



# INFORMATION REPORT

<b>TO:</b>	Chair and Members Public Works Committee
<b>COMMITTEE DATE:</b>	October 16, 2017
<b>SUBJECT/REPORT NO:</b>	New Municipal Facility Construction Costs in Hamilton (PW17084) (City Wide)
<b>WARD(S) AFFECTED:</b>	City Wide
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<b>SUBMITTED BY:</b>	Rom D'Angelo, C.E.T.; CFM Director, Energy, Fleet and Facilities Management Public Works Department
<b>SIGNATURE:</b>	

## **Council Direction:**

This report is in response to questions that arose from discussion during the September 18, 2017 Public Works Committee meeting respecting the cost of municipal construction projects vs typical residential costs in the community.

## **Information:**

In responding to the Councillor's request, staff hopes to minimize misconceptions around new municipal facility capital project costs in Hamilton by providing clarification on the following:

1. Residential construction vs. ICI construction & cost benchmarks across various facility types;
2. Park washroom construction cost considerations;
3. Municipal construction cost considerations;
4. Total project costs vs. construction costs;
5. Inflation & construction timelines;
6. "Design Fee" misnomer;
7. Use of independent, certified cost estimators as benchmark;
8. Ongoing staff efforts for cost savings & cost control;

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1. Residential Construction vs. ICI Construction & Cost Benchmarks Across Various Facility Types:

There are important differences in cost across different facility types. This is particularly true when comparing residential construction to ICI (industrial, commercial, institutional) construction.

ICI construction premium over residential construction:

- Premium for non-wood construction, required by code for ICI (e.g. 15%);
- Differences in Ontario Building Code requirements, prescribed based on building occupancy type (e.g. egress, electrical & fire protection);
- Higher insurance requirements for fire protection in public buildings (e.g. sprinkler systems and/or thicker fire separations);
- Accessibility requirements for public buildings;
- ICI construction does not tend to be mass-produced, whereas residential developments often include an element of mass-production which saves costs (e.g. economy of scale & distributing sunk costs);
- Larger site services (electrical, water supply, sewer) for high volume of public use, versus single family use;
- Durable construction materials & standard for large volumes of visitors;
- Large reception area(s), hallways, stairwells, elevators & egress for large volume of visitors;
- High cost per square foot amenities in public facilities (e.g. pools)

Residential construction can range from \$100 - \$250 per square foot, whereas ICI Construction Costs for municipalities are higher and vary widely from \$300-\$750 per square foot, depending on a number of factors. Please refer to Table 1 below for typical residential construction costs and Table 2 below for typical ICI municipal construction costs:

*Table 1: Typical Residential Construction Costs*

Facility type	Square foot cost construction costs	Typical Gross Floor Area (GFA)	Typical capital project cost (based on typical GFA)	Municipality typically Constructs?
Mass-produced residential dwelling from stock plans (with unfinished basement)	~\$100	2000	\$200k	No
Custom single residential dwelling	\$125-\$250	2000	\$250k-\$500k	No

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Multi-unit residential <6 story	\$175	22,500	\$3.9M	Rarely
Multi-unit residential >6 story (e.g. 15 story)	\$205	145,000	\$29.7M	Rarely

*Assumes \$10-\$45/square foot site service work costs included  
Assumes contractor's overhead & profit is in construction costs included  
Source RSMMeans 2007 data with 2.5%/year escalation (non-compounding)*

**Table 2: Typical ICI municipal Construction Costs**

Facility type	Square foot cost construction costs	Typical Gross Floor Area (GFA)	Typical capital project cost <i>(based on typical GFA) plus 30% soft costs for municipal</i>	Municipality typically Constructs?
Municipal Administrative offices (non-heritage)	\$300	80,000	\$31M	Yes
Sunshelters/sheds	\$330	400	\$170k	Yes
Community Indoor Arena	\$350	30,000	\$13.6M	Yes
Library	\$360-470	15,000	\$7M-\$9.2M	Yes
Recreation Centre (Community Halls, Seniors Centres -without Pool)	\$380	30,000	\$14.8M	Yes
Works Yards (heated)	\$385	20,000	\$10M	Yes
Fire Stations	\$390	20,000	\$10M	Yes
Recreation Centre (with Indoor Pool)	\$400	50,000	\$26M	Yes
Park Washrooms	\$750+	300-2000, <b>typical 700</b>	\$290k-\$1.95M, <b>typical: \$680k</b>	Yes
Trauma Hospitals* <small>(based on media reports of 3 recent examples in Oakville, Toronto &amp; St. Catherine's)</small>	\$1000+	900,000	\$900M	No

