

Renovation and Reuse

A Plan for Sports and Recreation Facilities



Presented by

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Build New or Renovate?

- Does any building outlive its purpose?
- Are we responding to our new world?
- Are we acting on emotion?
- Do we see opportunities and value?
- How do we put together a plan that leads to the right choice and helps manage the risk?



- **Vision – we need to grow but are not sure how ?**
- **Program – determining our needs**
- **Considerations – Location, Heritage, Sustainability**
- **Discovery – what do we have to work with ?**
- **Costs – how do they compare to new?**
- **Scope – can we control scope creep ?**
- **Implementation – what to watch out for**

Vision

- Can we merge our vision with our building?
- Will it be a compromise?
- What are the risks?
- What is the right thing?
- Are there options in between?
- We need it now and without any affect on our operation.
- What do we want from this change?
- We need function, comfort, community.

Vision

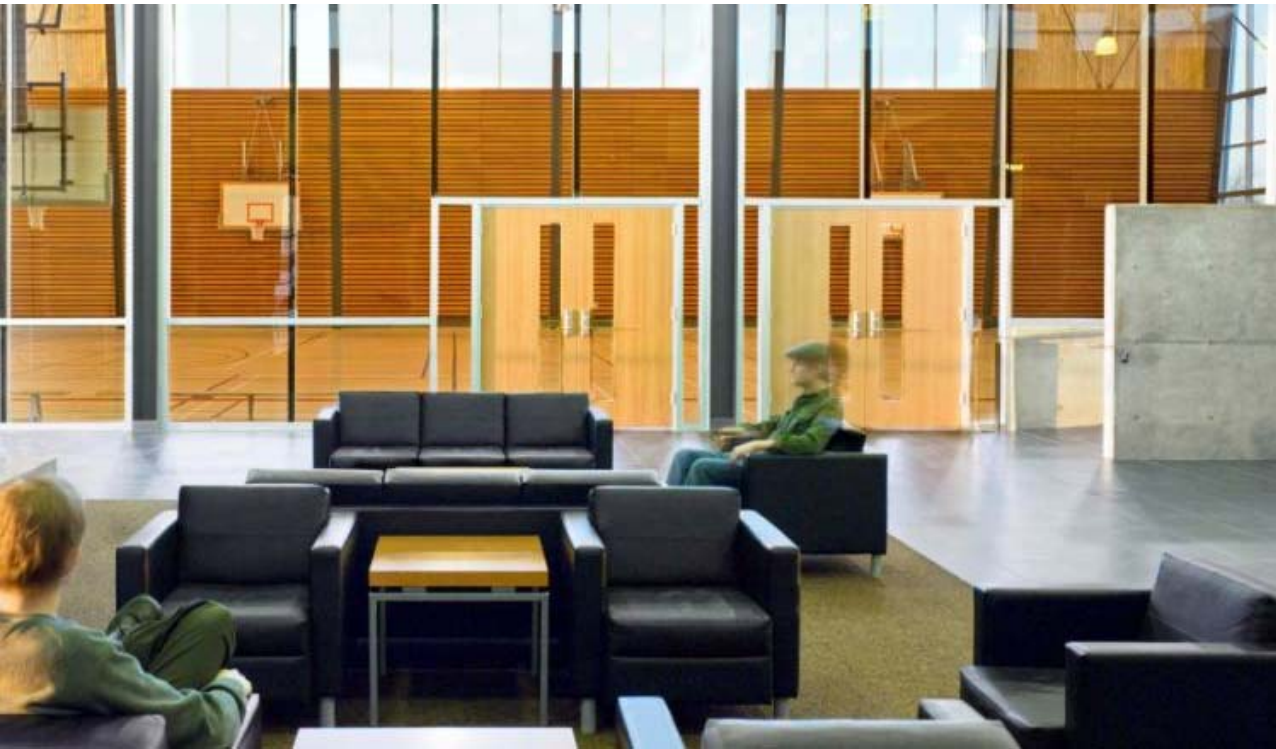
To Function Effectively and Beautifully



- Accommodate growth
- Provide new programs
- Operate efficiently
- Improve control & circulation
- Increase revenue
- A building that supports the activities (instead of fighting against them)

Vision

A Greater Sense of Comfort



- Satisfy your users or members
- Match the competition
- Increase Participation
- Exhibit pride and support for the centre

Vision

A Stronger Sense of Community



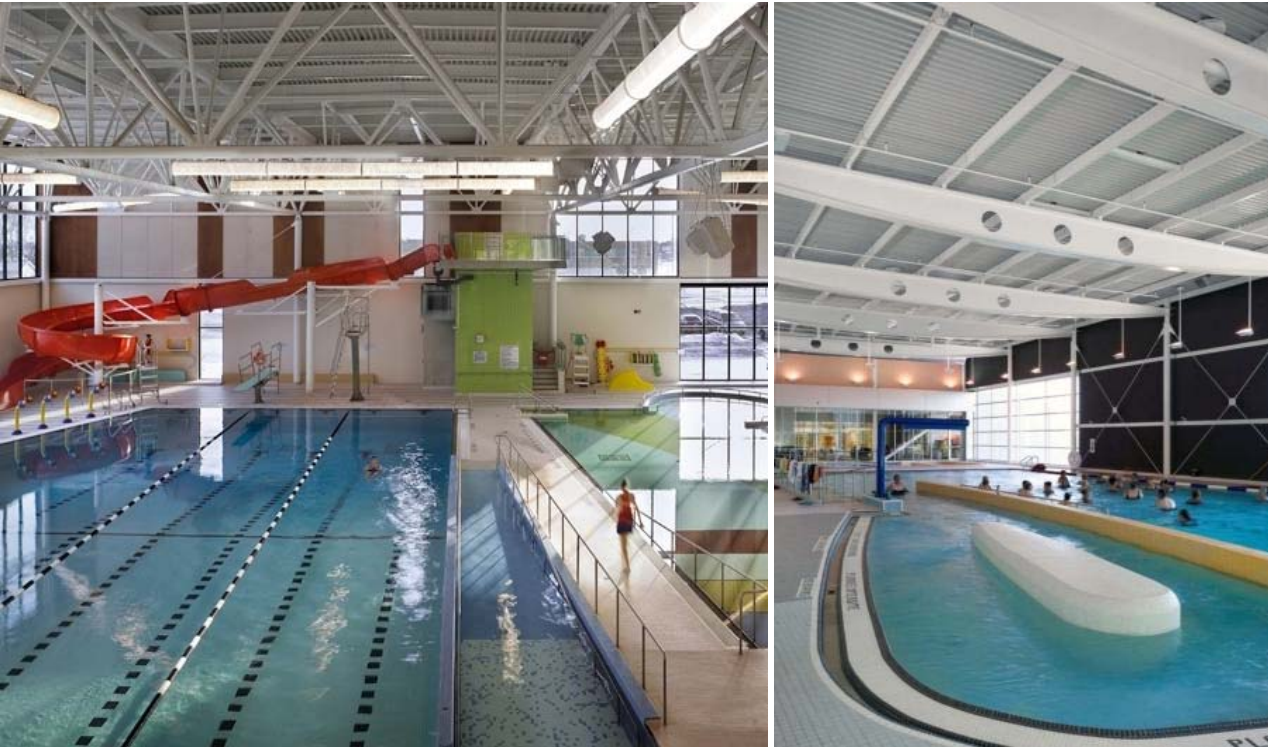
- Create a ‘social heart’
- Provide legible passive and active spaces
- Foster community spirit within the centre

