

TASSAL HATCHERY EXPANSION

TASMANIAN NATIONAL PRECAST MEMBER DUGGANS PRECAST IS HELPING SALMON PRODUCER TASSAL BOLSTER ITS HATCHERY CAPACITY WITH UNIQUE PRECAST CONCRETE TANKS.



One of Tasmania's most successful brands, Tassal, is expanding, and precast concrete is playing a big part. The salmon producer is doubling its world-best hatchery at Ranelagh, in Tasmania's Huon Valley. The company's state of the art hatchery has been replicated ahead of a doubling in production of young salmon.

PRECAST SOLUTION REQUIRED

Local precaster and National Precast member Duggans Precast has been part of several projects with Tassal, according to General Manager Brent Hardy. "They came to us to help with a potential solution with a site and space issue," Mr. Hardy says. "We worked with them, and an engineering firm, to shore up a solution".

"The timeline was an important factor to the client. Tassal had deadlines to get the fish in, so we worked really hard to meet the target for completion."

CURVED PRECAST ELEMENTS FOR TANKS

Mr. Hardy says the work was commissioned in several stages and began with a trial water inlet tank. "This was basically a water tank, and we needed to make sure the stitch joints and in-situ concrete base played their part in holding it together and keeping it water proof."

The two curved moulds manufactured by

the precaster were unique for the project. One mould was cast horizontally for the 12 metre diameter tanks, which were made up of five panel segments. The second mould for the seven metre diameter tanks was vertically cast due to the tight 3.5-metre radius and the challenge of concrete placement. These tanks were cast in three panel sections. In all, there were 100 panels for the 12 metre tanks and 24 for the seven metre tanks.

EASE OF TRANSPORT

The precast elements had to be transported from the factory in the Huon Valley to the Tassal site, 22 kilometres away. This was a straightforward operation. Mr. Hardy says the panels were fairly self-supporting and using a purpose-made rack and chains, the panels were transported vertically with each load comprising two sections.

ON-SITE TANK CONSTRUCTION

Once on site, Duggans used a premium sub-contractor to ensure the stitch joints were formed and poured in-situ concrete to join the panels. As well, the base needed to be poured in-situ to ensure integrity of the tank structure. "We needed a tight tolerance and smoothness on the inside of the tanks, for the benefit and well-being of the fish. That was one of the things that was really important," explains Mr. Hardy. The inside

walls were finished with a smooth off-form finish, the stitch joints were patched and the entire internals of the tanks were coated with an epoxy finished.

The high technology nature of the tanks required earthworks and complicated hydraulic plumbing. By using precast concrete, the space and time required on site was reduced, allowing quick access by other trades.

SUCCESSFUL EXPANSION

The completion of the tanks and hatchery expansion will allow Tassal to increase the number of premium quality smolt (young salmon) that are able to be produced at the site, and allow a subsequent on-growing in the company's marine farm leases, from four million a year, to 8.2 million.

Mr. Hardy says his company is proud to be involved. "We've worked closely with Tassal on a number of its key infrastructure projects. The company is significant and influential in the Huon Valley and it's satisfying to be a part of its growth." ■

Precaster: Duggans Precast
Engineer: Gandy and Roberts
In-situ concrete: Stephen Little
Constructions
Client: Tassal Operations



A precast solution was needed to double the capacity of the hatchery in Ranelagh..

INFRASTRUCTURE FOR THE FUTURE – DALRYMPLE ROAD BRIDGES

NATIONAL PRECAST MEMBER HUMES HAS HELPED DELIVER AN IMPORTANT BRIDGE PROJECT AIMED AT MITIGATING THE IMPACT OF FLOODING ON ONE OF TOWNSVILLE'S MAIN ROADS.

An important precast infrastructure project in the North Queensland city of Townsville has delivered better access and improved safety for both its residents and visitors.

Dalrymple Road is one of the main roads linking Townsville's central business district with the fast-growing Northern Beaches community, the Bruce Highway and the Townsville Ring Road.

During the wet season, the old low-level causeway was susceptible to flooding. It would often be inundated with water, causing road closures and frustrating traffic delays. That affected thousands of people in Townsville, trying to get to work every day from north to west. During the wet season, the crossing was typically flooded for up to 42 days.

PRECAST PLAYS KEY ROLE IN SOLVING FLOODING PROBLEMS

To alleviate the problem, Townsville City Council engaged BMD Constructions for a \$40 million upgrade. The upgrade included

the construction of two new bridges at the Dalrymple Road causeway, designed to withstand a one in 50 year flood event.

Understanding that precast would offer a long lasting, speedy and high quality solution, National Precast member Humes was contracted to deliver a timely and cost-effective prestressed solution for the two new bridges.

