



CONSTRUCTION & DEMOLITION RESOURCE RECOVERY CASE STUDIES

NTEX - RESHAPING THE TERRITORY

INTRODUCTION

Established in 2010, NTEX is a leading player in the delivery of civil construction projects, demolition services and the recycling of construction and demolition waste in the Northern Territory. NTEX has been working to provide innovative methods for resource recovery of demolition waste materials and the creation of a circular economy for the industry, primarily through the remanufacture of concrete and asphalt waste into aggregate products that have been incorporated back into residential, civil and infrastructure projects across the NT.

To date NTEX has recovered and processed close to 50,000 tonnes of concrete and asphalt waste material since July 2020 and has achieved a 93% recovery rate overall on demolition projects for NT and federal governments, defence, and private industry.



Photo1. Director Gerry Breen and demolition of John Stokes Square

COMMITMENT TO RESOURCE RECOVERY & A CIRCULAR ECONOMY

NTEX's resource recovery process is a practical example of a circular economy system in action. The process starts with the implementation of pre-demolition audits to all projects to identify hazardous contaminants that can't be recycled, such as asbestos and hexavalent chromium, to ensure they are separated and disposed of appropriately. This process guarantees that contamination does not enter NTEX sites or recycled end products.

Various waste streams are identified to determine repurposing and recycling opportunities, with all resources being tracked and traced from origin, right through to recycling and on to the end-user.

All NTEX recycled CDW products have contaminant clearance certificates, NATA accredited geotechnical testing, and tracking of processes right through the supply chain, providing complete assurance of a quality product.

To date NTEX has achieved an average **93% resource recovery rate on all demolition projects**, and most recently close to 98% resource recovery rate for the Richardson Park demolition project which has been recognised by the Department of Infrastructure, Planning and Logistics in NTEX's contractor performance review.

NTEX's commitment to creating resource recovery solutions for CDW on all projects has resulted in significant savings back to government on project costs, as well as the environmental and social benefits of reducing the amount of construction waste going to landfill and reducing the need for finite resources to make new building materials.

INNOVATIVE CONCRETE & ASPHALT RECYCLING TECHNOLOGY

In 2020 NTEX invested in a Hammbreaker mobile concrete crusher recycler unit imported from Germany that specialises in the removal of reinforced bar from concrete so that the concrete material can be repurposed as civil construction aggregate including type 1, type 2, type 3, select fill and general fill. Recovered asphalt material can also be recycled.



Photo 2. Hammbreaker Crusher in action at Katherine Sports Club demolition

Since July 2020 NTEX has processed 30,693 tonne of concrete and 18,914 tonne of asphalt waste materials.

That's 49,607 tonne of construction and demolition waste material diverted from landfill and remanufactured into aggregate products for the civil construction industry.

With demand rapidly growing for NTEX's concrete recycling services the company recently invested close to \$1 million in a Rubble Master concrete crusher recycler unit, complete with magnetic separator and inbuilt screening unit. The Rubble Master is perfect for recycling larger quantities of concrete and asphalt waste and operates out of the NTEX recycling yard as well as having mobile capacity to crush directly on the job site.



Photo 3. NTEX Rubble Master

CONCRETE CRUSHING/RECYCLING PROCESS



Photo 4. Feeding concrete into crushing unit



Photo 5. Output of crushed product



Photo 6. Steel extracted from crushed concrete

WATER AND CARBON GROUP - CONSTRUCTION OF LEACHATE TREATMENT PLANT

Client	Darwin City Council
Location	Shoal Bay Waste Management Facility NT
Date	26 May 2021 – Current
Project Type	Construction of civil works and structures

Project Overview

Water and Carbon Group were awarded a Design and Construct contract for a new leachate treatment plant at the Shoal Bay Waste Management Facility in Darwin, NT with NTEX subsequently awarded the construction of civil works and structures for the plant.

Through NTEX's recycling processes we identified an opportunity to incorporate previously recycled CDW into the project.

The access road for the project was originally designed with a 3-metre width suitable for one semi-trailer to enter, turn around and exit the site. NTEX, with its push for the continuous use of recycled asphalt road materials, was able to extend and seal the access road for the site enabling additional width to a dual 6-metre-wide carriage way. The recycled asphalt was from the Department of Defence AIR7000 Pavements Project Demolition at RAAF Base Darwin.

In addition, crushed concrete from AIR7000 was incorporated into drainage structures on the site and crushed concrete from the McDonalds Casuarina demolition project was repurposed as road base.



Photo 7. Asphalt crushing & screening process on site

“The works under NTEX control have been delivered efficiently and with a high level of quality assurance. The client has been particularly impressed with the use of recycled building materials, including recycled concrete and asphalt to build roads and foundations at the site.

