

INSITE

JAGGER HIMBS NEWSLETTER

UPFRONT



Jason Balsdon
Director

Jagger Hims' specialty in the earth and environmental sciences provides a strong advantage to our clients who have construction projects.

Our knowledge and expertise allows us to help our clients arrive at solutions that best meet their objectives and budgets. We manage projects from beginning to end with a strong multidisciplinary team of professional geoscientists and engineers, which include geological, geotechnical and civil. Completing our team are technicians and technologists who provide valuable support.

The two projects highlighted in this issue are prime examples of challenging projects in which we developed successful and cost-effective plans to reduce costs for the client and win public confidence. The latter helps garner public support for major projects in the long term.

In Niagara Falls, the new community centre was a particular challenge because it was to be built on earth and boulder fill that was placed there during the building of the Queenston-Chippawa Power Canal in the early to mid-1900s.

Foundation design options considered were earth removal, engineered fill and pre-loading, but these had cost and time implications. The final solution was to support the community centre on caissons that extended to the bedrock.

In Glen Acres, a small community just north of Uxbridge, the Region of Durham had to replace private wells and septic systems with municipal services. There was a lot at stake. Not only were the lives of the residents being disrupted, we also had to ensure that any dewatering, depressurization and construction did not affect the groundwater or disturb local creeks and wetlands.

This was a delicate undertaking and required careful planning. Using our

...please see over

BUILDING CHALLENGE



Project Manager David Schram of Urban and Environmental Management Inc. and Jagger Hims Branch Manager Steve Ash discuss site details.

COMMUNITY CENTRE MOVES FORWARD

WITH JAGGER HIMBS GEOTECHNICAL SUPPORT

Building the Niagara Falls Community Centre was a considerable gamble, although the odds of success turned out to be greater than those at nearby casinos thanks in part to the expertise of Jagger Hims.

The 100,000-square-foot facility is being built on fill material that was deposited from the Queenston-Chippawa Power Canal that was constructed more than 50 years ago. "It is the most complex site we've ever built something on," says Project Manager David Schram of Urban and Environmental Management Inc., who is relying on Jagger Hims Limited to help complete the \$25-million project on time and within budget.

The community centre, when completed this August, will be a cornerstone in the city's cultural, recreational and community commitment and will house an aquatic centre with two pools, gymnasium, library, community group offices, the YMCA and the city's parks and recreation department.

Steve Ash, Project Engineer and a Branch Manager with Jagger Hims, said the site was particularly challenging because spoil dredged from the power canal created a base of clay, rock,

boulders and gravel up to 12 metres (35 feet) thick.

"Removing all the soil from the site would have been too costly and would require fill to overcome grading issues," Steve says, adding that a caisson foundation was used to transfer the building foundation load to the bedrock. "Several boreholes were drilled to characterize site conditions and evaluate design options. We were also involved in construction inspection for QA/QC of materials, and advised on parking lot construction issues. We were involved in the excavation and base design for a new onsite statepark for the City which was a concurrent undertaking."

David noted the project involved several partners, making timing and scheduling an additional challenge. "Steve Ash went the extra mile, which was much appreciated because there were so many areas where we could have had serious delays. Instead we continued to remain on schedule and within budget."

"We chose Jagger Hims for its leadership to help us identify and rectify the complex geotechnical aspects of this project," David adds, saying he has had a relationship with Jagger Hims since the company was founded in 1987.

DEWATERINGSOLUTIONS

ENGINEERING WITH A PERSONAL TOUCH

Installation of water and sewer mains in the 30-year-old community of Glen Acres near Uxbridge posed some serious challenges for Durham Region.

The enclave of 150 homes is situated in the environmentally sensitive Oak Ridges Moraine. The failure of septic systems in the area meant that wells were becoming contaminated, making the project a necessity.

Durham Region Hydrogeologist Beata Golas said it was a complex and contentious project that required an engineering consulting firm with solid experience and good people skills.

"We needed a consulting firm that had engineering knowledge of wells because the

area is in the Oak Ridges Moraine and we needed to know if dewatering was required, which it was," noted Beata.

"We also needed a firm that was good in diplomacy and that could deal with the residents because we were disrupting peoples' lives during construction and upsetting those who opposed the expense of the new services."

To complete the project, there was a need to not only dewater the area but also to depressurize a subsurface aquifer during construction, and to monitor and control pumping which affected resident's wells in the short term.

Finally, all of this information had to be presented in a professional and meaningful way to

residents, whose lives were significantly disrupted during the construction stages.

"Jagger Hims has done a lot of work with Durham in the past. They have always proven to be professional and conscientious. In Glen Acres, we heard very little from the residents, which means Jagger Hims had everything well under control.

"In fact, we received a letter from one of the homeowners praising Jagger Hims. He thanked them for a job well done, which is something you don't often see when dealing with such a contentious project," Beata adds.

CONSTRUCTION DEWATERING

Construction projects for underground services and building foundations may require excavations that extend below the groundwater table.

Without proper planning and preparation, soil instability in these situations will cause significant construction challenges, delays and potentially high costs. Problems such as hydraulic sloughing or soil heaving due to artesian under-pressures can be avoided by proper dewatering or depressurizing saturated formations in advance of construction.

A subsurface investigation is a standard requirement for civil engineering projects to assess soil and groundwater conditions as input to design and construction procedures.

In areas where groundwater is a concern, the investigation should address piezometric water pressures at depth and physical characteristics of the subsurface materials, including hydraulic conductivity – a soil property that depends on the pore size and interconnectivity of the materials.

Supplemental pumping tests may be required to design dewatering systems and provide technical input for regulatory approvals. Since most large dewatering jobs will require pumping rates in excess of 50,000 L/day, a Permit To Take Water is required in Ontario from the Ministry of the Environment.

Other government and municipal agencies may be involved when working in sensitive areas, such as sites adjacent to existing development or sensitive surface water receptors, for example.

Impact assessments of pumping effects should consider adjacent water use and resources, both from pumping / interference and discharge perspectives, and the potential for soil settlement to occur.

Selection of the appropriate dewatering method depends on water levels and drawdown objectives, and the types of materials in the dewatering zone. Techniques include the use of filtered sumps within excavations, conventional well-points, bleeder wells for artesian pressure relief, eductor systems for deep drawdown, high capacity pressure relief wells, and vacuum well-point and electro-osmotic systems for fine soils.

Specialty contractors are usually retained to install and operate well-based dewatering systems, and professional services are necessary for hydrogeological performance and impact assessments as well as monitoring.

Jagger Hims has participated on a number of successful dewatering and groundwater depressurization projects for private and municipal clients. Our staff would be pleased to respond to any questions or supply additional information upon request.

UPFRONT

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multidisciplinary approach we were able to make accurate impact predictions that successfully mitigated public concerns by minimizing impacts to the local environment.

Our expertise in subsurface conditions, our ability to make accurate impact predictions and sound advice allows our customers to make good decisions, gain the confidence of their stakeholders and complete projects on time and on budget.

OUR LOCATIONS

NEWMARKET (905) 853-3303	1-800-263-7419
ST. CATHARINES (905) 687-1771	1-800-668-2598
WINDSOR (519) 974-5887	1-800-545-5406
NORTHVILLE, MICHIGAN (248) 449-4051	1-888-588-4010
PETERBOROUGH (705) 743-6850	1-866-818-8366
COLLINGWOOD (705) 444-2788	1-888-285-1272



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