoid corrosion of vehicles thus requires that the metal surfaces are regularly washed—rain, and driving on wet paved roads, are quite good at that if, as is the case on Gabriola, there is no car wash around.

The owner of the Gabriola Automotive Company (Tim Nicklom), who services many “gooped” vehicles on the Island, agrees that the “corrosion” seen on “gooped” vehicles is

consistent with the type of chloride corrosion so commonly seen in vehicles that have been driven extensively in winter “back east”.

This, in my opinion, confirms the theory that the “corrosion problem” is being caused by the sealing in of salt-laden moisture (all kinds of salt) on metal surfaces by cakes of hydraulic cement made up primarily of calcite and clay.

Conclusion

The clay in combination with the limestone (calcite) is a significant part of the “corrosion” problem, even though limestone is not itself corrosive.

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