

HOW FAST CAN WE BUILD IT?

Project Report #25

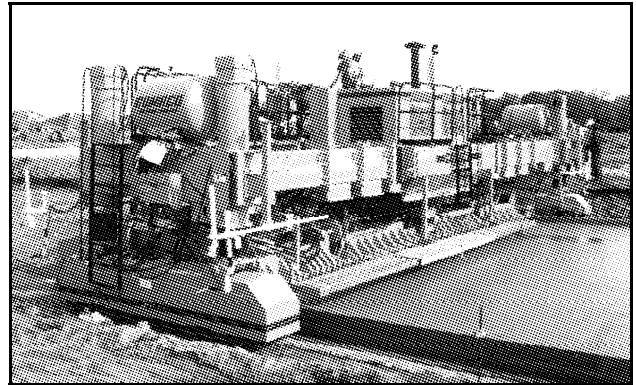
A Completion Time Comparison -- PCC vs. HMA

November, 2001

In recent years, the time within which construction/reconstruction projects can be completed has become crucial to motorists and, in some cases, to the local economy. During the era of booming highway construction, driven mainly by completion of the Eisenhower Interstate Highway System, completion time was not necessarily one of the primary concerns of the contracting agency. The public anxiously awaited the opening of these highways, but they were traveling existing routes until the day of the ribbon-cutting ceremony.

Our dependence on the pavements making up our transportation infrastructure has certainly increased along with the freedom brought by completion of the world's greatest public works project of all time. Yes, today's network of highways, roads, and streets in many ways epitomizes the freedom that Americans feel so deeply. When this sense of freedom is inhibited temporarily by construction or rehabilitation of a portion of this network, inconvenience may not be a strong enough word for the way the motoring public views this interruption of service.

Concrete pavement construction has long been recognized by many as a process that is quicker and less frequently required than that of other pavement types. Because concrete pavements can be built with one pass of the paving machine, regardless of thickness, it has been seen as a faster pavement to build. Plus, when one considers the length of time that concrete pavements remain in service without costly and extensive resurfacing, it has been recognized as a pavement that will cause less inconvenience throughout the years following construction.



Even so, some people have asked the following question:

"We know that concrete lasts longer, but can you prove that concrete pavements are quicker to build?"

During the year 2000, ICPA staff observed and documented progress on several highway projects constructed in Iowa. Our assignment was to find out if concrete pavements were actually being built faster than asphalt pavements right here under Iowa construction conditions. The answer came back even stronger than we had anticipated.

Concrete is about three times faster!

Our analysis focused on seven full-depth paving projects constructed during the year 2000 (see Table #1). These particular seven projects were selected for study because of their similarity and available field records.