Program

- This is what we have and this is what we need
- We're bursting at the seams
- What are the benchmarks?
- What are the trends?
- Do we understand where we are now?
- If only we had an additional 100,000 sq ft.
- What are our priorities
- Where are our biggest growth areas?

Program Opportunities

Expand Aquatics



- Expand beyond the 25m x 6 lane
- Appeal to all age groups and capabilities
- Increase capacity for programs + lessons
- Accommodate special needs
- Improve air and water quality

Average Program Increase = 9,000 to 10,000 sf
2000 sf Leisure Pool, 1500 sf slide, 3200 sf deck,
200 sf Therapy Pool, 1000 mechanical

Program Opportunities

Diversify Your Fitness Routine



- Capacity for more machines
- Space for special uses
- Flexible programming
- Accommodate new technology
- Provide a range of spaces
- Improve quality of space

Average program increase = 6,000 sf
Seen growth from approx 4,000 sf to target areas of 10,000 sf and 12,000 sf

Program Opportunities

Dedicated and Flexible Spaces

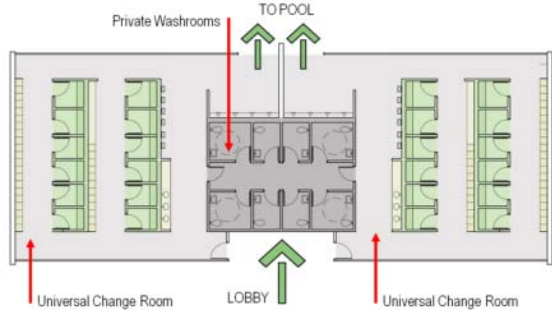


- Respond to specific needs of youth, seniors, children
- Provide new programs – indoor play spaces
- Re-assess childcare model
- Accommodate need for meeting spaces
- Cultural program spaces

Average program increase = 3,000 sf
Inclusion of 400 sf, 1000 sf rooms and 2000 sf, divisible rooms

Program Opportunities

Create a Welcome Change



- Create a more inclusive model for your members
- Accommodate privacy and comfort needs and trends
- Improve environment
- Meet demand for parent and child change spaces
- Improve circulation flow

Average program increase = 2,000 sf for family or special use change rooms
Renovate to split male/female from men/women
Renovate to add fitness or team change rooms

Program Opportunities

Accommodate New Activities



- Attract new users
- Improve playing conditions
- Improve air quality
- Respond to community needs
- In general these are 'wish list' items

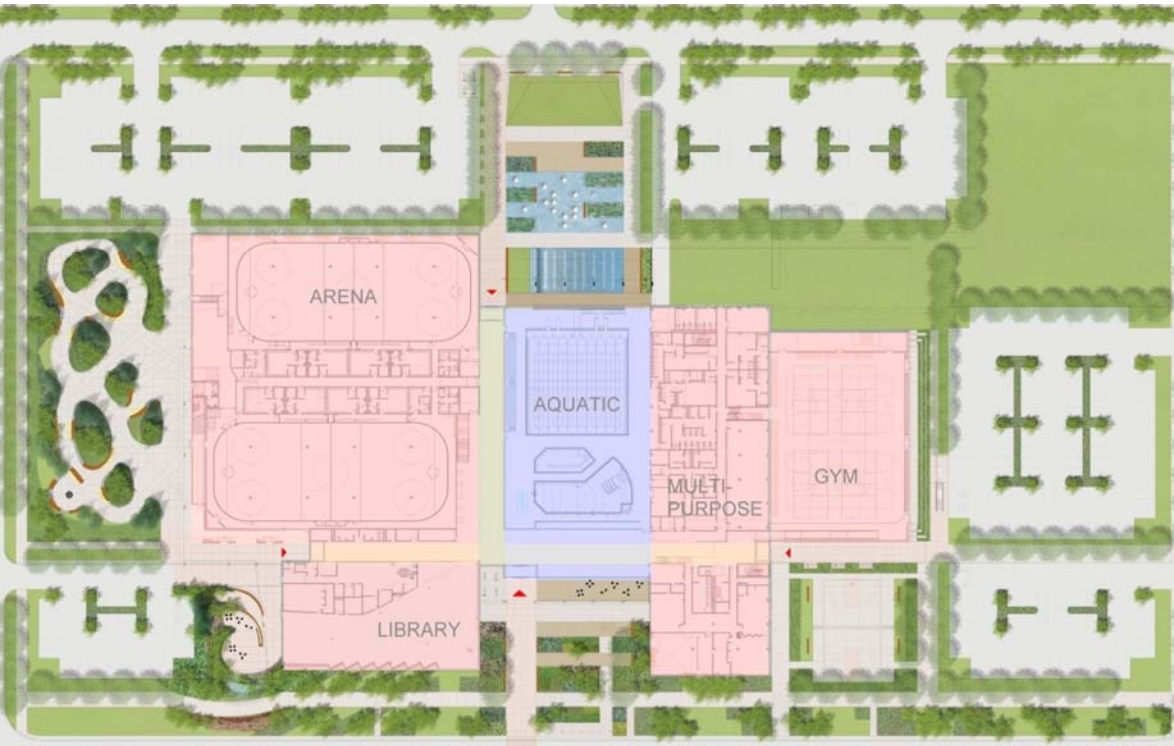
Average program increase = 4,500 sf for track , 1,500 sf for climbing wall,
Renovate to upgrade gym

Considerations

- **Location - Can we move?**
- **People love this building**
- **Heritage - Is it valuable or is it a junker?**
- **Sustainable - Maybe its best that we work with what we have**

Considerations

Location



- Is location ideal?
- Is there available and affordable land nearby?
- Are there partnering possibilities ?
- Can the present location accommodate expansion and parking needs?

