

Dresser Trap Rock: Two Billion Years of History

by Mark Scheer

Since the late-1800's, Wisconsin has been producing a highly sought after, very hard, gray rock. Trap rock, as it is known, was originally valued for its incredible hardness-and the particular vein near Dresser, Wisconsin is one of the hardest in the country. And for nearly a century of this history, Dresser Trap Rock has been one of the major producers from this area, supplying trap rock to the booming railroad industry since the early 1900s.

Trap rock is an altered basalt-a very hard, tight-grained, non-porous, igneous material formed through volcanic activity an enormously long time ago. "A num-

lion tons of it each year.

Because of its tremendous hardness, mining trap rock presents certain challenges not typically found in more traditional mining applications. "Our mining process begins with drilling," Demulling explained. "It is all vertical drilling and blasting from the surface, we don't do any underground mining." Blasted rock is hauled to the processing plant, where it is sent through various stages of crushing and screening to produce the end products desired by the marketplace. This is where the challenges begin.

"We are somewhat limited in size reduction because of the hardness of the rock, so we have to engage multiple stages of crushing to progressively take down the size," Demulling continued. "We employ two jaws as primary crushers, rather than just a single primary. The mined rock is first processed through our Allis Chalmers 6084 jaw, and screened over a Deister. The larger rock from that stream is crushed again in our Hewitt Robbins 4248 jaw." These multiple primary circuits are necessary to effectively break the trap rock to an appropriate spec before sending it to the secondary and tertiary circuits. "Our secondary crusher is a 7' Symons cone, which takes the rock down to about a 2.5" minus, where it is screened into various end products." For fine crushing, Dresser has two tertiary circuits as well. "When necessary, we can use any of those products to feed into our tertiary circuits for even finer crushing," added Demulling. Dresser employs both Metso and Telsmith crushers for their fine crushing needs.

"The harder the rock, obviously the harder it is to crush and screen," Demulling said. "So we run into some unusual things when drilling and crushing because of that." The extremely hard rock can wreak havoc on standard equipment, and Dresser Trap Rock has to take precautions to ensure their equipment can stand up to the extra beating the trap rock delivers. "We use a lot of special castings made specifically for our application. The design of the profile of our jaw and cone crusher parts are different than most other quarries," he continued. "We have a good working relationship with our OEM partners to help identify the design patterns that work best for our material; our needs really are pretty unique."



Easily mounted to a standard excavator, the Surestrike is a mechanical-impact hammer.

Photos courtesy of Craig Nelson

ber of geology classes from different universities have studied our vein, and estimate it was formed over two billion years ago," explained Rick Demulling, Director of Operations for Dresser Trap Rock. Yes, that's billion with a 'b'; roughly half the age of the Earth itself. It is highly valued for not only its innate hardness, but for its attractive gray color as well. Trap rock is found in a number of locations throughout the United States, but the Dresser, Wisconsin vein in particular is quite hard. Dresser trap rock can run twice the average hardness of granite, and up to four times that of limestone.

"In the early 1900s, trap rock was almost exclusively mined as railroad ballast," said Demulling. "Today, ballast still makes up about 30% of our production, but now trap rock is employed in numerous other applications as well." In crushed aggregate form, trap rock's gray color dominates; as boulders, it displays subtle hues of gray, blue, red, pink and purple. As a

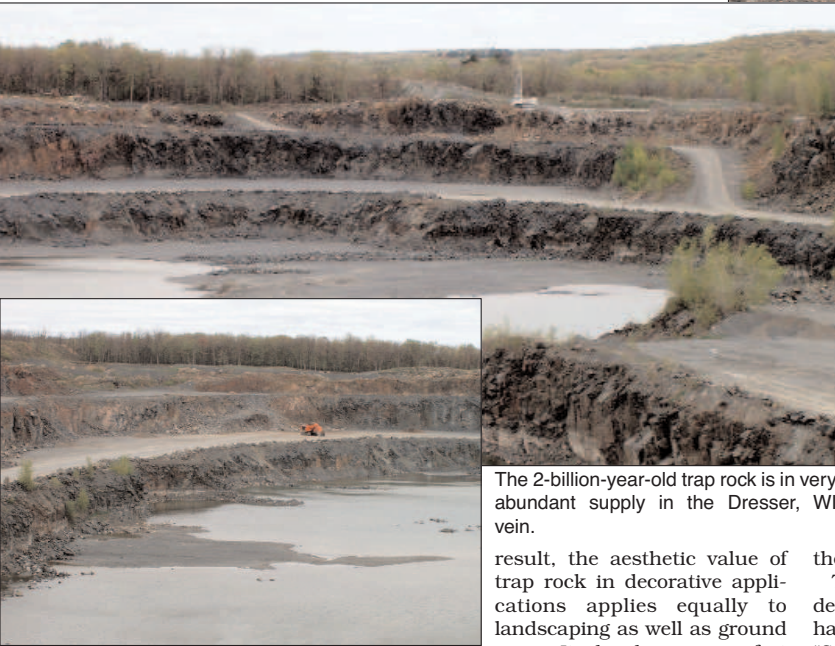


Because of the wonderful gray color, trap rock is prized in landscaping and other decorative uses for its aesthetic qualities.

