The Toronto Pan Am Sports Centre

Delivering Extra Value to the University Through Partnerships With Outside Organizations: A Case Study
1. Explore the requirements and processes that lead to innovative public and private sector partnerships including City of Toronto, University of Toronto, Pan Am Toronto 2015 and Canadian Sports Institute Ontario

2. Identify sustainable design principles that lead to overall reduction in operational costs including but not limited to: ground source heat pumps and photovoltaics.

3. Describe the creation of a unique, accessible, legacy facility for the University and the Community at large.

4. Recognize the delivery of a legacy project through an alternative finance and procurement model.
Andrew Arifuzzaman
Chief Administrative Officer
University of Toronto Scarborough

David Clusiau
Senior Principal, Architectural Design
NORR Limited Architects and Engineers
AGENDA

• Facility Needs and Drivers
  • Opportunity for Synergy
  • Goals
  • Delivery Method – Design Build Finance

• Design Solution
  • Flexibility
  • Accessibility
  • Green Standards
  • Energy features

• Results
Eastern Gateway to the City of Toronto
UTSC is a comprehensive research intensive university in the U of T tri-campus system

UTSC Currently has +14,000 students

Growth over the next 5 years to 16,000+ students

More then 1,000 Staff and Faculty

Total UTSC student population on Campus will over 20,000 by the end of the decade

The Toronto Pan Am Sports Centre (TPASC) Facility has created a regional draw for Campus for decades to come
University System Growth In Ontario

Ontario Undergraduate Full-time Demand Scenario Projections

2009 Ministry of Training, Colleges and Universities Study
City Building: Our Opportunities
Intellectual, Innovation, Cultural and Sporting Hub

- Teaching and Research
- Athletics Centre
- Retail, Industry & Partnerships
- Places to hang out

- Student Housing
- Public Transit
- Hotel/Conference Centre
- Image
Master Plan: New Intellectual and Cultural Hub

- Cohesive Academic Draw
- Academic/Industry Partnerships
- Residential Development
- Pan Am and Legacy
Programs provided by the following:

• Toronto Pan Am Sports Centre Inc.
• City of Toronto, Parks, Forestry and Recreation
• University of Toronto Scarborough
• National and Provincial Sport Organizations
• Canadian Sport Institute Ontario
Individual Objectives

**University**  Leverage investment to create an athletics facility to meet the needs of student sport and rec requirements for the long-term

**City**  Create a facility that address shortage of facilities in eastern GTA

**Canada**  Create facility that can host TO2015 and provide High Performance training Facility in Ontario
Opportunity for Synergy – Partnerships have Challenges

- Internal Challenges
  - Needing partnerships?
  - Giving up sole control
    - Design
    - Financial
    - Development
    - Systems

- External
  - Variability in stakeholder interests
  - City recreation programs
  - Elite High Performance
  - Near term Games
  - Long term operations
Space Allocation

• All Space has been allocated based on the use of “fields of play”:
  – 31% to the City
  – 17% to the University
  – 30% to High Performance (NSOs and PSOs)
  – 22% to Permit / Rental Groups

• The cost of space is charged back to each group based on the percentage allocated
LEGACY GOALS

• Puddle to podium for all ages and all calibers – from recreational to high performance
• Destination for the local and regional communities
• Signature gateway for the UTSC Campus
• Hub for students and amateur athletes
• Attract secondary benefits -new transit, community investment and student jobs
• Bring multicultural community together through sport and recreation
• Sustainable facility (environmentally and financially) for the long-term
Capital Contributions (TPB $248,000,000)

- Toronto: 22%
- Scarborough: 22%
- Canadian Heritage Sport Canada: 56%
Students Partner with the University

VOTE YES!

