

MEMORANDUM

In Reply to _____ Date 7/1/74 From BBH & BBQ To _____

Subject INSPECTION OF SHREVEPORT TEST DECKS
May 6 & 7, 1974CONFIDENTIAL

B- Mr. Heim
 BB- Mr. Hixon
 BBR- Mr. Frazier
 MB- Mr. Clay
 MK- Mr. Powers
 MS- Mr. Colvin
 MJ- Mr. Miller
 MP- Mr. Suva
 PB- Mr. Koval
 PK- Mr. Zinkowski
 PS- Mr. Marsh
 PJ- Mr. Dickinson
 PBL- Mr. Clark
 PKL- Mr. Price
 PSL- Mr. Potter
 PJL- Mr. Sutton

PACIFIC DIVISION

Mr. Wood
 Mr. Sweet
 Mr. McClung
 Mr. Hyde
 Mr. Koopmann
 Mr. Costa

Present at the inspection were technical people from Bird & Son with each division represented.

The personnel attending were as follows:

R. Potter & W. Kirklin	Shreveport
F. Clark	Norwood
K. Sutton	Perth Amboy
W. Price	Charleston
W. Costa	Martinez
L. Weaver & C. Homan	E. Walpole

The Shreveport test decks are a valuable tool; however, in order to obtain the maximum benefit from the decks it is important that exposures be made on a continuing basis and that inspections be made at periodic intervals.

The present program for exposures calls for yearly submission of samples from each plant along with competitive material from the same area. All plants submitted samples this year in line with this program.

We have not had a formal inspection of the decks by the Quality Control Supervisors from each division in more than 10 years. An inspection was made two years ago by L. Weaver, H. Koopmann, R. Potter, W. Kirklin, and C. Homan.

CONCLUSIONS

1. Although there is considerable variation between exposures the decks plainly show that, on the average, 235-240 lb. flat shingles are weathering better than the average thick butts. However, there are thick butts on the decks that are showing excellent results.

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We have no real data to show us why a few thick butt shingles weather very well while the majority are mediocre.

2. In general, the heavy shingles (those where the weight has been increased by additional coating) do not weather as well as the shingles that do not have an excessive amount of coating over and above that required to properly hold the granules.
3. Cracking is a destructive type of shingle failure. This occurs very quickly at the bottom of the embossed lines on shingles with cold embossing such as our Jet and Mark 25. Other types of cracking of unknown origin are a common type of shingle failure.
4. Horizontal cracking was found on the test decks but was not as severe as on homes in either Florida or Texas. Once again it was found only on seal down shingles.
5. Based on this inspection it was evident that the FS decks did not signal a problem with horizontal cracking early enough to be helpful.
6. The test decks showed excessive granule loss on many exposures. This emphasizes the need of maintaining good embedding on all production including white.
7. Open end joints were very evident on the test decks and also found without exception on the Jets and Mark 25 that were inspected in Houston. Indications point to shrinkage as the cause. A small amount of shrinkage masked by cut-outs was also quite apparent in cut-out type shingles.
8. Barrett's fungus resistant shingles made with a shadow line of metallic zinc granules exposed in 1966 have lost the majority of the zinc granules leaving a line of exposed coating.
9. There wasn't sufficient documentation of the asphalts used in the products on the decks to allow any conclusions as to the influence of different asphalts on the weathering of the product.
10. A series exposed to determine the effect of acid or alkaline felt on clawing shows clearly that a neutral felt (pH of 7.0) shows the least clawing. The more alkaline felts (pH of 8.4) were the poorest. The acid felt (pH of 4.8 - 5.0) were also poor but somewhat better than the alkaline felts.

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11. The 1972 exposures of an FB experimental run of fiberglass mat shingles are starting to delaminate. The mat had not been properly impregnated with the coating asphalt. Fully impregnated glass mat shingles do not delaminate.

RECOMMENDATIONS

The following recommendations are based upon the inspection of the decks and the discussions that were held by those making the inspection. We recognize that, for practical reasons, some of these are not realistic at this time however they are offered for consideration as ways of maintaining and improving the quality of our products.