Parking needs = Typically municipalities require 3 to 5 spaces per occupant or 1 space for 22 gross s.m.

Considerations

Heritage



- Is it designated?
- Is it perceived to be special?
- Has the community or users been notified?

Designated status: Ontario Heritage Act enables municipalities to designate properties of cultural heritage value or interest.

Volunteer group would apply for the designation bylaw.



- **MRc1 Building Reuse -Renovation specific category**
 - 1.1 Credit - Maintain 75% of Existing Walls, Floors & Roof
 - 1.2 Credit - Maintain 95% of Existing Walls, Floors & Roof
 - 1.3 Credit - Maintain 50% of Interior Non Structural Elements
- **Intention is to extend the life cycle of building stock , conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings from manufacturing and transport**

**MRc1 Credit cannot be applied if addition is more than twice the area of the existing building
(New construction and School LEED categories)**

Considerations

Sustainability 2



Trent

Only addition was considered for LEED as costs for full renovation to existing was too costly.

QEP Community Centre

3 credits – Maintained 75% of existing building and shell plus 50% of non-shell areas

Maintained 100% of existing building structure.



LEED Costs = Typically 2% additional construction costs can be attributed to LEED upgrades but that is decreasing as the industry accommodates LEED process costs

Discovery

- Do we really understand the building?
- Why don't we gut the entire building?
- How are the rooms being used now
- Are we close to ADA compliant?
- What building codes issues are there?
- How bad is the mechanical system?
- In a renovation, the risks are all in the building.

Discovery Period

Existing Layout and Spaces



- How well do the rooms work now ?
- Is control, circulation and adjacency working?
- How much additional storage is required ?
- Are materials and finishes in existing rooms suitable to use?
- Are AV, IT and equipment systems suitable
- How much additional space is really required?

Program Check – Start by clearly establishing how much space is presently available. Draw up an existing program and cross check against an expansion program. Plan for a larger ‘gross up’ i.e. more non-useable space.

Discovery Period

Existing Layout and Spaces - Example

Program Component	Existing	Interior Expansion	New	Total (sf)	Remarks
Lane Pool & deck	7000			7000	Upgrade drainage, deck tiles
Leisure tank & deck		4000	4000	4000	New addition required
Male Change	1500			1500	Modest upgrades
Female Change	1500	500.		2000.	Additional locker area
Multi Use Change		2000		2000	Interior modifications req.
Pool Storage	500		500	1000	Interior modifications req.
Viewing area	.	500		500	

Program Check – look for adjacencies that can accommodate change .

Discovery Period

Construction Quality and Condition



- Exterior Shell – poor insulation and lack of vapor barrier
- Glazing and Doors – poor thermal break and units
- Environmental impact – years of moist air under positive pressure will rust out brick ties, metal supports & fasteners
- Structural capacity – what is the capacity for additional floors or additional snow loads
- Roofing – Years of re-roofing may have led to deterioration of parapets, expansion joints and curbs.

Documentation – Lack of adequate documentation will require additional resources to determine the existing structural system.

Investigation – Engage a team to prepare an audit of the enclosure.

Discovery Period

Mechanical and Electrical Efficiency and Capacity



- Energy Use – air handling unit energy efficiency
- Energy Use - boiler efficiency
- Energy Use – lighting efficiency
- Water Use – shower, WC and pool filtration efficiency
- Sanitary capacity – will it accommodate increase
- Electrical capacity – will it accommodate increase
- HVAC capacity – status of existing ductwork

Documentation – Lack of adequate documentation will require additional resources to determine the existing mechanical and electrical system

Investigation – Engage a team to prepare an audit of the systems

Discovery Period

ADA Compliance



- Do not expect any leniency from authorities or codes
- Will affect all areas that are being renovated
- Adds area to support spaces
- WC- addition of scooter WC (100 sq ft)
- Doors – all public doors to be 1100mm wide + 600mm
- Pools – trend is away from lifts and towards ramps
- Entry – automatic door operators
- Change rooms –barrier free cubicles and shower areas

Authorities – Consider the OBC to be the minimum. ADA will be eventually be reviewed and implemented. Municipal accessibility requirements take precedence

Discovery Period

Ontario Building Code Compliance



- **Exiting** – additional stair or exits may be required
- **Sprinklers** – may be required to reduce travel distance and provide for interconnected floor spaces
- **Fire Alarm** – new systems will be required
- **Additions** – determine if fire separations are required between new additions and existing areas.
- **Guards** – Stair and guard rails may require upgrades

**The Grandfather myth – Do not assume that the existing will be accepted.
Alternative code compliance must be proven.**

Discovery Period

Phase 1 Environmental Site Assessment



Phase 1 ESA – environmental liabilities

- Asbestos – friable, non friable,
- Mercury – thermostats,
- UFFI – spray insulation
- Ozone Depletion – Older HVAC units have ODS
- Radon Gas – basement area emissions
- Mould – water damage and moisture infiltration

Designated Substance Report – Engage a team to provide an investigation of the existing condition.

Discovery Period

Physical Due Diligence



- **Physical Due Diligence Report**
 - outlines the physical characteristics of the building
- **Site Parking and Paving**
- **Structural and Exterior Walls and Roofing**
- **Doors and Windows**
- **Walls, Floors and Ceilings**
- **Mechanical and Electrical Systems**
- **Life Safety and Barrier Free Access**

Designated Substance Report – Engage a team to provide an investigation of the existing condition.

Discovery Period

Special Conditions – Pools 1



- Upgrading pool mechanical systems- assess area for new filters, pumps and piping – increase in area
- Skimmer retrofit – possible to replace from deck
- Drain upgrade – code requirement

Pool upgrade costs – Replacement of piping, skimmers deck and tiles = \$100,000.

Discovery Period

Special Conditions – Pools 2



- Ladders and equipment- may require replacement
- Deck drainage repair – excavation and re-piping
- Pool shell repair – consider newer technologies
- Pool tank re-configuration – build within the tank

Challenge – To retrofit but with minimal cutting into the pool shell.
Caution- check code compliance of pool. Any significant renovation will require pool to become fully code compliant in terms of mechanical systems and tank design.

Discovery Period

Special Conditions – Pools 3



- Audit the air handling mechanical equipment to determine upgrade status
- Can negative air pressure be maintained consistently?
- Have glazing frames and units deteriorated?
- Are there significant areas of visible corrosion in building structure?
- Check concealed bulkheads and ceilings for corrosion of structure and suspension systems.

