



ASHRAE Ottawa Valley Chapter

- DATE:** Tuesday November 19, 2019
Social: 17:30, Dinner: 18:30, Program: 20:00
- LOCATION:** Centurion Conference & Event Center
170 Colonnade Rd, Ottawa, ON K2E 7J5
- THEME:** Research
- PROGRAM:** Transcritical CO₂ Refrigeration Systems

Learn about the particularities of CO₂ when used in a **refrigeration** system. Explore the different type of CO₂ systems and the advantage of each technology. Learn how to take advantage of the properties of your refrigeration system to save **energy** on heating. Learn how to select the right technology based on the customer requirements and restriction. Quick **overview** on refrigeration regulation and installation requirements for **Canada** and specific regulation for **Ontario**.

SPEAKER: **Frédéric Lavallée-Trubiano P. Eng**
LMP Systems inc

Frédéric Lavallée-Trubiano is the director of engineering of **LMP Systems Inc.** in **Laval Quebec**. The company is a manufacturer of Refrigeration system and specialized in CO₂ refrigeration systems since 2012. Prior to working for **LMP Systems Frédéric Lavallée-Trubiano** was a **mechanical engineering** student at **Polytechnique de Montréal**. His first contact with refrigeration system was during his internship in **Beijing, China**, at **CTC Group**. After the intern, he specialized in **building mechanical** and became a member of **ASHRAE**.

Space is limited so please register online at the link below

Chapter Members: \$48.00	Guests: \$65.00
Student Members: \$35.00	Life or Fellow: \$48.00

<https://ashraeottawa.simplesignup.ca/en/4020/index.php?m=eventsList>

President's Message

As we prepare for the last meeting of 2019, I would like to thank everyone for joining us at the **Centurion Centre**. Thank you to our speaker **Ryan MacGillivray** for presenting for the evening and thank you to **Walmar** for their donation of **Ottawa Senators** tickets to help raise money for the **Research Promotion** campaign.

Congratulations to **John Naef** who was the lucky winner of the **Ottawa Senators** tickets and **Evans Mutua** who won the tool bag donated by **Clark Campbell** from **Belimo**. The monthly raffles help the **Research Promotion** committee reach their annual target. We appreciate all donations that are made to this cause.

Our program meeting is at the

Centurion Center with **Frédéric Lavallée-Trubiano** as he discusses how **CO₂** is used in a modern refrigeration system and what are the advantages and the requirements of a **CO₂** system.

Our theme for **November** is **Research**. We would like to thank all of those that continue to support **ASHRAE** research. **ASHRAE Research** plays an important role to improve the quality of life and to answer tomorrow's questions through research today. **Adam Moons** will be hosting a donor recognition night at the **November** meeting to recognize all of those individuals and organizations that helped make the **2018-2019** campaign such a success. To learn more about our **November** program please go to our website at



President
Aaron Dobson
2019-2020
OVC President
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www.ashrae.ottawa.on.ca and click on the **November** meeting link for more information and to register. Thank you and I look forward to seeing you soon!

ASHRAE Table Top Displays

What better way to display a new **product**, **existing line**, or share great **ideas** than to have a table-top display at our local **OVC ASHRAE** meetings? The **OVC** meetings provide a captive audience in the industry and exposure to **60+** people.

We currently have openings at the **November** meeting and into the **New Year**. Book your display today before they are all sold out!

Please contact **David Michelin** (david.michelin@hts.com) to secure yours today!

Cost for a table-top is **\$225**.

Payment is to be made through the online system prior to the date reserved. Follow the link below:

