



REPORT TO

CORPORATE AFFAIRS, STRATEGIC PLANNING AND PROPERTY COMMITTEE

ELEMENTARY SCHOOL DESIGN STANDARDS UPDATES 2015

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First Tabling

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Review

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RECOMMENDATION REPORT

Vision:

At Toronto Catholic we transform the world through witness, faith, innovation and action.

Mission:

The Toronto Catholic District School Board is an inclusive learning community rooted in the love of Christ. We educate students to grow in grace and knowledge and to lead lives of faith, hope and charity.



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A. EXECUTIVE SUMMARY

This report recommends updates to the current Elementary School Standards to incorporate 21st Century Learning principles, standardized gymnasiums sizes based on pupil places, Full Day Kindergarten space requirements, revisions to the Heating, Ventilation and Cooling (HVAC) system as well as other updates subject to Ministry of Education approval of funding to support these initiatives.

The report further recommends continuing the inclusion of a multi-program room, to support a range of program needs – including instrumental and vocal music, art, science, second language instruction and the Student Nutrition program.

B. PURPOSE

1. Provide design standards for new elementary schools in support of current program, legislative and building performance requirements.

C. BACKGROUND

1. In conjunction with the Board's Capital 1998-2008 Capital Program, school design standards were created to identify and codify key program and space requirements for both elementary and secondary schools. On September 2006, the Board approved the "Elementary School Design Standards for the Toronto Catholic District School Board". These standards did not specify at the time, gymnasium sizes or the space requirements for the yet to be established Full Day Kindergarten program.
2. On April 28, 2010, the Ministry Supervisor approved revisions to the Elementary School Design Standard to address the need for a multi-program/multi-purpose space in lieu of loaded music, art and science rooms, as well as a revision to the HVAC to incorporate radiant heat flooring and displacement (tempered) air.
3. In June 2010, the Ministry of Education (MoE) released a report from the Expert Panel on Capital Standards entitled "Building Our Schools, Building Our Future". This report was the precursor to the MoE's Space Plan Template, which dictates the acceptable area benchmarks for new elementary and secondary schools and major additions based on the approved number of pupil places.

D. EVIDENCE/RESEARCH/ANALYSIS

1. The revised Elementary School Design Standards take into consideration recent program, legislative and policy changes, as noted below:
 - a) 21st Century Learning principles;
 - b) Community use of schools;
 - c) Environmental stewardship and energy efficiency;
 - d) Classrooms that incorporate Reggio Emilia and the Third Teacher inspired principles to provide natural light and ventilation, conducive to learning;
 - e) Larger gymnasium to support physical activity, school and community gatherings;
 - f) Physical accessibility standards to address needs of both adults and children;
 - g) Welcome and safe school environments;
 - h) Incorporation of architectural elements or features that highlight our Catholic faith;
 - i) Incorporation of a childcare facility as part of the new school design, where there is sufficient space on the site, and where funding is made available from the Ministry of Education and the City of Toronto.
2. Incorporating 21st Century Learning, Reggio Emilia and the Third Teacher inspired principles into elementary school design standards has resulted in the following changes:
 - a) Wireless connectivity availability throughout the school (less emphasis on fixed desktop computers to provide more self/student directed in-classroom opportunities with mobile devices such as laptops and tablets, (also provides opportunities for students and staff to utilize 'Bring Your Own Device' capabilities);
 - b) Inter-connection between classrooms, through use of sliding wall panels to expand classroom space;
 - c) Provide breakout spaces in corridors, classrooms and the Learning Commons for alternative group learning activities;

- d) The Learning Commons replaces the traditional library and cross-curricular computer lab by eliminating fixed computer stations with an emphasis on flexible seating to encourage group work and self/student directed learning, with the use of mobile devices, and other technologies;
 - e) Multi-program room provides a flexible space for speciality workshops.
3. The gymnasium, multi-purpose room, kitchenette (server) and barrier-free washrooms are grouped together on the ground floor plan to facilitate community access, and address security concerns, by restricting access to the remainder of the building including the upper floors. As well, custodial staff are able to clean the classrooms, library and other spaces while there are permit holders in the gymnasium and/or multi-purpose room. More than one group can permit the building at the same time with the choice of the gymnasium or the multi-purpose room.