Objective: to audit the area that is under the most environmental stress. This exposes the extent of work required and the risks.

Discovery Period

Special Conditions – Change Rooms



- Provide a 'swing space' for change room relocation
- Target renovation areas without removing partition walls – determine if existing is bearing wall construction
- New shower systems – investigate retrofit solutions
- Drainage – new drainage will require trenching
- Materials – assume upgrade of all finishes and millwork
- Barrier Free requirements will affect layout and systems

Renovation costs are high (\$180/sf) therefore minimal changes to existing walls and plumbing can reduce impact.

Costs

- **Do we really understand the building?**
- **What are the costs?**
- **How are the rooms being used now?**
- **Why are they so high ?**
- **Can we keep them under control?**
- **How do they compare to new?**
- **In a renovation, the risks are all in the building.**

Quantity Survey Levels - Typical



- **Class D Costing** – program areas and assumed quality of construction
- **Class C Costing** – schematic design with SME design descriptions
- **Class B Costing** – Design Development with design input from Structural, Mechanical and Electrical.
- **Class A costing** - Contract Documentation at 3 stages (25 %, 50% and 85%)
- **Pre Tender Costs** – prior to tendering

A typical per square foot cost test will not reflect the specific challenges of a renovation.

Quantity Survey Levels - Renovations



- **Class D / C Costing** – Program with schematic plan allocation identifying new construction, light renovation and heavy renovation
- **Class C Costing** – completed with elevations and massing
- **Class B Costing** – elemental costs + costs for phasing, life safety measures, temporary exiting , hazardous material removal
- **Class A costing** - Contract Documentation at 3 stages (25 %, 50% and 85%) + further refinement of renovation cost through exploration
- **Pre Tender Costs** – prior to tendering

Contingency levels – 5 % for new + 10% for renovation
Premium costs – 10% for working while the building is occupied

Quantity Survey Levels – Renovation and New Construction



- **New Construction – set quality level**
- **Major Renovation**
 - gutting of internal spaces
 - new partitions doors and interior glazing
 - new mechanical and electrical systems and fixtures
 - new roofing , ceilings, floors and wall finishes
- **Minor renovation**
 - new lighting and mechanical as required
 - new roofing, ceiling and floor finishes
 - new paint to existing walls
 - new millwork as required

Distinguish between work that will require extensive removal of existing structure and systems and work that is primarily finishes and system upgrades



- Demolition costs = \$20/ s.f. *
- Full interior removal = \$5/ s.f.*
- Factors that affect cost:
 - Asbestos Removal
 - Hazardous Materials
 - Contaminated SoilConditions

Case Study : QEP Community centre demolition cost = \$2.0M
* Area costs based on QEP CC 2008

New Construction Compared to Renovation

Program Component	Minor renovation costs/sf*	Major renovation costs/sf*	New construction cost/sf*
Aquatic centre	\$ 109 /sf	\$ 180 / sf	\$ 475 / sf
Gymnasium / Track	\$ 102/sf	\$ 150 / sf	\$ 300 / sf
Squash	\$ 98/s.f.	\$ 140/sf	\$ 250 /sf
Fitness	\$ 120/ s.f.	\$ 160/ sf.f.	\$ 320 / s.f.
Multi Purpose	\$ 118 / s.f.	\$155/ s.f.	\$ 300 / s.f.
Common Areas, Admin.	\$ 117 / s.f.	\$ 145 s.f.	\$ 300 / s.f.
Childcare	\$ 99/ s.f.	\$ 155 s.f.	\$ 300 / s.f.

* Area costs based on 60,000 sf facility in 2010

Deciding if the Cost is Acceptable

	column A	column B	column C
Building System	% of new construction	% required for renovation	Col A x Col B = score
Site Improvements	10		
Superstructure	20		
Exterior Enclosure	25		
Interior	15		
Mech/Elec/ Plumbing	30		
Total	100		

**A scorecard can help compare renovated costs to new construction .
Start by understanding the breakdown**

Deciding if the Cost is Acceptable

	column A	column B	column C
Building System	% of new construction	% required for renovation	Col A x Col B = score
Site Improvements	10	25	
Superstructure	20	30	
Exterior Enclosure	25	40	
Interior	15	40	
Mech/Elec/ Plumbing	30	30	
Total	100		

Estimate the work required as compared to new construction

Deciding if the Cost is Acceptable

	column A	column B	column C
Building System	% of new construction	% required for renovation	Col A x Col B = score
Site Improvements	10	25	$10 \times .25 = 2.5$
Superstructure	20	30	$20 \times .30 = 6.0$
Exterior Enclosure	25	40	$25 \times .40 = 10.0$
Interior	15	40	$15 \times .40 = 6.0$
Mech/Elec/ Plumbing	30	30	$30 \times .30 = 9.0$
Total	100		33.0

Arrive at the approximate cost of renovation as a percentage of new construction.
Eg. In this example the renovation would cost about 33% of new or a 2/3rd savings.

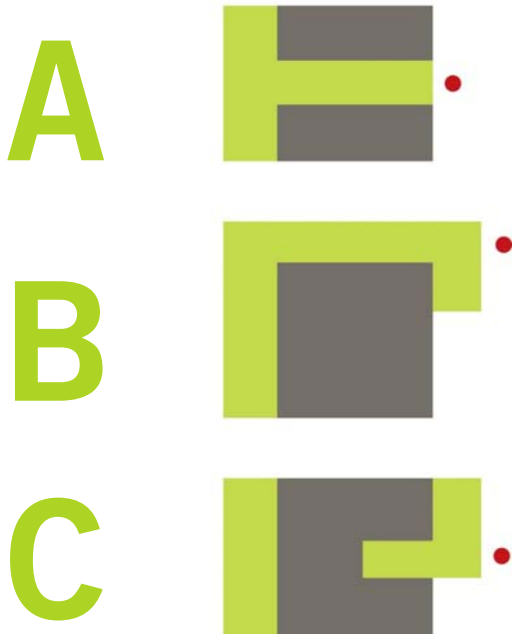
Deciding if the Cost is Acceptable



- The score card can be used for initial planning discussions
- A low score = modest costs and therefore low risk
- A high score = costs comparable to new and therefore higher risk
Eg. A score of 70 means there is only a 30% savings
- Scale has some impact
Eg . On a large project the 30% savings could be substantial but on a small project it may be negligible as unknown conditions could easily erase those savings

Contingency levels – 5 % for new + 10% for renovation
Premium costs – 10% for working while the building is occupied

