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JULY / AUGUST 2024

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Controlled Demolition Inc. plays a critical role in the structural demolition of the collapsed Francis Scott Key Bridge in Baltimore.



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Controlled Demolition Inc. crews used a chain of explosives to free the MV Dali from the collapsed Francis Scott Key Bridge in Baltimore.



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COVER PHOTO COURTESY OF CONTROLLED DEMOLITION INC.

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Real-life heroes

THE SINGAPORE-BASED container ship MV Dali made international headlines after it lost power March 26 and collided with the Francis Scott Key Bridge in Baltimore, subsequently collapsing the bridge and halting activity in one of the world's busiest ports.

A portion of the bridge fell directly on the ship's bow, pinning it in the harbor and requiring a high-stakes, emergency demolition project in the choppy waters of the Baltimore harbor. It was a treacherous assignment to use explosive cutting to free the Dali, whose crew had been detained on the boat for 48 days since its crash, and to reopen the port.

It was one of the highest-profile demolitions of the year, and yet the demolition contractor wasn't listed anywhere in media reports before or after the demo. While the Army Corps of Engineers and the U.S. Coast Guard should, of course, be recognized for their incredible work in cleaning up the primary shipping channel into Baltimore, *Construction & Demolition Recycling* wanted to give credit where credit was due. A little digging revealed the identity of the company that handled the demolition: Controlled Demolition Inc. (CDI), a nationally known name coincidentally based right out of Baltimore.

CDI has a long history of excellence

in explosives demolition. The company's founder, John D. "Jack" Loizeaux, demolished his first structure with explosives in 1947. During the 1950s, the family's public relations efforts drew attention to their "implosion" method, at the time a new and innovative approach to demolition. Mark Loizeau entered the business in the '60s with his brother, Doug, and in 1986, they took over management of the company as president and vice president, respectively.

In the decades since, CDI has continued to cement its reputation as one of the best-known names in the business. So much so that, even though CDI's name was not mentioned in media reports surrounding the demolition, many in the industry correctly guessed the company had been involved.

"One look at the perfect placement of the perfect amount of shaped charges on perfectly cut notches, all timed to the millisecond, and I knew it was the work of CDI," one fan commented on social media. "They wrote the book on controlled demolition."

Read all about the company's experience starting on Page 12. To watch a video showing everything from the prep work required for this project to the view from onboard the Dali during the controlled demolition, visit www.youtube.com/@theloizeauxgroupllc.



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◆ WOOD, BIOMASS

Lautenbach Recycling subsidiary offers biochar-blended compost

Skagit Soils Inc., a composting facility in Mount Vernon, Washington, that is part of the Lautenbach Recycling family of companies, has begun offering biochar-enhanced compost developed in collaboration with the Bellingham, Washington-based Kulshan Carbon Trust (KCT).

“This innovative soil amendment ... promises to revolutionize sustainable agriculture and gardening in the region,” the company says.

Biochar is an end product most often derived from the pyrolysis process when it is applied to organic materials including scrap wood, manure, leaves and other green waste, plus some industrial byproducts.

Skagit Soils, which describes itself as a “cornerstone” of the local agricultural community in providing high-quality soils and mulches, says its biochar-infused compost can improve soil health, enhance water retention and boost soil fertility.

“Our biochar-enhanced compost not only supports healthier plant growth but also contributes to long-term soil health and carbon sequestration,” Skagit Soils CEO Craig Culmbach says.

KCT has agreed to provide regional growers with Skagit Soils biochar-enhanced compost for applications in field trials. The trials have been designed to understand and document the benefits of biochar in different agricultural settings. The KCT organization, which operates from and works with tribal groups, works with people in northwest Washington to design, develop and implement tailored natural climate solutions by connecting local knowledge, technical and practical assistance and financial markets.

By integrating biochar with compost, the biochar-enhanced compost initiative aims to create a desirable soil amendment that supports sustainable farming practices and enhances crop productivity, according to KCT and Skagit Soils.

KCT credits the Russell Family Foundation, Gig Harbor, Washington, for helping it engage with growers such as Viva Farms, Burlington, Washington, and Puget Sound Food Hub Cooperative, based in Mount Vernon, as well as reaching out to other food producers.

Skagit Soils’ biochar-enhanced compost is now available to consumers and farmers alike for applications in home gardens or agricultural fields.

◆ RESEARCH

Tarkett partners with Mycocycle

Solon, Ohio-based flooring and sports surface solutions provider Tarkett USA Inc. has partnered with Mycocycle, a Chicago-based biotech startup that leverages the root structure of mushrooms to break down construction waste.

Mycocycle says its research and development has found that fungal root structures called mycelia have been shown to consume and eliminate toxins from construction waste, producing a natural byproduct.

“This partnership is rooted in a shared investment in the exponential power of collaboration and innovation,” Tarkett North America CEO Eric Daliere says. “Together, we share a commitment to creating a circular economy that protects our natural resources, promotes climate health and sustains every living thing.”

Through this partnership, Tarkett and Mycocycle will leverage Tarkett’s ReStart take-back and recycling program to further test the effects of mycelium on all types of flooring and explore the resulting byproduct as a central ingredient in new flooring products.

“Because of its legacy and reputation for transparency, its respect for the importance of third-party verification and its willingness to invest in innovation, it was clear to me that Tarkett walks the talk,” Mycocycle founder Joanne Rodriguez says. “That was important to me.”

Last year, Tarkett diverted an estimated 1.5 million pounds of post-use flooring to recycling in North America, both in-house and with external recycling partners. Through its partnership with Mycocycle, the company says it is on track to at least double that number in 2024.

DEMCO FOCUSES ON **MAKING HAULING, UNLOADING EASIER**

Demco focuses on unmatched versatility, offers side dump trailers for any job site

Producers of crushed concrete and other aggregate materials know all too well that time is money and excess time spent loading and unloading aggregates is time (and money) needlessly spent. For more than a half-century, Demco, headquartered in Boyden, Iowa, has designed and built trailers in recognition of this crucial operational and profitability truism.

Faithful to its slogan “Doing Our Best to Provide You the Best,” Demco’s side dump trailers have been a boon to the recycled aggregates industry for years, providing companies, their drivers, and workers with a time-saving way to move heavy loads of material.

Side dump trailers are often preferred over end dump and belly dump trailers due to their versatility, efficiency, and stability during unloading. Side dump trailers offer advantages such as precise placement of materials, faster unloading times, improved control over the dumping process, and the ability to unload in areas with overhead obstacles. Additionally, side dump trailers distribute weight more evenly, providing better stability, especially on uneven terrain. Their ability to unload on both sides without repositioning the vehicle makes them more versatile for various job sites and their unloading times, at less than 15 seconds, are unparalleled.

Side dump trailers also excel in environments with limited overhead clearance as they don’t require lifting the trailer like end dump trailers do. This feature is advantageous in areas with height restrictions, offering more flexibility in unloading locations. Moreover, side dump trailers can unload while the truck is in motion, saving time and increasing efficiency, especially in continuous unloading scenarios.

If you’re considering buying a side dump trailer today, you’d be investing in a versatile, efficient, and stable option for your hauling needs. Side dump trailers offer precise material placement, faster unloading times, improved control, and the ability to unload in areas with overhead obstacles. Their even weight distribution provides better stability, especially on uneven terrain, making them a reliable choice for various job sites.



Remarkably, innovation and durability also are matched with industry-leading load capacity. Demco side dump trailers have the largest standard payload in the industry, with up to 26.1 cubic yards of capacity. Additionally, Demco side dump trailers are specially designed to handle larger, heavier loads without sacrificing stability and durability.

Users of Demco side dump trailers also report an easier clean-out from each tub, which has been raised to make room for its outer supports. It is one more reason why Demco side dump trailers reduce the total cost of ownership by decreasing maintenance, increasing durability and enhancing resale value.

Demco side dump trailers are the top choice for many users today due to their reputation for quality, durability and innovative design. Demco trailers are known for their robust construction, advanced features and reliability in various working conditions. Users appreciate the precision, efficiency and stability that Demco side dump trailers offer, making them a popular and trusted option in the industry.

Prospective customers should visit <https://www.demco-products.com/trailers/demco-side-dump> to learn about the quality design, ease of use, and safety aspects of Demco’s side dump trailers.