<https://ashraeottawa.simplesignup.ca/en/3654/index.php?m=eventSummary>



Table Tops
David Michelin
2019-2020
OVC Table Tops
HTS Engineering

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 <p>AMERESCO Green • Clean • Sustainable</p> <p>ROY SAMHABER, P. ENG. senior project manager</p> <p>P: 613 224 7500 x6158 P: 888 283 7267 F: 613 224 3726 rsamhaber@ameresco.com ameresco.ca Ameresco Canada Inc. 106 Colonnade Rd N, Ste 200 Ottawa, ON K2E 7L6</p>	<p><i>Mark Csiffary P.Eng.</i> President</p>  <p>BAXTEC MECHANICAL SERVICES</p> <p>2470 Don Reid Drive Ottawa ON K1H 1E1 mark@baxtec.com www.baxtec.com W: 613-738-7450 C: 613-229-8277</p>	 <p>BELIMO</p> <p>Belimo Americas 5845 Kennedy Road Mississauga, ON L4Z 2G3 Tel: 905-712-3118 Toll Free: 866-805-7089 Cell: 416-659-0823 Fax: 905-712-3124 clark.campbell@ca.belimo.com www.belimo.ca</p> <p>Clark Campbell CET District Sales Manager, Eastern Ontario & Atlantic Canada</p>
<p>ENGINEERING PERFORMANCE...</p> <p>... mechanical, electrical, building automation, environmental, ...</p>  <p>bpa advanced sustainable building systems</p> <p>Patrick St-Onge, P. Eng. LEED AP 613-596-6454 bpa.ca 1960 Robertson Road, Suite 100, Ottawa, Ontario, K2H 5B9</p>	 <p>DILFO MECHANICAL CONTRACTORS</p> <p>DANNY DILLON, GSC PRESIDENT</p> <p>1481 Cyrville Road Ottawa, ON K1B 3L7 Ph: 613.741.7731 Cell: 613.880.8504 Fax: 613.741.9962 danny@dilfo.com</p> <p>DILFO.COM</p>	 <p>Goodkey, Weedmark & Associates Limited Consulting Engineers</p>  <p>Ross McIntyre, P.Eng. Principal, Designated Consultant, Mechanical Engineer</p> <p>1688 Woodward Dr., Ottawa, ON, Canada, K2C 3R8 Telephone: 613-727-5111 ext. 239 Fax: 613-727-5115 rossmc@gwal.com</p>

What You Missed

The **October** program meeting of the **2019/2020 ASHRAE** season was held at the **Centurion Conference and Event Center** on **Colonnade Road**, and the theme for the evening was **Students**.

The meeting was attended by **forty-five** guests, which consisted of **thirty-one** members, **six** guests and **eight** students. The program for the evening was **Hydronic System Heat Transfer**, presented by **Ryan MacGillivray**. A tech session was delivered by **Joel Primeau** on **Hydronic Systems 101** before the meeting. **Joel** will be presenting several tech sessions in this upcoming **ASHRAE** year.

President **Aaron Dobson** called the meeting to order. Aaron introduced the **Executive, Board of Governors** and **Chapter Chairs** and **Volunteers**. Secretary **Ryan Dickinson** introduced the guests for the evening. **Andrew Brown**, the membership promotion chair, welcomed three new members to the Chapter.

Michael Callaghan, student activity committee, thanked all the students who came out tonight and the **ASHRAE** members who helped sponsor student meals. Coming up in future events is the student design team which includes members from **Algonquin College, University of Ottawa** and **Carleton University**, with mentor **Joel Primeau**. On **December 6th**, the student activities committee will be taking a group of **Earl of March High School** students to **Modern Niagara's** shop for a tour. **Michael**

also thanked the students from **CEGEP** for their table top, who brought their project of a heating or cooling system that demonstrates the heat transfer from water to air.

President **Aaron Dobson** reminded everyone that this is the second year that the chapter will be awarding a **\$3,000 Student Scholarship**. The deadline is in **December**, and students can apply through the **ashrae.org** website. This **February**, there will be a joint **ASHRAE & MCA** booth at the **OCA Trade Show** geared towards high school students entering the industry.

Adam Moons, President-Elect and **Research Promotion Chair**, talked about the benefits of contributing to **ASHRAE** Research and how the money raised within our region stays within our region, funding several projects at **Carleton University** and the **NRC**. The Chapter has also started a new **Endowment Fund** for the continuing support of the **YEA** leadership program. To date, the chapter has raised over **\$11,000** out of our goal of **\$34,600** for the year. Adam thanked everyone for their generous contributions.

Joe Della Valle talked about the stroke play golf tournament. There were **22** people in attendance, and the champion from the tournament was **Trevor Thomson**.