David Leinster - Wastewater & Solutions Development Manager



Photo 8. Concrete prior to crushing



Photo 9. Crushing concrete



Photo 10. Crushing & Screening asphalt



Photo 11. First prime to place recycled Asphalt



Photo 12.



Photo 13. Primed road



Photo 14. Overview of project works

T20-2110 RICHARDSON PARK AND ANCILLARY BUILDINGS DEMOLITION

Client	Department of Infrastructure, Planning and Logistics
Location	Ludmilla NT
Date	11 January – 29 March 2021
Project Type	Demolition of Richardson Park and ancillary buildings

Project Overview

The Northern Territory Government is working to deliver improvements to Richardson Park to open up the space for community benefits. The improvements will enhance and activate the area for the community and Ludmilla Primary School whilst upgrading the existing sports field to be suitable for training.

NTEX were successful in tendering for stage 1 of the project.

The demolition of structures included the grandstand building, kiosk, eastern change rooms, club house, hydraulic services, electrical services, large trees that were mulched and the removal of the concrete stockpile on site.

The Project encountered additional hazardous materials that required management and NTEX implemented its mitigation strategy to keep the project on time.

NTEX in conjunction with DIPL strategized to recycle waste concrete from the project on site, along with waste concrete from the nearby Motor Vehicle Registry demolition works, to produce type 2, type 3 and select fill materials which are being utilised in stage 2 of the Richardson Park upgrade.



*NTEX was able to use the concrete waste from the project and produce a type 2 material that will be used in the redevelopment of the site. The innovation techniques used will be a huge cost saving to the overall redevelopment project and an excellent example of how future local demolition projects should be undertaken. **Andrew Jacka – DIPL Superintendent***

- Project cost savings of approximately \$130,000
- Reduction of 360 heavy truck movements on local roads
- Reduction in CO2 emissions
- 4500 tonnes of waste concrete kept out of landfill
- Saving of finite quarry resources
- Overall resource recovery value for the project was 97.9%

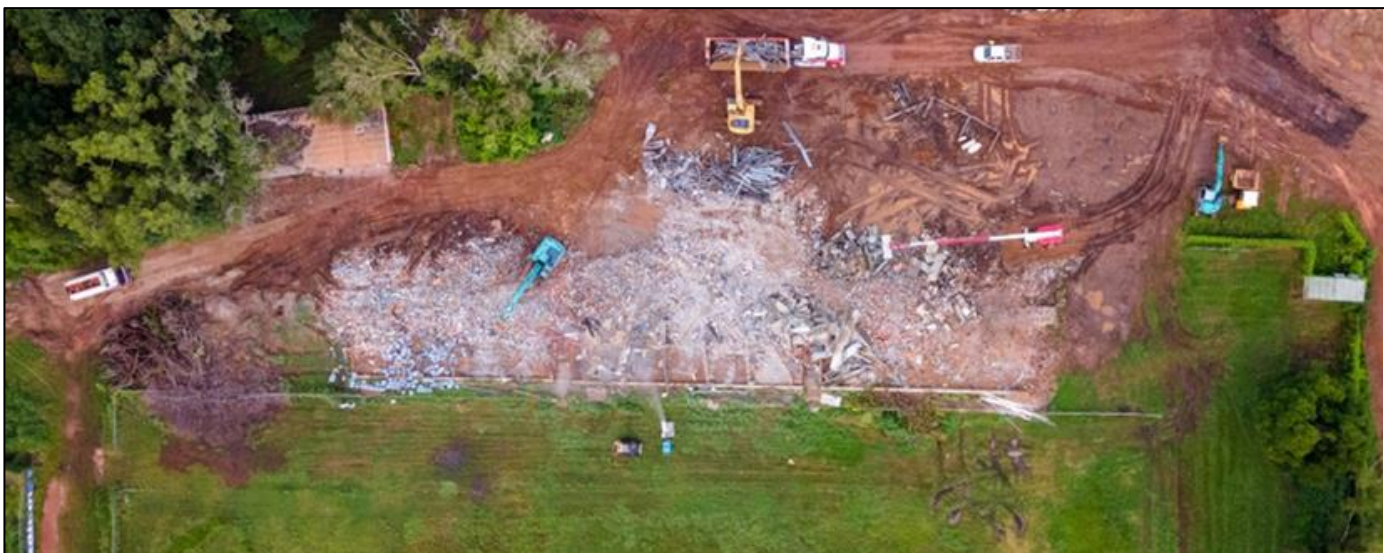


Photo 15. Overview of Richardson Park Demolition project



Photo 16. Demolition in progress



Photo 17. Concrete stockpile to be crushed



Photo 18. Concrete crushing in action



Photo 19. Concrete crushing



Photo 20. Crushed concrete stockpile

DNP-PSS-1920-1 - AURORA KAKADU SOUTH ALLIGATOR DEMOLITION

Client	Director of National Parks
Location	Kakadu NT
Date	1 June – 2 September 2020
Project Type	Demolition and removal of infrastructure at Aurora Kakadu, South Alligator

Project Overview

Aurora Kakadu (South Alligator) is located on the Arnhem Highway, approximately 220km east of Darwin CBD and approximately 45kms from Jabiru in the world heritage listed Kakadu National Park. The property contained several aging infrastructure which were beyond economic repair and removal was required to encourage alternative business opportunities for the site.