◆ FACILITIES

Midwest Cos. announces new 10-acre C&D recycling facility

Midwest Cos., an Illinois-based sustainable waste management company, has officially opened its newly built construction and demolition (C&D) recycling facility in Hampshire, Illinois.

Midwest Cos. is a parent company operating a family of sustainable waste management brands. One of them is Midwest Material Management (MMM), a business that provides demolition, recycling and industrial waste disposal for the construction and railroad industries. The new facility expands MMM's nonhazardous industrial waste recycling and disposal services and allows the organization to meet growing demand.

"Midwest Material Management has provided construction waste management solutions for more than 30 years, and our new ten-acre facility in Hampshire allows us to better serve our construction and railroad company partners," Midwest Cos. founder and President

Steve Berglund says. "With the Midwest family of brands, we're uniquely positioned to provide innovative end-to-end disposal services that allow our customers to operate more sustainably and efficiently."

Until spring 2022, MMM accepted and processed all nonhazardous C&D debris at its recycling facility in East Dundee, Illinois. The Hampshire facility moved and is currently located at 370 South Brier Hill Rd.—closer to I-90 for additional convenience. The new facility includes 26,000 square feet dedicated to sorting waste and separating recyclables from nonrecyclable material. Construction and railroad companies can deposit waste and obtain industrial dumpsters or opt for MMM's pick-up and collection services.

MMM's Hampshire location is LEED-certified and has a history of sustainable leadership across its family of brands. Berglund was named a 2023 Notable

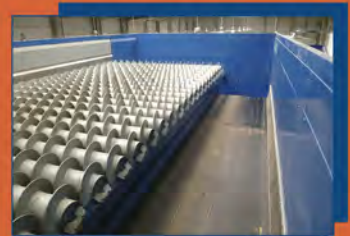
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Midwest Cos.' new facility includes 26,000 square feet dedicated to sorting and separating waste.

PHOTO COURTESY OF MIDWEST COS.

Leader in Sustainability by Crain's Chicago Business, an honor recognizing the leadership of Midwest Cos. and its subsidiaries.

One of the company's sub-brands is TiEnergy, a company that recycles and repurposes retired railroad ties. The ties are ground into Tieroc, a proprietary aggregate

substitute that's in high demand for landfill operations. The new MMM center in Hampshire will accept railroad ties and other wood waste, like other Midwest Cos. facilities, and give it new life as Tieroc. As a tribute to its sustainable operations, the Hampshire facility will be enclosed by a custom fence made of retired railroad ties.

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NEIL MULLAN

DIRECTOR OF SALES - C&D RECYCLING

5

SUGGESTIONS FOR A SUCCESSFUL C&D RECYCLING WET-PROCESSING BUSINESS

1 What should be the driving factor for starting a C&D recycling wet-processing operation?

When initiating a construction and demolition (C&D) recycling wet-processing business, which uses water to separate and clean materials, it's essential not to solely focus on sustainability as the primary motivator. While sustainability is undoubtedly important, it's essential to first understand the market demand and what it will take to become profitable. This involves analyzing the costs associated with collecting, sorting, cleaning, processing and selling recycled materials against the revenue generated. If the costs outweigh the revenue, the business will struggle regardless of its sustainability goals.

2 How does the market you're in affect your C&D recycling operation?

Large or growing metropolitan markets are characterized by having higher demand for construction aggregate as well as generating large amounts of construction and demolition waste. Some markets are also characterized by having low supply of natural aggregate. These markets benefit from C&D recycling operations due to their ability to meet that demand for construction aggregate with a sustainable model, as well as minimizing waste going to landfill.

From a legislative point of view, each market will make its own set of rules for governance of C&D recycling operations. Getting new permit applications or amendments to applications processed can take several months if not years.

It's essential to identify which materials are in demand in the local market, who the potential customers are and what price they are willing to pay. Research local landfill tipping fees and set your tipping fee accordingly. Don't set the price higher than the landfill tipping fee or you won't receive sufficient feed material. However, setting the price too low may encourage some customers to deliver undesirable feed material with excessive levels of fines, which will create a bottleneck in the tailings management system.

3 What should you look for when selecting a location for your C&D recycling operation?

Consider establishing your C&D recycling facility in an urban location that is close to a large customer base. This minimizes transportation costs to and from your customers. Find a location that has adequate space for storage of different incoming feed materials. Typically, more space is required for incoming feed materials than for washed stockpiles, as incoming materials should be quarantined.

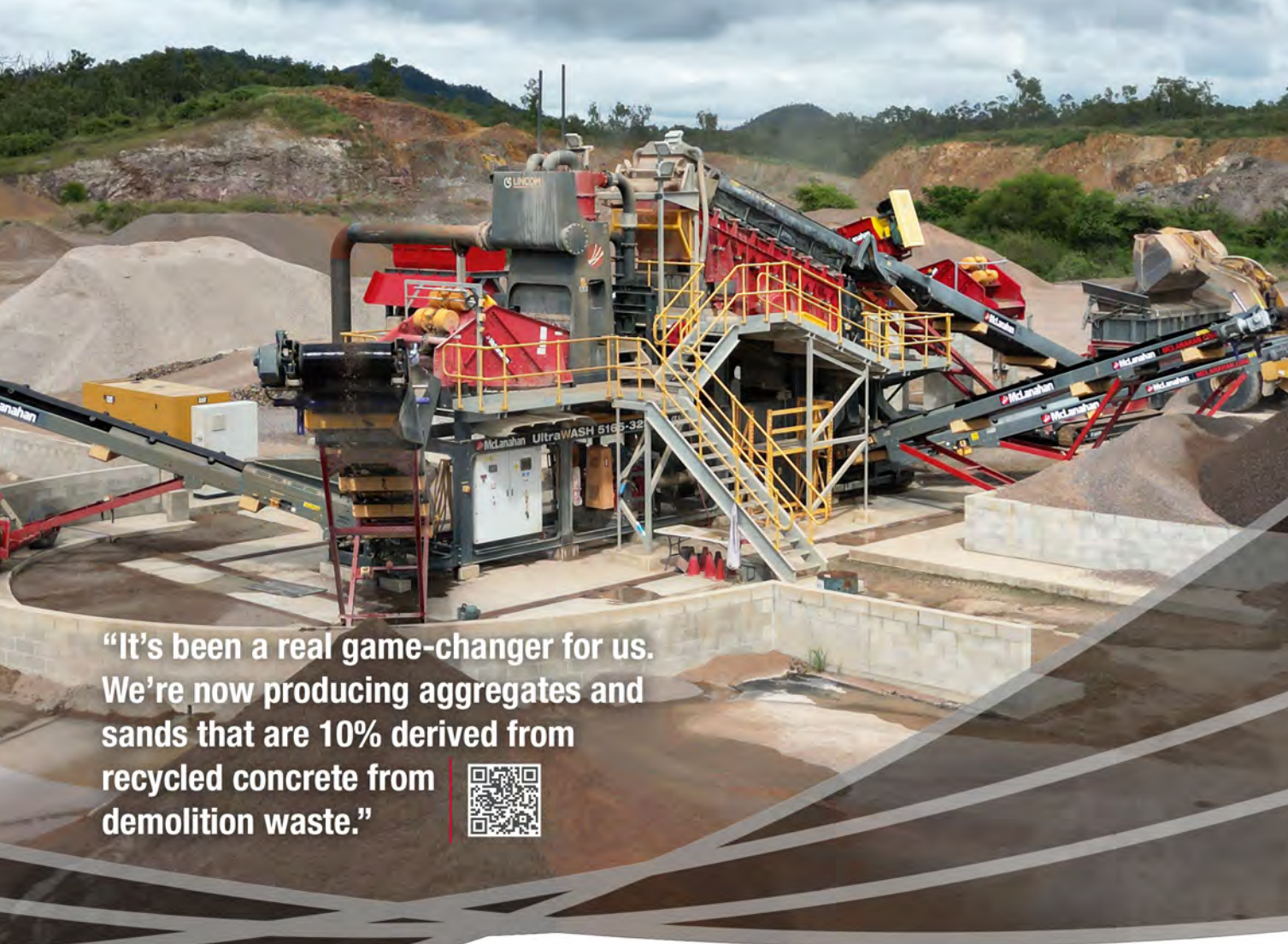
4 What factors should you take into consideration when designing a C&D system?

