

REPORT

To the Honorable Mayor and City Council
From the City Manager

June 5, 2006

Subject

Approval to reconfirm the Slurry Seal Specification requirement, which specifies that the newly developed black-color aggregate material, only, is to be used for the City's Slurry Seal projects.

Recommendation

1. Approval to keep the requirement in the Slurry Seal Technical Specification, which states that black-color aggregate (volcanic in nature) is to be used for the City's Slurry Seal projects.
2. Approve the Contract Documents entitled, "2005-2006 Slurry Seal Project," which includes the Slurry Seal Technical Specification for black-color aggregate, and authorize the advertisement for bids.

Background

As part of the City's Pavement Management Program, annual Slurry Sealing is performed on City roadways as a cost-effective preventive maintenance measure to preserve the condition of the roadway system, and extend the life of the pavement.

Since the year 2000 the City standard slurry seal mix specifies that the aggregate in the slurry seal mix is to be "volcanic in origin and black in color." For the past six years, staff has been very satisfied with the resulting quality of the sealing and the appearance of the treated streets such as Middlefield Road from Woodside Road to Jefferson Avenue, Veterans Boulevard from Whipple Avenue to Chestnut Street, and most of the City's residential streets.

Recently, a local material supplier has contacted the City raising concerns regarding our specification of black-color aggregate. The supplier has requested that the City change the specification to eliminate the black-color aggregate requirement, thereby opening up the specification to accept aggregate that is gray in color. The supplier has cited that there is only one supplier/quarry in the area that can provide the black-color aggregate, and this needlessly increases the cost of the project.

Some of the attributes and characteristics of the two different aggregates are as follows:

Aesthetic:

- Slurry with the black-color aggregate is more aesthetically pleasing. The black-color aggregate provides the treated streets with an appearance similar to that of a newly paved road. The black-color aggregate has been well received by

Redwood City residents. Several neighboring Cities have recently switched to black-color aggregate, because of the improved appearance over gray-color aggregate.

- Slurry made with lighter colored aggregate becomes light grey soon after application, resulting in a pavement that appears aged and worn down. Residents may perceive that the gray aggregate is an inferior or a lesser quality product, based on appearance.

Visibility:

- Slurry with black-color aggregate provides a darker pavement surface. This provides a better contrast for the white and yellow pavement markings and traffic lane lines, making the markings stand out more, especially at night.
- According to a report prepared by the local material supplier, lighter color aggregate roadways improve the effectiveness of streetlights and headlights at night by reflecting more lighting than would a darker surface, which would absorb more of the light.

Durability:

- Based on observations of past projects, staff believes that the black-color aggregate performs better to resist the problem of “bleeding” when placed over a new chip seal surfacing. Bleeding occurs when the asphalt emulsion rises up through the aggregate, and pools on the surface. We believe that the porous nature of the black-color rock allows more absorption of excess asphalt oil.
- To ensure quality, aggregate must meet minimum requirements measured as the *Sand Equivalent (SE)* and *Durability Index (DI)* of the aggregate. Both the *Sand Equivalent* and *Durability Index* values were greater for the black-color aggregate sample.¹
- According to a report prepared by the local material supplier, gray-color aggregate is lighter, and therefore reflects heat while darker colored materials absorb heat. The lighter colored material reduces the temperature of the slurry seal coating, and also reduces the temperatures transferred to the underlying pavement layers. Higher temperatures age asphalt products, causing the asphalt to become brittle or stiff more rapidly.

¹ SE expresses the concept that most granular soil and fine aggregate are mixtures of desirable coarse particles, and generally undesirable plastic fines. The higher the SE, the less undesirable plastic fines. DI provides a measure of relative resistance of an aggregate to producing clay-sized fines when subjected to prescribed methods of interparticulate abrasion in the presence of water. The City has a report from a testing laboratory in which these values were measured for both a sample of black-color and gray-color aggregate. The table below shows the test results.

Test	City Requirement	Black Rock	Gray Rock
Sand Equivalent	60 minimum	76	69
Durability Index	55 minimum	81	68

Cost:

- The initial cost of the black-color aggregate is almost double the cost of the gray-color aggregate. This results in roughly a 10% increase in the overall project construction cost. For example, a typical slurry seal project costing \$400,000 with gray aggregate would cost roughly \$440,000, if the black aggregate were specified.

In consideration of all of the points stated above, staff would like to recommend that the City continue to specify the use of black color aggregate for future slurry seal projects despite the somewhat higher initial cost. Staff believes that the black-color aggregate produces a higher quality slurry seal, and is more aesthetically pleasing.


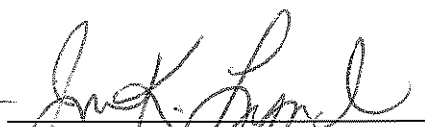
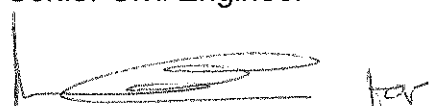

Alternatives

Bid future slurry seal projects with alternative bid items for both the gray-color and black-color aggregate, and make a determination on which to use knowing the actual cost difference.

A copy of the Contract Documents for the 2005-2006 Slurry Seal Project, are available for review in office of the City Engineer.

Fiscal Impacts

Funds in the amount of \$1,000,000 have been budgeted in the FY 2005-2006 Capital Improvement Project program for annual roadway maintenance and reconstruction projects.

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