Upcoming events include the **Ottawa 67s** game on **October 25th** with **YEA**. **Michael Callaghan** talked about the upcoming **ASHRAE**



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Ryan Dickinson
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bowling tournament at **Merivale Bowling Lanes** on **Wednesday November 27th**, and **Adrienne Mitani** talked about the upcoming **Women In ASHRAE** event on **Thursday October 24th** at the **Clocktower Brew Pub** in **Westboro**. **Trevor Thomson**, CTTC Chair, talked about the first seminar of the year on **Fundamentals of Air System Design** taking place on **October 16th**.

Dinner was an assorted buffet with cake and coffee served for dessert.

Raffle tickets were sold to win two tickets to the **Ottawa Senators** vs. the **Detroit Red Wings** donated by **Walmar Ventilation**. **Clark Campbell** from **Belimo** had also generously donated a Belimo bag. A total of **\$520** was raised for **ASHRAE** research. **John Naef** was the lucky winner of the **Senators** tickets, and **Evans Mutua** was the lucky winner of the **Belimo** bag.

President **Aaron Dobson** announced the program topic for the evening, **Hydronic System Heat Transfer**, and introduced the speaker, **Ryan MacGillivray** from **Saskatoon**. **Michael** works for **Daniels-Wingerak Engineering Ltd** as a **Principal Engineer**.

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Ryan started off by talking about heat transfer fundamentals and how it relates to hydronic systems. All matter has internal energy generated by the movement of molecules. The amount of internal energy can be labelled as the object's heat. We measure this by the temperature of the object. All systems try to reach a thermal equilibrium by equalizing the temperature of the components with the surroundings. Heat transfer is therefore dependent on the change in temperature. There are three forms of heat transfer, **conduction**, **radiation** and **convection**.

- **Conduction** is only through solids and is dependent on the temperature difference, material property (conductivity), area, and thickness in the direction of heat transfer.
- **Radiation** is heat that travels at the speed of light, travels by line of sight and can be reflected. It is dependent on the temperature difference, area, and material property (emissivity).
- **Convection** is the third type of heat transfer, and deals with the motion of a liquid or gas, natural convection or forced convection. Natural convection involves buoyancy, while forced convection involves motion created by a pump or fan. Convection is dependent on the temperature difference, area, and fluid properties (density, velocity, specific heat).

Most heat transfer involves all three modes, conduction, convection and radiation. **Energy** is conserved between systems according to the **First Law of Thermodynamics**. The change in internal energy can be measured by the enthalpy of the object. **1BTU/HR** is the amount of energy required to heat **1lb** of water **1 degree Fahrenheit**.

Hydronic heat transfer can be calculated by **$Q = 500 \times GPM \times \Delta T$** . This equation only applies

for water at **20 degrees**. Density and specific heat change as the fluid and temperatures change. For air, the density and specific heat is a lot less, so the heat transfer is a lot less. **Sensible heat transfer** can be calculated as **$Q = 1.08 \times CFM \times \Delta T$** . A lot of systems are designed around a temperature change of **20 degrees Fahrenheit**.

There is a limit to the change in temperature that can be reached by increasing the flow. As the flow rate increases, the temperature does not change proportionally. There is a limit to how much heat transfer is available for a system. As the flow rate is increased, noise and pressure drop become a concern. Typical maximum flows for noise is **4ft/sec**, and for pressure drop is **4ft/100ft**.

Ryan asked why choose a hydronic system? **Water** is a very good heat transfer medium. It has much greater heat transfer capability than air, it is easier to install smaller pipes in a system than larger ducts to get the same heat transfer, water is safe to use and is readily available, and it's easy to make piping changes to the system for zoning.

Typical heating supply temperatures are **210F, 180F, 160F, and 110F**; typical chilled water temperatures are **45F, 60F, maybe even 25F**. Domestic hot water production needs over **160F**.

Originally, **210F** was based on wood fired boilers with no temperature control. With the transition to natural gas, controlling the burning process allowed the water temperature to be controlled to **180F**. More recently, there's been a shift away from high temperature boilers to low temperature boilers, which offer better control and efficiency when the return water is below **130-134F**. The **130-134F** threshold is when **condensation** begins to occur in the flue gases depending on the amount of **oxygen** in the burner. Condensing

boilers provide the system with extra efficiency. This can be achieved with a supply temperature of **160F** and a **30F** temperature drop.

