Green engineering a Winner

The green engineering of stormwater and floodwater management on the massive Drury South Crossing subdivision has created a functional and aesthetically appealing wetland.
The project won the Project Award at the 2021 Water New Zealand national awards.

South Auckland's 361-hectare Drury South Crossing subdivision – the largest business park development in the country – required a suitable storm and floodwater management solution under the mandates of the Auckland Council Unitary Plan. This prompted setting aside over 80 hectares for a system of ecological parks and recreation areas.

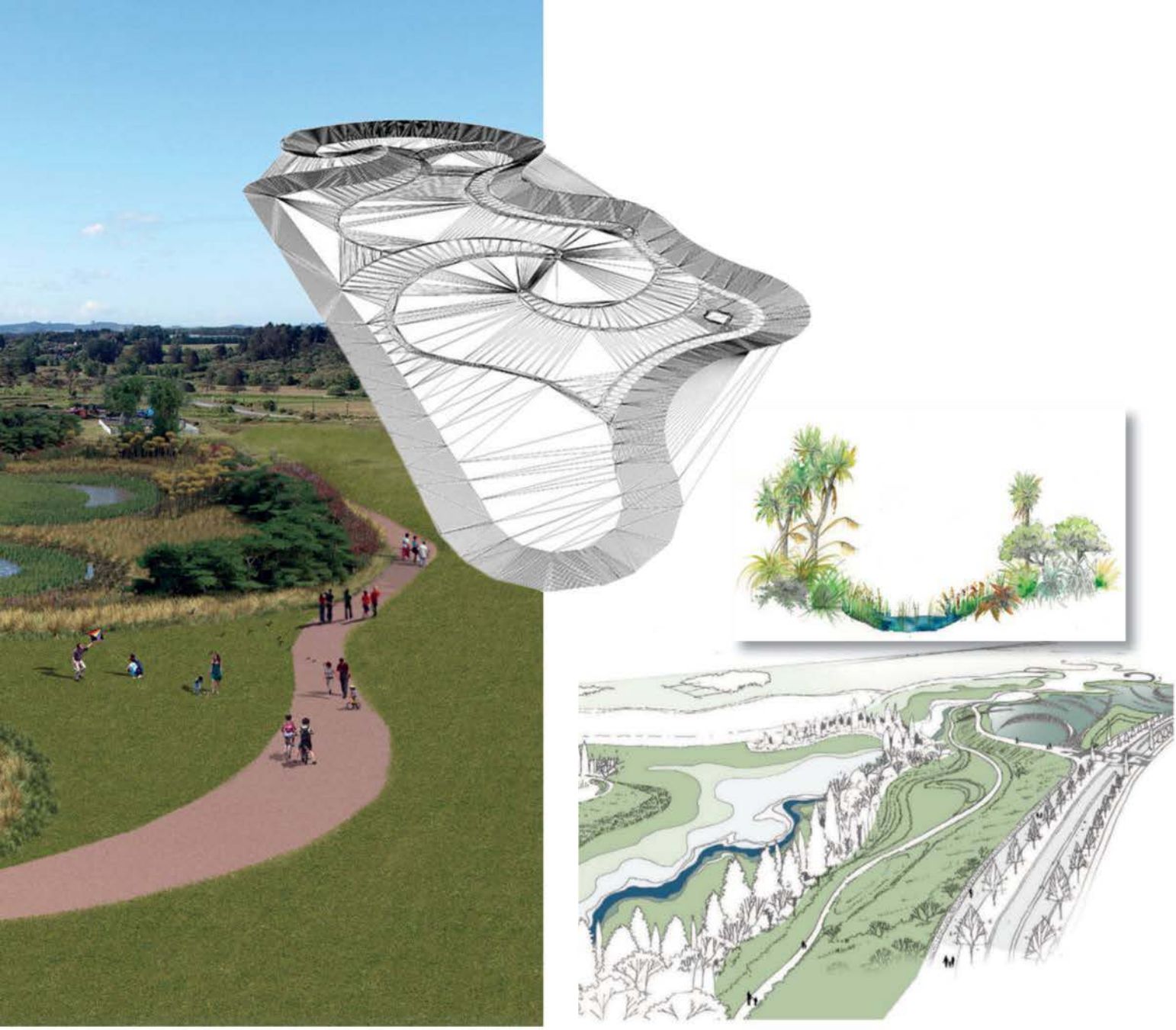
The design team of Boffa Miskell and Tonkin and Taylor applied a green engineering approach to stormwater management across the site, including rain gardens, tree pits, and swales, leading to a large central wetland. This central wetland is 3.5 hectares in size, located within the active floodplain of the Hingaia Stream, a significant ecological area.

The constructed wetland sits below a large mixed-use commercial precinct and, like the precinct itself, is one of the largest in the country; taking over two years to complete and requiring the excavation of over 396,000 tonnes of earth.

Located in one of Auckland's deepest floodplains, the wetland is designed to hold floodwater volumes of up to 58,900 cubic metres, or the equivalent capacity of 23.5 Olympic size swimming pools.

Boffa Miskell led the landscape architecture and ecological aspects of the project. Mark Lewis, the landscape architect for the wider project, says, "We promoted a sinuous wetland design with a double forebay device. This offered an efficient treatment approach, diverse ecologies, and an opportunity for a strong landscape response for public enjoyment.

"Taking inspiration from the tuna that inhabit the adjacent Hingaia Stream, an iterative design process with Ted Ngataki and Tonkin and Taylor



translated those representative forms, while consolidating the functional elements required for effective stormwater treatment and operation."

Multi-disciplinary workshops balanced requirements for aesthetics and function and developed a digital model for analysis and fine-tuning.

The curved geometry inspired by the sinuous form of the tuna was achieved using detailed 3D modelling and providing precise machine control systems for Stevenson Mining – the company in charge of earthworks construction.

The team's desire was to achieve the required engineering outcomes whilst creating a signature feature for the project. The result is a mosaic of terrestrial, wetland and aquatic habitats; providing an artwork at a landscape scale that can be viewed from the commercial precinct and explored by a network of paths.

Mark says that extensive research was undertaken to understand the area's specific ecological values.

The first stage of the project began more than 10 years ago, with Boffa Miskell ecologists undertaking bird surveys and mapping of key vegetation. Pre-construction surveys identified more than 50 bird species in the area including eight endangered species.

Creating new habitats for these bird species, such as the grey duck, red-billed gull, white heron, and pied shag was a priority.

The project team worked closely with Auckland Council and mana whenua to develop a revegetation strategy of diverse native planting types, representing the historic vegetation in the area, says Mark.

"One of the key outcomes of our consultations with local iwi and hapū will see the establishment of hectares of harakeke flax] and purei [sedge] wetlands, and large stands of kahikatea, kanuka, podocarp, and broadleaf forest types.

"These restored natural systems will connect the mature vegetation remnants scattered across the site."

The first stage of the restoration programme included more than a quarter of a million native plants introduced to help support the regeneration of indigenous birdlife. The number of plants will more than double by the time the project is completed.

Over the next few years, the project will continue, with further restoration and enhancement of the Hingaia and Maketu Streams, which meander through the project's open spaces, and will include many kilometres of walking and cycling trails to connect the wetland and open space recreation areas to Drury Village. **LG**