Utilizing innovative technologies and efficient processes is essential. Design a system diverse enough to handle a variety of tough feed materials that, given their nature, are partly characterized by having large swings in size distribution between coarse and fine aggregate.

Once the system is operational, it's important to understand what kind of a yield to expect in terms of the quantity and quality of each type of feed material. One way to do that is by processing material streams in campaigns. That way the system can run predictably and consistently and measurements can be taken.

5 Why is the quality and consistency of the input material important to your output material?

Unless the source of the material is singular and guaranteed, it is normal for 4 mm size particles of asphalt, concrete, brick and other materials of similar density to come out with 4 mm sand particles and rock fragments in the finished sand product. To minimize variability in the production of high-quality sand, it is key to wash a homogenous blend. Ensuring a consistent quality of materials used in concrete applications requires expertise and collaboration between concrete technologists, mixing masters, material planners and the aggregate recyclers. However, keep in mind the ideal feed material for concrete recipes may or may not exist at the right dollar amount because the recycling facility is dependent on its customer base, rather than a mineral reserve.



“It’s been a real game-changer for us. We’re now producing aggregates and sands that are 10% derived from recycled concrete from demolition waste.”



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EDITED BY **SHELLEY MANN**

UNDER CONTROL

Controlled Demolition Inc. plays a critical role in the structural demolition of the collapsed Francis Scott Key Bridge in Baltimore.



Controlled Demolition Inc. placed 162 pieces of explosives at 52 places along the bridge truss to free the MV Dali, separating the truss from the vessel and rolling as much of the truss as possible off the bow during the blast.

When Mark Loizeaux, president and owner of Controlled Demolition Inc. (CDI), got the call to ask if his company could assist with the design of, preparation for and execution of a controlled demolition of the largest remaining span of the recently collapsed Francis Scott Key Bridge in the Baltimore Harbor, he didn't think twice. It was an emergency demolition job that required him to pull men off a number of other projects, but he immediately said yes.

"We're based out of Baltimore, so this was a worldwide news event right in our backyard," Loizeaux says. "It was catastrophic. This is one of the biggest ports in the world."

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◆ COVER STORY

After midnight March 26, the Singapore-based container vessel MV Dali lost power while traveling south on the Patapsco River out of Baltimore Harbor. The starboard shoulder of the vessel's bow hit the southern channel pier of the Francis Scott Key Bridge before crashing into one of the bridge's support columns, causing the collapse of the pier and progressive failure of the 1.6-mile bridge's entire truss, a continuous span of supports that encompassed two 720-foot-wide approaches. Tragically, six maintenance workers filling potholes on an overnight shift died in the collapse of the bridge, which resulted in the subsequent closure of one of the nation's busiest ports.

CDI was tasked with the complex job of using explosives to break down a 600-ton span of bridge truss that landed on the cargo vessel's bow. According to Associated Press reports, that truss had effectively pinned the Dali, preventing the cargo vessel from being refloated and leaving the harbor.

Working on the water while removing marine structures requires greater expertise, experience and coordination than demolishing structures on land, Loizeaux says, and CDI has extensive experience in the demolition of suspension, arch, truss, girder and bascule bridge elements. His company is no stranger to high-profile demolitions, either, having previously completed demolition

on the former Trump Plaza Hotel in Atlantic City, Three Rivers Stadium in Pittsburgh and the Landmark Hotel Casino in Las Vegas.

CDI's crew first completed preparation work on the span of bridge truss elements to free the MV Dali for salvage, performing precision torch cutting on the main structural bridge elements for subsequent placement of explosives. This method allowed CDI to control how the trusses would break down, causing the steel structure to be thrust away from the Dali upon explosion. Team members worked with a structural engineer every time a cut was made, Loizeaux says.

"It's challenging when you are on the water," Loizeaux says. "We were

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Preparing for the demolition involved precision torch cutting for subsequent placement of explosives.

working in this narrow section of the Patapsco River with waves created by passing vessels and by the wind. We were very limited in our working hours due to that.”

Still, the company worked as quickly as it could to complete demolition so the port could reopen. The bridge’s collapse had put an estimated 4,000 port employees out

of work while impacting another 15,000 longshoremen, truckers and small business owners who rely on port activities for their livelihood, Loizeaux says.



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Construction & Demolition Recycling spoke with Loizeaux about the demolition experience.

Construction & Demolition Recycling (C&DR): Who was in charge of responding to the bridge's collapse?

Mark Loizeaux (ML): The city of Baltimore, the state of Maryland and the federal government immediately joined forces toward reopening the channel as quickly as possible under a Unified Command structure led by the U.S. Army Corps of Engineers.

The federal government assumed responsibility for clearing debris from the 1,200-foot-wide main channel while Skanska, [a New York-based construction company], was tasked with debris removal responsibilities outside the main channel. Resolve Marine of Fort Lauderdale, Florida, was retained by the ship's owner and its operations company to remove debris that had fallen on the ship's bow and to salvage the vessel.

C&DR: How did CDI get involved?

ML: Resolve Marine had worked with us before as an explosives contractor on the demolition of the Tappan Zee Bridge over the Hudson River in New York. For this project, Resolve Marine retained CDI to carry out explosives separation of the 600-foot long southern portion of the channel-span truss from the bow of the Dali. When the bridge fell, the bridge truss, pier cap and roadbed debris had fallen vertically onto the bow of the vessel. The continued motion of the ship caused the truss to twist, adding additional stored energy to the already compromised bridge truss system.

C&DR: What was the scope of the demolition project?

ML: CDI's scope was to separate the truss from the ship, including preparatory preburning operations that would identify and then cope with the stored energy in the box configuration and other truss elements. These elements had flange thicknesses up to 4 inches thick, and they were to be severed with explosives. Strain gauges and other monitoring devices were installed to provide real-time readings on truss stability so that preburning could be paused as necessary to ensure CDI employee safety.

CDI's goal was to provide a 60-foot-wide space between the vessel and the remaining truss, in the water, while rolling as much of the truss as



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possible off of the bow of the Dali during the explosives initiation sequence. There were flammable materials in containers damaged by the bridge collapse, which necessitated cold cutting to prepare the shaped-charge locations where hot work couldn't be safely performed.

Cold cutting could not be completed on all elements above the bow due to the energized truss elements, leading to a plan that would leave a small portion of the truss on the bow and other truss elements draped over the port side for post-blast crane removal.

Preparatory burning was carefully monitored by CDI and structural engineers. The sequence, and nature, of preburning was changed several times after we observed twisting in the bridge elements during torch work.

C&DR: What were some of the challenges your team faced?

ML: Working out of crane baskets and 185-foot manlifts on a barge proved challenging on the water due to wave action, winds and poor weather, including strong winds and heavy rain that limited working hours. Resolve Marine provided marine platforms and equipment to support our operations to remove the truss from the Dali as quickly as was safely possible.

C&DR: What did the controlled demolition entail?

ML: A total of 162 pieces of linear-shaped charge explosives were placed at 52 locations, with a net explosives weight totaling 312.69 pounds of RDX [research department explosive] and PETN [pentaerythritol tetranitrate] explosives to create the separation of the truss and the vessel and to permit as much of the truss as possible to rotate off the ship during the blast. The explosives were positioned on the bridge using rubber bands and secured with tie-wire.

Conveyor belt at-source protection

was placed by CDI to control the fly of debris from the detonation of the explosives charges. Once the Unified Command cleared the CDI-specified exclusion zone around the blast area, Resolve Marine turned on a water fire suppression system over the damaged

containers at the bow to mitigate the risk of fire. The charges were successfully detonated at 5 p.m. on May 13.

C&DR: What about the 21-member Dali crew? Weren't they still on the ship at the time of the demolition?



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ML: The Dali crew was sheltered below decks at the stern of the vessel in a soundproofed area during the blast while Resolve Marine and CDI employees positioned themselves at the stern of the vessel during the explosives detonation. The nonelectric initiated blast had an integral 9.6-millisecond delay, directing the pressure bar away from the vessel and the windows in the bridge, which was the most sensitive element to remain on the vessel.