Moving Forward and Managing Costs



- Keep design constructible and efficient
- Simplified phasing – strategy that has least impact
- Clearly identify levels of renovation
- Minimize temporary exiting
- Identify all risks and unknowns eg. hazardous material removal
- Consider Master Plan approach

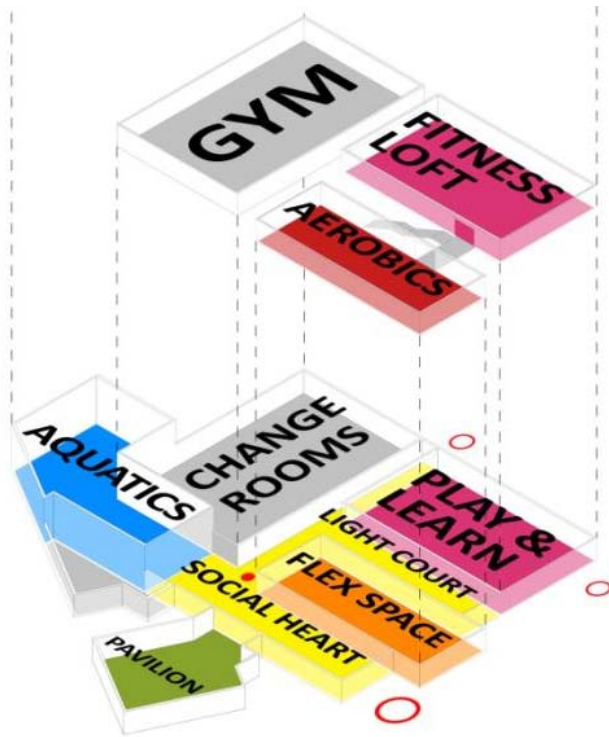
A – major interior renovation and addition

B – addition wraps existing with minimal interior renovation

C – strategic addition with minimal renovation

Scope

- If we can, let's do it all now
- While we are there we might as well...
- We don't want to come back a year later.
- The Wish Lists grows and grows...
- How much really should be done ?
- In a renovation, controlling scope is critical.



- Building Audit – determine the real needs
- Program Confirmation – estimate costs at Class D/C
- Determine new and heavy renovation costs
- Develop Master Plan during Schematic
- Strategize on Phasing Options and impact
- Maintain a renovation contingency
- Monitor renovation contingency during construction

In a renovation, scope control is directly related to cost control



- Program Scope Control
- Design test for ultimate phased build out
- Plan structure, mechanical and electrical systems
- Survey for existing services
- Minimize site planning

Case Study : Trent University designed to accommodate future expansion of Student Services

Delivery + Implementation

- Do we really understand the building?
- What are the costs
- How are the rooms being used now
- Why are they so high?
- Can we keep them under control?
- How do they compare to new?
- In a renovation, the risks are all in the building.



Stipulated Sum

Advantages – full control and documentation

Disadvantages – Unknowns cannot be explored during design

Staged Tender

Advantages – Allows exposure of building before new work

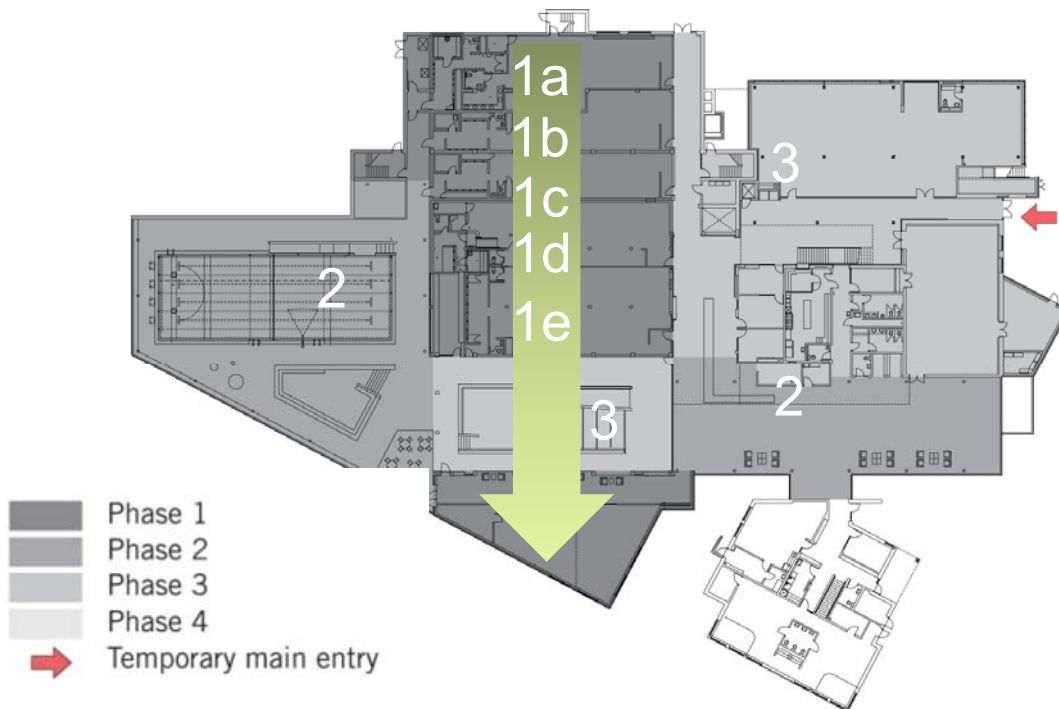
Disadvantages – Overlap of GCs may lead to complications

CM

Advantages – Successive tenders allows for cost control

Disadvantages – Documentation is not fully completed

Engage in discussions with consultants early in the process to determine the best fit for the project.



- **Swing Space** – Are there swing or temporary spaces for the users or members while areas are being renovated?
- **Temporary facilities**– will life safety requirements mean temporary exiting or entry?

