Recycling and Circular Economy in Practice

Concrete Recycling and Rebar Recovery in Large-Scale Hospital Demolition: A Crown Point, Indiana Case Study

Introduction

Modern demolition increasingly functions as a materials recovery operation rather than simple waste disposal. Reinforced concrete structures contain two major recyclable materials, namely aggregate and reinforcing steel which can be efficiently separated through staged crushing and magnetic recovery. This technical paper documents field observations from the demolition of the former Franciscan Health Crown Point Hospital campus in Indiana. During a site visit facilitated by Patrick Heneghan, President of Heneghan Wrecking (a NorthStar company), and project personnel including Andy Piano, the author observed large-scale concrete crushing and rebar recovery operations. Approximately 95% of the structure's materials were salvaged, primarily through recycling of concrete and steel reinforcement. Residual materials such as wood studs and insulation required landfill disposal.

Reinforced concrete is one of the most widely used structural materials in modern infrastructure. At the end of a structure's service life, demolition produces large volumes of construction and demolition debris dominated by concrete and embedded reinforcing steel. Historically, this material was often disposed of in landfills. Today, demolition practices increasingly emphasize material recovery, allowing concrete to be processed into recycled aggregate while reinforcing steel reenters the steel production cycle.

Demolition Contractor Background

The demolition work involved Heneghan Wrecking and Excavating, a Chicago based demolition contractor founded in 1973 and now part of NorthStar Group Services. Following its acquisition by NorthStar Group Services in 2020, the company continues to operate under the leadership of Patrick Heneghan, President of Heneghan Wrecking, overseeing complex demolition projects across the Midwest including healthcare facilities and industrial sites.

Field Observations at the Crown Point Site

Approximately 95% of building materials were recovered and recycled. Reinforcing steel was separated from crushed concrete and stockpiled for recycling, while concrete rubble was processed into recycled aggregate. Mobile crushing equipment enabled on-site processing which minimized hauling requirements. Materials such as wood studs and insulation were not economically recyclable and therefore required landfill disposal.

Process of Removing Rebar from Concrete

The separation process begins with excavators using hydraulic breakers or pulverizers to fracture reinforced concrete elements. The rubble is then processed through primary crushers which reduce material size and liberate reinforcing bars. Magnetic separators positioned along conveyor systems remove ferrous metals. Secondary crushing further liberates steel fragments,

and screened recycled concrete aggregate is stockpiled while reinforcing steel is transported for scrap recycling.

Circular Economy Implications

Concrete recovery during demolition can be reused as aggregate, reducing demand for virgin quarried materials. Reinforcing steel can be recycled indefinitely without degradation of mechanical properties. On site crushing reduces transportation requirements and associated emissions. However, mixed interior materials such as insulation and wood framing remain difficult to recycle.

LEED Project Specific Observations:

The Crown Point Hospital demolition illustrates how project level recovery practices align with current LEED materials and resources priorities. Site observations showed that approximately 95% of building materials were recovered and recycled, with reinforcing steel separated from crushed concrete, concrete processed into recycled aggregate, and only limited residual materials sent to landfill.

These practices are consistent with the intent of LEED v4.1 BD+C MR Credit: Construction and Demolition Waste Management and with the broader direction of LEED v5 Credit: Construction and Demolition Waste Diversion, both of which emphasize diversion of construction and demolition debris from landfill through structured recovery strategies.

The Crown Point demolition is best presented as a field example of how high diversion, aggregate recovery, and steel recycling can support LEED-aligned waste reduction, material circularity, and embodied-carbon strategies. Project-specific LEED applicability, documentation requirements, and credit treatment should be confirmed by the project manager or LEED administrator.

Conclusion

Through staged crushing and magnetic separation, demolition contractors can recover both recycled concrete aggregate and reinforcing steel. Observations from the Crown Point hospital project demonstrate that recovery rates approaching 95% are achievable, highlighting the importance of demolition engineering in advancing circular economy practices within the construction industry.

Acknowledgments

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Photos:

Photo-1: Andy Piano, Project Manager, Heneghan, in front of the demolition Site in Crown Point, IN

Photo-2: Rebar separated from crushed concrete

Photo-3: Close up of concrete being pulverized to separate rebar.


Photo-4: Concrete prepared for transport to the crushing site.