

The Way to a Better Road

City helps pioneer use of foamed asphalt base reclamation.

By Blair Barnhardt

Roswell is a historic city founded in 1836 and incorporated in 1854. The sixth largest city in Georgia, Roswell has grown to over 85,000 people and sits atop the northeast corner of Metro Atlanta in North Fulton County. One ideal that the city strongly promotes is recycling. With asphalt being the number one recycled material by weight in the United States today, it seems only natural that the city would welcome road reclamation with open arms. However, this did not happen overnight.

In 2000, John Indrunas, Rosewell Construction Supervisor, attended an Asphalt Recycling and Reclaiming Association (ARRA) meeting in Atlanta, along with the Rosewell Director of Public Works, Jack Seibert. Based on the ARRA seminar that year, Indrunas initiated the first reclamation project for Roswell in 2001. Bids were accepted for Houze Way reconstruction, a major cut through and

around the Highway 9 corridor. "Blount Construction (www.blountconstruction.com) was the successful low bidder for this project and we went to work on traffic control immediately following the pre-construction meeting," said Indrunas. "As the road was traveled by over 16,000 cars per day, we decided to run single lane traffic in one direction in the morning, then turn them around the opposite way that afternoon."

Among the first cities in the Southeast to perform foamed asphalt

base stabilization, Rosewell's Indrunas clearly can be considered a pioneer in road-recycling. "Houze Way reconstruction went better than expected, and afforded us the opportunity to not only match the existing curb elevations on one side of the road, but we also widened the eastbound lane an additional three feet at the same time," explained Indrunas. "Even with the success of the initial project on Houze Way, I attended another seminar on Full Depth Reclamation at the Georgia Department of Transportation Materials

asphalt projects in the southeast to determine an average layer coefficient for road design purposes. At this point the industry is using 0.40 as a layer coefficient for foamed asphalt stabilization based on test data from existing projects in other parts of North America. Another pioneer himself in the reclamation industry worldwide, Emery had been involved with foamed asphalt as well as cold-in-place recycling since its inception in North America.

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Once an aged asphalt pavement is alligatorized to this extent the reclamation process provides a new 20-year life cycle at a fraction of the cost of conventional reconstruction techniques.

crowded and under-designed roads, Indrunas let a project for conventional construction in the fall 2001 for Jones Road reconstruction. The bids came in at over \$1.5 million to complete this work. This amount was well over the budget that the city staff had set aside for this road. "When you have to undercut a road by 16 inches to place new rock, you are going to have to get utility clearances and relocates. All this takes time, and we knew that this project would take upwards of six months to perform," stated Indrunas. "We were shocked when we rebid this same road as a reclamation project the following spring and the successful low bidder was awarded the work at just over \$270,000."

and Research Lab in September 2001. It was there that I first heard John Emery speak on the benefits of reclamation with foamed asphalt base stabilization." Emery, President of John Emery Geotechnical (www.jegel.com), was one of the featured speakers at that fall seminar hosted by Blount Construction. His firm provides technical support and mix designs for companies doing foamed asphalt base stabilization. Moreover, he and his staff are conducting a study on four years of foamed

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While still skeptical of the process, despite having one successful project under his belt from the previous season, Indrunas was pleased at the fact that his

city was looking at a potential cost saving of over \$1.2 million. "In addition to the monetary savings, having a roadway open to traffic after seven or eight working days with reclamation versus six months with conventional construction is priceless," said Indrunas. "Rather than waiting for utilities to be relocated and adjusted as in conventional reconstruction, the Blount crew simply pulverized and mixed the existing asphalt and base, trucked away surplus material to make room for curb reveal, and injected lime and foamed asphalt into the ground up road mixture. We got the strength of a brand new road for a fifth of the cost and substantially less time than conventional reconstruction."

Plenty to Learn

Though the project went well, there was still plenty to be learned in the developmental stages of this process. "There is a definite learning curve, but we work closely with the low bidders of these projects to achieve the desired results," said Indrunas. "We learned very quickly that there is a trade off between following the old in-place curb with the new road and rideability. We soon found out that it is best to ignore the old curb profile and focus on the finished ride. With 15,000 cars a day on these roads, you only get one chance to do the work, so we learned that it is imperative to get it right the first time."

With two foamed asphalt base stabilization projects that both worked out well for the city, staff went to work on the budget for 2003. It was now a question of where—not if—to use full depth reclamation with foamed asphalt. The cost savings alone was reason enough to plan on using it in following years. It looked as if the days of adding more and more layers of asphalt resurfacing then raising the curbs were soon coming to an end in Roswell.