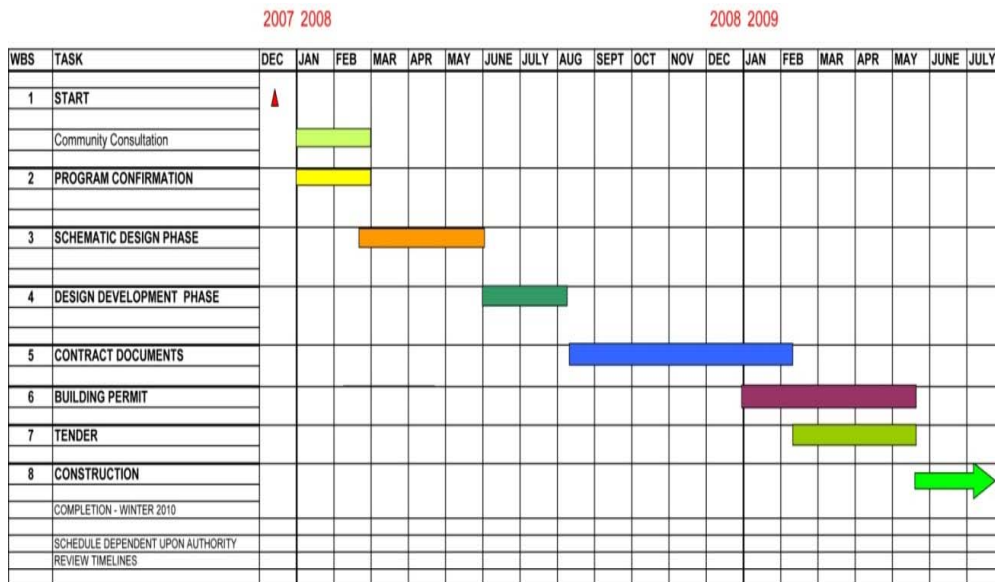
Example: one change room is used as swing space for the renovations of others



- Are phases clearly separated without need to return to complete areas?
- Establish reasonable time frames for construction.
- Do the phases follow a logical pattern that both the constructor and the user/owner can follow?
- Are there sufficient staging areas and relatively easy construction access?

**Owner and Consultant establish the priorities for phasing and critical milestones.
General Contractor is responsible to provide a detailed phased construction schedule.**

Schedule Management



- Provide time to fully document existing building
- Set a realistic time frame for design and construction
- Design with schedule in mind – ease of construction
- Prioritize tasks that expose and reduce risk
- Work with flexibility to accommodate changes
- Allow time for further inspection
- Explore construction delivery options

If time frame is aggressive than the risks of encountering unknowns increases.
Ensure construction budget and contingency reflect this priority.

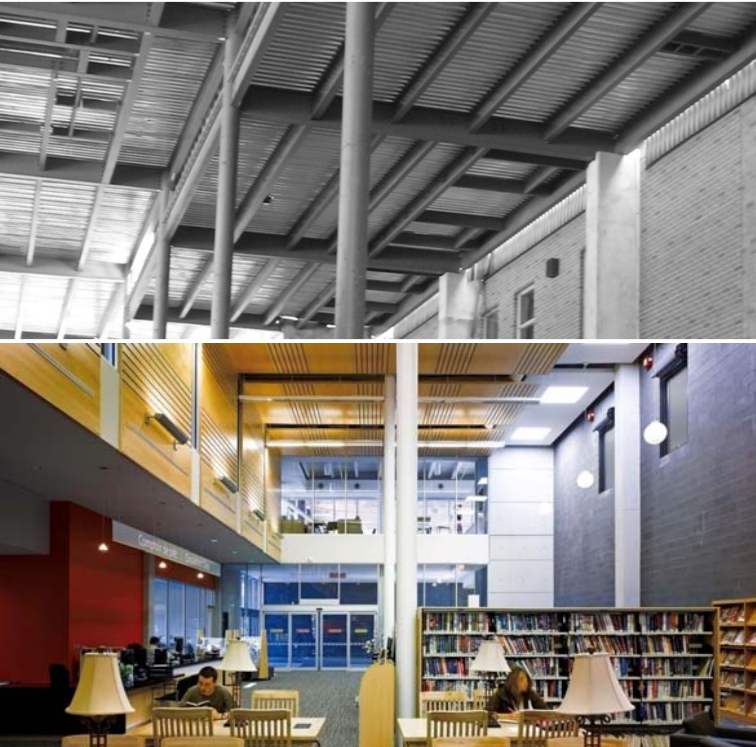
Addition

Clarence Rockland Community Centre and Library



- Addition is not integral to the existing building
- Exits –life safety requirements meant temporary and permanent exiting corridors
- Permanent Separations –fire walls and shutters were required
- Existing building – Existing conditions were not upgraded or renovated
- M&E systems – separate systems

Case Study Statistics : 65,000 sf - \$14.5 M 2008



Challenges

- New higher roof affected adjacent roof structure
- Phased construction sequence affected exits
- Extensive fire shuttering and fire wall construction
- Shared electrical service with adjacent building
- Sloped site with shale base

Case Study Specific strategy: Clearly define the extent of work and phasing required in the documentation

Addition

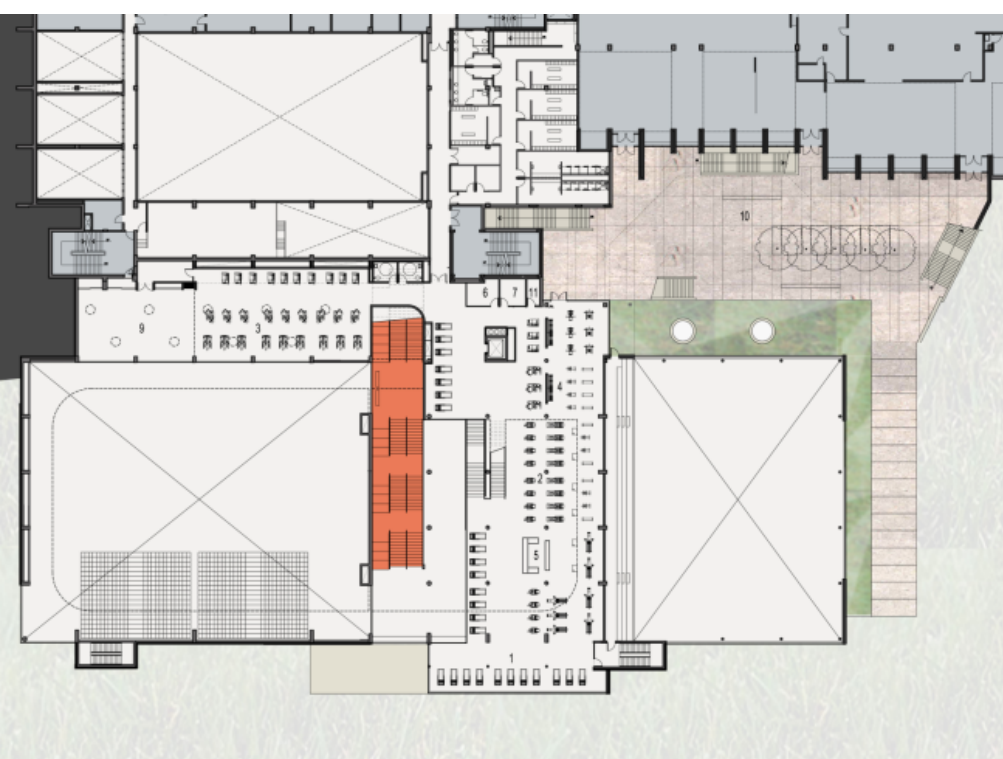
Clarence Rockland Community Centre and Library