VOTE ON MARCH 17, 18, 19 IN THE STUDENT CENTRE

www.scsu.ca/YES
Project Partners

Owners/Capital Funders/Land Contributors

Capital Funders

High Performance Sport Partners
Delivery Method – Design Build Finance

• Responsibility
• DBcF
• Procurement
• Project Specific Output Specifications
• Project management
• Provide Financial backstop for cost overruns
ADDED COMPLEXITY UNIQUE TO PAN AM

- Multiple phases
  - Pre games facility
  - Games facility
  - Post games legacy facility
- Multiple clients
  - Infrastructure Ontario
  - Toronto 2015
  - University of Toronto
  - City of Toronto
Project Team

Design and Construction  Project Management  Ownership
DESIGN CONSULTING TEAM

• Architects
  NORR Limited Architects and Engineers
• Structural Engineers
  Halsall Inc.
• Mechanical and Electrical Eng.
  Smith + Anderson
• Aquatic Design
  Counsilman-Hunsaker
• Landscape Architects
  Janet Rosenberg + Associates
Critical Elements to Deliver the Toronto Pan Am Sports Centre

- Site of facility
- Landfill remediation
- Student support
- Project Delivery via Infrastructure Ontario
- Creating a model for operations
Land Fill and Site Remediation

- 300,000 tones of Landfill removed
- Over 100 Transport trucks per day
- Work started in summer of 2011 and completed in summer of 2012
TPASC Site

• Collocated on City and University Lands
• Built in a way that function in the near-term and long-term
• Master plan Road infrastructure in place
# Project Timeline

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Design Solution
PROGRAMME REQUIREMENTS

- Aquatics Component
  - 2- FINA Regulation 50m Competition Pools
  - 1- 10 m Dive Tank
  - 3200 permanent seats

- Fieldhouse
  - FIBA Basketball
  - FIVB Volleyball
  - 1200 permanent seats

- Fitness Centre
  - Teaching Studios
  - Rock climbing
  - Fitness area

- Canadian Sports Institute Ontario (CSIO)
  - Training facility for elite athletes
  - Administration

- Support Spaces, Administration Offices
  - Daycare,
  - Food Services,
PAN AM REQUIREMENTS

Pan Am Games Mode
  • Swimming and Diving events
  • Modern Pentathlon
  • Fencing
  • 6000 seats (2800 temporary seats)

Para Pan Games Mode
  • Swimming and Diving events
  • Seated Volleyball
DESIGN
SHORT TERM INTERVENTIONS

• Fencing ceiling clearances in the fitness area

• Delayed Change cubicles in the universal change room

• Exits used as temporary games entrances
NO SPACE CREATED JUST FOR GAMES

- Pan Am Family Lounge = Legacy board room
- Pan Am Press Centre = Sports Medicine Clinic
- Pan Am equipment, operating technology, massage and extra doping facilities = storage in the legacy facilities
- Games broadcast and operations compound = post games north parking lot
- Landscaping delayed to allow games access in certain areas
TEMPORARY SEATING

- Temporary seating enclosure for the aquatics venue
  - Roof retained as a permanent feature
  - Roof support designed based on summer roof loading to achieve a column free viewing during the games

Field house designed to achieve required field of play for key events with additional temporary seating for games events

2800 temporary aquatics seating
FLEXIBILITY

• 3 meter deep 50 meter warm up pool with a retractable floor

• baby room and daycare to all participation by additional community members
ACCESSIBILITY

• Responding to the Para pan requirements drove a new level of accessibility
• Flow through elevators
• Hierarchy of corridors
• Seating standards
• Barrier free washrooms, change/ locker rooms
• Universally accessible change rooms
• Accessible change rooms
• Barrier free hardware- push pads
ACCESSIBILITY

• Philosophical approach overcoming cultural and economic barriers
• Community accessibility
  • Building transparency
  • Venues on display inviting participation
• Culturally accessibility
  • Designed to allow privacy and women only swimming
• Educational accessibility
  • Impact of using a university faculty, breaking down barriers to higher education
TORONTO GREEN STANDARDS

• bird friendly frit
  • Shading and energy reducing component
  • Branding and identity opportunity
Environmental Highlights

• LEED Gold
• Brownfield (Soil Remediation – 400,000 MT)
• 95% construction waste diverted from landfill
• 30% of materials in building contain recycled material
• Rain fed irrigation system
• Green roof and Low albedo roof
• 1.3 acres of green roof
• 2.2 acres of PV panels
• (500 Kilowatts)
• 100 geothermal wells
  600 Feet deep
Energy Highlights

