

Internship at Heritage Conservation Services

NSERC CREATE HERITAGE ENGINEERING PROGRAM EXPERIENCE LARISSA IDE – M.A.SC. CIVIL ENGINEERING STUDENT

My Work at Heritage Conservation Services (HCS)

- Researched
 - Collaboration
 - Review related documents
- Participated in a multi-disciplinary team for the preparation of a draft heritage and sustainability guide
- Presented energy modelling software strengths and limitations









The Experience

Engaging and interesting Challenging Great work environment Great colleagues Meaningful connections

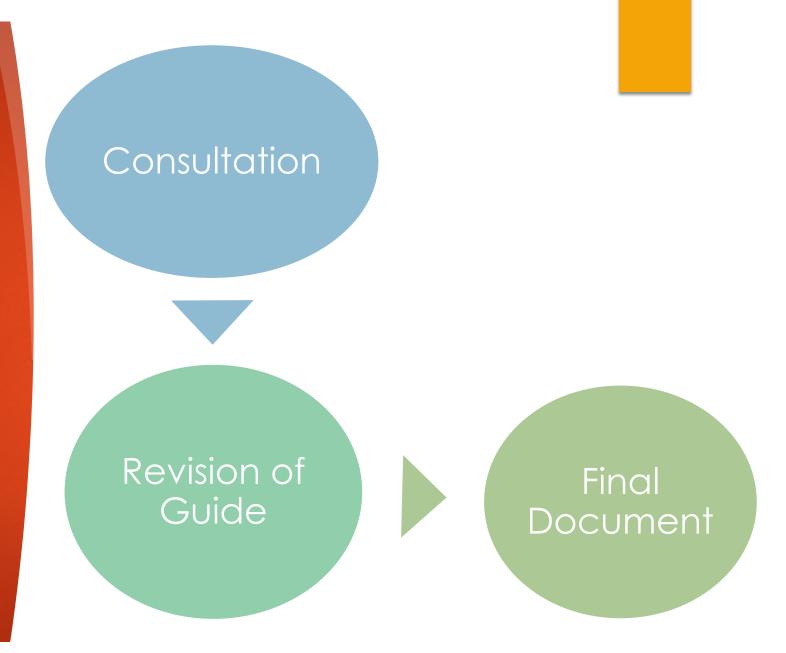
The Process

Occupant & building operator surveys

Evidence Based Decision-Making Process for Optimizing Sustainability of Heritage Buildings and Sites **PSPC & Consultant Multidisciplinary Team & Integrated Design Planning Understanding** Intervening **Ongoing Maintenance** (NPMS Project Inception & Identification) (NPMS Project Delivery) (Before NPMS Project Inception) (After NPMS Project Delivery) **Cultural Heritage** Assessment **Set Project Review by Regulatory Authorities Objectives** Manuals, Schedules, **Define Scope of** Balanced Post-**Building Research** Feasibility Design Construction Audits, Inspections & Investigations Construction **Options Analysis** Work Determine Heritage Sustainability Acronyms Assessment ASHRAF: American Society FR IAR PMP SoR of Heating, Refrigeration, Air-Conditioning Engineers BCR: Building Condition **Sustainability Assessment Cultural Heritage Assessment** ECM: Energy Conservation APMS Deliverable oeliverable, **Set Project Objectives** Review by Regulatory Authorities Manuals, Schedules, Audits, Inspections - Heritage assessment - Environmental Impact: - Integrated Design Approach SoR: Statement of FHBRO and NCC Follow User Manuals & Maintenance Heritage zoning - Indoor environmental monitoring DSR: Designated - Federal and Departmental Policies Site & outdoor environment assessment Substances Report **Building Research &** Conservation Guidelines - Applicable Codes - Resiliency to climate change assessment Utility & Energy Audits Validate & Summarize Previous FHBRO: Federal Heritage - Sustainability Targets Post-Construction **Building Inspections** Heritage Elements Assessments Existing documentation (BCR, - Resources Buildings Review Office FR: Feasibility Report - Periodic Evaluation of Building Occupant & Building Operator Surveys Inventory. Gap Analysis (Additional Assessments) etc.) review GHG: Greenhouse gas Energy Performance & Resource **Determine Heritage Conservation** IAR: Investment Analysis Report Sustainability, Heritage Conservation, Evolution of the building & site Conservation: Approach PMP: Project Management Plan IRT: Infrared - Utility & Energy Audit and Building Science Principles Condition assessment-building - Baseline audits (ASHRAE Level 1 energy, - Determine Primary Treatment Thermography Building Inspection Quality Assurance envelope, destructive and nonutilities, waste, sub-metering) (Preservation, Rehabilitation, Restoration) M&E: Mechanical and Commissioning Commissioning destructive testing, structural/ - Other investigations (IRT, Blower door Apply the Standards and Guidelines **Balanced Options Analysis (continued)** Education & Behaviour Changes Electrical seismic, mechanical and Heritage Recording test, etc.) onstruction Feasibility - GHG Reduction & ECMs electrical, materials, Reports, BIM models, Gap - Embodied energy NCC: National Capital Prequalification of Contractors - Energy Modelling & Calibration (ASHRAE accessibility, site, code Analysis Reports, Building ASHRAE Level 2 Building Energy Audit Commission Level 3 Building Energy Audit) Quality Assurance compliance review Review by Regulatory Authorities Envelope Screening Community Integration NPMS: National Project - Life Cycle Cost Analysis Quality Control Testing Heritage documentation Reports, Condition FHBRO and NCC Management System - Other Project Objectives Mock-Ups & Samples Monitoring (condition, **Balanced Options Analysis** Select Options that O&M: Operation and - Iterative Process User Manuals & Maintenance environmental) Heritage Considerations Best Balance All Maintenance Schedules - Prioritize Sustainability Measures Technical Compatibility Project Objectives Commissioning

Define Scope of Work

Next Steps for the Guide



HOT2000

eQuest

WUFI

EnergyPlus and OpenStudio

ESP-R

Building
Performance
Simulation
Software
Tools



What I Learned



- Sustainability is so much more than just focusing on energy.
- You can get a lot done in four months with consistent hard work
- Collaboration and feedback is key to create something great
- Focus on putting work into learning your craft and you will succeed
- We are not machines, we are human
- Make the most of every opportunity
- HCS is a great place to work!
- Pursue your passion and success will follow

Thank You







- Carleton University
- Laurie Smith and Prof. Santana



Government of Canada

Gouvernement du Canada



- Sanskriti Singh and Ann De Mey
- Heritage Conservation Services (PSPC)