Europe has been designing around a **20C (36F)** temperature drop for some time. The higher temperature drop allows for lower flow rates, smaller pipe sizes, and smaller pump requirements. Just as there is an upper limit to flow rates, there is a limit to the minimum flow that is practical. Too slow of a flow and it may no longer be in turbulent flow, so the heat transfer will change.

Older hydronic systems can be upgraded to make use of newer technologies and lower temperatures. Heat loss calculations should be confirmed to determine whether a lower average water temperature would achieve the output capacities required with the existing terminal units. Additional terminal units, such as more wall fin piping, may be needed to meet the load with the lower temperatures, or the terminal units may need to be replaced with higher output units, such as **fan coils**.

Ryan concluded his presentation by discussing heat exchanger fundamentals. Heat exchangers transfer heat between mediums. Examples include a boiler which transfers heat from gas to water, or a steam to water heat exchanger.

The three main types of heat exchangers are:

- **Shell and tube**: straight tube, u-tube, horizontal, vertical.
- **Coiled**: typically used for domestic hot water production using boiler water flowing through a coil and domestic water in the main tank.
- **Flat plate**: plate and frame, brazed plate.

Heat exchangers can either operate in **Parallel flow** or **counter flow**; however, most heat exchangers are designed for counter flow because of



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the better heat transfer performance. Heat exchanger performance is dependent on the heat transfer coefficient, area, and log mean temperature difference. **Fouling** inside the heat exchanger

occurs over time and will reduce the heat transfer capabilities.

President **Aaron Dobson** thanked **Ryan MacGillivray** and reminded attendees of the survey which will be

emailed. The next meeting is scheduled for **November 19th** at the **Centurion Conference and Event Center**.

2019 Bowling Social

It's time again for the **ASHRAE Bowling Social!** This year it will be held on **Wednesday November 27th** at the **Merivale Bowling Center** (1916 Merivale Rd, Ottawa, www.merivalebowlingcentre.com).

The format will be three games with 4 people per lane. **7:00pm** start. Please show up at **6:30pm** to register. The entry fee is **\$200** per foursome, or **\$60** per individual. The entry fee includes warm-up, 3 games, shoe rental and plenty of nachos/wings/pizza. Individual participants will be assigned into groups of four.

This is intended to be a social event to promote the camaraderie and fellowship of **ASHRAE**, please consider attending. Numbers need to be finalized by the third week of **November**, so please register early. If you have any questions, or need more information, please don't hesitate to contact:

Michael Callaghan
mcallaghan@master.ca

Payment can be made on the link below.

<https://ashraeottawa.simplesignup.ca/en/5234/index.php?m=eventSummary>



President Elect
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News Update

ASHRAE Recognizes 2019 LowDown Showdown Modeling Challenge Teams

ATLANTA (Oct. 9, 2019) – **ASHRAE** recognized the 2019 **LowDown Showdown** modeling competition teams. The competition was held in conjunction with the 2019 **ASHRAE Building Performance Analysis Conference**, Sept. 27-29 in **Denver, Colo.**

The **ASHRAE LowDown** engages **architects, engineers, designers** and **energy modelers** by working on integrated teams in the creation of effective

workflow and outstanding design in real-world building efficiency challenges.

"The competition not only challenged teams to achieve near **net-zero**, but also to include design and modeling elements to create a **resilient** building capable of withstanding natural disasters and providing prolonged emergency operations," said **Annie Marston**, competition chair.

This year's model building was a 90,000 square foot **city hall** (new construction) located in **San Diego, Calif.** The project involved designing



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a facility that is meant to be a multi-functional building, housing many of the cities vital public services including being an Emergency Operations Center in times of disaster or crisis.



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Teams were evaluated in six categories:

- Energy use
- Teamwork
- Innovative approach
- Creativity
- Workflow
- Presentation

First place and fan favorite were awarded to **C.R.E.A.M.** (Carbon Rules Everything Around Me) for a proposed city hall that can maintain operations for **14 days** during a utility outage to coordinate emergency responses while maintaining critical functions like prisoner **life safety** and **security**. During an event, the building will transition to a setback mode, minimizing energy consumption by relaxing thermal comfort targets. Building systems will then draw energy from a **10,000 kWh battery system** & **427 KW PV array** for power and **10 kgal** potable & **20 kgal** non-potable water storage tanks.