PILES, DECKS, CULVERTS AND SLABS

The first bridge involved the supply of 98 prestressed piles and 205 prestressed decks (five spans). For the overflow channel bridge crossing, the precaster supplied 111 prestressed piles and 246 prestressed deck units (six spans). The company also supplied 39 large box culverts and 26 slab units for the project.

TWO FACTORIES MEET PROJECT PROGRAM

In order to meet the project's tight production timeframe ahead of the 2015-16 wet season, Humes used its

manufacturing facilities in both Townsville and Rockhampton. With each unit built to unique specifications, the supply of products from two factories required thorough planning and coordination.

AHEAD OF SCHEDULE AND UNDER BUDGET

The Dalrymple Road Bridge project was completed two months ahead of schedule, under budget and to an impressive standard.

The bridges are now open and will deliver vital flood-mitigation infrastructure to withstand any environmental impacts for a century. Importantly for the local community, these two new bridges have made a huge difference in the day-to-day lives of Townsville residents. ■

Precaster: Humes
Builder: BMD Constructions
Client: Townsville City Council





THE PRECAST CULVERT SOLUTION

PRECAST CONCRETE COMPONENTS ARE INTEGRAL TO MANY MAJOR INFRASTRUCTURE PROJECTS AROUND AUSTRALIA. REINFORCED PRECAST CONCRETE BOX CULVERTS ARE ONE SUCH ELEMENT WITH MANY BENEFITS THAT HAS AN IMPORTANT PART TO PLAY.

Most of us take for granted the infrastructure we use everyday that takes a team of people to plan, design and construct. Building these structures is a complex process, with many parts required. In much of the infrastructure around today, precast concrete plays an integral part. There are many components that might not be visible as part of the construction. One of these is a reinforced precast concrete box culvert. Often used under roads, railways and runways, culverts are a fast, economical, robust and long life solution for many drainage and short-span bridging requirements.

FLEXIBILITY IN DESIGN

Box culverts are available either as an inverted 'U' on a concrete base foundation, or as a U-shaped trough with a lid.

While many authorities have their own specific structural requirements and often their own designs, the minimum standards to which box culverts are designed are contained in AS 1597 Part 1, for small culverts up to and including 1200-millimetre span, and AS 1597 Part 2 for larger culverts from 1500 to 4200-millimetre span.

In most instances, culvert design hinges around standard highway vehicle and rail loads as described in the Austroads Bridge Design Code. Sometimes though, construction considerations on site require that heavy equipment travels over them. This can result in loading conditions much more severe than those expected in service. In these circumstances, either the design must satisfy construction conditions or

provision is made to back-prop the units during construction.

APPLICATIONS IN DRAINAGE...

In drainage structures, culverts can cope with large flows of water where headroom is limited. For an equivalent waterway area to circular pipes, box culverts can be configured so they have less impact on upstream water levels and downstream flow velocities.

An innovative use of culverts can be seen in Fiona Stanley Hospital in Perth, where National Precast Member Humes supplied their innovative purpose-built storm water system. The system is made up of individual precast culvert modules that can be connected into a flexible configuration to meet specific project requirements. In Fiona Stanley's case, the system's storage design included a grated side opening to allow extension and interaction of the basin with nearby bushland during high flows. It has a capacity of 3,708 cubic metres.

...AND IN BRIDGES

Culverts are also ideal in road and rail structures, where they are designed to take heavy wheel loads with no fill required above the structure. This provides instant bridging with minimum traffic disruption.

If fill is placed over the culvert, the superimposed load lessens because the fill will distribute the load over a larger area. The fact that traffic may use such an installation immediately after placing compares favourably with any in-situ construction and most alternative materials,

which require compacted fill in place before loading is applied. Further, in-situ construction, time is required for curing prior to stripping forms ready for use.

Special culvert structures have been built in Australia for spans up to seven metres. Standard combinations of spans and leg-heights - as specified in AS 1597 - are available from most culvert manufacturers.

The Wheatstone Project for Liquefied Natural Gas has seen National Precast Member PERMAcast manufacturing more than 1000 individual box (trench) culverts in its West Australian factory. Originally the plan had been to cast the culverts in-situ, but PERMAcast's in-house engineers developed solutions to enable cost savings and efficiencies by manufacturing off-site. The result was 560 lineal metres of trench culverts being manufactured and lined with a perlite insulating concrete. For this project, each culvert average 19 tonnes and was cast with variable falls.

THE LOGICAL SOLUTION FOR DIFFICULT SITES

Precast box culverts are an ideal solution where site conditions are difficult. The off-site manufacture means less disruption on site and easier installation in challenging locations including where excavation is in rock. In these cases, installation of a box culvert requires minimal excavation and backfill.

National Precast member provide precast culvert solutions for projects across the country. For more information visit <http://nationalprecast.com.au/find-a-precaster-civil-elements/> ■