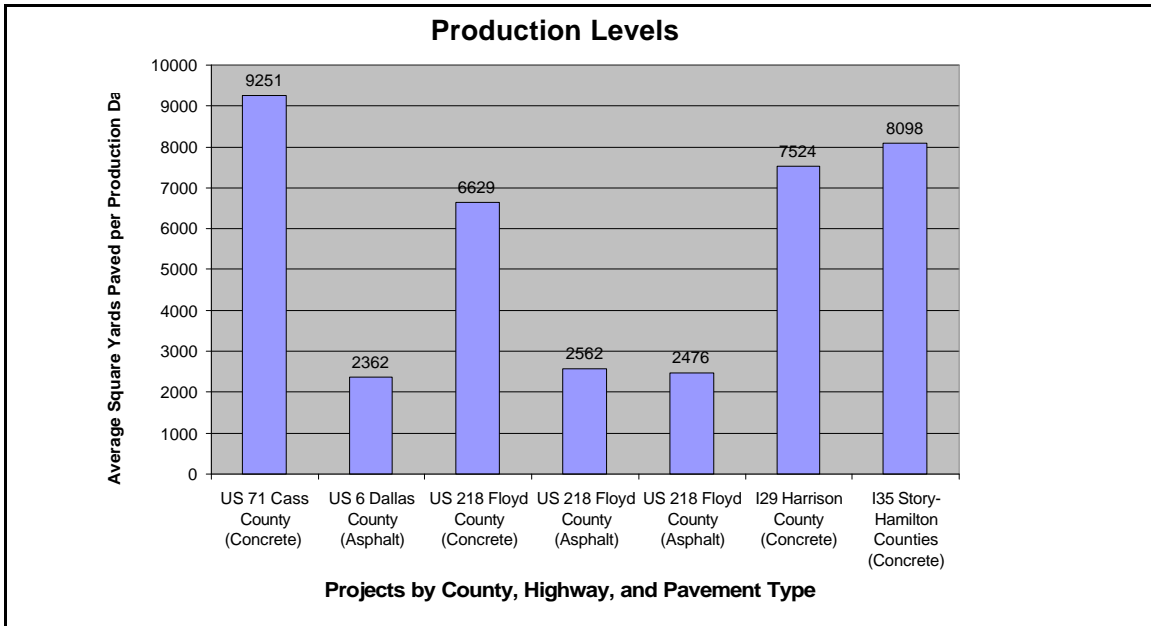


Table 1

This analysis only looked at time to complete the paving portion of the project. No attempt was made to look at grading, shouldering, drainage work, or final clean up in an effort to isolate comparisons to pavement type only. Furthermore, the time taken for non-paving construction events can be diminished through pre-design work and value engineering. It should be noted that future comparisons including these other events could likely show concrete paving, in comparison to asphalt, to be an even faster process than is reported herein.

Summary of Results

The completion times observed for paving on the subject projects showed that concrete pavements in Iowa are being placed at an average rate of 7,876 square yards per working day (see Table #2). For asphalt, the average completion time was shown to be 2,467 square yards per day (see Table #2). Concrete production, according to these average rates, would be 319% faster than asphalt.