*Assumes \$10-\$215/square foot site service work costs included  
Assumes contractor's overhead & profit is in construction costs included*

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Source Hanscomb report May 2017  
\*Source 3 recent tender examples in GTA

## 2. Public Park Washroom Construction Cost Considerations:

City of Hamilton costs per square foot for public park washrooms are similar to industry benchmarks, as compiled by a certified cost consultant. Construction costs per square foot are significantly higher than for other facility construction types, even within ICI. This is because there are certain cost considerations which are relatively unique to public park washrooms:

- Services must be run long distances to run services underground through the park to the building (e.g. electrical, water supply, & sanitary sewer) and often road cuts are required to connect to municipal services at a cost;
- High number of costs must go into a relatively small square footage (e.g. foundation, fixtures and all services: electrical, water supply, sanitary sewer, storm water management);
- Design requirements are individualized by park and often present priorities which compete with cost. This is because each park site is unique in terms of engineered storm water management requirements, site grading, public pathways and services, tree management plans, environmental conservation considerations, archeological assessments, user requirements and neighbour site lines. Public consideration in these matters is frequently deemed more important than cost;
- Sufficient gross floor area (sq. ft.) required in order to accommodate fully accessible public universal washroom. Public events often require more than one water closet and therefore the design must include sufficient gross floor area to the men's & women's water closets;
- Care is taken when constructing park washroom buildings to select robust building materials, which is advisable for this type of public facility (unfortunately prone to vandalism), and with a mandate to last 60+ years of public use.

## 3. Municipal Construction Cost Considerations:

The City of Hamilton's construction costs per square foot are similar to industry benchmarks for, as compiled by a certified cost consultant in a report by Hanscomb May 2017.

The City of Hamilton, like many municipalities takes steps to ensure that the cost for construction, as well as the quality of work, is competitive as follows:

- Competitive tenders;
- Public tender advertising & public opening;
- Cost estimate, compared to industry, prior to tender.

The City of Hamilton, like many municipalities, also takes steps to minimize construction risks, & ensure compliance with applicable labour legislation. Minimizing risks and ensuring compliance appears to come at an incremental cost per tender; however it minimizes the exposure of the organization to the potential for larger liabilities by ensuring that the contractor has:

- Appropriate insurance
- WSIB
- Performance bond
- Bid bond
- Payment certification for lien law

The City of Hamilton also holds as priority its fair wage policy & contractual labour obligations to Carpenter's Union Local 18 as it relates to construction. Therefore, competitiveness of facility construction tenders at the City of Hamilton is necessarily limited to bidders who can pay its own labour and sub-trades in compliance with the Fair Wage Policy and with labour from a single union due to the City's labour obligations.

#### Total Project Costs vs. Construction Costs:

A common misunderstanding of the estimated cost of a capital project originates from the fact that only the "Construction Cost" of projects is quoted. "Total Project Costs" include not only Construction Costs, but the costs of the planning, design, engineering, due diligence requirements (environmental, geotechnical, archeological, etc.), site plan approval fees, building permit fees and the internal costs of delivering the project. These costs are defined as "Soft Costs" and equate to a premium of approximately 30% in addition to the construction cost. This means that when discussing a capital project, the construction costs are being quoted as Total Project Costs, when in reality, the Total Cost of the capital project would be higher.

#### 4. Inflation & Project Timelines:

Another common misunderstanding of the estimated cost of delivering capital projects is that often, municipalities complete preliminary designs and their associated cost estimates in an effort to budget projects into future years. Those with an interest in the project may take preliminary budget information that was completed years prior, and assume the cost of delivering the project have not changed. In reality, certified cost estimators recommend budgeting 2.5% per year for inflation. Project timelines frequently extend 3-5 years past project initiation, in part because of legislated processes such as Site Plan Control and Building Permit. There are also examples of projects which experience delays for numerous reasons. In this way, inflation can easily push projects 10% over budget at the time of tender.