The principals of the recently completed Phase 2 schools were surveyed regarding the benefits/uses of the multi-purpose room. They all indicated that the multi-purpose room is used for a variety of functions including music and art classes, for the breakfast and lunch programs, as well as an indoor play area for primary students, on inclement weather days.

4. New buildings are required to meet rigorous energy saving criteria. Consideration is given to the orientation of the building on site, as well as the composition of the building envelope including window design. Subject to capital funding and budgets, the key energy efficiency features for new schools include:
- a) Daylighting and occupancy controls for lighting;
 - b) LED lighting for high bay spaces and exterior lighting;
 - c) Natural lighting and operable windows are included in the majority of occupied spaces, including the gymnasium, library, offices and the multi-purpose room. Where possible, natural light is also provided in corridors and stairwells;
 - d) Micromesh window blinds and/or exterior sun-shading features to limit solar heat gain for west south facing windows;

- e) Building Automation System (BAS) that allows building temperatures to be pre-set to a schedule, and zoned within the building;
- f) Where budget permits (currently under review against the Ministry's cost benchmark), new schools will feature a Displacement (tempered) Air system, which brings 100% fresh air into every room, at a low volume rate – more comfortable for occupants than the traditional higher volume forced air ventilation system which uses a mixture of fresh and recirculated air;
- g) Where budget permits (currently under review against the Ministry's cost benchmark), Radiant In-floor Heat for classroom and office spaces, is considered to be a more even form of heat distribution and more energy efficient than perimeter terminal or radiator units.
- h) Water flow restrictors in all washroom fixtures (sinks and toilets) and if budget and site conditions permit, use of grey water from storm water reservoir to irrigate the fields.

As detailed in **Appendix A**, based on readings taken on hot degree days in the recently completed Phase 2 schools, the average classroom air temperature and humidity levels is lower than in non-air conditioned schools, particularly for the upper floor rooms. Temperature data from Environment Canada indicates that on average, there are between 20 to 35 high temperature *school days* per year (mechanical cooling is typically required if the outside air temperature is greater than 23 Celcius and the relative humidity is greater than 55 %) as noted in Appendix B. Currently, the displacement air/radiant in-floor heating model is under review to meet the Ministry cost benchmark requirements which does not take into account the long term operational benefits, such as life cycle costing or energy efficiency.

5. Symbols of Catholic faith are featured both in the exterior and interior design of the building – for example, by incorporating a cross into a feature window or by highlighting the cross on the main building façade. Where budget and space permit, there may also be an opportunity to include a gathering space for mass adjacent to other spaces.
6. Elementary schools, unlike secondary schools, do not offer separate religion classes. Religious teaching is typically incorporated into the regular classroom curriculum and students frequently attend mass or catechism classes at the

local parish. As such, MoE's Space Plan Template does not make provision for a chapel in elementary schools.

7. Curriculum and policies changes that have impacted elementary school design include the following:

- a) Required 30 minutes per day of physical fitness – Ministry's Space Plan Template standardizes gymnasium areas per pupil places. The recommended area for new elementary school gymnasiums is in the range of 425.6 M sq. (4591 sq. ft.).
- b) Increased environmental and outdoor learning requirements – integration of naturalized areas within the school yard;
- a) Introduction of Full Day Kindergarten program and subsequent increase of students per classroom as of March 2012 – Ministry standard for larger kindergarten rooms is 111 sq. metres (1195 sq. ft.), to include space for cubbies, toilets and sinks, plus storage and a dedicated outdoor FDK play areas; The 2006 elementary school design standards also included creation of a separate kindergarten class zone within the ground floor plan that included the following features:
 - Rooms grouped together at one end of the building, with direct access to a dedicated exterior play area that also can be used by parents for direct drop-off/pick-up access.
 - Where site conditions permit, drop-off/pick-up parking is provided near the kindergarten zone;
 - Washrooms and cubby areas are open to and shared between two kindergarten classrooms, as a means of providing additional security/oversight.
- c) Adoption of a Safe Welcome Program, January 2013, encouraging elementary schools to lock the front door - necessitates front door entry systems (video phones, as well as direct view of the front door from the front office, with remote door release controls) and card readers at doors closest to parking, childcare and/or portables.