Another unique need at Dresser goes back to the initial drill and blast process. Again, due to the exceptional hardness of the trap rock, the blasting stage results in a decent amount of oversize that is still too large to feed the primary crushers. In the past, Dresser has employed several methods to break this oversize into crushable spec or usable rip rap. "For a long time, we had been using a standard drop cross (drop ball) crane to bust the oversize. But this is a very inefficient method overall," admitted Demulling. Drop ball cranes simply involve the raising of a 12,000-pound ball (or in the case of Dresser, a cross-shaped weight) 60 feet in the air and dropping it on the target rock. Results can be extremely varied. "If your operator's aim is off and he is not having a good day, you just aren't going to get a lot of rock broken! And with all the cables and slings, it's just not a very reliable, or inherently safe, way to accomplish the task."

So in 2001, Demulling began searching for a better way to tackle these boulders. "At first, we had rented several different types of hydraulic hammers to see if we could improve on breaking our oversize," he said. "We spent about a year testing all kinds of hydraulic hammer options, with absolutely no success." The strength required to break the trap rock just could not be delivered by the hydraulic hammers. "They had the accuracy, but not the strength. And the cranes had the energy, but are just wholly inaccurate."

Then Demulling found Surestrike. Surestrike hammers are a mechanical-impact design that deliver the energy of a drop-ball crane with the accuracy of a hydraulic hammer. In 2002, Dresser Trap Rock purchased a Surestrike model 4000. "Surestrike has made all the difference in the world," Demulling beamed. "We simply attach it to an excavator, and you set the hammer directly on the rock where you want it to break and it's done." Dresser's increase in the productivity of breaking oversize has been dramatic. "We don't break any more rock than we used to,



The 2-billion-year-old trap rock is in very abundant supply in the Dresser, WI vein.

result, the aesthetic value of trap rock in decorative applications applies equally to landscaping as well as ground cover. Its hardness is perfect for building natural-looking structures such as retaining walls and waterfalls. Other, more utilitarian uses include erosion and ice control, road construction and concrete applications. Clearly, there is no shortage for the use of trap rock, and Dresser Trap Rock has no problems selling close to one mil-

Dresser Trap Rock has been producing trap rock from this quarry for nearly 100 years.

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we just do the same amount of material in about 10% of the time. We don't even need to run it [the Surestrike] everyday." As a result, Dresser has been able to eliminate a significant amount of operating time from the process.

And the performance of the Surestrike after four years has continued to be dependable. "We haven't found anything the Surestrike couldn't break," Demulling added. "If you beat on it long enough, sooner or later you'll break any rock. But with the Surestrike, it just takes one direct hit. When you start with a 20 or 30-ton boulder, your drop cross is going to take much longer to get that job done. And with Craig [Nelson, of Surestrike] making sure everything remains in peak condition, we just can't imagine having to break our oversize without it anymore."

After processing, Dresser Trap Rock produces numerous end products. "We have products available to satisfy most any aggregate application," said Demulling. "Concrete, asphalt, seal coating; we even supply rock to use as finish granules in the roofing industry." But the landscape industry also utilizes trap rock for a wide range of applications. "We produce a range of prod-



As was the case in the early 1900s, a large share of Dresser's production is still employed as railroad ballast.

Competitively, Dresser Trap Rock finds themselves in a very stable position. "We are the only trap rock quarry in this area," Demulling added. "But there are other aggregate producers here mining limestone, granite, quartzite, sand and gravel." The trap rock reserves in Dresser's mine are also quite stable. "We have a very large quantity of rock all around us, so we're not too concerned with running out of material either." So what, if any, issues must Demulling handle? "We have been here for a very long time, but the community profile has continued to change all around us," he said. "The growth of housing around here continues to come closer and closer to our mine, so we must be very considerate of the community." Demulling says Dresser Trap Rock works very hard to ensure their operations are mindful of their neighbors. "We maintain communication with the community and the neighborhoods so they understand our business and we can be aware of their concerns. And we have worked hard to enjoy a good relationship with our community."

With such a strong, stable and mature business, the future for Dresser Trap Rock is less about what new opportunities they can pursue, and more about how they can continue to do what they do better and more efficiently. "Based on commercial demand, our production of 750,000 to 1,000,000 tons per year is pretty much what the market can bear," explained Demulling. "My goal is to continue to find ways to accomplish our tasks more efficiently and effectively." With such advancements as those brought about by adding the Surestrike hammer, creativity is the key factor to continued improvement for Dresser. And Demulling continues to keep his finger on the pulse of those equipment and processing advancements that can create new advantages for their operation.