C&DR: What was the outcome?

ML: Everything went to plan and everything went exactly on schedule. The separation was completed, and that portion of the truss intended to roll off of the bow did so exactly per

plan. There was no reported damage to the vessel or its cargo, and no fire was initiated on the vessel as a result of CDI's operations. It was very, very challenging, but we had a great crew of wonderful guys and everything went according to plan.

C&DR: Officials are estimating the total amount of wreckage at 50,000 tons of steel and concrete. Are those materials being recycled?

ML: We were dealing with 970,000 pounds of truss, so this was a huge recycling project. Key Bridge Response Unified Command was picking up all of the steel from the bridge using cranes positioned around the ship so it could be

salvaged and recycled.

Editor's note: According to the Daily Press, Newport News, Virginia, the Unified Command salvage operation is working with logistics hub Tradeport Atlantic, where 5 acres of the company's 3,300-acre property have been converted into a scrap steel processing center to process the remains of the bridge. Federal and state contractors will use the hub, located on the site of a former Bethlehem Steel Plant, to carve the bridge into pieces that will ultimately be taken to a recycling center. **C&DR**

Mark Loizeaux is president and owner of Controlled Demolition Inc. Learn more about the demolition company at www.controlled-demolition.com.



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GOAL CRUSHING

Techniques explored by concrete crushing and cement production firms could divert an even higher percentage of end-of-life concrete to recycling markets.

BY BRIAN TAYLOR

France-based Holcim is one of the largest producers of cement and aggregates products in Europe and North America. When the company directs its attention toward boosting its recycling rates, it can have widespread impacts.

Aggregates operations of the global firm include those of the former Lafarge company, which Holcim acquired in 2015. At least two projects involving Holcim, one in France and one in Canada, focus on “upcycling” concrete recycling methods by isolating materials that can be used as clinker, an intermediate product in cement production.

A separate research project has focused on using steel furnaces as a crucible for purifying end-of-life cement to produce a low-carbon substitute for lime in producing new cement.

At a Holcim quarry site in France, the company has enlisted the help of global aggregates crushing and recycling equipment maker Metso in a project designed to add more value to the concrete crushing process.

At the site in Saint-Laurent-de-Mure near Lyon, France, the Holcim plant combines a variable pressure crushing system (a Metso HRC 8 crusher) with an airflow system (Metso Air Classifier AC30),

making it possible to separate and recover the cement paste during the crushing operation without grinding the original aggregate.

With this proprietary processing technology, Holcim says it can upcycle 100 percent of construction and demolition (C&D) materials into new building solutions, from aggregates to decarbonized cement paste. According to the company, it’s an advanced circular system aimed at lowering the carbon dioxide footprint of new buildings while closing the material loop to save virgin resources.

The recycling plant makes it possible to produce a superior quality of recycled construction aggregates for high-end applications, Holcim says, adding that the technology also helps produce cement-rich fractions that can be used to replace limestone in cement making, therefore helping decarbonize cement manufacturing.

The setup, which began operations last September, is focused in part on isolating very fine materials with a high concentration of cement in demolition concrete. This provides carbon-free additions to the manufacturing of new cement, Metso says.

The plant will serve as a pilot for Holcim to deploy this equipment in other parts of France in the future. If the technology goes global, Holcim has a considerable recycled aggregate presence in the United States in the form of facilities formerly operating as the Aggregates Industries brand. In the late 2010s, the company intended to “multiply by four our volume of recycled aggregates from C&D [materials] and reclaimed asphalt paving” as one of its two main circular economy targets to reach by 2030.

In Saint-Laurent-de-Mure, the cementitious materials separation plant consists of two independent



University of Cambridge researchers have developed a method to produce low-emission concrete using steelmaking electric arc furnaces.

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Metso's cementitious materials separation plant in Saint-Laurent-de-Mure, France

lines: the first line receives concrete demolition material as infeed (sized from about one-third of an inch to 1.2 inches) into the HRC 8, which separates the aggregates from the cement paste. A second line helps further separate and refine material,

creating the final products.

According to Metso, cement fines, which in most existing crushing processes remain attached to the sand-like residue, is becoming a sought-after alternative source material to supplement clinker, a limestone-rich



cement material, making it possible to reduce clinker's share in the final composition of the cement and therefore reduce its carbon weight.

Concrete is the most widely used construction material in the world thanks to its durability, affordability, versatility and strength, Holcim says, and that's why the company is working to scale up low-carbon, circular and smart concrete applications to decarbonize construction.

"Construction [materials] generated worldwide represent a great opportunity to accelerate circularity to close the loop in construction, while decarbonizing building," says Vincent Teissier, head of circular construction at Holcim. "Holcim is a world leader in recycling. Building new from old, we recycle nearly 7 million tons of C&D materials each year into new building solutions. We are working to double down on that as soon as possible."

Metso, citing the concrete recycling organization Recybeton, based in Paris, says in France, 80 percent of end-of-life concrete currently is recycled, primarily in road applications such as pavement base course. In partnering with Holcim to up-cycle and reintroduce these demolition concretes into the cement and concrete manufacturing chain, the company aims to increase demolition material value while helping Holcim to advance its circular ambition.

"This new [plant] is a decisive step in developing the reuse of demolition materials by utilizing all the value they have to offer," says François Petry, CEO of Holcim operations in France and Belgium. "Recovering the fines from crushed concrete to reuse

PHOTO COURTESY OF METSO



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them as a carbon-free addition to the cement process is a first in Europe and a giant step forward in the ecological project of building the city of tomorrow with the materials of the city of yesterday.”

CLOSER TO HOME

This May, Holcim and member companies Lafarge Canada and Geocycle Canada completed a pilot program at the Lafarge Brookfield Cement Plant in Nova Scotia.

That pilot effort was designed to produce high-quality clinker made of recycled minerals recovered from waste sources, which the companies say can potentially reduce [the] CO₂ level by 60 percent per ton of clinker.

According to the company, each year there is more concrete sold globally than all other building materials combined.

“Our teams have been tirelessly working toward finding solutions to decarbonize our business in Canada,” says David Redfern, president and CEO of Lafarge Canada East.

Crushed discarded glass is one component of the recycled content the company used in the pilot while the larger stream is materials otherwise destined for landfill. The goal in Nova Scotia, Holcim says, is 100 percent circular production of clinker at the Brookfield Plant.

“This new clinker product will be used to produce a 100 percent recycled cement during this pilot, which will in turn be employed in ready-mix concrete operations to produce a 100 percent recycled concrete product,” says Andrew Stewart, a vice president at Lafarge Canada East.

NEW RESEARCH

An alternative method of making cement more circular is being studied at the University of Cambridge in England. Researchers there say they have developed a method to produce low-emission concrete at scale us-

ing steelmaking electric arc furnaces (EAFs) already engaged in the recycling of that metal. The researchers refer to the finding as “an absolute miracle,” saying using the EAFs to simultaneously recycle cement offers a “scalable, cost-effective way of reduc-

ing concrete emissions while meeting global demand.”

The Cambridge researchers say used cement is an effective substitute for lime flux, which is used in steel recycling to remove impurities and normally ends up in skimmed

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furnace slag. But by replacing lime with used cement, the end product is recycled cement that can be used to make new concrete, they say. The cement recycling method, reported in the journal *Nature*, does not add any significant costs to concrete or steel production and significantly reduces emissions from both concrete and steel, they claim.

“We held a series of workshops with members of the construction industry on how we could reduce emissions from the sector,” says Professor Julian Allwood from Cambridge’s Department of Engineering, who led the research. “Lots of great ideas came out of those discussions, but one thing they couldn’t

or wouldn’t consider was a world without cement.”

Although the binding material is a small proportion of concrete, cement is responsible for almost 90 percent of its emissions. Cement made via the clinkering process, where limestone and other raw materials are crushed and heated to about 2,600 degrees in large kilns, releases large amounts of CO₂.

“I had a vague idea from previous work that if it were possible to crush old concrete, taking out the sand and stones, heating the cement would remove the water, and then it would form clinker again,” says research report co-author Cyrille Dunant.

He added, “A bath of liquid metal would help this chemical reaction along and an EAF, used to recycle

steel, felt like a strong possibility. We had to try.”