8. New elementary schools and major additions will be required to meet the recent (2015) Accessibility for Ontarians with Disability Act (AODA) Amendments to the 2012 Ontario Building Code (OBC), including :

- a) Fire and Smoke Alarm systems will have a visual signalling component;
 - b) Minimum door width to be 860 mm and all door operators to be "closed fist" (lever) type;
 - c) Automatic door operators for minimum two exit (and corresponding vestibule) doors;
 - d) Larger barrier-free washrooms and stalls (to accommodate 2400 mm turning radius);
9. As noted in the recently Board-approved report regarding Accessibility, the OBC accessibility standards are typically designed to meet the needs of adults, not children. A barrier-free washroom in a new school, while meeting code requirements, may not be appropriately-sized for a child. As such, consideration may be given to the placement of a child-appropriate barrier-free washroom on *each* floor of the new building.
10. The City of Toronto Green Standards have resulted in changes to both the site and the new building design, as summarized below:
- a) Storm water retention system on the school site, to meet the capacity needs of the 100 year storm, including requirement of a green roof as part of the system;
 - b) Bird Friendly Glazing;
 - c) Increased building energy performance standards;
 - d) Bike racks;
 - e) Garbage bin enclosures or garbage/recycling storage within the building;
 - f) Increased tree planting (or cash in lieu) and a percentage of permeable paving/surfaces.

11. Elementary School Design Standards for other district school boards:

School boards must complete a Space Plan Template (SPT), as the first step in the MoE's approval process to build a new school or major addition. The SPT is intended to standardize school size and design by setting out maximum building area and number of classrooms, based on the number of pupil places. Boards are required to stay within the

total area benchmark for a new school – however, some spaces/rooms can be increased if there is a corresponding decrease of area elsewhere in the floor plan.

- a) In addition to area benchmark, all school boards are required to meet the MoE's cost benchmark, based on square metres (square foot) area. The Ministry has provided a 2% geographical cost adjustment factor for some parts of the province including Toronto – however, based on construction of the Phase 1 and Phase 2 Capital projects, adjustment factor is inadequate to address the cost the challenges of building in Toronto, such as:
- i. Higher construction costs resulting from mobilization, labour costs, and haulage rates to/from dense urban sites;
 - ii. Smaller and more constrained sites, often with limited street frontage, which require three-storey schools (Ministry cost benchmark for elementary schools is based on a two-storey model);
 - iii. City of Toronto Green Standards, in particular for storm water management and the Green Roof Bylaw, as well as naturalizing the site and tree planting;
 - iv. Cost escalation or inflation arising from the length of time for municipal approvals from the City – in some cases up to 24 months;
 - v. Additional requirements imposed by the City, through Site Plan Approval, in order to address infrastructure improvements. For example, the City often requires the private owners/developers to cover the cost of new street lighting, traffic signal lights or sidewalks, beyond the property area.
- b) In order to reduce construction costs to meet benchmark, school boards may need to consider a range of options:
- i. reduce the size of the building by making corridors, storage, administration and even program (gymnasium/classrooms) spaces smaller;
 - ii. eliminate design features or *amenities* such as the stage, sinks in the classroom, interior mezzanine/glazing

- iii. specifying less costly materials such as stucco/metal cladding instead of brick exteriors, vinyl tile throughout instead of porcelain tile in corridors and on stairs;
- iv. specifying less costly HVAC, electrical and data systems;

Some of these options may impact building performance (less energy efficient) or be more costly to maintain/operate over the long term. Reducing the building size on the other hand, not only throws into question the Ministry cost benchmark which is based on building area in relation to square foot costs.

12. In June 2014, the Board approved use of Proceeds of Disposition (POD) to help fund capital projects, including the construction of expanded additions, larger gymnasiums and a replacement school for St Margaret. The MoE has challenged the use of POD to cover capital costs over benchmark as well as for larger gymnasiums at the expanded additions. This change of attitude regarding POD is the subject of a separate report to Board.

E. VISION

VISION	PRINCIPLES	GOALS
<p>Provide elementary school design standards that foster an environment of achievement and well-being for students and staff, and strengthen public confidence.</p> <p>Provide buildings that demonstrate a Catholic presence – through interior and exterior expressions of faith, and through role of building within the community and parish.</p>	<p>Equitable and consistent design standards for all new schools and major additions;</p> <p>Incorporate latest technology, and program-related features to support 21st C Learning;</p> <p>Responsible design, to demonstrate financial accountability with capital funding and Board resources.</p>	<p>Promote healthy, and positive classroom environments ;</p> <p>Security and accessibility</p> <p>important design considerations, as well addressing energy efficiency and building operation and maintenance;</p> <p>Promotion of physical activity, through gymnasium and school yard design.</p>

VISION	PRINCIPLES	GOALS
		Incorporate a symbol of Catholic faith and community within the main entrance hallway (vestibule) and on the façade of every new school or major addition.