In 2003, the Hardscrabble Road Reconstruction project was let. This was a reclamation project with a combination of 2.4 miles of foamed asphalt base stabilization and 1/2 mile of milling and resurfacing. Mix designs were prepared and Blount went to work as a sub-contractor to APAC Paving to prepare a 5-in. stabilized base under a 2-in. asphalt

overlay. With the road closed to local traffic only, reclamation crews were able to expedite the work in record time. "Here is a road with 16,000 cars a day being completed in ten days versus being done in six to seven months with conventional reconstruction," emphasizes Indrunas. "Even if we chose to do deep patching instead of conventional reconstruction to save time, unless you are going to go down ten inches with your patches, the patch method cannot address the subbase failure problems the way full depth reclamation does. I have the reclamation crews go down as deep as 18 inches on occasion to inject extra quick lime to stabilize subbase problems prior to stabilizing the entire road."

Knowing that the subbase failures are properly addressed and that the foamed asphalt base has a long life cycle when properly performed gives Indrunas confidence when it comes time to tell his elected officials that their engineering staff can meet their 20-year life cycle expectation. As Roswell experienced unprecedented growth in the last ten years, Indrunas states that additional subdivisions have been added to the original road design. "We can adjust and correct the resultant drainage deficiencies," said Indrunas. "Now with proper



Bucket holds the hot foamed asphalt shortly after it has been extracted from the sample nozzle on the pulverizer. Typically the asphalt cement is expanded 10 to 12 times its normal volume.

drainage, cross slope, width, and uniformity, we are giving our tax payers roads that are new for a third or more of the cost of conventional reconstruction. The fact that we can do this recycling reconstruction in record time under traffic is invaluable. On some occasions where it is feasible, road closures can expedite the construction time even further. Backing up 20,000 cars a day is not an option anymore in this just-in-time age."

By 2004, Indrunas had three successful foamed asphalt base stabilizations out of the way. Subsequently, the bid for Riverside Road Reconstruction was let, and Blount Construction was the suc-



Pulverizers like this one not only grind up the existing roadbase, but they also perform the actual foaming process with specially designed onboard computers and asphalt expansion chambers.



Quality control consists of nuclear density readings as well as before and after sampling involving gradation and AC-extractions back at the laboratory.

cessful low bidder. Originally the work was to take place over the year in four phases so as not to disrupt traffic flow too much. This road, in addition to allowing the passage of over 20,000 cars a day, also sees its fair share of cycling enthusiasts and joggers. Ironically, due to the fact that phase one went so fast, the city decided to go ahead and complete the latter three phases all at once. “When I first studied the logistics of the jobsite I realized that several thousands of tons of new material would be required to stabilize the shoulders in phase four of the project,” explained Indrunas. “I knew that the surplus reclaimed material in phases one and two could be utilized in lieu of new material on phase four so I was delighted with the city’s decision to

do all four phases at one time.”

While numerous complaints were received from delayed motorists during the reconstruction of Riverside Road during phase one, the contractor and the city worked diligently to resolve congestion problems during the next three phases. Construction was completed ahead of schedule and on budget.

Chris Arnold, Regional Roadway Services Manager of QORE Engineering (www.qore.net), Atlanta Division, performed quality control on site. Arnold, like Indrunas, has been involved with foamed asphalt reclamation base stabilization since it debuted in the Southeast in 2000. “We correlate on site nuclear density readings with the sand cone method,” said Arnold.

“Target density of 96 percent of modified cold method is what we are looking for. Typically, we see results between 95 percent and 98 percent with occasional variances.”

Before and after extractions and gradations are also compared, along with net AC, moisture content, flow, and stabilities. “It is common to see Marshall stabilities in the 9,000 to 10,000 (lb force range), largely due to the combination of the foamed asphalt cement and quicklime mixture,” states Arnold. “I have been looking at these reclamation sites since 2000, and we are impressed with the results that the contractors are achieving here in the Southeast.”

Since the strength of the existing bases are stabilized with the addition of foamed asphalt, cities and counties alike can reap



The newly rebuilt Riverside Road has an added shoulder made from reclaimed asphalt pavement that was taken from another phase of the project. The additional platform width provides bikers and bicyclists a smooth path to share with cars.



Two in. of black HMA overlay is placed upon a lighter colored five-in. layer of foamed asphalt base. The paint marks denote the centerline of the road. The cold-recycled base resembles that of a high-quality HMA binder mix.

the benefit of placing less hot mix asphalt as a wearing course. Rather than going with thick binder courses, typically the 5- and 6-in. foamed asphalt bases are topped with a single hot mix overlay of 2 in. In fact, there is a trucking terminal in Savannah that to this date has only the foamed asphalt base as its wearing course after two years in service. GE

Blair Barnhardt is the Operations Engineer with Blount Construction Company Inc. He has been involved with foamed asphalt reclamation for eight years in North America. Working in conjunction with instructors from the Asphalt Institute, he has taught the National Highway Institute course “Asphalt Pavement Recycling Technologies” (NHI Course #131050A). For more information on this two-day course, visit www.nhi.fhwa.dot.gov.