1. It was the consensus of the group that we could improve the weathering of our Mark 25 by making it as a flat instead of a thick butt and surfacing the full width with #9 or slightly larger granules. We would advise against a 285 - 290 lb. product with either #9 or #11 granules, and recommend a product weight, using #9 granules, of 270 - 280 lbs. per square.
2. Replace the thick butt shingle with the flat with special emphasis on making the change at FS and FK as soon as possible.
3. Maintain the quality of the "unexposed" area of the no cut-out shingle to prevent premature failure at the end joints where shrinkage exposes the "unexposed" area in much the same way as a cut out is exposed.
4. Continue working to develop a substitute for the present embossing of no cut-out shingles to help disguise the patterning of the end joints. Embossing is definitely injurious to asphalt roofing.
5. Maintain the same embedding standards for white granules as for other colors in spite of the possible tendency to increase shading problems classified as "overpressing."
6. Continue an active program of developing fiberglass shingles. Included in the program should be house exposures to be followed by BBH for such problems as blistering, splitting, loss of coating, etc., and how these conditions effect final failure.
7. Approach the Barrett system of making a fungus resistant shingle using metallic zinc granules with caution. Early loss of the metallic granule could be very damaging.
8. Maintain as nearly neutral a pH for the dry felt as possible to reduce the possibility of clawing.
9. Develop a program to extend the use of the test decks in order to take maximum advantage of this valuable tool.

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DISCUSSION

The examination of the exposures on the decks by the group coupled with the discussion which followed was beneficial to everyone present.

1. The decks show that on the average the Bird thick butt shingles are not weathering as well as competitive flat shingles. There are exposures of the 235 lb. thick butts that are weathering as well as the flats but these are the exception and not the rule. The exact difference between the thick butts that are performing well and those that are borderline is not known. We do know that sufficient coating asphalt has to be present on both the base and overlay portions to properly hold the granules or in other words a good balance must be maintained between the base and overlay. The result is that a thick butt requires much closer manufacturing control than the flat.

2. The generally accepted concept that heavy weight shingles are superior to lighter weight shingles is not born out by the evidence on the FS decks. The decks indicate that for a given construction there is an optimum range of weight per unit area.

A product which exceeds this optimum by too large an amount will fail prematurely as will one which is too far below the optimum.

3. The horizontal cracking of seal down shingles which is now evident on the test decks did not occur as quickly and is not as severe as that which has been observed in Florida and Texas. This may be due to the small area of roof exposed on each test deck, however there is also the possibility that the climatic conditions in Shreveport are not as conducive to this type of failure as in either of the other areas.
4. Traces of horizontal cracking were found on Architect 70 shingles exposed in 1970. This was very faint and Dick Potter suggested that it perhaps was the result of the handling of the components being fed into the Architect 70 machine. We observed the combining operation to check this and there is little doubt but what this is a distinct possibility. The cracks are not evident at the time of the combining but the #1 components are severely flexed during handling with the most severe bend coming in the approximate location of the horizontal cracks. This bending could easily cause hairline cracks that would develop as the shingle weathers.

Examination of the Architect 70 shingles on the FS office roof where the first of the Architect 70 produced were applied showed no evidence of horizontal cracking, again pointing to the possibility that the weather conditions at Shreveport are not as conducive to this type of failure as Florida or possibly Texas.

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5. The lack of information available as to the influence that the type of asphalt has on actual shingle performance is disappointing. BBH is taking steps to remedy this in the future by exposing shingles made with asphalts that are being tested in the accelerated weathering program. In this way it is hoped that some correlation may be obtained between laboratory accelerated testing and outdoor weathering.
6. There is wide variation in the performance of the asphalt roofing products on the decks even though they were made in the same plant. This makes it impractical to select single exposures and use them as a basis for valid conclusions.

The wide variation observed on the test decks is also very evident in the field as shown by roofs where shedding, blistering, shading, etc., can be plainly traced to individual bundles.

To minimize these differences, continuous attention must be given to manufacturing control to quickly identify where deficiencies in quality are occurring and to notify the machine people so that corrections can be made immediately.

The 15 to 25 year warranties on shingles coupled with the increased cost of roofing and roofing application make it more important than ever before that we keep our quality standards high and that we provide our customers with products that are of uniformly high quality for maximum performance.

Uniformity is extremely important to the overall performance of an asphalt shingled roof. A few sub-standard bundles can result in serious complaints and very possibly early replacement of a roof even though the majority of the roof is giving good service.

CAH
LW

CAHoman/
LWWeaver/rp
Attach.

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The photograph shown below illustrates the weathering of a heavy weight shingle as compared with one of lighter weight by the same manufacturer.

FS Panel No. 2041

Exposed 1/20/59

Mfr.- Fry (Jacksonville, Fla.)

Weight/Sq. - 290#

Color: Natural Red Slate

FS Panel No. 2040

Exposed 1/20/59

Mfr.- Fry (Jacksonville, Fla.)

Weight/Sq. - 255#

Color: Natural Red Slate