NTEX was engaged to undertake the demolition of all dilapidated infrastructure including two-storey accommodation blocks, demountables, and an inground pool, and removal of materials, asbestos, existing electrical and communication services, and equipment present on the site and made redundant by the demolition works.

In line with NTEX's commitment to a circular economy for the construction industry, a pre-demolition audit identified opportunities for resource recovery, recycling and reuse of the construction and demolition waste.

All concrete within the project was crushed and remanufactured onsite and stockpiled for future use as hardstand material for Parks Australia. In total over **3,200 tonnes of waste concrete was diverted from landfill**, remanufactured, and independently tested for use in Kakadu National Park.

Overall recycling value for the project was 82.5% with all decommissioned air conditioning split systems donated to the HPA (Helping People Achieve) recycle shop, and the resort furnishings donated to the Northern Land Council for distribution to local indigenous communities.

The remaining construction and demolition waste was segregated in conjunction with the Jabiru Waste Disposal Depot to minimise landfill and increase recovery of reusable materials including steel, copper, and timber.



Photo 21. Demolition in progress



Photo 22. Concrete crushing



Photo 23. Crushed concrete stockpile

Natasha Fyles
Chief Minister

Lauren Moss
Minister for Environment



Media Release

Creating a Circular Economy in the Northern Territory

21 June 2022

The Territory Labor Government is working to protect the environment and support the reuse of resources to contribute to a \$40 billion economy by 2030.

Implementation of the Northern Territory's first Circular Economy strategy is in progress with work commencing on:

- The \$3.8 million in recycling modernisation funding available to small business, industry and local councils on a 50:50 co-contribution basis;
- Stage 1 Needs Analysis of the Big Rivers Material Recovery Facility in Katherine;
- An independent review of the NT landfill guidelines is being carried out to deter landfilling of recyclables and ensure protection of the environment; and
- Reforms to environmental regulation of mining are being finalised and a cost benefit analysis of implementation of waste levies is in train.

These programs will assist in generating economic opportunities through diversion of waste into a valued resource.

Local Territory businesses are also getting on board circular economy initiatives with waste and debris from numerous projects being repurposed into new builds.

Territory construction company NTEX's recycling process is a practical example of a circular economy system in action. The process starts with the implementation of pre-demolition audits to all projects to identify waste streams and determine recycling paths and opportunities to create useable products in civil construction.

To date NTEX has averaged over 93% recyclable rate on all 18 demolition projects combined during the past two years, and most recently close to 98% recyclable rate for the Richardson Park demolition project.

The Territory Labor Government released the Circular Economy Strategy in April this year, outlining the Territory's roadmap to protecting the environment from waste by increasing resource recovery, recycling and reuse, including phasing out and banning single use plastics by 2025 and investing and supporting businesses to develop and resource their own recycling schemes.

This includes a Territory Labor Government commitment of \$1.9 million for the Northern Territory Recycling Modernisation Fund for a grants program, and \$300,000 per year from 2021-22 recurring for the Department of Environment, Parks and Water Security to coordinate delivery of the strategy.

The strategy also encourages innovation and adoption of resource recovery and recycling technology through partnerships and collaborations, and will see consideration of a waste levy to improve waste outcomes.

The five-year plan to transition the Territory from a linear model of taking, using and disposing of resources into a circular economy, addresses the Territory's existing challenges with waste, building a more sustainable Territory and establishing the circular economy industry as a contributor to the Territory's \$40 billion economy by 2030.

Quotes from Chief Minister Natasha Fyles:

"The Territory Labor Government is focused on creating a sustainable environment.

"Applying circular economy principles means turning waste into a valuable resource, which keeps it out of the environment where it can cause harm, and inside the economy where it can create value, jobs and growth.

"NTEX are showing Territorians exactly how a circular economy should work with their projects. Their waste has been diverted from landfill, into another useable product."

Quotes from the Minister for Environment, Lauren Moss:

"The Recycling Modernisation Fund is a great initiative to assist local business and organisations to adopt innovative and sustainable recycling models, and they can still apply ahead of tomorrow's deadline.

"Investing in businesses and systems that increase the Territory's recycling rate will create local jobs and grow the economy.

"More than a third of the Territory's waste is generated from construction, demolition, commercial and industrial activities so it's great to see companies such as NTEX leading the way as part of its successful business model.

Northern Territory Government



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