Cambridge says its electric cement process has been scaling rapidly, and the researchers say the world could be producing 1 billion metric tons per year by 2050, which represents roughly a quarter of current global annual cement production.

For recyclers of construction and demolition materials, the inclusion of cement recycling and production may soon play a larger role in how they navigate the C&D recycling landscape. **C&DR**

The author is senior editor for the Recycling Today Media Group and can be reached at btaylor@gje.net.

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CLOSE QUARTERS

Dickson Co. overcomes unique challenges and recycles nearly 92 percent of debris during a tight Washington demolition.

BY **HALEY RISCHAR**

Crews used Brokk remote-controlled demolition robots to perform work on upper floors.

Dickson Co., founded in 1937 by Lige Dickson with just a few pieces of equipment, has grown to become one of Washington's most well-renowned demolition companies.

With more than 70 years of experience in selective demolition, abatement, recycling and waste disposal, the family-owned business has been selected for several high-profile jobs, including work for the city of Seattle, the demolition of two, four-lane viaduct bridges through the heart of the Nalley Valley area of Tacoma, Washington, and demolition work for the renovation of a submarine building facility at the Puget Sound Naval Shipyard at Bremerton.

David Dickson, great-grandson of Lige and current president of Dickson Co., joined the company in 1996 and took over as president in 2019, succeeding his father, Richard. David's brother, Paul, also is involved with the family business and serves as vice president.

At this year's National Demolition Association conference in San Antonio, Dickson Co. was recognized with an Excellence in Demolition award for its demolition of Little Creek Casino's Starlight Lounge in Shelton, Washington. Additionally, it was nominated for another award for demolishing a 10-story, 133-foot-tall building in Bellevue, Washington, that posed unique challenges.

The company says it faced "challenges in every direction," with an occupied office building to the north of the site, an active roadway 50 feet to the west, a transit hub and bus terminal 40 feet to the south and an active excavation 15 feet from the east wall of the structure.

TAKING IT SLOW

Dickson Co. was involved in both Phase I and Phase II of the project, with Phase I being the demolition of an adjacent parking garage.

In Phase II, the company was tasked with demolishing 227,000 square feet of former office space, once home to Honeywell's regional office.

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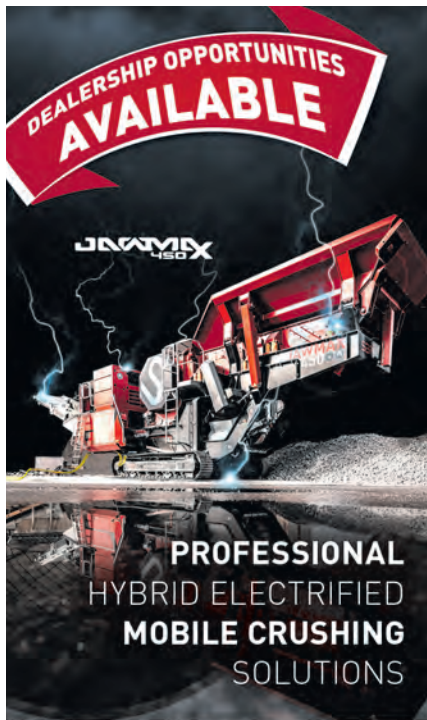
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◆ JOB SITE RECYCLING

“IT WAS A LITTLE BIT SLOWER AND A LITTLE MORE COSTLY, BUT IT WAS MUCH SAFER TO DO IT THAT WAY, AND WE WERE ABLE TO FINISH A COUPLE WEEKS AHEAD OF SCHEDULE.”

– DAVID DICKSON, PRESIDENT, DICKSON CO.

With active uses close to all sides of the site, notably a crew working to prep the foundation for a new neighboring building, the general contractor made it clear any debris entering the excavation was unacceptable.

“We weren’t allowed to drop even one pebble of concrete in there,” David says.

With the help of a team of engineers and demolition professionals, Dickson Co. decided against relying solely on high-reach machinery to do the demolition. Instead, crews formed a plan to demolish the building in two parts, first by using robotic demolition machines and support equipment to demolish sections of the building closest to the transit hub to the south and the excavation site to the east.

Dickson Co. also used scaffolding, screens and plywood barriers to prevent flying debris from leaving the site.

“When you’re using a big machine, there’s always a chance that a piece of rebar, or definitely pieces of concrete, are going to fly in the air,” David says.

Because of this, the team elected to do roughly 40 percent of the building demolition using small machinery and to work from the top down. By working systematically floor by floor, David says crews could more easily contain debris within the barrier system created.

“It was a little bit slower and a little more costly, but it was much safer to do it that way, and we were able to finish a couple weeks ahead of schedule,” he says.



The 10-story office building previously was home to Honeywell’s regional office in Bellevue, Washington.

Crews used Bobcat mini excavators and Brokk remote-controlled excavators with hydraulic breakers to perform much of the top structural work and Bobcat skid steers to move debris. Given site constraints, debris had to be dumped down the building’s elevator shaft, where it would be loaded from the bottom floor.

The top-down demo first consisted of removing concrete decking, then supporting beams, girders and columns. Crews performed similar work on each floor until reaching the ground-floor slab.

For the remaining 60 percent of the building, or the south portion, crews relied on a Hitachi ZX850 high-reach excavator. Some lower floor materials and columns were removed using a Volvo EC340 excavator.

Crews consisted of 10-15 workers for abatement and selective demolition activities, 10-12 workers for

PHOTO COURTESY OF DICKSON CO.

structural demolition using Brokk machinery and three to five workers using high-reach equipment.

Dickson Co. began work on the site in December 2021 and finished in September 2022, more than a month ahead of schedule.

PRIORITIZING DIVERSION

Once hazardous materials were abated, Dickson Co. used small equipment and demolition attachments to size, reduce and separate all possible recyclable materials.

David says 100 percent of concrete was recovered and recycled at the company's recycling yard, which accepts clean dirt, concrete, concrete with rebar, asphalt, rock, brick and other nonorganic inert waste. Recycled concrete is crushed and sold to contractors for trench backfill or structural fill.

Any clean wood extracted was recycled by DTG Recycle, a Bothell, Washington-based recycling company, and recovered ferrous and nonferrous metals were sent to various metal recyclers in the area, such as Tacoma Metals and Radius Recycling.

During Phase II of the Bellevue project, over 14,000 tons of concrete and more than 1,200 tons of metal were recycled. In total, Dickson Co. recycled 15,916 tons of debris, achieving an approximate diversion rate of 92 percent for the project.

Additional materials such as carpet, insulation, drywall and other soft debris were removed before structural demolition. Crews also made concerted efforts to extract all acoustical ceiling panels before demolition so they could be recycled rather than disposed of in a landfill. **C&DR**

The author is associate editor of *Construction & Demolition Recycling* and can be reached at hrischar@gie.net.

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REMEDIAL action

Five innovative approaches to tackling remediation projects. BY **SHELLEY MANN**

Every remediation project looks different, from scope to materials involved to timeline, as do the methods for funding remediation.

Looking back at recent memorable remediation projects covered by *Construction & Demolition Recycling* magazine, we identified five innovative ways communities and companies across the country have approached remediation funding.

1 APPLY TO BE A SUPERFUND SITE

In Frankfort, New York, the U.S. Environmental Protection Agency (EPA) removed nearly 30,000 tons of debris as part of its 2022 cleanup of asbestos contamination at the Charlestown Mall after a fire destroyed the former manufacturing and retail space.

In situations where there is no viable responsible party, the Superfund program gives EPA the funds and authority to clean up contaminated sites. A state agency, EPA regional office or any person or organization can notify the EPA of a potentially hazardous site. The EPA then conducts a preliminary assessment and site inspection to determine whether the site qualifies for cleanup under Superfund and is potentially eligible for federal funds for cleanup and remediation.

Following cleanup, the EPA's Superfund Redevelopment Program provides ongoing reuse support services to the

community to transform the site from a "liability into an asset supporting economic development."