- 36% Less energy than MNECB Reference building
  - LED Lighting throughout

- 500 KW Solar PV Array =
  - 75 Homes off the grid

- Geothermal
  - Provides HVAC Efficiency in Pool Dehumidification Process
  - 4000 Tons of GHG Emissions saved annually
Geothermal

• Heat pump chiller is 1st stage of cooling and rejects heat to the geothermal field (320 tons of building cooling load)
• In the winter it is reversed and is used to generate low grade heat for the air handling units
• Given heating dominated nature of the building the building automation system limits winter runtime to maintain thermal balance of the field
• the number and depth of bore holes resulted in a fair number of broken drill bits
• Bed was one of first stages of the construction given the site phasing
• 15 year pay back given present gas prices and significant green house gas reductions
Photo Voltaic

• Late addition to the project
• Structural modifications required to the long spans in order to support the extra loads
• 5,223 sm of solar panels installed Generates 500 kilowats of energy annually
• 15% of building energy needs
• Provides 100,000-150,000 savings annually and has a 14 year payback
Other energy saving features

• Achieves 6 LEED energy points
• High efficiency condensing boilers and magnetic bearing chillers to supplement heat pump chiller
• Enthalpy wheels and heat pipes
• Low grade heat recovery loop for pool dehumidification units capturing waste heat to per heat pool water
• Use of high volume low speed ceiling fans in natatoriums to reduce air handling requirements
RESULTS

• Energy performance
• Community and University Use
• 80% of 1400 students have visited the facility in first year of 14,000
• Planned for 900 community members actual have 2300
• Great facilities - Fast water
• Games results – Women’s Olympic team train in this pool
• Architectural Awards
Records

Over 100 World, National and Pan American records broken in the facility in first 2 years of operation

“a demonstration of the building’s superb competitive athletic venues, fast water and its supportive environment in which elite athletes are encouraged to deliver their best.”

Enroute magazine

Penny Oleksiak
2016 Olympic Gold Medalist
Awards

• 2014 Large Project Achievement Award – Toronto Construction Association

• 2015 Facility of Merit – Athletic Business Magazine

• 2016 Parks and Recreation Ontario Awards – Excellence in Design Award

• 2015 Design Award Winner: Best Stadium Area – Precast / Prestressed Concrete Institute

• 2015 Ontario Concrete awards – Architectural Institutional Building

• 2015 Best Project in Ontario – Ontario General Contractors Association

• 2015 Athletic Business Facility of Merit – Athletic Business Conference & Expo

• 2016 Engineering News Record’s Global Best Project Awards

• 2016 Communication Arts Magazine – Design Environmental, Sports

• 2017 Graphis Magazine – Design Annual
Conclusion

• Widely recognized as the most successfully delivered sports facility of the 2015 Pan Am games

• Delivered on time and on budget

• Result of the specific individuals involved and the collaborative environment that was nurtured from the inception with all participants willing to compromise to achieve an overall success.

• This spirit was carried through the design and construction process and now into the operations phase
Questions
Canadian Sports Institute Ontario

- 5,000 sq. ft of Strength & Conditioning Space
  - State-of-the-art equipment including cardio machines, stationary bikes, weights and lifting platforms
  - Woodway Blade Treadmill – oversized and embedded in the floor for accessibility
- Biomechanics Suite
  - Complete with motion capture cameras and video analysis
- 35m 3-lane track
  - 4 force plates embedded in the track
  - Opens to the 200m track in the greater TPASC facility
- Altitude Chamber (K2Room)
  - Anti-gravity treadmill

Recovery and Regeneration Centre
  - Hydroworx 2000 pool with moveable floor, treadmill, and video analysis
  - Hot and Cold Pools

Sport Lab
  - DXA Body Scan for accurate body composition analysis

Sport Performance Kitchen
  - Instructional and Demonstration Stations
  - Induction cook-tops

Athlete Lounge

Medical Offices

CSIO Administrative Offices, Board room

Meeting space