

# Roller Compacted Concrete: Long Life Choice for Jack Daniel's

**L**ynchburg, TN is home to one of the world's most famous whiskey brands, Jack Daniel's. The Jack Daniel's Distillery is the oldest registered distillery in the United States, first licensed in 1866. The Tennessee sour mash whiskey is crafted from iron-free cave spring water, mellowed through ten feet of sugar maple charcoal, and then stored and aged to perfection in handcrafted and charred white oak barrels. The square bottle and black label with the "Old No. 7" insignia is an enduring and recognized symbol of quality by whiskey connoisseurs worldwide.

The Jack Daniel's organization continues to grow their international market, thus needing more storage space for their barrels to age. Two large warehouses were needed to be constructed quickly to house the new product prior to shipment. Lee Adcock Construction of Shelbyville, TN has a long standing relationship with Jack Daniel's and was chosen as the general contractor to complete the expansion.

The scope of the project included two new warehouses and 162,000 square feet of paving, which included a 1000 foot access road. Geotechnical and testing engineers S&ME in Huntsville, AL performed preliminary evaluations on the sub-grade and concluded that the soil condition contained a California Bearing Ratio (CBR) of 3. The initial pavement design by S&ME called for 6" (SN=0.16) of granular aggregate base, 3" of bituminous base, and 2" (SN=0.44) of asphalt topping yielding a total SN= 3.16. Mr. Adcock was approached by Mark Deason, sales representative



from Irving Materials (IMI), about considering a longer life pavement alternative, Roller Compacted Concrete (RCC). After visiting other RCC projects in Chattanooga, TN, Mr. Adcock and the Jack Daniel's team quickly learned that RCC provides the same low-maintenance benefits of conventionally placed concrete pavement at a very competitive initial cost. After such compelling in-situ evidence was presented in favor of RCC, all agreed that an RCC alternate should be considered. With a structural number equivalent to 3.96, the 6" of granular aggregate base and 5" (SN= 0.6) of RCC was a better-than-equivalent pavement design. The 20 year RCC design was formulated using the Portland Cement Association's (PCA's) RCC- Pave Software.

The installed price of the RCC was 10% below the cost of the asphalt design. With the lower maintenance, no seal coats, no resurfacing, less passes during placement, faster placement, advances in a smoother finish, and the structurally superior more durable pavement, RCC was an intelligent business decision for Jack Daniel's. Paving contractor Robert Smith Inc. (RSI), Chattanooga, TN was chosen as the RCC sub-contractor, because of their ten year plus experience with RCC placement. Following the successful development of an RCC mixture design one year earlier, IMI eagerly anticipated this major project. PCA's RCC mix proportioning methods were followed for IMI's mixture design. The specified RCC compressive strength was 4000 psi after 28 days.

A portable Stephens twin-shafted mixer produced the RCC mixture, which was hauled by dump trucks to paving equipment at the Jack Daniel's site. The total time in the dump truck from plant to placement of the RCC was around 35 minutes. RSI placed the 5" pavement in one pass with a high-density Volvo ABG 7820 paver. Placement moistures were maintained at 6-7% and checked with a Trident TI-90 moisture meter from James Instruments.

A total of 2600 cubic yards of RCC material were needed to complete the project, with only a 1%

material overrun. This tight control over material and reducing waste is a huge savings to the owner, contractor, and the concrete producer.

RSI's work force included a crew of 10 to 12 placing RCC at an average of 550 CY per day. The paving widths varied from 15 to 20 feet in the warehousing areas and 26 ft for the access road. A white pigmented curing compound per ASTM C309 standards was applied to the pavement immediately after placement. Using an early entry saw, transverse control joints were cut to ¼ of the pavement depth at 18 to 20 ft intervals. Paving was completed in only six days. Core samples indicated 7-day strengths in excess of 3700 psi. These early test cores convinced all parties that the 28-day strength requirements would be well exceeded.

The final project was a huge success for the Jack Daniel's team, Lee Adcock Construction, IMI, RSI, and the local community. Stakeholders put the local concrete and construction industry to work on a paving project that was originally planned to be asphalt. With this latest expansion, Jack Daniel's has a long-life, heavy duty, low maintenance concrete pavement that can easily handle the anticipated loads. RCC is clearly an outstanding product that will not rut or shove under the heavy truck loads. RCC provided Jack Daniel's the benefit of investing in a long-life pavement while stimulating growth in the local economy.



### ***Team Members:***

- *Jack Daniel's*
- *Robert Smith Inc.*
- *Lee Adcock Construction*
- *IMI*
- *Lafarge Cement*
- *Buzzi Unicem USA*
- *Vulcan Materials*

[www.rccpavement.info](http://www.rccpavement.info)

[www.concreteparking.info](http://www.concreteparking.info)

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