

# Building Design

Novus approaches building design holistically, working closely with architectural and engineering design teams while providing the benefit of expertise in multiple disciplines.

Our acoustical and climate-change work pervades most building types but our service mix and integrated design approach is particularly well suited to Health Care, Laboratories, Higher Education, Institutional and other high-performance buildings where competing requirements for air quality, acoustics, vibration, EMI/RFI and human health need to be balanced, considering energy and water efficiency, safety, comfort and functionality.



**Laboratories**  
**Science & Technology**  
**Higher Education**  
**Institutions**  
**Health Care**  
**Hospitality**  
**Sports & Entertainment**  
**High-Rise**  
**Urban Development**  
**K-12 Education**  
**Transportation**  
**Industry**



## AIR QUALITY

- Exhaust emissions and dispersion
- Contamination of building air supply or outdoor spaces
- Exhaust and air intake design
- Ventilation modelling
- Environmental approval permitting

## SOUND & VIBRATION

- Architectural acoustics
- Building systems noise control
- Sound Isolation & speech privacy
- Environmental noise & vibration impacts
- Building systems vibration control
- Vibration & sensitive equipment
- Construction vibration
- Wind-induced noise

## EMI/RFI

- Site surveys
- Simulation and modelling
- Shielding assessment and design
- Health and safety
- Land Use Compatibility

## SUSTAINABLE WATER SYSTEMS

- Urban Agriculture & Water Management
- Water Resource Forecasting

## WIND & CLIMATE

- Forecast effects of climate change on local environments
- Pedestrian Wind & Thermal Comfort
- Snow Drifting
- Wind tunnel modelling



# Laboratories, Science & Technology

Novus understands laboratory design. We find the balance between competing requirements for air quality, acoustics, vibration EMI/RFI, considering water and energy efficiency, safety, comfort and functionality. Our principals have worked on over a hundred laboratory designs for both new and upgrade construction across the world. These include research, teaching and production facilities spanning universities, private industry (pharmaceutical, biotechnology, microelectronics, petrochemical), governments, national laboratories and health care.

## AIR QUALITY

- Exhaust emissions and dispersion
- Contamination of building air supply or outdoor space
- Optimization of exhaust design
- Air intake design location
- Ventilation modelling
- Environmental approval
- Health and safety assessment
- Guidance on contaminants

## SOUND & VIBRATION

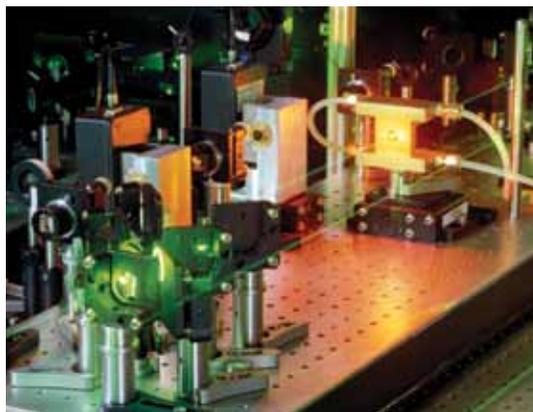
- Architectural acoustics for comfort and productivity
- Building systems noise control
- Sound isolation
- Noise impacts on the building and for environmental permitting
- Environmental vibration impacts
- Building systems vibration control
- Floor dynamics
- Vibration impacts & control for sensitive research or processes
- Construction vibration

## EMI/RFI

- Toolset and equipment siting
- Shield design
- Utility infrastructure planning

## WIND & CLIMATE

- Wind tunnel modelling
- Pedestrian level winds
- Snow drifting
- Effects of global climate change and its interaction with the environment



# Higher Education

Novus understands higher education design. We focus on sound, vibration, air quality and EMI/RFI issues. We also work on wind and climate as it affects building energy models and campus master planning. Our principals have worked on over a hundred higher education facilities for both new and upgrade construction across the world. These include research, and teaching facilities spanning community colleges and universities addressing the design of buildings for the Humanities, Natural Sciences, Professions and Applied Sciences – Engineering, Medicine, Pharmacy, Veterinary Medicine, Law and Business.



