

# Making complex demolition simple

Equipment supplied by Genesis Attachments is keeping the removal of a huge Minnesota office building and county jail complex on schedule.

**S**uccessful demolition contractors need a skill set that solves unusual challenges. These include close proximity to active areas or other structures, the need to demolish a section of a building while its business remains operational, and heights that exceed the reach of most standard items of equipment.

In St Paul, Minnesota, USA, Rachel Contracting is meeting all three requirements as it brings down a 65,000 sq m (700,000 sq ft) complex that was built into a bluff, faces a pair of busy thoroughfares and, in places, is just a few steps from a working railway line.

To address these concerns, the company used a range of machinery, including a newly-designed tool from Genesis Attachments.

The former West Publishing headquarters, built in 1886, and the Ramsey County Adult Detention Center (ADC), built in 1979, were mainstays of the St Paul riverfront, and took 15,800 sq m (170,000 sq ft). However, by the time West moved out to a suburb, the seven-structure complex had outlived its usefulness, and the jail was quickly deemed inadequate.

Repeated efforts to sell were hindered by the thought of demolishing the existing structures and years of on-again, off-again government tenants that finally led to the entire complex remaining unoccupied for several years. Recognising the property's tax revenue potential, Ramsey County committed to demolition and Minnesota-based Rachel Contracting won the bid to do the job.

The eight-storey ADC is the first structure

to come down. Work on it started in August 2015 with interior demolition.

"The interior work included asbestos abatement, followed by removal of any remaining hazardous materials as well as municipal solid waste and other debris," said Mark Kraemer, Rachel's vice president of field operations.

"What makes this job different, however, is that the structures are built right into the side of a bluff alongside the Mississippi River. With the preliminary interior work completed, we moved into a bluff stabilisation phase.

"For that, we had the crew core-drill into the back wall of the building, install 12 m (39 ft) threaded rods, and inject each core with grout to secure the structure to the bluff during demolition. Once demolition is complete, a new concrete wall will be built and backfilled to keep the bluff face intact and ready for new construction."

## ALTERNATIVE TECHNIQUES

The height of the structures, more than 27 m (88 ft) in most areas, coupled with their proximity to active pedestrian, vehicle and train traffic, eliminated the use of traditional demolition techniques such as implosion or a wrecking ball. The alternative was a high reach excavator outfitted with a GDT Razer 290 from Genesis Attachments.

"We have the GDT mounted on a Volvo EC700C HR, an 89 t base machine with the high reach package," said Mark.

"That configuration affords us just over 27 m of reach, more than enough for even the uppermost reaches of the ADC structure. Our options were definitely limited by our surroundings. An active Amtrak line runs as close as 7 m (23 ft) to one side of the jail, and one corner of the structure is just feet from the heavily-travelled Wabasha Street Bridge."

Material encountered during the ADC portion of the demolition included 250 mm (9 ins) thick two-way concrete slabs reinforced

with number 4 rebar at 250 mm (10 in) on centre each way. The structure also included a parking garage which had 300 mm (12 in) concrete slabs.

"We also processed 45 cm (18 in) square reinforced concrete columns, and concrete waffle slabs measuring 300 mm deep, with a 480 mm (19 in) dome, 130 mm (5 in) wide ribs and a 90 mm (3.5 in) topping slab," said Mark.

As the project continues, the company will eventually be far enough into the structure that they will be at street level and facing

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The St Paul demolition project involved buildings close to a riverside, two busy thoroughfares and a railway line



Fitting the Genesis Attachments GDT Razer to a high reach excavator opened up new possibilities for Rachel Contracting

Kellogg Avenue, a major east-west artery in St Paul and another logistical challenge.

At 3,750 kg, the GDT Razer is light enough to be very manoeuvrable, even at peak heights, yet still provide the power needed for effective concrete cracking. According to Rachel's project superintendent, Jim Jude, that manoeuvrability is being tested on the ADC facet of the job.

"The jail's overall footprint is a strange zig-zag shape, but the interior of the structure also has hallways and walls that seem to run in every direction," he said.

