MEMORANDUM

PLAINTIFF'S EXHIBIT

BIR-225

To Distribution

From Mr. O'Berg - BBH

Date June 23, 1981

Subject SEMI ANNUAL TESTING - UNFILLED AND FILLED COATING ASPHALTS

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Accelerated weathering results of unfilled and filled coatings, as part of the coordinated weathering program, have been completed. The test samples consist of 26 to 30 mil unfilled or filled coatings applied to aluminum panels as described in ASTM D-1669-62. The samples were then placed into the Weather-O-Meters for accelerated weathering in accordance with ASTM D-529-62, Cycle A (Table 1).

Results:

Accelerated Weather Testers - Cycles to Failure

Unfilled Coating		Filled Coating	
FJ	69	FJ	109
FK	63	FK	94
FC	61	FO	80
FO	53	FB	69
FM	53	FC	65
FS	51	FM	65
FB	50	FS	63
FF	46	FF	60
FW	41	FW	45

Semi Annual Testing - Unfilled and Filled Coating Asphalts - Cont.

1. FJ unfilled coating shows the best weatherability of all the asphalt coatings tested. FK& FC also show good weatherability results.

2. FJ coating with 53% filler added shows excellent weatherability results. The results for the Fall of 1979 showed that there was no increase in the number of cycles to failure when 53% filler was added.

3. FO, FM, FS, FB are average weathering asphalts. The 53% filled coatings from these mills are also considered to be average weathering asphalts.

4. The addition of 53% filler to the asphalt from FC shows only a slight increase in weatherability. This is however, an improvement over the 1979 Fall sample which showed a decrease in weatherability for the filled coating sample.

5. The asphalt from FF was a poor weathering asphalt. The addition of 53% filler did improve the weatherability characteristics. Presently, BBH is investigating a new source of filler that is less coarse than the material presently in use at FF.

6. FW unfilled as well as filled coating asphalt shows poor weatherability results. However, the accelerated weathering results were considerably better than the results obtained for the Fall of 1979.

The Color of Ash Test was performed on all the asphalt samples received at BBH. The only noticeable change in the color of ash since the Fall of 1979 (semi-annual test) is at FW. FW is now using catalyzed asphalt; giving the ash a reddish-brown color. FM and FO are also using catalyzed asphalts.

The asphaltene settling rates were determined on the unfilled coating samples. The correlation between accelerated weathering results and the asphaltene settling rates is not as strong as the correlations that were seen with the Fall 1979 series. Research efforts are presently being conducted by the ARMA Committee as well as BBH to revise the procedure for the Asphaltene Settling Rate Test (Table II).

Corbett Analysis and Dispersability Factors were determined on the samples. The degree of correlation between the accelerated weathering results and the dispersability index is somewhat close but still shows a trend between "good" and "bad" weathering asphalts. (Table II).

The pH of filler (water extract) were measured on the nine rock filler samples submitted to BBH. The pH of the fillers from Portland was excessively high. Portland was informed of this situation and an alternative supply of filler was recommended. (Table III).

References: O'Berg, G. Lab Notebook BBH 397, pgs. 18-35, 38-40,43
Joseph, B., Progress Report No. 22, May 22, 1981

GO'B/ac
Attach.

Gerry O'Berg

BIRD 010956

TABLE I

CYCLES TO FAILURE IN ACCELERATED WEATHER TESTERS

Source of Asphalt	SP (°) (Unfilled	Filled)	Pen (@77°F) 0.1MM	Unfilled Sample #/Cycles	53% Filled Sample #/Cycles
Norwood Exxon-Shell Venezuela (filler-FBW Dust)	242	262	16	50	69
Chicago Amoco Mid-Continent (filler-Vulcan Limestone)	215	236	22	61	65
Franklin Gulf Mid Continent (filler-Armco Limestone-PCS)	241	258	12.5	46	61
Perth Amboy Chevron, Exxon (filler-GAF, B-65 Rock Dust)	215	231	18	69	109
Charleston Exxon, Venezuela (filler-Auguston & Monroe)	221	238	16.5	63	94
Martinez Shell, Alaskan-North Slope (filler-Rancho Cordova)	239	262	19.5	53	65
Portland Shell (filler-Limestone)	235	249	21	53	80
Shreveport East-Texas-Arkansas (filler-3M)	230	252	17	51	63
Wilmington Edgington Oil (filler-3M)	242	262	17.5	41	45

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TABLE II

CORBETT ANALYSIS - ASPHALTENE SETTLING RATE

Plant	FRACTION PERCENTAGE					D* NA+PA / SAT	ASR#
	Asphaltene	Saturate	NA	PA-1	PA-2		
FK	35	14.7	30	18	5.3	3.6	-.07
FB	35	16	29.7	15.5	4	3.1	-.094
FS	38	16	27	18	4	3.1	-.17
FJ	29	17.5	28.9	16	6	3.0	-.10
FO	33	18.7	29	21	4	2.9	-.13
FF	28	20	21	21	7,5	2.5	-.08
FC	31	20	27	17	5	2.4	-.14
FW	37	20	22	24	1	2.4	-.14
FM	34	20	24	21	2	2.3	-.15

* Dispersion Factor

Asphaltene Settling Rate (mls./minute)

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TABLE III

pH of Rock Fillers (water extract)

FB	9.00
FC	9.20
FF	9.00
FJ	9.00
FK	9.30
FM	7.95
FO	9.90
FS	8.80
FW	8.00