F. METRICS AND ACCOUNTABILITY

1. All boards must submit the pre-construction estimate prepared by an external cost consultant to the MoE to request Approval to Proceed, prior to issuing the project for tender. Cost estimates are undertaken during design development as well as upon completion of the Site Plan Approval process. Project budgets include construction costs as well as municipal approval / consultant fees/ site development studies/ equipment/ furniture and moving costs. Utility costs are tracked and compared to other similar-sized buildings of similar age to assess overall building performance upon completion of construction and occupation of the building.
2. A subsequent report may be required pending the outcome of further discussions with the Ministry regarding the use of POD and project costs, resulting further revisions to the elementary school design standards.

G. IMPLEMENTATION, STRATEGIC COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT PLAN

1. Subject to Ministry approval of funding and capital costs, new school projects will incorporate the design standards as approved by the Board detailed in the report.
2. The revised Elementary School Design Standards will be presented to the recipient school at the start of the design development process. Photographs and drawings of recently completed Phase 2 (and eventually Phase 3) schools would be of benefit as part of the presentation. Provide members of the school's Building-design sub-committee an opportunity to tour new facilities.

3. Typically, the community has an opportunity to view the plans/design for the new school as part of the Site Plan Approval process at an Open House organized by the Board (school) or at the request of the local City Councillor through the City's Planning department at Community Council.
4. Plans and drawings for the new school are provide on the schools web site and linked to the Board's "Investing in Our Schools" web site.

H. STAFF RECOMMENDATION

That the 2015 Elementary School Design Standards as outlined in this report be adopted for new school design.

Date 2012	Air temperature maximum (°C)	Relative humidity (%)
19/05/2012	26.7	60%
20/05/2012	28.35	61%
21/05/2012	26.93	68%
24/05/2012	27.72	72%
25/05/2012	27.69	75%
26/05/2012	26.7	62%
27/05/2012	28.5	56%
28/05/2012	30.51	74%
10/06/2012	30.41	65%
11/06/2012	29.97	67%
15/06/2012	28.31	62%
16/06/2012	29.58	60%
17/06/2012	28.34	68%
18/06/2012	28.25	72%
19/06/2012	31.96	69%
20/06/2012	33.77	61%
21/06/2012	32.38	70%
22/06/2012	28.27	61%
23/06/2012	28.48	52%
24/06/2012	28.17	57%
27/06/2012	29.87	54%
28/06/2012	35.06	51%
29/06/2012	32.81	51%
30/06/2012	33.9	52%
01/07/2012	31.85	50%
02/07/2012	33.14	46%
03/07/2012	32.21	69%
04/07/2012	29.79	84%
05/07/2012	33.41	58%
06/07/2012	36.79	51%
07/07/2012	34.02	56%
08/07/2012	31.85	52%
09/07/2012	29.86	49%
10/07/2012	30.44	45%
11/07/2012	31.75	44%
12/07/2012	34.88	42%
13/07/2012	34.32	50%

Number of hot days in May Jun Sep that may require cooling *	
2012	51
2013	19
2014	25

Date 2013	Air temperature maximum (°C)	Relative humidity (%)
13/09/2013	28.93	67%
23/06/2013	26.49	85%
24/06/2013	26.26	84%
26/06/2013	27.39	80%
08/07/2013	26.68	87%
10/07/2013	26.29	90%
14/07/2013	28.55	75%
15/07/2013	30.06	72%
16/07/2013	31.14	72%
17/07/2013	29.64	87%
18/07/2013	29.79	86%
19/07/2013	28.98	87%
20/07/2013	27.01	77%
20/08/2013	26.49	78%
21/08/2013	27.09	77%
26/08/2013	26.28	85%
27/08/2013	26.83	87%
29/08/2013	28.46	77%
30/08/2013	27.06	79%
31/08/2013	26.79	84%
10/09/2013	26.87	91%
11/09/2013	26.72	90%
Date 2014	Air temperature maximum (°C)	Relative humidity (%)
28/06/2014	27.34	78%
30/06/2014	26.41	85%
21/07/2014	26.95	72%
22/07/2014	27.76	73%
10/08/2014	26.8	71%
11/08/2014	26.42	80%
26/08/2014	28.7	77%
30/08/2014	28.92	71%
01/09/2014	26.57	83%
04/09/2014	27.43	72%
05/09/2014	29.07	75%