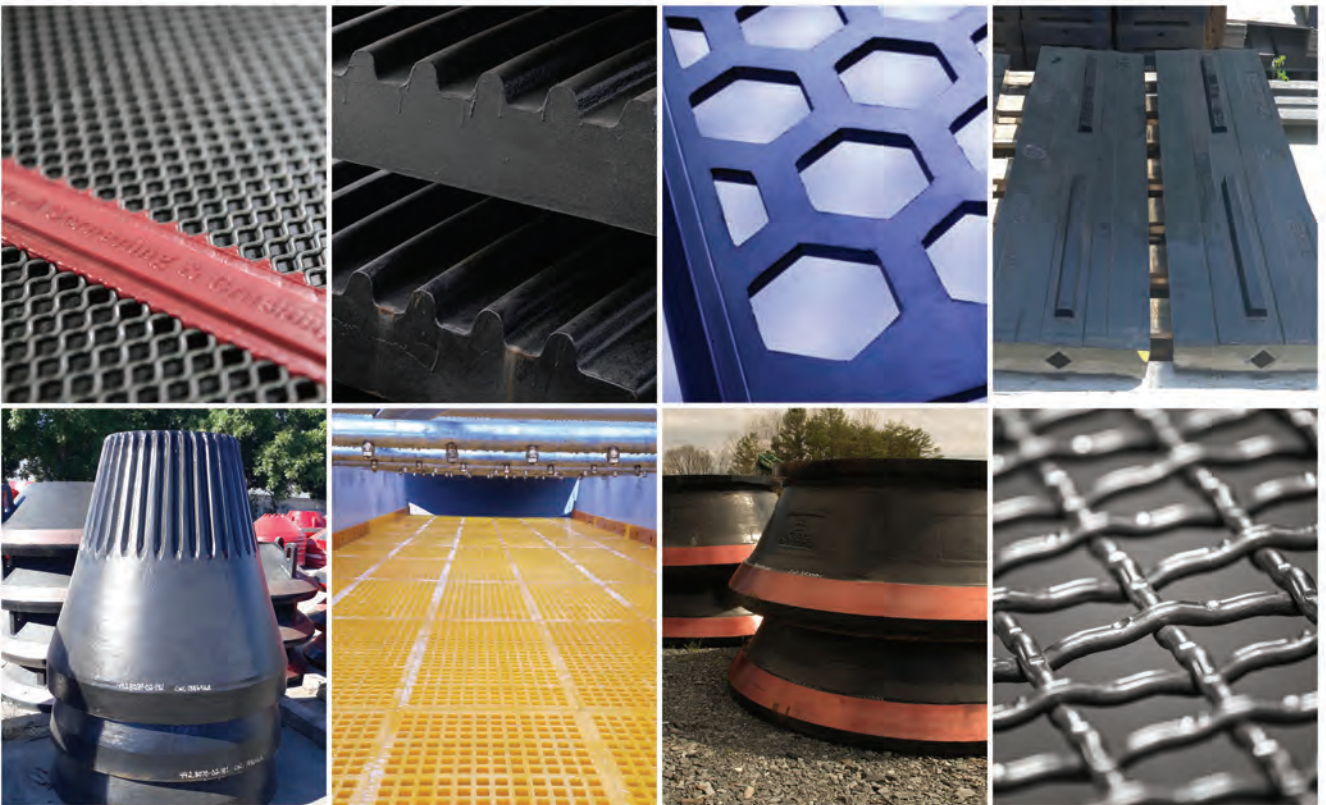
The Superfund Redevelopment Program works with local communities to help repurpose cleaned-up sites. The program provides site owners and prospective buyers with direct support, such as technical assistance, redevelopment planning services, tools and resources to help communities explore reuse choices.

For more information on the EPA's Superfund program, visit www.epa.gov.

2 ENTER A LAND BANKING AGREEMENT

The Houston Land Bank (HLB) and the city of Houston entered into an innovative land banking agreement in 2023 as part of ongoing efforts to revitalize a former incinerator site. The agreement allows for beneficial reuse for the community and enables the city to apply for EPA funding to clean up the former Velasco Incinerator site.

The city operated the 4.56-acre site as a municipal incinerator facility from the 1920s through the late 1960s. During those 40 years of incinerator operations, ash and fill material were deposited on the property at a depth of 4 feet to 35 feet below the ground surface. Multiple environmental assessment activities conducted since 2006 have demonstrated that this waste contains elevated levels of arsenic,



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lead, mercury, dioxins and furans.

The city says the site has remained vacant for decades due to the complexities of cleaning the environmental hazards on the property. The agreement requires working with strategic partners, local stakeholders and the community to create a green space and reuse plan for the site.

Estimated cleanup costs are \$7 million. Cleanup activities include covering contaminated soil and waste material with protective material to prevent the spread of pollutants, reduce exposure to harmful substances and promote environmental safety and health.

3 EXPLORE LOCAL LEGISLATION

Earlier this year, the Seattle City Council unanimously passed legislation that would allow the Seattle Fire Department to expedite the demolition or remediation of dangerous vacant buildings. According to Council, 130 vacant building fire incidents occurred in 2023.

“The inability to demolish these hazards has contributed

to a permissive environment where government stands by as predictable accidents and crimes occur,” says Councilmember Bob Kettle in a news release.

The bill amends the Seattle Fire Code to allow the fire department to order remediation or complete demolition of derelict buildings. It requires property owners to pay for necessary work to make dangerous buildings or sites safe, authorizes the city to conduct needed abatement work in extreme cases to improve a site’s safety and places liens on properties to recover costs.

4 PURSUE PRIVATE-PUBLIC PARTNERSHIP

The Buffalo Color Corp. plant in New York was an industrial site owned and operated by Allied Chemical that produced dyes and organic chemicals starting in 1879.

Through a private-public partnership, Allied predecessor Honeywell partnered with a Buffalo businessperson and a brownfield redeveloper to clean up the site. The result was a partnership with the EPA’s Great Lakes National

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Program Office, the U.S. Army Corps of Engineers, Buffalo Niagara Waterkeeper and the New York State Department of Environmental Conservation to clean up the Buffalo River.

Over eight years, Honeywell says, the Buffalo River Restoration Partnership removed contaminated sediment, installed aquatic and plant habitats and decreased contaminants in the food web.

5 FIND A COMPANY THAT HANDLES BOTH REMEDIATION AND DEMOLITION

Recent trends have brought people and businesses back to urban centers, typically filled with older buildings rife with asbestos, lead and other hazardous materials. It's given rise to firms specializing in remediation and historic renovation and rehabilitation. However, since many contractors offer remediation or demolition services but not both, clients often are forced to hire multiple firms to handle the process.

Seek out contractors such as ADEP Group, short for American Demolition Environmental Professionals, that

handle both instead. ADEP, based in Lawrence, Massachusetts, has cultivated crews with extensive experience in both disciplines to provide turnkey solutions in environmental remediation and demolition for customers in New England.

Environmental Resources Management, based in London, brings a similar approach to remediation and demolition, says Susan Angyal, ERM's regional CEO for North America. Maintaining a well-balanced business with capabilities across the asset life cycle, she says, has been critical to the company's success.

"We find many of our competitors to be primarily focused on the end-of-life phase, like remediation, which provides good, sustained revenues but is becoming increasingly commoditized," Angyal tells *C&DR* for a 2020 cover profile. "Our broader client platform makes us more resilient as different parts of the market tend to ebb and flow." **C&DR**

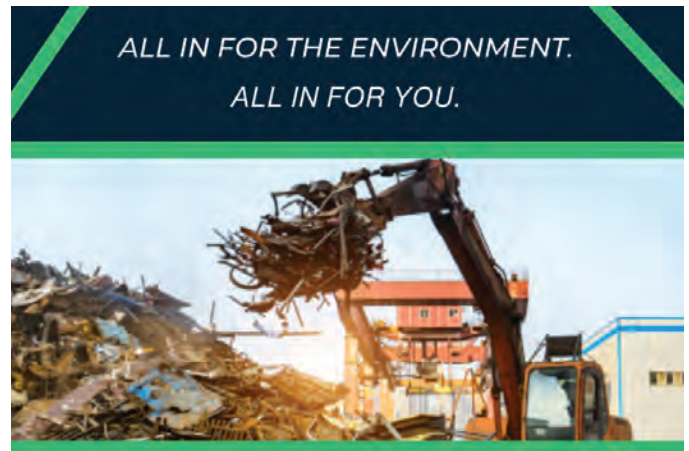
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◆ Liebherr announces new divisional director and sustainability GM

Liebherr USA Co., a Newport News, Virginia-based construction and material handling equipment business unit of Europe-based conglomerate Liebherr AG, has appointed **Shane Kuhlmeiy** as divisional director for Crawler Cranes, Deep Foundation Machines and Maritime Cranes.

