PERFORM WITH PRECISION™

WELDED DOWEL ASSEMBLY LOAD TRANSFER PRODUCTS

CONCRETE CONSTRUCTION SOLUTIONS

BROCHURE
Today the modern Portland Cement Concrete pavements found in highways, airports and industrial floor slabs are under ever increasing loads. Increased truck and car traffic, heavier airplanes with more frequent take offs and landings, and the new material handling techniques used in industry and distribution all add to a very high level of stress placed on these pavements. The highest level of stress and deflection is found at the joints and it is for that reason that provision must be made to properly transfer load from one slab to the next.

Load transfer is a necessary ingredient of well engineered highway, airport and industrial floor slabs. It is the mechanism through which wheel loads are conveyed from one slab to the next. If done correctly, proper load transfer will significantly reduce joint distresses such as pumping, faulting, loss of support and corner breaks (shown below).

One method most commonly used and specified by the engineering community is the steel dowel bar. Arranged in a line at proper intervals and at the midpoint of the pavement thickness, this device can address all of the problems inherent in adequately transferring the load from one pavement section to the next. Knowing the loads and the environment in which the dowel will be asked to perform, the engineer can select the proper diameter, length, spacing and coating which will best suit the situation.

For the dowel to perform, it is critical that it is aligned properly. Prevailing practice for placement of dowel bars is to orient them parallel to the pavement centerline and surface of the pavement within +/- 1/4 inch (6 mm) per 12 inches (309 mm) of dowel.

Dayton Superior understands that the best way to achieve this alignment is to provide an assembly which will position dowels as described in the previous paragraph. The industry calls this a “welded dowel assembly” and Dayton Superior Paving Products is proud to be the largest manufacturer of this system in the United States (shown on right).

Most typically dowel bars are manufactured from billet steel, grade 40 bars in accordance with ASTM A 615 and AASHTO M31, “Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement”. Various diameters, lengths, and spacing can be used depending on the load requirements that need to be met. Drawn wire of various sizes are used (Fig. 3).
Due to the environment in which the dowel will be placed, the specifier may choose to either use a fusion bonded epoxy coating, a painted or even a plain dowel. Most typically highway construction calls for the epoxy version done in accordance with AASHTO M 254 with the ends of the bars left plain after cutting. Airport pavements use an epoxy coated or painted dowel basket (in compliance with FS TT-P-664) depending on the environmental conditions and at the engineers discretion. Commercial and industrial slabs are well served by a plain dowel due to the controlled environment in which they exist.

Therefore, it is evident that welded dowel assemblies can have many variations. Paving thickness, dowel size, coating, spacing and other specified characteristics can make choosing a welded dowel assembly a little confusing. The Quote/Order Form in this publication is designed to make the selection process easier and can be copied for use as a quote request form. By checking the appropriate boxes and filling in the data where indicated, we will know how to price and fabricate your next welded dowel project.
Dowel baskets must be properly aligned if they are to function correctly. For that reason it is necessary to attach them to the subgrade at a 90 degree angle to the edge of the pavement. Dayton Superior offers several devices for this purpose. Most commonly used is a stake. These come in various diameters and lengths. (See Detail A, Figure 2)

Also available are clips which capture the bottom runner of the basket and can be secured with large nails which can be either hand driven or shot from a powder actuated gun. (See Detail B, Figure 2)

Once the concrete is placed and is set, sawing can take place across the center line of the basket usually at a depth of 1/4 of the slab thickness thus allowing the slab to crack and form the necessary contraction joint. Load transfer will then be achieved for many years to come.
Fill in the appropriate information for each project and send to your Dayton Superior representative.