"We saw the **LowDown Showdown** as an opportunity for our team to collaborate across **Built Ecology** offices coast to coast and to experiment using new tools and workflows," said **Jason Lackie**, team captain for **C.R.E.A.M.** "With the wide-ranging scope of this year's competition - encompassing aspects of **energy, water, resiliency, and health and wellness** - everyone had a chance to step up and showcase their expertise while also being challenged to integrate that work with an evolving design. As much as the pallet of tools we drew on helped with this multifaceted

design problem, our team's success depended on our ability to collaborate through obstacles."

Other teams presenting their results are as follows:

Highway to Sustainability – This second place team designed a new **city hall** with a 3-story atrium to provide ample space for **green walls, skylight** and **natural breeze**. The project included a spacious semi-outdoor area for **fitness** activities and the deployment of **EnergyBox**, an in-house web platform which speeds up design exploration by automating processes and encouraging collaboration by effective visualization.

Operation ReSHED – The team's project included elevated walkways to surrounding critical government buildings for quick access to the Emergency Operations Center residing inside the new **city hall**. The vertically massed city hall would be designed not only to transform the skyline, but creates opportunities for resiliency against forecasted disasters, increasing energy efficiency during the regular operation and to provide a safe and healthy environment for the occupants.

Parametric Posse – The team incorporated **parametric** modeling to replace design assumptions made with data-driven simulations to achieve a **holistic** design that exceeds technical requirements, leverages passive strategies, and supports use during emergency situations. Using both **proprietary**

and **open-source** software for the parametric modeling, the base digital model allowed for interface with **energy, daylighting, and climate analysis** tools.

Ulti-Performance - The team's project included assembling an integrated team using a variety of design tools to achieve a **net positive** building designed for comfort, using **dynamic glazing, natural ventilation, and a green roof** outdoor amenity.

Resilience features included underground water cistern, PV and battery storage.

The results were announced at a reception during the conference. See complete project overviews, including team posters on the **2019 ASHRAE LowDown Showdown Modeling Challenge** results webpage.

The **6th annual LowDown Showdown Competition** will take place at the **2020 Building Performance Analysis Conference** and **SimBuild** co-organized by **ASHRAE** and **IBPSA-USA** in **Chicago**.

 <p>Frank Picchione Regional Sales Manager</p> <p> t 800 561 3449 c 514 781 8381 f 800 668 8476 e frank@tamcodampers.com </p>	 <p>Steve Moons Principal</p> <p>Total HVAC Inc 4A – 1050 Baxter Road Ottawa, Ontario, Canada K2C 3P1 Tel.: 613-723-4611 Fax: 613-723-4677 stevem@totalhvac.com Web: www.totalhvac.com</p>	<p>Glenn Jones B.Eng LEED AP BD+C Sales Manager - HVAC Systems</p>  <p>1024 Morrison Drive Ottawa, ON K2H 8K7 613-356-1940 / Cell 514-951-7809 613-820-8111 / Fax 613-820-1414 gjones@trane.com www.trane.com</p> 
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ASHRAE Golf Stroke Play

Hi **OVC!**

The **ASHRAE Stroke Play Golf Championship** wrapped up a few weeks ago. I would like to thank everyone who participated, we had a great turnout of over 20 people.

Congratulations go out to **Trevor Thomson** who was the crowned 2019 champion with a score of 79!!

Thanks again for your support and hope to see you again next year.



**Governor
Joe Della Valle**
2019-2020
OVC Governor
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YEA

Hi **OVC!**

YEA had our first event of the year and a lot of fun was had by all! We would like to thank **Total HVAC** again for sponsoring the event and allowing us to offer a reduced entry rate to our students and members. With the reduced rates we were able to sell out the event in just over two weeks!