Case Study Time frame: construction 18 months

Addition/Renovation

UTM Recreation and Wellness Centre



- Addition is integral to the existing building
- Exits –temporary exiting corridors only
- Permanent Separations –fire walls and shutters were required but kept open (different levels of fire safety)
- Existing building –partially upgraded & renovated
- M&E systems – some integration (boilers & fire alarm)

Case Study Statistics : 85,000 sf - \$18.5 M 2008

Addition/Renovation

UTM Recreation and Wellness Centre



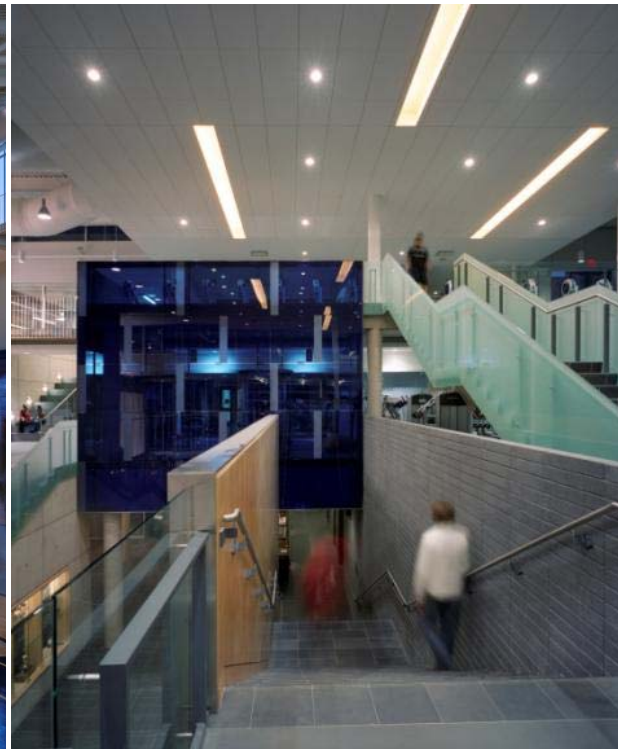
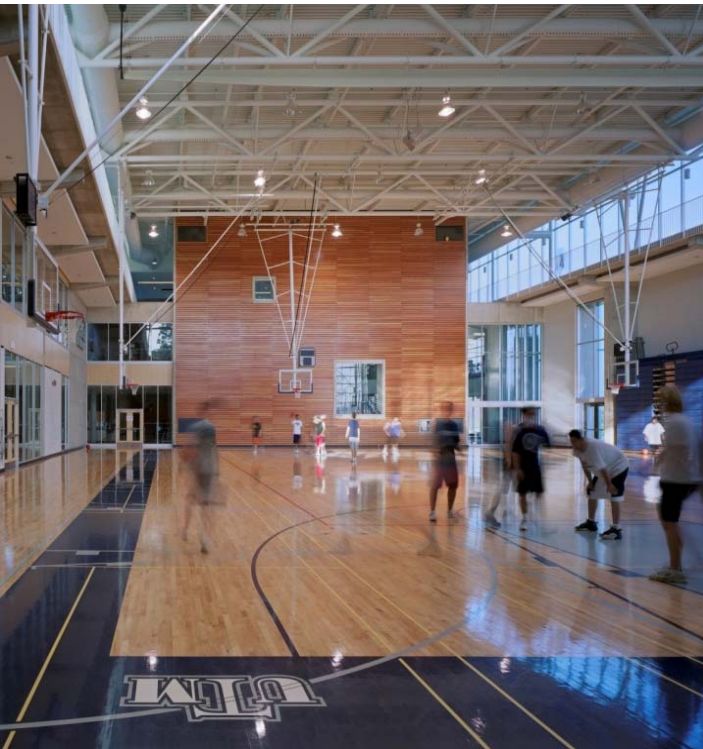
Challenges

- Separation of existing building
 - Exiting distances
 - Spatial separation
 - Complex shoring
- Underground service relocations
- Integration of public and user circulation

Specific Strategy: pre tender excavation to limit impact on users

Addition/Renovation

UTM Recreation and Wellness Centre



Lesson Learned : Explore how you can improve circulation, connection and social spaces. The benefits will pay back though community involvement.

Addition/Renovation

Trent University Athletic Centre



- Addition and renovation existing building
- Exits –life safety requirements meant temporary exiting corridors only – occupancy for only a partial period
- No Separations –building was treated as one entity
- Existing building – Existing conditions were upgraded and renovated to various levels
- M&E systems – total integration

Case Study Statistics: 25,000 sf new @ \$340 s.f. , 53,000 sf renovation @ \$108 s.f. = \$14.0 M 2010
(excluding allowances)

Addition/Renovation

Trent University Athletic Centre



Challenges

- Building required full sprinkler system
- Re-orientation of entry affected systems
- Extensive temporary exiting
- Renovation scope was reduced to suit budget
- Barrier free access at existing entry
- Building shell deterioration

**Unexpected find: Exterior pool wall was not constructed as designed .
Was not code compliant or able to support new facing. Required extensive structural steel reinforcing.**

Addition/Renovation

Trent University Athletic Centre



Time frame: construction 18 months

Addition/Renovation

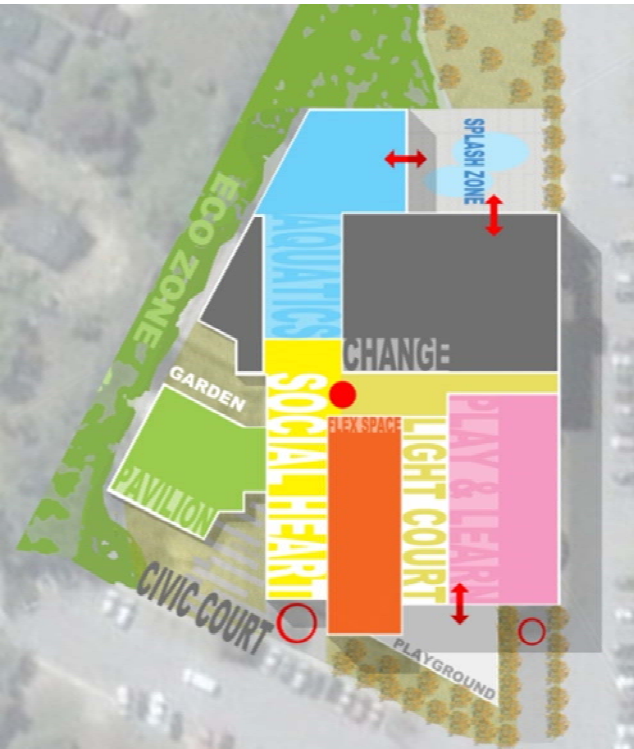
Trent University Athletic Centre



**Lesson Learned : A new entry addition can transform a building.
Balance practical needs with the opportunity to market your new facility.**

