

Full-Depth Reclamation

By Allan Heydorn



Depending on job size, several facets of the full-depth reclamation process can take place simultaneously as happened at a Lockheed Martin parking lot where mixing, grading and compaction are getting done.

How Full-Depth Reclamation Saves Parking Lots

For more than 20 years Ruston Paving's use of the FDR option has been helping extend parking lot life

In today's construction world where "preservation" and "sustainability" have become essential facets of many pavement projects, one East Coast contractor has been ahead of the game and is seeing significant growth in a process that both preserves and sustains existing parking lots.

Ruston Paving has been offering a full-depth reclamation (FDR) option to commercial and industrial clients for more than 20 years. And partly through their own educational efforts, and partly as a result in a change in buying habits, FDR is increasingly becoming a go-to option for property managers.

Full-depth reclamation is a recycling process in which the entire thickness of asphalt pavement and a predetermined thickness of base material is pulverized, blended and stabilized using some type of additive.

Tim McConnell, Ruston Paving's pavement and soils specialist, says that while FDR is more commonly used on roadways, it works just as well on parking lots for the same reasons. "It's very expensive to dig out and haul off all that material whether you're getting down to subgrade or not," he says.

Lang Butler, Ruston Paving's vice president, says Ruston Paving offers a variety of paving and maintenance options to help customers match their budgets and pavement needs. "It's important people know what they're getting. Some options are more expensive than others and they need to know what their expenses will be in the future based on the option they select in the present."

He says FDR is a repair option Ruston Paving can turn to for pavements that have failed, worn out or simply

expired. "The bottom line is that we use the full-depth reclamation process regularly when it's appropriate for the job. It's another tool for the toolbox," Butler says.

McConnell says the company starts thinking about suggesting the FDR option when they've figured out how many "box-outs" – remove-and-replace repairs – are needed. "When the pavement requires a lot of box-outs, the full-depth reclamation option can really save the customer some money while providing a better product," McConnell says. He estimates there's roughly a 30% - 50% cost savings using FDR over complete pavement reconstruction, but cautions the savings vary considerably based on pavement condition and size of the project among other factors.

"When we're bidding a job, we don't necessarily specify FDR on every lot,"

McConnell says. “For us to recommend FDR, the parking lot has to have issues with structure where we need to get stability back in that lot. It comes down to the condition of that pavement and its supporting layer.”

“Full-depth reclamation is important to many property owners because it’s utilizing existing onsite material, material that owners of these properties have already had capital expenditures on,” Butler says. “And if you’re an owner who has parking lot failure, and you have stone underneath and have already spent money on that stone, it’s disheartening to see it get torn up and hauled away. It’s smarter, greener and more sustainable to reuse the material and make it better. It makes everyone happier.”

EDUCATION LEADS TO ACCEPTANCE

Don Barry, director of business development for Ruston, says the contractor’s biggest challenge is educating the consumer. “They’re just not used to seeing FDR proposed as an option and they don’t know what it is.”

He says in most cases contractors come in and quote a full remove-and-replace solution, so when Ruston Paving suggests the less-expensive FDR option they need to make sure the customer understands what it is. To that end Ruston Paving conducts seminars for

Learn “Best Practices” for Warm Mix, Thin Overlays

The 2015 National Pavement Expo, Jan. 28-31 in Nashville, offers contractors an opportunity to learn “best practices” for a variety of asphalt paving from driveways to parking lots and more. Two topics covering increasingly used processes will be:

- “How to Place, Compact, and Troubleshoot Thin Asphalt Overlays,” presented by veteran NPE speaker James Curtis, Chec Management Systems
 - “Warm Mix Asphalt and Its Impact on Your Paving Operation,” presented by Curtis and *Pavement Advisory Board* member Don Rooney, Pioneer Paving & Grading.
- Details including complete session descriptions and the full conference schedule can be found at www.nationalpavementexpo.com.

engineers and property owners as well as “lunch & learns” with continuing education credits for engineers. Ruston Paving also relies on its website (RustonPaving.com) and videos to teach people about the FDR process.

“You can really see people understand the value in the process once we explain it to them,” Barry says.

FROM DRIVEWAYS TO PARKING LOTS

Started in 1943 in Syracuse, NY, as a driveway paving company, family-owned Ruston Paving is now run by President Mark Ruston, representing the third generation. In the 1960s Mark Ruston’s father, Larry, assumed control and transformed the company from residential to commercial paving. Today Ruston Paving serves only the commercial and industrial marketplace. “No highways and no driveways but everything else is fair game,” Butler says.

Since 1943, Ruston Paving has grown to more than 150 people and expanded geographically with operations in three states: Syracuse, Rochester and Watertown, NY; Manassas and Richmond, VA; and Durham and Greensboro, NC. Services include asphalt paving and site work, stormwater systems, new construction and rehabilitation of existing areas.

“On new construction, we generally provide the pavement structure from subgrade up. This includes stone, curb and gutter, grading and paving. But, if you’re expanding an existing pavement area, we have the ability to do turnkey in that situation too,” Butler says.