Kuhlmeiy previously led Liebherr's mining division, where he built and led a nationwide team of mining experts to achieve advancements in efficiency and safety.

"As I transition to the Crawler Cranes, Deep Foundation Machines and Maritime Cranes division, I

look forward to learning about the intricacies of the crane and maritime industries, meeting our valued customers and building strong, lasting relationships," Kuhlmeiy says. "I am enthusiastic about the future and committed to ensuring continued success and growth."

Liebherr also has appointed **Alexandra Hobgood** as general manager of corporate responsibility and sustainability.

In her role, Hobgood will oversee sustainability initiatives throughout Liebherr's U.S. locations by educating stakeholders, implementing new processes and providing additional structure to current programs.

Hobgood previously worked with the Hampton Roads Sanitation District in Virginia, where she engaged in



Shane Kuhlmeiy

laboratory work and water testing, Liebherr says. She also worked for the Virginia Aquarium in Virginia Beach, Virginia, where she was involved in the management and implementation of safety and environmental programs.

"There are a lot of great processes already being implemented at Liebherr, so the structure for building a strong program is already in motion," Hobgood says.

◆ Brokk opens new Canadian distribution center

Brokk, a Monroe, Washington-based remote-controlled demolition machines manufacturer, has opened a distribution center in Hamilton, Ontario. The new location will be run by **Jim Bennett**, who has joined the Brokk team in Canada as warehouse and logistics manager.

Bennett's responsibilities include managing products and assisting customers and regional sales managers by providing parts support throughout Canada.

The new 4,000-foot Canadian distribution facility will house the full line of demolition machines with attachments as well as Aquajet Hydrodemolition robots and parts inventory for both brands. The new center also will offer Brokk and Aquajet demonstrations.

"Adding a distribution center gets us closer to our Canadian customers and generally streamlines the ordering and shipping process," Brokk Inc. President Lars Lindgren

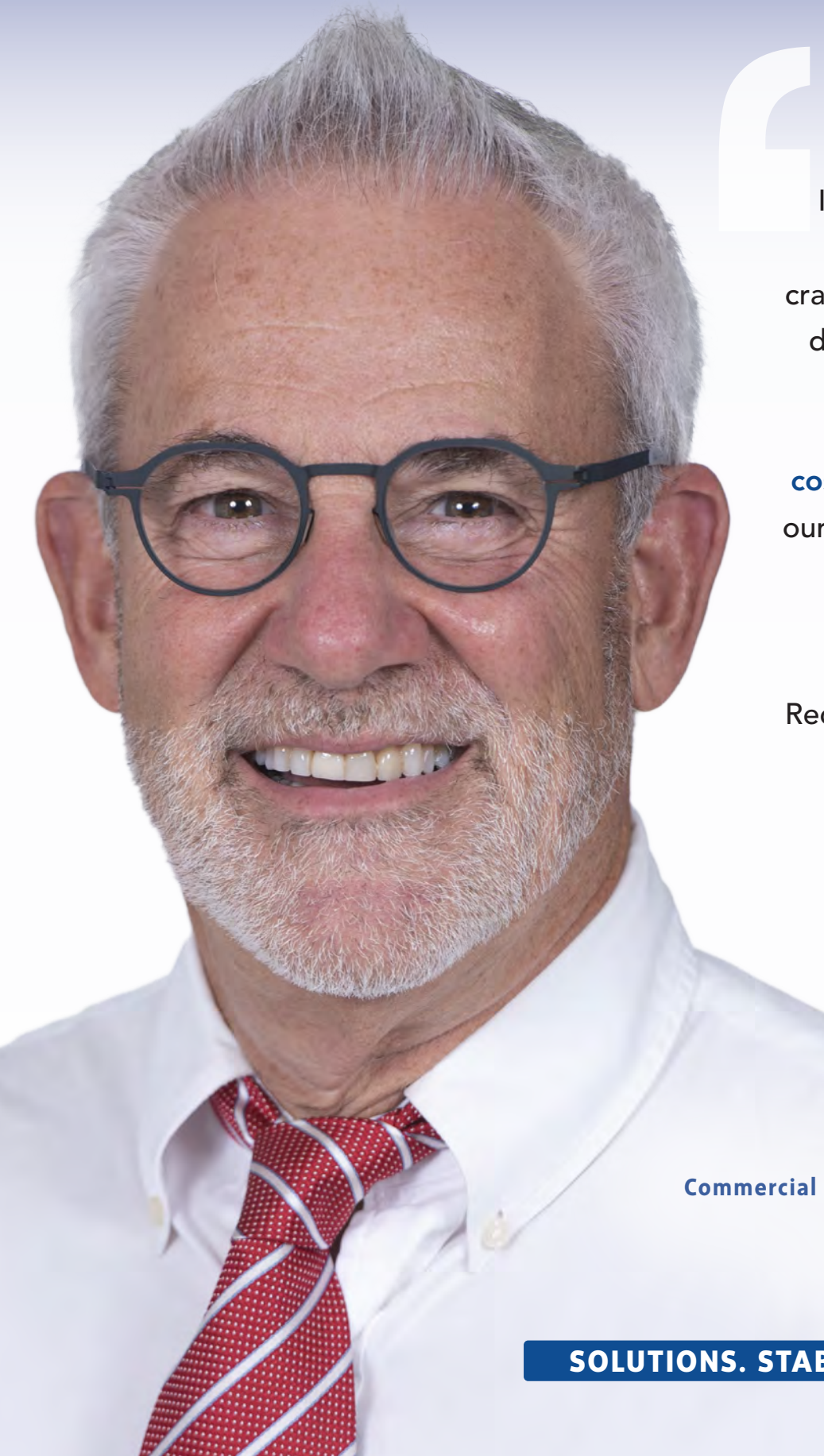


says. "We're all excited to see what Jim will make of the facility and how it will help our customers in the Toronto area and beyond. He has a wealth of warehouse management experience and will closely monitor demand for Brokk and Aquajet to ensure optimal stock."

Bennett has more than 30 years of warehouse and logistics experience within the auto and construction sectors. He started working as a warehouse manager before working

his way up to operations supervisor. His last two positions have been as a warehouse manager and warehouse supervisor before transitioning to his current role with Brokk.

"My whole career has been customer driven, and that's what's so exciting about this role," Bennett says. "My vision aligns with Brokk's. The new facility will help meet our goal of providing Canadian customers with machines and parts from both Brokk and Aquajet."



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equipment report

◆ Sennebogen expanding capacity in North Carolina

Sennebogen LLC, the Stanley, North Carolina-based subsidiary of Germany-based Sennebogen GmbH, hosted a ceremony to celebrate an expansion of its campus in Stanley.

Saying its subsidiary in the United States “has been very successful for almost 25 years,” Sennebogen credits the North Carolina-based business unit for its reach into several industry sectors, including metal recycling, steel mills, the timber industry, port operations and waste management.

Sennebogen LLC, founded in 2000, initially was housed “in modest rented premises,” the company says. “Nine years later, thanks to dynamic growth, the company was able to move into its own location with offices, training rooms and a large spare parts warehouse.”

Four years after that, Sennebogen had to double its space, and a spring 2024 groundbreaking ceremony was held to mark “an impressive further expansion” that will entail the creation of an additional three training rooms and halls, new office space, a spacious apprenticeship workshop based on the German model and a presentation and demonstration area.

The more than 160,000 square feet of floor space that will exist after expansion will be situated on Sennebogen’s 35-acre site in Stanley.

At the North Carolina campus, Sennebogen hosts sales partners and customers from the U.S., Canada, Central America, Brazil and Uruguay.

“With 110 employees and the continued market success of the last 24 years, this investment forms the basis for the further expansion of the company’s market leadership in these important markets,” the company says.