Addition/Renovation

Barrie YMCA

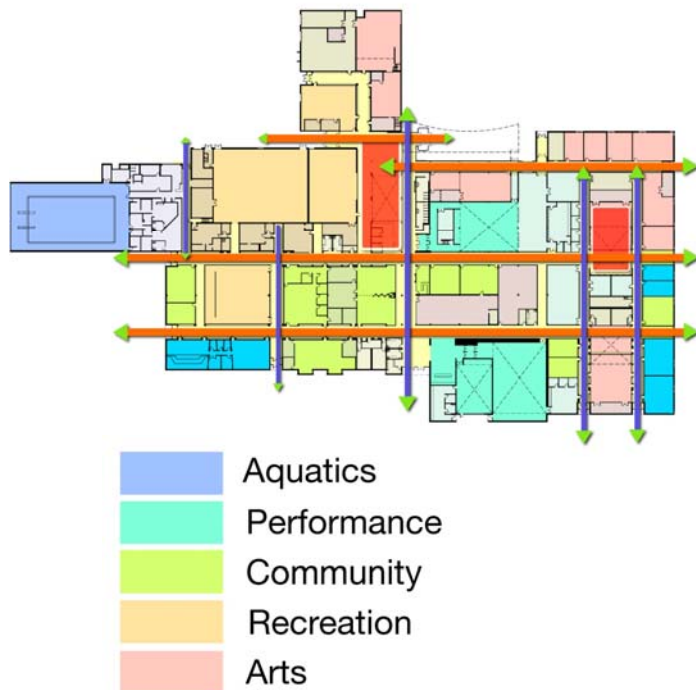


- Addition and renovation to an existing building
- Exits –life safety requirements will mean temporary exiting corridors – building will remain occupied
- One Separation –building will be treated as two entities
- Existing building – Existing conditions will upgraded and renovated to various levels
- M&E systems – total integration

Case Study Statistics: 25,000 sf new – 60,000 sf existing with partial renovation

Renovation/Reuse

Queen Elizabeth Park Community Centre



- Transform an existing building
- Exits –building was empty
- No Separations –building was treated as one entity
- Existing building – Building was fully gutted of existing finishes, ceilings and gypsum board partitions
- M&E systems – total removal and new systems introduced
- Site Expansion - additional parking to accommodate new uses

Case Study Statistics: 145,000 sf existing with extensive renovation and reuse
\$ 20.8 M (\$143/s.f.) 2010

Renovation/Reuse

Queen Elizabeth Park Community Centre



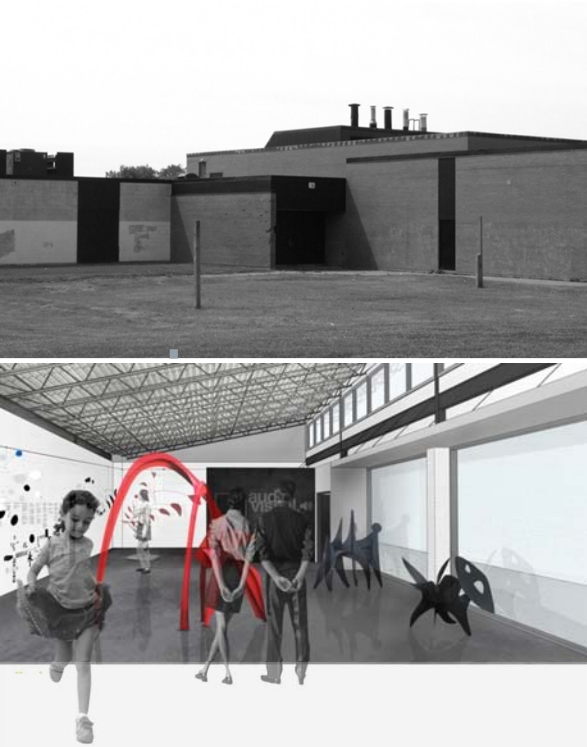
Challenges - Building

- Program required flexibility to suit existing conditions
- Exterior shell required total re-cladding
- Bearing block construction interference with new systems
- Barrier free accessibility at most entries
- Asbestos removal cost impact
- Limited space to accommodate new pool mechanical

Case Study Strategy: limited budget over a large foot print resulted in a careful selection of materials to achieve 'a loose fit' into the existing.

Renovation/Reuse

Queen Elizabeth Park Community Centre



Case Study Lesson Learned: Renovation and Reuse provided more area at better value. This however required flexibility in program and layout.

Renovation/Reuse

Queen Elizabeth Park Community Centre



Challenges - Systems

- Fitting program to existing plumbing locations
- Deterioration of existing plumbing
- Revision to roof top units will affect opening sizes and roof structure
- Electrical and Mechanical lines are not as indicated on drawings

“You can’t know the existing building well enough”

Other Examples



- **Preservation**
Reinvigorating historic properties
- **Adaptive Reuse**
Repurposing older buildings
- **Post Industrial Planning**
Parks and Waterfront planning

Engage a team that has both programming expertise and an understanding of renovation and re-use.

Benefits + Results

- Do we have a better building?
- Did we make the right decision?
- Was it a horrible experience?
- Where our costs manageable?
- Did we make too many compromises?
- Are our users satisfied?
- A renovation can regenerate a building.

Benefits and Results



- A rigorous and thoughtful approach is required
- Respond to emotion but answer the practical questions
- Research your program, your needs and your building
- Understand costs and control scope
- Prepare for the unexpected
- Results
 - A better world – greener choice
 - A Transformation
 - A smart Financial choice

Begin with a plan that understands the challenges of renovation and reuse.
Aim not only for functional improvements but for a regeneration of the facility.

Thank You.

PRO Conference | March 30, 2011



Presented by

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