

Awards

Award of Excellence 2011

Municipal Engineering Category

Consulting Engineers
of British Columbia

District of Kent
Duncan-Bateson Pump Station

Award of Merit 2011

Municipal Engineering Category

Consulting Engineers
of British Columbia

Abbotsford Mission Water &
Sewer Services
Dickson Lake Upgrades

Award of Excellence 2009

Municipal Engineering Category

Association of Professional
Engineers & Geoscientists of
British Columbia

Award of Excellence 2009

Municipal Engineering Category

Consulting Engineers
of Canada

District of West Vancouver
Eagle Lake Membrane
Water Treatment Facility

Award of Excellence 2009

Municipal Engineering Category

Consulting Engineers
of British Columbia

Gold Award 2009

Water & Wastewater Category
American Council of Engineering
Companies of Washington

Honor Award Local Civil Engineering Achievement 2009

American Society of
Civil Engineers

King County, Washington State
Design/Build of the
Brightwater Marine Outfall



Head Office - North Vancouver

Opus DaytonKnight was incorporated in British Columbia in 1965. The company is largely made up of technicians and professional engineers. Management rests with senior engineers who are active in the day-to-day activities of the organization.

Fields of specialization include sewage collection, treatment, disposal, and reclaimed water reuse; water supply, treatment, and distribution; stormwater management; solid waste management; SCADA systems; emergency response planning, trenchless technology; and asset management.

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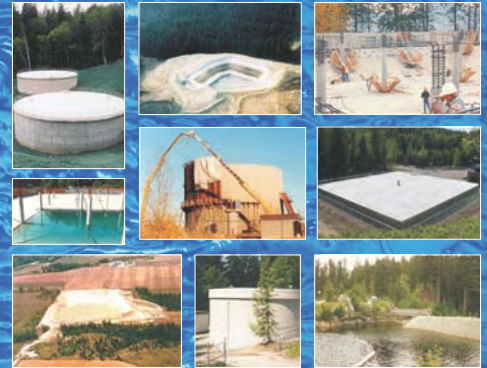
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*As of 15 Nov 2010 Dayton & Knight Ltd. became Opus DaytonKnight Consultants Ltd.

Reservoirs



OPUS DAYTONKNIGHT



General

Since 1965 DaytonKnight has assisted in the development of traditional and innovative site-specific solutions for client's needs regarding reservoir facilities. The Company has experience with over 100 reservoirs.

Usage

Reservoirs provide an extra, readily available, relatively large volume supply source to that which exists in water mains.

This volume is available for:

- Supplying the peaks in water demands
- Fire fighting requirements

Reservoir Sizing

Various formulae exist for the sizing of reservoirs. A typical formula is:

Volume = Fire flow + 25% of the Peak Day Demand.

This sizing will enable the reservoir to meet fire flow requirements along with peak hour demands which are usually 1.5 to 4 times the Peak Day Demand.

Materials

Typical materials are:

1. Clay lined and open top
2. Woodstave
3. Concrete
4. Steel

Options 1 and 2 are usually associated with older reservoirs.

Concrete is typically the most economical solution, particularly if the reservoir is buried or partially buried.

Steel reservoirs can be cost effective in remote areas where the supply of concrete can be a challenge or where relatively tall reservoirs are required.

Shape

Shape options are:

- Rectangular
- Irregular
- Round
- Square
- Inverted Pyramid
- Elevated

The inverted pyramid design has been pioneered by Dayton and Knight Ltd. Typical advantages of the inverted pyramid design compared to more conventional shapes are:

- Lower cost
- Less exposed to view
- Better fire protection
- All of upper area can be inspected without draining all the reservoir



Concrete Reservoir with Architectural Finishing.
City of Prince George
Danson Reservoir



Standpipe Coated Steel Water Storage Reservoir.
Kispiox Band



Inverted Pyramid Shape.
City of Penticon
Duncan Avenue Reservoir



Lining Repairs where Large Voids were Uncovered.
District of West Vancouver Crosscreek Reservoir



Leakage Repairs to Correct Freeze Thaw Action.
City of Prince George
La Freniere Reservoir



Leakage Repairs Using a High Density Polyethylene Liner.
District of West Vancouver Upper Nelson Reservoir



Seismic Repairs of Existing Reservoir Facilities.
City of Campbell River Evergreen Road Reservoir



Solar Powered SCADA Security Monitoring.
City of Abbotsford
Dickson Lake Reservoir



Monitoring Reservoir Level by SCADA.
District of Houston

Repairs

Repair work we have been involved with includes:

- Lining Repairs. If a lining joint has been leaking, the subgrade can wash away, leaving a void below the slab. The void can be repaired by either injecting grout through a pre-drilled hole, or if an extensive void has formed, the slab can be removed and a repair section poured in place. If the development of void spaces is not rectified, then catastrophic failure of the reservoir structure can occur
- External leakage through walls can result in freeze-thaw action. If left unattended, reinforcement corrosion will subsequently occur. Cases of repair to severely damaged areas can involve removal of the damaged area and the recasting of a replacement section
- Rather than repair the numerous flexible joint material which can become brittle after 15-20 years, it can be more economical to line the reservoir with a high density polyethylene liner
- Many existing reservoirs do not meet current seismic codes. Dayton and Knight Ltd. can assist in providing seismic upgrade solutions

SCADA

- Real-time and historical monitoring of operations
- Remote process control (raising and lowering of reservoir levels)
- Monitoring of security at reservoir facilities including intrusion and fire alarms
- Data collection for planning