Dresser Trap Rock consistently delivers close to 1 million tons of trap rock annually.

ucts from manufactured sand to large boulders for landscaping. Trap rock makes a nice decorative rock." And of course, railroad ballast is still a major application for Dresser's production. The majority of Dresser's production is distributed in mostly local markets. "Most of what we generate is shipped within 100 miles of our facility," explained Demulling. "The railroad ballast can obviously end up throughout the midwest, maybe further. But most of our buyers are in Wisconsin."

Surestrike

by Mark Scheer

In the early 1990s, if you needed a secondary oversize rock-breaking solution, you were mostly choosing between traditional drop-ball technology, or a hydraulic hammer-type system. But neither was good enough for Dan Whitney and Dennis Demers. So in 1991, they launched Surestrike International to market a solution they believed to be superior over existing options. Their initial success was impressive, and in 1995, Craig Nelson purchased the company and relocated it from its New England origination to its current home in Luck, Wisconsin.

Nelson started in the industry back in the mid-70s with Durex, a manufacturer of aggregate and mining screen products. After serving as that company's president for ten years, he departed in 1995 to acquire Surestrike and pursue something new. "I knew Dan [Whitney] through our relationship at Durex," said Nelson. Whitney owns a well-known equipment dealer based in New England. "He said he had something to share with me when I was ready, and after leaving Durex, I went up to see what he had going on." Nelson understood the potential of the concept immediately. "I thought it was a great idea, and jumped on the opportunity pretty quickly."

In its early stages, Nelson moved the one-product company to Luck so he could concentrate on growing the market and further developing the product. "Surestrike was one product back then, the model 2000, which we no longer manufacture," explained Nelson. "Now our product line consists of four different models, each offering a greater degree of energy for breaking consistently harder stone and rock."

Surestrike products are based on the old, tried-and-

true drop ball technology, but with much more precision and accuracy. As a result, Surestrike hammers can break even the hardest rock with relative ease and efficiency. "Drop balls are old technology," Nelson continued. "They still are pretty effective, but quite slow and inefficient." Hydraulic hammers offered an improvement over drop-ball solutions, but with a different shortfall. "A hydraulic hammer offers more control, but does not deliver nearly as much energy as a Surestrike."

The technology behind Surestrike hammers combined the best of each of these technologies. "Our mechanical-impact hammers provide the energy of a drop-ball with the precision of a hydraulic hammer." As a result, oversize rock and concrete processing can be accomplished both effectively and efficiently. "Our hammers can produce 2-4 times more than a drop ball, and generally twice as much as a hydraulic hammer."

The four products in the Surestrike line vary in the amount of energy delivered, and are designed to target specific types of stone. "For light to medium rock, such as limestone, sandstone or concrete, our model 1100 or 2100 would be well-suited for the job," said Nelson. "But for very hard rock like granite or trap rock, our model 4000 or 6000 would be most appropriate." Capable of delivering up to 75,000 foot pounds of impact energy, the model 6000 can handle the hardest rocks and stones known. And with a cycle time of only 3 seconds, it can generate up to 20 blows per minute, producing good, cubical sized pieces much more quickly than a conventional hammer. Designed to be mounted to an excavator or front-end loader, Surestrike hammers are easily adaptable to

existing equipment. And their low-vibration operation not only results in a significant noise reduction (typically 5-10db), but longer bit life as well.

Surestrike hammers are recommended for spec sizes down to about 24". Sizes beyond that would be better produced with a secondary crushing plant to achieve the desired smaller spec. But for a primary breaking or rip rap application, Surestrike hammers are well-suited for the task. Nelson recalled a recent application that he witnessed in California. "A few weeks ago a customer had a rock 6 feet high, 15 feet wide and probably 25 to 30 feet long. With a traditional hammer, it was taking the better part of a day to break that down, but the Surestrike had it in pieces in about 10 minutes." Mostly employed in oversize rock-breaking applications in quarry operations, Surestrike has also begun to get a foothold in some ground breaking and concrete demo applications as well. "We continue to explore new applications to grow the potential of the product," added Nelson.

Having successfully established a network of dealers to distribute Surestrike hammers, they continue to pursue opportunities for expanding awareness and understanding of the technology. "Our sales have grown quite significantly over the last ten years," said Nelson. "But we have only just scratched the surface." Sales of Surestrike hammers have increased many times over from their levels in the mid-1990s, but Nelson continues to expand market share by educating their customer base on the advantages of mechanical-impact hammer technology. "It's still mainly word-of-mouth networking. Once someone sees the Surestrike hammer in operation, they understand the benefits and difference it can provide."