## AIR QUALITY

- Exhaust emissions and dispersion
- Contamination of building air supply or outdoor space
- Optimization of exhaust design
- Air intake design location
- Ventilation modelling
- Environmental approval
- Guidance on contaminants

## SOUND & VIBRATION

- Architectural acoustics for sound clarity, comfort and learning
- Building systems noise control
- Sound isolation
- Noise impacts on the building and for environmental permitting
- Environmental vibration impacts
- Building systems vibration control
- Floor dynamics
- Assessment and control of vibration for sensitive research or processes

## EMI/RFI

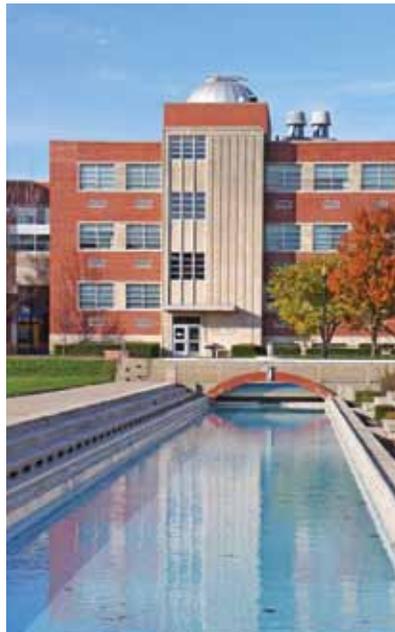
- Health & Safety
- Utility infrastructure planning

## SUSTAINABLE WATER SYSTEMS

- Urban Agriculture & Water Management
- Water Resource Forecasting

## WIND & CLIMATE

- Wind tunnel modelling
- Pedestrian level winds
- Snow drifting
- Effects global climate change and its interaction with the environment





## Institutions

Novus understands institutional facility design. Our practice encompasses acoustics, noise, vibration, air quality, EMI/RFI assessments, wind and climate issues. Novus staff have worked on numerous and diverse institutional design for both new and upgrade construction across North America. These include museum, justice, law enforcement, corrections, civic buildings, community recreation, education and health care and other government/ municipal buildings.

### AIR QUALITY

- Exhaust emissions and dispersion
- Contamination of building air supply or outdoor space
- Optimization of exhaust design
- Air intake design location
- Ventilation modelling
- Environmental approval
- Guidance on contaminants

### SOUND & VIBRATION

- Architectural acoustics for sound clarity, comfort and productivity
- Building systems noise control
- Sound isolation, speech privacy
- Noise impacts on the building and environmental permitting
- Environmental vibration impacts
- Building systems vibration control
- Floor dynamics
- Assessment and control of vibration for sensitive activities or processes

### EMI/RFI

- Health & Safety
- Utility infrastructure planning

### SUSTAINABLE WATER SYSTEMS

- Urban Agriculture & Water Management (green roofs)
- Water Resource Forecasting

### WIND & CLIMATE

- Pedestrian level wind
- Snow drifting
- Effects of global climate change and its interaction with the microclimate



# Health Care

Novus understands health care design. Our guidance on air quality, sound, vibration, EMI/RFI, wind & climate considers the views of the stakeholders involved — the design team, owners, staff and patients addressing comfort, functionality and regulatory requirements. Our principals have worked on private and public sector projects across Canada and the US for both new and upgrade construction. These include facilities for clinical, ambulatory, acute and long-term care, research and teaching.