For the event, we went to watch the

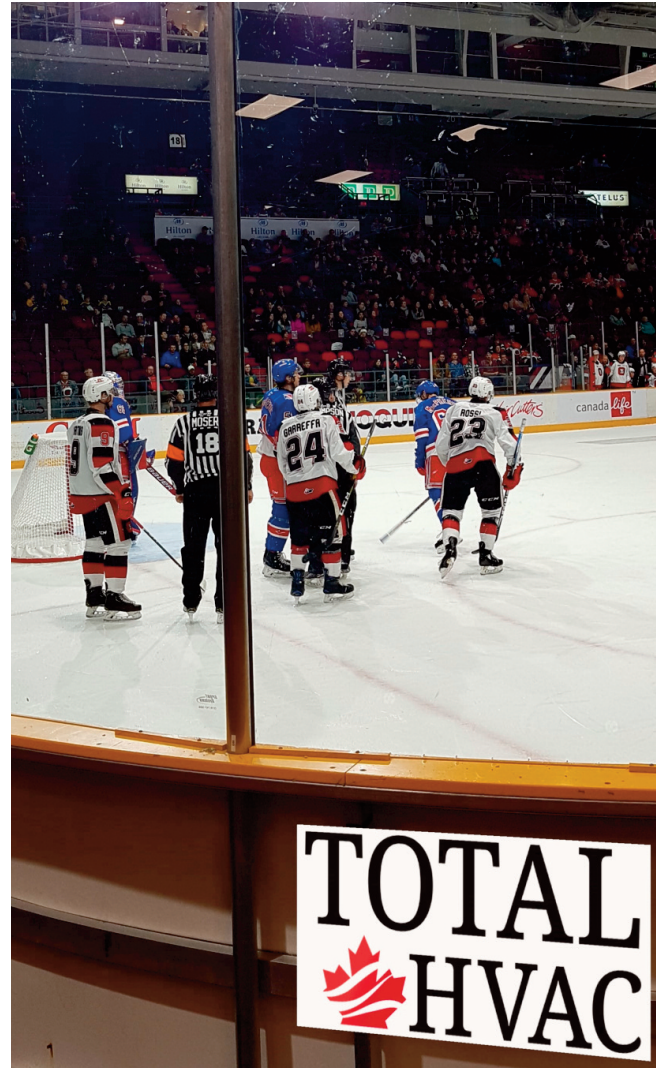
Ottawa 67s play the **Kitchener Rangers**. It was an exciting game that saw the **67s** come back to score the game winning goal in the final minutes. Chapter member **Trevor Scott** and guest **Chris Farnham** provided some entertainment for the crowd as they were on the ice between the 1st and 2nd period to play the on-ice intermission game where **Trevor** walked away victorious.



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2019-2020
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Thank you everyone for your continued support. We will have details on the upcoming events shortly!



Women in ASHRAE

Our first Women in **ASHRAE** event at **Clocktower Brew Pub Westboro** on Thursday October 24, 2019 was a success! Thank you to everyone that came out. Stay tuned for to our next event!



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Student Activities

For the first time ever the **Ottawa Construction Association** has a **youth engagement** section at the tradeshow in **February**. The objective of these dedicated booths is to give high school students, grade **7 to 10**, the chance to try the trades in a safe and fun environment.

The **OVC**, along with the **Mechanical Construction Association**, is putting on the **HVAC, Sheet Metal and Plumbing** booths. This is an exciting opportunity for us to reach out to hundreds of students over two days.

If you are interested in lending a hand at the booth, or helping out with the planning please send me an email at elizabethp@totalhvac.com.

The **Student Activities** committee is going to be reaching out soon to fill up our **Career Fair** for early **2020**. We hope to repeat the success of the past few years and see over a dozen employers and near **200** students. If you are would like to reserve a booth please email **Jayson Bursill** at JaysonBursill@cmail.carleton.ca or **Chris Habets** at chris.habets@condair.com.



Student Activities
Elizabeth Primeau
2019-2020
OVC Student Activities
TOTAL HVAC

E-mail: elizabethp@totalhvac.com

NRC-CNRC Mechanical Engineer

* If you have previously applied on this competition, you do not need to re-apply.

City: Ottawa

Organizational Unit: Administrative Services and Property Management

Classification: RCO

Tenure: Continuing

Language Requirements: Bilingual Imperative BBB/BBB

Note: In the event that no qualified bilingual candidates are identified, NRC may consider English or French unilingual candidates.