"Through a combination of the attachment's rotation and its design, the GDT Razer is able to easily access every area we need to get at, then crack and drop the concrete material. It will also be great to have that degree of control when we are at

the part of the structure where the tie-backs are present. Being able to trim in these areas without fear of messing with the tie-backs will be a real plus."

For added versatility, the number and location of crushing teeth on the GDT Razer can be customised to meet Rachel's project needs. In addition, the bolt-on teeth can be interchanged and reversed front to back, increasing their life and lowering the cost of operation.

Jim added that the position of the pin centres on the tool make it easier for him to roll it back to get under a beam.

"That alone has helped keep things moving out here."

While the GDT Razer has four-way indexable blades for cutting any rebar encountered in the structures, the bulk of the

actual material processing is being done using a combination of additional Genesis tools. These include an LXP 300 Logix Processor and a GDR 300 Demolition Recycler, each mounted on a Cat 336E; and a Demo Pro 900 on a Cat 349.

"The other attachments will be pulling double-duty on this project," said Mark Kraemer.

"In addition to processing the more than 100,000 t of concrete and brick we expect to encounter here, they will be doing actual demolition on some of the lower, more accessible areas of these structures. We like that they are multi-faceted in what they can do and use it to our advantage whenever possible."

### 'THE WHOLE PACKAGE'

Mark said Rachel Contracting's relationship with Genesis goes back about eight years. "We like that Genesis is always there when we need it, treats us well and keeps us in the loop with new developments as they arise. It has the whole package, and we like that."

The St Paul project includes far more than just the Ramsey County Jail. Next on the list is the one-time West Publishing complex of buildings, now called the Ramsey County Government Center, (RCGC). The RCGC sits adjacent to the jail, is roughly three times its size, and presents the same logistical challenges as the ADC.

"The RCGC complex represents the bulk of the demolition," said Mark.

"And, because it was added onto repeatedly in its 130-year history, there are different types of construction evident, some with much more structural steel, for example.

"However, because of who we are as a company and the way we approach projects like this, we are equipped to tackle anything we encounter."

The US\$13.1 million (€11.8 million) demolition is due to be completed in the spring of 2017. ■

## Turning a steel mill into a solar city with Indeco

North America is proving a lucrative region for Italian hydraulic hammer manufacturer Indeco, with opportunities in both the USA and Canada.

In 2015, five Indeco hammers demolished the foundations of a former steel mill in Buffalo, New York, in an area seeing construction of the largest solar panel production plant in the United States.

The SolarCity project's manufacturing hub will annually produce next-generation solar panels in sufficient quantity to generate 1 GW of energy, establishing itself as the largest and most productive in the Western Hemisphere.

Site conversion and construction of the new industrial complex were assigned to LP Ciminelli, a major contracting firm based in Buffalo.

To perform demolition, it used five Indeco hammers, two HP 8000, two HP 13001 and an HP 16000. The hammers were used to a great extent, not just to demolish elements in reinforced concrete and structures where the new foundations were to be built, but to excavate trenches for installation of the large utilities network.

Commenting on the project, Keegan Lachut, site manager for LP Ciminelli said: "The demolition was incredibly challenging, due both to the quantity of material we removed from the ground and because we really didn't know what to expect as the job progressed. All Indeco hammers performed optimally, but in certain situations the one that delivered the best was undoubtedly the HP 16000. I don't think I've ever seen a hammer giving that type of performance."

Further north, in Quebec, Canada, three Indeco hammers are digging an artificial lake and performing other earthworks involving the excavation of over 400,000 cu m (14.1 million cu ft) of rock. The new lake is part of a programme to convert what was a well-known local campground into a modern resort.

FDT (Forage Dynami-tech), a major contractor in Quebec specialising in the use of explosives for excavation works, drilling and blasting, used two HP 16000 and two HP25000 Indeco hammers on the project, the latter of which is capable of reaching 460 blows per minute.

Elsewhere in Quebec, vehicle demolition specialist Pièces Auto Talbot has specified an Indeco ISS20/30 rotating shear with 360° rotation.

Co-owner of the business Pierre Arsenault said: "Before we bought the shear we could fill one 30 t container a week using three people working the torch. Now we can fill two containers using just one machine operator."

Indeco on site at the former Buffalo steel mill