◆ Hyva creates global recycling business unit

Hyva, a Netherlands-based manufacturer of dump body tipping and hydraulic lift solutions, has named industry veteran **Chris Zuniga** as head of sales for its recently created North American Recycling business unit. Zuniga will focus on Hyva’s extensive hooklift product line and introduce U.S. waste haulers to Hyva’s soon-to-be-released family of small rear loaders.

Zuniga has more than 25 years of experience in global refuse, vocational and commercial vehicle sales and distribution. He previously led Oshkosh’s commercial segment sales efforts for all markets outside of the U.S. and Canada. Zuniga will handle developing marketing, sales and distribution for Hyva’s newly created Recycling business unit.

“I am excited to be part of such a truly global team and honored to be given

the opportunity to lead sales and distribution development in North America,” Zuniga says. “I look forward to the opportunity to leverage Hyva’s global footprint and product offering to meet the needs of refuse and container-handling customers across North America.”

Hyva says the newly formed Recycling business unit is part of a new strategy to separate its business units into three distinct entities: components, cranes and recycling. Each will have its own leadership and infrastructure, allowing for more focus and accountability.



Chris Zuniga

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◆ Volvo excavator line

With an optimized electro-hydraulic system, smart cooling system and engine speed regulation, Shippensburg, Pennsylvania-based Volvo Construction Equipment's new line of medium and large excavator models includes the ECR145 short swing, EC201, EC230, EC370 and EC500 crawler excavators. The updated excavator lineup was designed to increase productivity, provide a 15 percent increase in fuel efficiency and enhance safety, the company says. Features include:

- Volvo Smart View with Obstacle Detection, which combines camera technology and a radar detection system to provide operators with 360-degree visibility of the machine's surroundings
- work modes that expand to 10 settings, including two specific to power and four specific to automatic ECO modes
- a creep travel mode coupled with boom and arm shock reduction settings, designed to provide tight load command and reduce spillage

For more information, visit www.volvoce.com

◆ Stellar NXT68 hooklift

Tailored to meet the demands of material handling within the waste management and recycling sectors, the NXT68 hooklift is the latest offering from Garner, Iowa-based Stellar Industries. The machine is available for 16-foot-to-22-foot containers, with a 12.5-inch load height and a bolt-on body lock system that provides universal adjustment for outside locks, designed to provide compatibility and flexibility. With a Z-rail design, the base comes predrilled for easy installation onto the chassis and to accommodate the placement of body saddles as required. Other features include:

- a 62-inch hook height that can handle 68,000 pounds and a 54-inch hook height that can handle 57,000 pounds
- a telescopic jib with a lightweight, multiplate design to support various body lengths
- integrated replaceable wear pads designed for serviceability

For more information, visit www.stellarindustries.com



◆ Bateman 210 series grapple

Designed for the scrap and recycling industries, the Bateman 210 grapple is engineered to provide superior performance and versatility, according to the Ontario-based company. Its design allows for the efficient handling of various materials, including metal scrap, demolition debris and other bulk recyclables. The 210 series boasts a larger pin diameter and improved bushing design with seals for longer life and optimized work time. Features include:

- an improved rotator guarding for greater impact protection
- fully enclosed cylinder guards for zero chrome exposure
- a thicker frame design for better pin support and hose guarding
- an improved tine design for optimal scrap penetration and material collection

For more information, visit www.batemanmanufacturing.com

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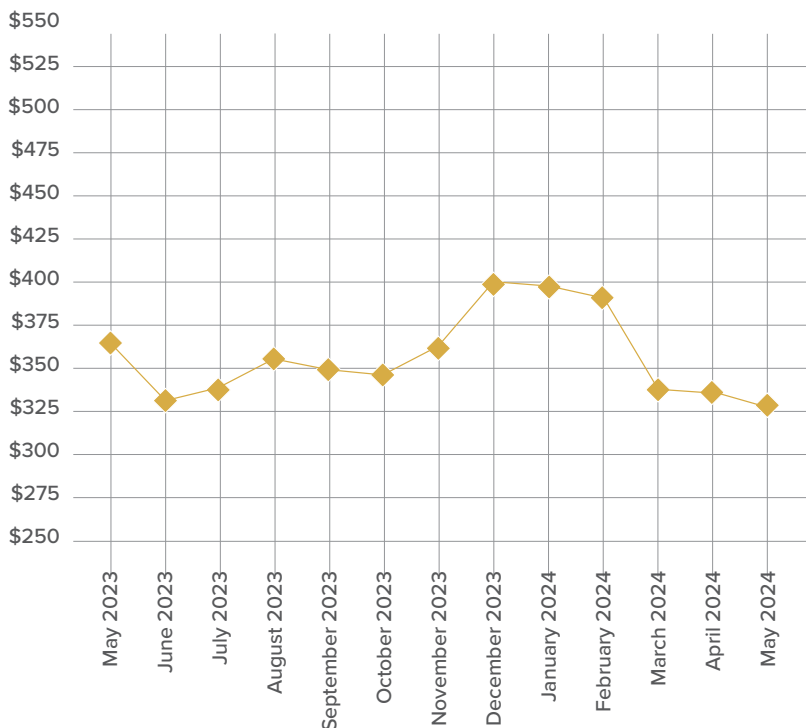
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A LOOK AT REGIONAL AND NATIONAL PRICE FIGURES FOR SOME OF THE MOST COMMONLY PRODUCED C&D MATERIALS

◆ SCRAP IRON

RMDAS No. 1 Heavy Melt Steel Pricing (Per Gross Ton for No. 1 HMS scrap)



Reported United States aggregated spot market prices per gross ton shown for each commodity are based on all Management Science Associates' (MSA) Raw Material Data Aggregation Service (RMDAS) participants' actual order data submitted to and processed by MSA as of the 20th of each respective "buy month," rounded to the whole integer. A map of RMDAS regions is available at <http://rmdas.msa.com>, as is a further explanation of RMDAS methodology and an accompanying disclaimer.

No. 1 HMS defined as prepared obsolete scrap, 5 feet long and under. Additional pricing information on each grade can be found at www.RecyclingToday.com.

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◆ COPPER – LME PRICING

(Average monthly settlement price, cash buyer; U.S. dollars per metric ton)

MAY 2024	\$10,127.76
MARCH 2024	\$8,674.60
JAN. 2024	\$8,342.73
NOV. 2023	\$8,173.00
SEPT. 2023	\$8,269.52
JULY 2023	\$8,443.98
MAY 2023	\$8,232.88
MARCH 2023	\$8,833.65

Source: London Metal Exchange, www.lme.com

◆ ALUMINUM – LME PRICING

(Average monthly settlement price, cash buyer; U.S. dollars per metric ton)

MAY 2024	\$1,857.14
MARCH 2024	\$1,810.00
JAN. 2024	\$1,866.59
NOV. 2023	\$1,667.00
SEPT. 2023	\$1,493.57
JULY 2023	\$1,812.19
MAY 2023	\$1,939.65
MARCH 2023	\$2,005.00

Source: London Metal Exchange, www.lme.com

◆ STONE AND AGGREGATE INDEX

Construction Sand, Gravel and Crushed Stone
(Bureau of Labor Statistics
Producer Price Index)

MAY 2024	489.9
APRIL 2024	488.2
MARCH 2024	485.7
FEB. 2024	484.0
JAN. 2024	483.2
DEC. 2023	464.1
NOV. 2023	462.8
OCT. 2023	462.5
SEPT. 2023	462.3
AUG. 2023	462.0
JULY 2023	459.7
JUNE 2023	459.2
MAY 2023	454.9

*Index is based on 1982 average price as 100
Source: U.S. Bureau of Labor Statistics

◆ WOOD SCRAP

Biomass Fuel Pricing
(Quarterly average for California
Woody Biomass and Mill Residues;
price per bulk dry ton, delivered)

Q2 2024	\$45
Q1 2024	\$45
Q4 2023	\$47
Q3 2023	\$46
Q2 2023	\$46
Q1 2023	\$46
Q4 2022	\$45
Q3 2022	\$44
Q2 2022	\$43
Q1 2022	\$42
Q4 2021	\$42
Q3 2021	\$42
Q2 2021	\$43

Source: Forisk Wood Fiber Review; detailed pricing and market analysis for regions in the U.S. and Canada available by subscription at www.forisk.com



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