Inter-Office Communication

Division of Highway Operations

Date: March 23, 2001

To: All District Deputy Directors

From: William C. Lozier, P.E., Deputy Director of Highway Operations

By: David J. Humphrey, P.E., Administrator, Office of Pavement Engineering

Subject: Use of Free Draining Base for Pavements

In the late 1980's and early 1990's, ODOT, and many other states, developed and implemented specifications for Free Draining Base (FDB) as an attempt to solve many of the problems associated with water under pavements. Concurrently, ODOT designed and constructed the DEL-23-SHRP (Strategic Highway Research Program) project, as well as a few additional test sites to study various pavement design attributes including drainage and the effect of FDB on pavement performance.

Data has been collected over the past years from these sites to determine the cost-benefit of the use of FDB under both rigid and flexible pavements. The following are preliminary results of this research:

- Moisture probes indicate FDB has no effect on the moisture levels below the pavement structure. Subgrade moisture saturation levels are not affected regardless of base type. More research is planned to substantiate this.
- Rigid pavements on FDB have shown either no difference in performance or, in certain cases a detriment to performance when compared to rigid dense graded base pavements.
- Flexible pavements on FDB have not shown any difference in performance compared to flexible pavements placed on a dense graded base.

Other facts to consider:

- Underdrain maintenance and outlet clean-out have not been a high enough priority for the free draining base pavements. Provisions for subsurface drainage is important for all subbases, but the porosity of FDB allows for substantial water to collect if the underdrains are not functional. This excess water could create obvious problems during freezing and thawing cycles.
- FDB layer costs (per square yard for the same thickness) are approximately twice that of standard dense graded base (Item 304), yet the pavement structure is equivalent.

Based on the above, it has been determined ODOT will discontinue the use of FDB under both rigid and flexible pavements at this time. This will probably lead to changes to the pavement design and rehabilitation manual in the future. This decision was made by a committee which included representatives from District, Academia, FHWA, and Central Office. The Office of Pavement Engineering will continue to monitor the research on FDB and continue to observe the performance of the many FDB pavements in service. All future pavement designs yet to be approved by the Pavement Selection Committee (PSC) shall be done without the use of a FDB. Any prior approved projects containing a FDB can proceed towards construction as designed, however it may be more cost effective to eliminate the FDB. This change should be done by replacing the layer of FDB with an equal thickness of Item 304. The Office of Pavement Engineering should be advised of any changes for their records.

If there are any questions regarding this subject, they should be directed to David Humphrey at 614-995-5997

WCL:DJH:AAM

C: All District Transportation Planning Program Administrators
All District Production Administrators
All District Highway Management Administrators
Pavement Selection Committee
Bill Ujvari, David Powers, Bill Christensen, Keith Keeran, Randy Morris, David Riley, District Pavement Designers, Pavement Office, Bob McQuiston (FHWA), Reading File, File