The NRC Advantage

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The National Research Council of Canada (NRC) is the Government of Canada's largest research organization supporting industrial innovation, the advancement of knowledge and technology development. We collaborate with over 70 colleges, universities and hospitals annually, work with 800 companies on their projects, and provide advice or funding to over 8000 Small and Medium-sized Enterprises (SMEs) each year.

Screening Criteria

Applicants must demonstrate within the content of their application that they meet the following screening criteria in order to be given further consideration as candidates:

Education

Successful completion of a Bachelor degree in an accredited* Mechanical Engineering program.

*An accredited engineering program consists of studies in engineering leading to a bachelor's degree (or higher level) that fulfills the academic requirements for licensure with Canada's engineering regulators per the rules and practices set forth and administered by Engineers Canada (<http://engineerscanada.ca>).

Membership in a provincial professional engineering association, Professional Engineers Ontario (PEO) / Ordre des Ingénieurs du Québec (OIQ) in Quebec, etc. will be considered an asset.

For information on certificates and diplomas issued abroad, please see Degree equivalency

Experience

- Recent* experience in the design of mechanical systems relating to institutional, commercial or industrial facilities including: heating ventilation and air conditioning (HVAC), plumbing, fire protection systems, etc.
- Recent* experience in the preparation of tender/construction drawings (with the AutoCad software), specifications and associated construction cost estimates.
- Recent* experience interacting with other discipline designers and engineers as well as clients, contractors and other participants working in institutional, commercial or industrial facilities construction or renovation projects.

* Recent is defined as: within the last two (2) years.

Please direct your questions, with the requisition number (7208) to:

E-mail: NRC.NRCHiring-EmbaucheCNRC.CNRC@nrc-cnrc.gc.ca

Telephone: 613-993-0542

Closing Date: Posted until filled

Apply now »

Postuler maintenant »

Advertising

Advertising career opportunities on the **ASHRAE Ottawa Valley Website** makes good business sense. We offer a unique way to reach technical professionals and make your ad dollars work hard for you.

To discuss your needs, contact one of our chapter officers, via our "This Year" page. Increase the impact of your advertising through the **ASHRAE Ottawa Valley Website** today.

Rates for **career opportunities** ads are as follows:

Chapter Member:

\$50/month
\$80/2 months
\$100/3 months

Non-member:

\$250/month

Note: Purchase of additional months will only have a discounted rate if purchased up front. Otherwise the standard rate will apply for additional months.

Placement of an Ad

We suggest that you complete and submit our advertisement form to speed up the processing of your request. If you have provided your e-mail address, a confirmation receipt e-mail will be sent to you for reference.

Please note that ads require prepayment made to the treasurer. Please register and pay through the online system and contact **Adam Moons** (amoons@master.ca) with any questions. Follow the link below for payment.

The ads will appear on the website until the end date for publication provided in the submitted form. To extend the ad, please resubmit the form with the new publication dates and the required prepayment amounts.

Link: <https://ashraeottawa.simplesignup.ca/en/2590/index.php?m=eventSummary>

Link: <https://ashraeottawa.simplesignup.ca/en/2593/index.php?m=eventSummary>

Business Card Ads

You can support your chapter and promote your business by placing your business card in the Capital Communiqué. It will also appear on the chapter website.

The cost is \$250.00 for the year. Please contact **Rod Lancefield** at rod.lancefield@hts.com for more details.

Payment will be made through the online system. Follow the link below for payment.

<https://ashraeottawa.simplesignup.ca/en/2591/index.php?m=eventSummary>

Ads will **now require prepayment**. All of last year's ads will appear in the Communiqué for the first month of this year to allow time for payment for the upcoming year. Ads will be refreshed accordingly in the second Communiqué.

Publicity 2019-2020 Publicity Committee Co-Chair

HTS Engineering Ltd.
E-mail: rod.lancefield@hts.com



Treasurer
Adrienne Mitani
2019-2020
OVC Treasurer
Smith+Andersen

E-mail: adrienne.mitani@smithandandersen.com



Publicity
Rod Lancefield
2019-2020 Publicity
Committee Co-Chair
**HTS Engineering
Ltd.**

E-mail: rod.lancefield@hts.com

2019-2020

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Website

Ryan Dickinson