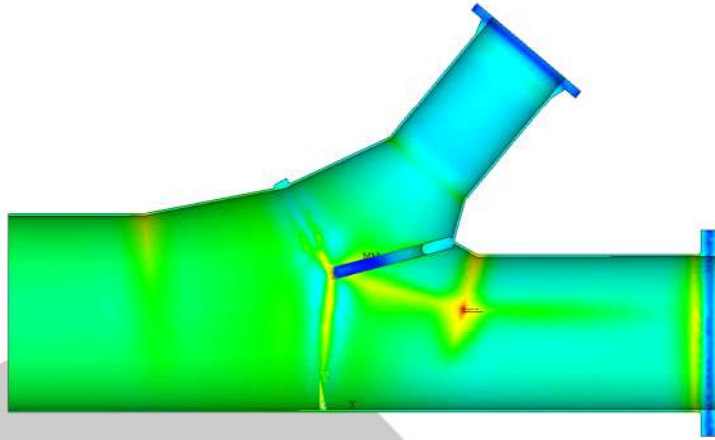


DESIGN AND MANUFACTURING

Bifurcations and other complex pipe junctions frequently form an integral part of a hydro scheme. HydroWorks uses the modern method of internal reinforcing where appropriate, and computational fluid dynamic (CFD) analysis to ensure we have stable flow and low head losses. World leading capabilities in ANSYS and SolidWorks Cosmos FEA, and extensive knowledge of pressure vessel design form the basis of this HydroWorks capability.

HydroWorks has designed and manufactured over 20 bifurcations.



3.0M Highbank Bifurcation



HydroWorks undertook the design and manufacturing support of the 3000mm diameter bifurcation at Highbank pump station - the largest in New Zealand. A bifurcation was needed as the pump station utilised the existing Highbank hydro station penstock to pump water back up the hill into the headrace.

Two unusual design requirements were present in this project:

1. The downstream pipe exit was designed with ovality and reinforced to de-stress the existing concrete anchor. (which was cracking)
2. It was necessary to move the existing penstock 40mm upslope. (a design project in its own right)

PELTON TURBINE DISTRIBUTORS

Pelton turbine distributors represent a special class of bifurcation, where the requirement for low head losses and uniform flow entering the nozzles is critical.

HydroWorks has the experience to manufacture distributors with up to 6 nozzles. The adjacent picture shows the 6 jet arrangement for Amethyst (8MW), commissioned in 2013.