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#### 5. “Design Fee” Misnomer

The “Design Fee” is one of several of the 30% incremental soft cost on a project (which also include but are not limited to permit fees, geotechnical, archaeological, environmental, certified cost estimate(s), internal staffing costs and contingency).

A common public perception of the “Design Fee”, which typically ranges from 6-12% of the cost of construction, is that this fee goes to the Architect exclusively for their design. This is not the case, and there are many additional requirements besides design, as well as other resources which the Architect must employ (e.g. engineering sub-consultants) built into the “Design Fee” include but are not limited to the following:

- Engineering (e.g. structural, electrical, mechanical, civil/municipal, etc.);
- Contract administration to minimize risk to the City (e.g. certification of payment for Lien Law and Change Orders to control costs);
- Site Plan Control & Building Permit applications & necessary modifications;
- Value-engineering design to bring costs down;
- Prepare specifications for competitive tender package;
- Attend construction meetings;
- Coordinate testing, commissioning & certification of equipment;
- Occupancy letters & permit close-out documentation.

#### 6. Use of Independent, Certified, Cost Estimators as Benchmarks:

In an effort to obtain up to date and accurate costs of various types of capital projects, Public Works, EFFM, Strategic Planning, Capital & Compliance have engaged the services of a professional certified cost consultant, Hanscomb, to complete an analysis of the various types of facilities within the portfolio of over 500 buildings, and provide cost breakdowns for new construction and renovations of each type based upon 2017 figures. The industry standard provided is very detailed and is indicative of high construction costs than previously understood. SPCC has since, routinely utilized this report in the capital planning process; however, it is important to note that the costs provided are strictly “construction” or “Hard Costs,” therefore it is necessary to add around 30% to cover Soft Costs as described previously.

The new washroom facility being completed at Turner Park is an example of common misconceptions. While it may appear that the cost of constructing this facility is high, the actual Construction Cost per square foot of area is below the benchmark value from a certified cost estimator, for a potential savings of \$25/s.f. Turner Park washroom, while single-sourced, compares favourably with other tenders competitively tendered. Also, looking at the information provided on similar facilities in other municipalities indicates very similar project costs. However, this project has unique requirements such as services to run over 500 feet through the park. The project team saved construction labour costs where possible, such as through the use of pre-cast walls,

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templated from another project. The breakdown of costs for Turner Park Washroom is listed below in Table 3 and Table 4 for information.

Table 3: Turner Park Washroom Project Costs:

<b>Item</b>	<b>Cost</b>
Soft Costs (consulting, permits, internal, due diligence, etc.)	\$110,000 (~20% of Construction Costs)
Site Services (water, storm, sanitary sewers, hydro, etc.)	\$280,000
Construction (foundations, building, landscaping, contractor's overhead, etc.)	\$270,000
<b>Total Project Cost (Hard and Soft Costs)</b>	<b>\$660,000</b>

Table 4: Turner Park Washroom Costs per Square Foot

<b>Item</b>	<b>Cost</b>
<b>Construction Cost/s.f.</b>	<b>\$723/s.f</b>
<b>Cost/s.f. (Construction) per Hanscomb 2017 for Park Washroom Facility</b>	<b>\$750/s.f</b>

#### 7. Ongoing Staff Efforts for Cost Savings & Cost Control

Facilities staff and the project team of professional Engineers & Architects to value-engineer designs to the lowest cost possible, while still meeting Ontario Building Code and achieving a robust facility serving the public. While it is common for code requirements & stakeholder requirements to compete with cost savings, the team does its best to achieve a balance on each project.

Some of the ongoing ways staff control and save costs on projects include the following:

- Certified Cost estimate and/or Architect's cost estimate prior to each tender;
- Value engineer if costs are out of line with industry benchmarks or budget;
- Minimize square footage of the design where possible;
- Balance competing priorities against cost where possible;
- Selecting lower cost materials where possible, where it does not compromise quality;
- Selecting structures/designs which result in lower construction labour costs (e.g. prefabricated structures, where possible);
- Approved contract administration methods (e.g. CCDC2 contract with change orders);
- Favourable clauses for the City in construction contracts where possible.

#### **Appendices and Schedules Attached**

Not applicable