## AIR QUALITY

- Exhaust emissions and dispersion
- Contamination of building air supply (e.g., Central energy plant, kitchens, ambulance bay, lab, helipad or exterior wellness space)
- Optimization of exhaust design
- Air intake design location
- Ventilation modelling
- Wind tunnel modelling
- Environmental approval

## SOUND & VIBRATION

- Architectural acoustics to promote patient comfort, rest, recovery, staff productivity and retention
- Building systems noise control
- Sound isolation and speech privacy
- Noise impacts on the building and environmental permitting
- Environmental vibration impacts
- Building systems vibration control (e.g., physical plant, loading dock and helipad)
- Floor dynamics
- Construction vibration
- Assessment and control of vibration-sensitive imaging or processes

## EMI/RFI

- Imaging suite siting
- Shield design
- Utility infrastructure planning

## SUSTAINABLE WATER SYSTEMS

- Urban Agriculture & Water Management (green roofs)
- Water Resource Forecasting

## WIND & CLIMATE

- Pedestrian level wind
- Snow drifting
- Effects of global climate change and its interaction with the microclimate



# Hospitality, Sports & Entertainment

Spaces for play have some of the most demanding requirements for occupant comfort and functionality. The outdoor and indoor environmental quality of these spaces directly relate to the microclimate, sound, vibration, air and water quality present. These are significant factors to be considered during design to meet the expectations of patrons and facility managers.

Novus' expertise and experience encompasses a diverse range of issues pertaining to hospitality, sports and entertainment facilities including examples such as thermal or wind comfort, theatre acoustics, hotel room sound privacy, restaurant odours, resort water efficiency and stadia or convention centre floor motion.

## **AIR QUALITY**

- Exhaust emissions and dispersion
- Contamination of building air supply or outdoor space
- Optimization of exhaust design: stack height, exhaust velocities, flow rates and location
- Air intake design location
- Environmental approval

## **SOUND & VIBRATION**

- Architectural acoustics for sound clarity, comfort and performance
- Building systems noise control
- Sound isolation, speech privacy
- Noise impacts on the building and environmental permitting
- Environmental vibration impacts on the building and master plan
- Building systems vibration control
- Floor vibration – occupant comfort

## **SUSTAINABLE WATER SYSTEMS**

- Resort water efficiency
- Water and waste-water quality
- Alternative supply and re-use
- Water resource forecasting

## **CLIMATE CHANGE**

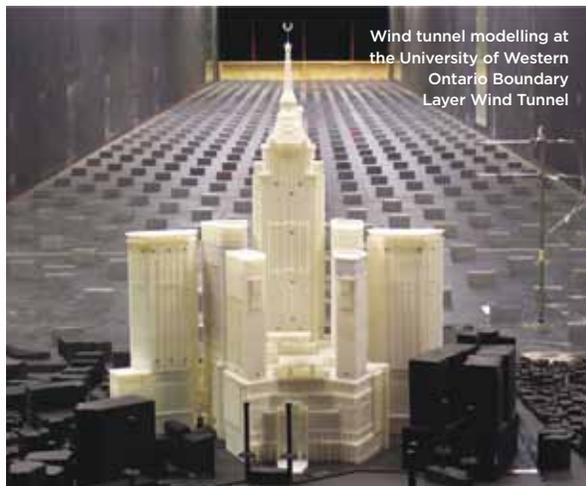
- Forecast effects of climate change on local environments



# High-Rise/ Urban Development

Urban development presents unique design challenges. At Novus, we address issues internal and external to the building including microclimate considerations such as noise, atmospheric pollutants and wind on buildings and surroundings. Novus' work encompasses high-rise developments including residential, commercial and mixed-use as well as large scale master plans for developments and cities.

Using advanced modelling tools such as computation fluid dynamics and wind tunnels, we readily address issues unique to urban and high-rise development such as pedestrian level winds, wind-induced noise and acoustical privacy in high-density development.



## AIR QUALITY

- Ventilation modelling
- Environmental approval

## SOUND & VIBRATION

- Architectural acoustics
- Wind-induced noise
- Building systems noise control
- Sound isolation and privacy
- Noise and vibration impacts on the building and master plan
- Environmental permitting
- Building systems vibration control
- Floor vibration
- Construction vibration

## EMI/RFI

- Health & Safety
- Utility infrastructure planning

## SUSTAINABLE WATER SYSTEMS

- Urban Agriculture & Water Management (green roofs)
- Water Resource Forecasting

## WIND & CLIMATE

- Pedestrian level wind
- Thermal comfort
- Wind tunnel modelling
- Snow and dust drifting
- Effects of global climate change and its interaction with the microclimate