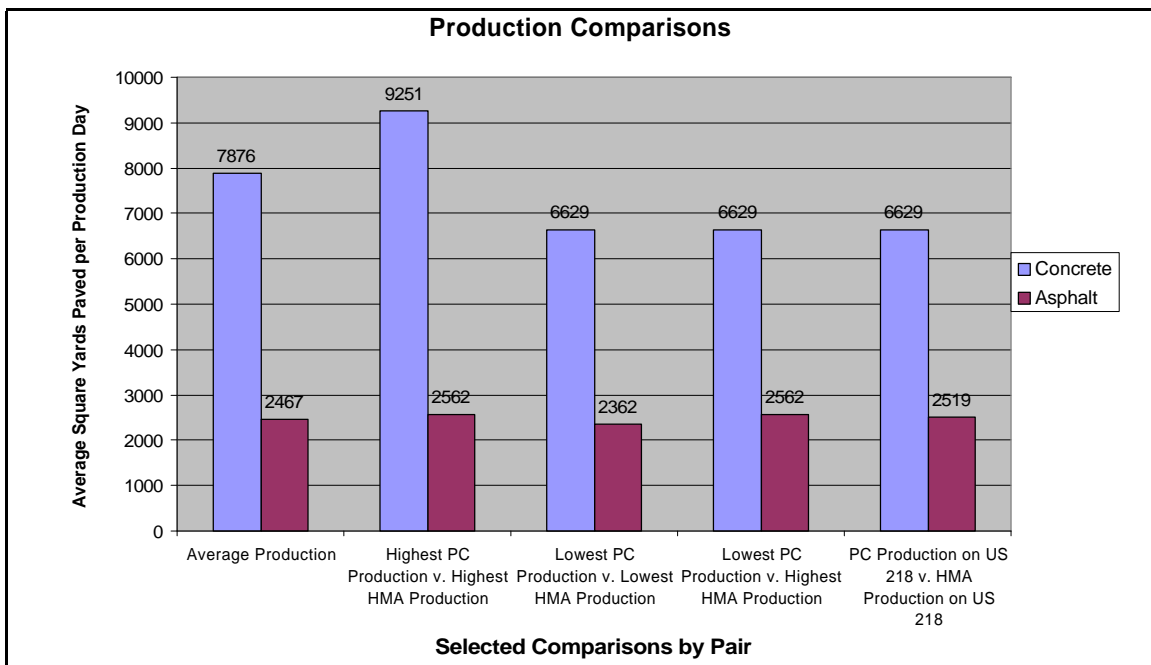


Table 2

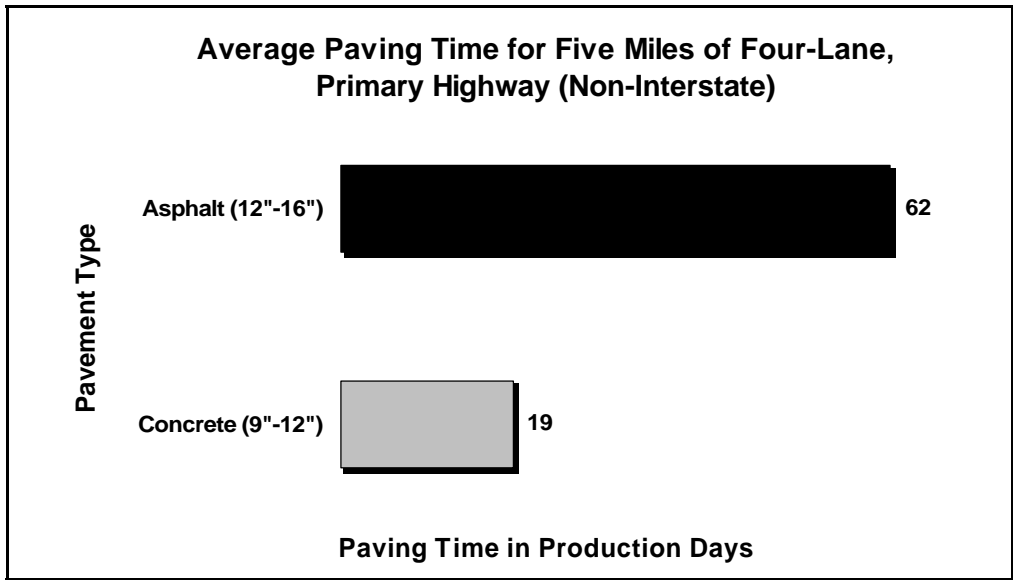


Table 3

Furthermore, other comparisons between pavement types (Table #2) reveal a decided advantage in production time by paving with concrete. For all intents and purposes, the production rates shown for US 218 in Floyd County could be a side-by-side comparison between concrete and asphalt. These production rates indicate that concrete is being placed 263% faster than asphalt. In another comparison, the lowest average production level for concrete is still 258% faster than the highest average production for asphalt.

Conclusions

It seems clear that the assumptions regarding faster completion time with concrete are supported by the facts observed and reported herein. Consider the scenario of five miles of primary highway paving and the amount of time it would take to complete this project with either concrete or asphalt. By choosing concrete, the public might see the paving completed in less than 20 working days as opposed to over 60 for asphalt (Table #3).

Though there may be some disagreement over the effects of other construction events like cure time, it would be difficult to argue against the assertion that concrete will dramatically save overall construction time. This is especially true when one considers the time saved through innovations like maturity monitoring, which has greatly reduced cure time for concrete pavements.

Public expectations have increased the importance of reducing interruptions in the service provided by our transportation infrastructure. Concrete pavements can have a very beneficial impact on reducing the amount of time a facility may be out of service. Because concrete pavements require less frequent maintenance, have longer service lives, and are quicker to build, the interruptions in service are less numerous and less lengthy. With concrete, construction crews can...

...get in, get out, and stay out!

By John Cunningham, Director - Local Partnerships