

# HGC ENGINEERING –ACOUSTICS, NOISE AND VIBRATION CONSULTING

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## Abstract

HGC Engineering is one of the largest and most experienced, dedicated acoustical consulting firms in Canada. Our principal engineers have each been consulting in acoustics for 25 to 35 years and, with a team of engineers, technologists and scientists from a wide variety of disciplines, the firm offers a comprehensive range of expertise spanning all aspects of acoustics and vibration.

**Keywords:** noise, vibration, acoustics, built environment, industrial noise, renewable energy, wind power, vibration, expert witness, peer review

## Résumé

HGC Engineering est un des plus grands bureaux d'études en acoustique et vibrations au Canada. Avec ses ingénieurs principaux, qui ont entre 25 et 35 ans d'expérience dans l'industrie, et son équipe d'ingénieurs, de techniciens, et de scientifiques issues de disciplines variées, l'entreprise offre une gamme complète d'expertise dans tous les aspects de l'acoustique et des vibrations.

**Mots clefs:** bruit, vibrations, acoustique, bruit de bâtiment, bruit industriel, énergie renouvelable, énergie éolienne, témoin expert, examen par les pairs

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## 1. Introduction

HGC Engineering is one of the largest and most experienced, dedicated acoustical consulting firms in Canada. We are an employee-owned, Canadian-based acoustical consulting group that was founded in 1994. At that time, the regulatory environment for noise and vibration in Ontario was rapidly evolving and growing ever more stringent (a scenario that still holds true today). The province was one of the first jurisdictions in North America to designate noise as an environmental pollutant with the potential to impact community health and well-being. We have been fortunate to leverage our experience working in this environment of intensive noise regulation into a worldwide reputation in the measurement, assessment and mitigation of acoustics, noise and vibration challenges.

## 2. Global Services

HGC Engineering has worked internationally to provide site-wide noise assessments and mitigation solutions of large petrochemical and refinery complexes such as the Braskem-Idesa, Etileno XXI Facility, in Coatzacoalcos, Mexico (Figure 1), HGC Engineering provides services in construction vibration monitoring; whole building vibration isolation and analysis; as well as isolating the impact of vibration on hypersensitive equipment used in healthcare and scientific institutions. The vibration investigation projects have included the KK Hospital in Singapore, the Riverbend Residences in Chicago, and Canary Wharf in London, UK.



**Figure 1.** Braskem-Idesa, Etileno XXI Facility, Coatzacoalcos, Mexico

## 3. Acoustical Services for Condominiums

Toronto is currently the “Condominium Capital” of North America and HGC Engineering provides comprehensive acoustical consulting services for more than a hundred projects in the city, its suburbs and well beyond. Notable projects include The Aura at College park, Canada's tallest and largest residential building at 78 floors high; and Absolute World (Figure 2), a two tower, 56-storey residential development that was, in 2012, judged to be the best tall building project in North America by the respected International Council on Tall Buildings and Urban Habitat. Many of the high-rise developments have included ancillary blocks of townhouses. In Ontario, HGC Engineering has also been involved in the Tarion Bulletin 19R review process since its inception.

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**Figure 2.** Absolute Towers, Mississauga, Ontario

#### 4. Acoustical Services for Commercial Projects

HGC Engineering has also participated in commercial projects that have added to the urban skylines of major cities, both in Canada and around the world. Office tower projects in Canada include: The Bay Adelaide Centre East and West, in Toronto; and the Tour Deloitte in Montreal, both of which are the first office buildings in their respective cities to be LEED Platinum targeted. International Projects include The Goldman Sachs office tower in Jersey City, (which at 42 stories is the tallest building in New Jersey); and the Manama's Bahrain Financial Harbour Complex (The site's twin-towers are the tallest structures in Bahrain – Figure 3).



**Figure 3.** Bahrain Financial Towers, Manama, Baharain

#### 5. Other HGC Engineering Projects

The company also provides ongoing consulting as part of both Planning, Design, Compliance (PDC) and Design-Build (DB) teams on many P3 projects that include large scale, complex and often LEED targeted developments such as healthcare, academic and civic institutions such as the Papadakis Integrated Sciences Building at Drexel University, Philadelphia; the MaRs Discovery District in Toronto, and the Edmonton Clinic Health Academy at the University of Alberta in Edmonton. We are also involved in major infrastructure projects: from roads, railways, highways, tunnels, and bridges to sewage, potable water, power, and oil and gas distribution systems. The company has contributed to many land-use studies for mixed-use, master-planned communities including the Waterfront

Revitalization in Toronto and The Barton-Tiffany Lands Redevelopment in Hamilton. The Barton-Tiffany Urban Design Study, which HGC Engineering contributed to, won a 2015 Hamilton Urban Design Award for Excellence in Community Planning (Figure 4).



**Figure 4.** Barton-Tiffany Lands Redevelopment, Hamilton Ontario

#### 6. Wind Farm Noise Issues

HGC Engineering is extensively involved with the burgeoning global wind energy industry. The company is a leading participant in the adoption of new acoustical measurement standards and techniques related to wind turbine noise. HGC Engineering was the acoustical consultant for Cerro de Hula, the first wind power plant in Honduras and the largest wind farm in Central America. (Figure 5).

Brian Howe, President of HGC Engineering is the current chair of the Canadian Standards Committee on Acoustic Noise Measurement of Wind Turbines. He developed “Wind Turbines and Sound: Review and Best Practice Guidelines” for the Canadian Wind Energy Association (CanWEA). The guide is used extensively by leading industry developers and operators. Brian Howe was part of an expert panel brought together by the prestigious Council of Canadian Academies to examine wind turbine noise and human health.

Recently The Standards Council of Canada (SCC) granted the company lab accreditation for acoustic noise testing of wind turbines in accordance with CAN-P-4E (ISO/IEC 17025:2005) for acoustic noise measurements as per IEC 61400-11 acoustic noise testing standard for wind turbines. This accreditation means that HGC Engineering has demonstrated both the technical competence and management system requirements to consistently produce valid test and measurement results.



**Figure 5.** Cerro de Hula, wind power plant in Honduras