

# Hydraulic Structures

## Meeting client needs with high standards and innovative hydraulic structure designs

AMEC is noted for its commitment to quality water resources engineering, including the design of hydraulic structures. Our team has received awards for its practical, cost-effective approach in solving client problems. AMEC has significant experience in analysis and detailed design of hydraulic structures such as:

- Hydraulic and Structural Design of:
  - Conveyance Canals on a Wide Range of Conditions (unstable)
  - Drop Structures and Control Structures (weirs)
  - Dams
  - Low Level Outlet and Hydroelectric Facilities
  - Spillways
  - Syphons
  - Flood Levees
  - Floodwalls
- Numerical Analysis of Hydraulic Structures



AMEC staff members have expertise in confirming the capacity and structural condition of existing facilities. Some of this work includes:

- Structure Rehabilitation and Restoration
- Dam Safety Analysis and Inspection
- Dam Breach Modeling and Inundation Mapping
- Construction Inspection and Management
- Commissioning and Decommissioning
- Materials Testing

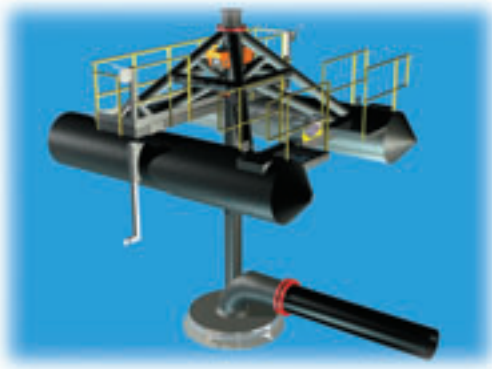
AMEC provides planning, design and construction services for the development and operation of hydraulic structure projects. AMEC can provide full project service from feasibility level study to final commissioning. Some examples of the project phases we have worked on are listed below:

- Project Management
- Planning and Feasibility Studies
- Investigations and Baseline Studies
- Economic Analysis
- Detailed Designs
- Contract Document Preparation
- Construction Inspection
- Project Commissioning
- Operational Support
- Monitoring

Our designs incorporate innovative solutions that minimize the cost of project development. Following are brief descriptions of projects undertaken by AMEC.

## Syphons

The following picture is a 3-dimensional ACAD graphic produced for construction of a floating portable syphon for use in a mining operation. The system is pulled by boat to any location in a water body and the inlet elevation can be set to remove water from any strata.



Syphons are a simple and reliable alternative to otherwise more complex and costly pumping systems or low-level outlet works. The structure consists of a pipeline constructed over the top of an embankment or high topographic feature, connecting a source pond to a receiving pond or channel. The syphon action is initiated by removing air from the pipeline. Once primed, the syphon flow rate can be controlled or stopped by a conventional gate valve or other devices. Repriming is not required if the syphon has not been drained. AMEC staff have successfully applied this concept in several projects.

## Fish Ladder

The original dam timber structures were constructed in 1952. These were in poor condition and considered to be hazards to the safety of the dam. The original chute type fish ladder was marginally effective in allowing salmon to migrate further upstream. AMEC was retained to conduct geotechnical investigations and design a new spillway and fish ladder structure and low level outlet for the dam. A combined spillway/fish ladder configuration was chosen as shown in the photo.

The reinforced concrete structure consists of a chute with a series of ten equally spaced vertical cross walls. Each wall includes a notched weir section, which serves as the fish passage during normal flow conditions. During higher flow conditions, fish passage can occur across the entire width as water spills over the cross walls.



## Clients

AMEC is dedicated to providing a high standard and comprehensive set of services to clients worldwide. Our clients include the following:

- Federal Government
- State/Provincial Governments
- Environment Canada/EPA
- World Bank
- Irrigation Districts
- International Oil Companies
- International Mining Companies
- Department of Fisheries and Oceans Canada

For a list of office locations, company contacts and other services refer to:  
[www.amec.com/earthandenvironmental](http://www.amec.com/earthandenvironmental)