Barry says Ruston Paving has been offering the FDR option on commercial and industrial lots for more than 20 years, but not to the extent it’s offering the service today. McConnell says that has a lot to do with the machinery. “The machinery and horsepower it takes to do the FDR process has improved substantially in the last 10 years,” McConnell says. “Grinders, spreaders and even compaction have improved significantly to make the FDR process even more effective.

“The process today with the compactive effort you really need, the ability to meter the material you’re putting down and the ability to control what’s going down on the ground has improved significantly,” he says. “There is a science to it and it is important that it’s completed to meet the specifications using the right machinery.”

◀ A Wirtgen mixer hooked up to water truck blends Portland cement with pulverized material.





THE FDR PROCESS

McConnell says that unlike the “train” that is used when doing FDR on roads, doing FDR on commercial or industrial properties requires a step-by-step approach where each stage follows in order.

Pulverizing. Ruston relies on its Wirtgen 2400 reclaimer/recyclers to pulverize the asphalt pavement, and then blend that pulverized material with the base, typically 8-12 inches deep.

Rough grading. After the pulverized material is blended, crews rough grade the area with motor graders and bulldozers. “We rough grade to the level we need to accommodate the new asphalt,” McConnell says. “That gives us an opportunity to correct any drainage issues in the original pavement surface.”

He says that in most cases, especially on larger projects, crews are able to move the blended material from one location to another to both improve drainage and so they don’t have to haul material from the site. “We are able to compact it somewhat more densely but not always enough to accommodate the layer of asphalt we’ll be placing,” McConnell says. “So sometimes we do have to remove some of the materials and we do that before we add Portland cement so we’re not hauling away treated material.”

Stabilizing the base. Once the rough grading is done, a water truck and computer-controlled spreader follow

Essential to the full-depth reclamation process, a sheepfoot roller compacts stabilized material. ▶

adding Portland cement as a stabilizer at a specified rate. The Wirtgen machine then blends the Portland cement and reclaimed material while metering the exact amount of water into the mixture so Ruston’s crews can achieve the level of compaction and strength they’re looking for.

“The reason we typically do FDR is because there’s a poor subbase and we need to add a stabilizing agent (Portland cement) to strengthen the base. We add the water to create a uniform mix of reclaimed material and Portland cement,” McConnell says. “The binding agent you’re adding chemically bonds the aggregate together and at the same time it helps to dry it out. The Portland cement bonds all the materials together into a more stable base that’s stiffer than just a granular base. It also protects the

▶ Ruston Paving’s crews install a binder course of hot mix asphalt on stabilized parking area.

modified base from moisture because it’s bonded together.”

McConnell says that in some cases they might not add cement until the day following rough grading, because once the cement is added you have to compact and fine grade the material and then let it set up.

“As soon as we add the Portland cement and water, the job has become time sensitive and we need to get it graded and compacted in two to three hours,” McConnell says. “You can see the results of the Portland cement additive immediately. There are situations where our equipment has been buried and once we stabilize the



area we can take our bigger equipment in and can drive right on top of it.”

Compaction. McConnell says compaction starts with a sheepsfoot roller in vibratory mode, followed by a steel drum roller, also in vibratory mode.

“It’s a very rare FDR job where we don’t use a sheepsfoot roller. It’s a standard piece of equipment on every FDR job we do,” McConnell says. “Typically sheepsfoot rollers are used in clay-type soils, but when you add water and cement to this pulverized base-and-asphalt mix it creates a sticky paste that reacts very well to the sheepsfoot roller.

“We’ve got to get the compaction as deep as we can in the blended mix and the sheepsfoot concentrates the compactive effort deeper,” he says. “The finished product is not as solid if you don’t get proper compaction at this stage.”

He says the fine grading affects only the top 2-3 inches and so they finish that off with the smooth steel drum roller.

PRESERVATION NOT REPLACEMENT

Butler says clients are concerned about accessibility to retail businesses and offices, and FDR really appeals to them. “Once we get done with FDR we can open those parking lots up to traffic and they can drive right on the prepared base,” Butler says. “Clients are very aware of time and that’s a real big thing that helps us. They like that we can get in there and knock it out in less time [than remove and replace reconstruction].”

And, Barry adds, there’s no big hole that requires barricading to prevent people from falling or driving into it.

“A big part of it is that full depth removal leaves a hole 1-2 feet deep and, if you get rain during the excavation, it may saturate the subgrade and you may have to go in and remove even more material before reconstructing,” Barry says. “With FDR, we’re never really

excavating below the existing surface. People can get right on it because it provides a cleaner, neater and safer work site.”

“We want to get our customers into the cycle where we’ve eliminated the base failure and base issues that can happen with partial box-outs and smaller repairs,” Butler says. “When this process is done, you’re actually getting to the bottom of the issues. You’re getting down deep and correcting the structural problem within the pavement.

“It’s pavement preservation rather than replacement,” Butler says. “Following FDR projects, our clients will either be sealcoating or installing a thin overlay down the road as opposed to full-depth patching. It seems a whole lot of clients want to take the sustainable route.” ▼