Number of hot days in May Jun Sep that may require cooling *	
2012	51
2013	19
2014	25

* Outside Air dry bulb >23°C & RH > 55%

2014 Electricity Consumption per sq ft (kWh/ft²)

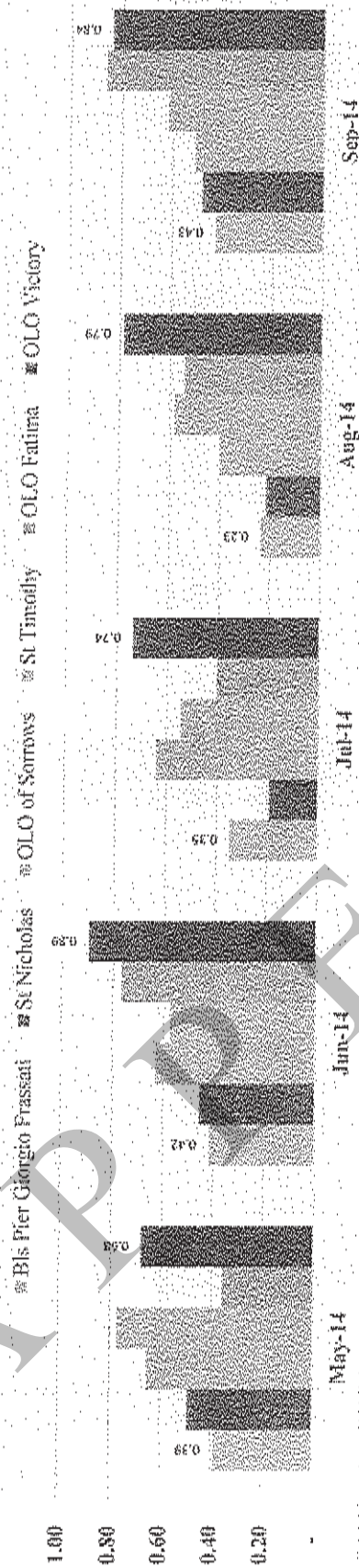


Table 1 : Electricity consumption in 2014

List #	School	Address	Area (ft²)	May-14	Jun-14	Jul-14	Aug-14	Sep-14
1	St Nicholas	33 Amarillo Drive Scarborough ON M1J 2P7	41,313	20,245	18,800	7,927	8,914	19,846
2	Bls Pier Giorgio Frassati	8 Seasons Drive Scarborough ON M1X 1X4	48,599	18,848	20,174	16,836	11,396	20,791
3	St Timothy	25 Rochelle Crescent Willowdale ON M2J 1Y3	59,783	46,173	34,193	32,438	34,786	36,933
4	OLO Fatima	3176 St Clair Avenue East Scarborough ON M1L 1V6	67,038	23,956	51,418	27,062	36,334	57,675
5	OLO Victory	70 Guestville Toronto ON M6N 4N3	67,619	45,758	60,385	49,730	53,223	56,717
6	OLO of Sorrows	32 Montgomery Road Toronto ON M8X 1Z4	67,457	43,889	42,437	43,001	27,106	34,362

Table 2 : Electricity Intensity in 2014 (kWh/ft²)

List #	School	Address	Area (ft²)	May-14	Jun-14	Jul-14	Aug-14	Sep-14
1	St Nicholas	33 Amarillo Drive Scarborough ON M1J 2P7	41,313	0.49	0.46	0.19	0.22	0.48
2	Bls Pier Giorgio Frassati	8 Seasons Drive Scarborough ON M1X 1X4	48,599	0.39	0.42	0.35	0.23	0.43
3	St Timothy	25 Rochelle Crescent Willowdale ON M2J 1Y3	59,783	0.77	0.57	0.54	0.58	0.62
4	OLO Fatima	3176 St Clair Avenue East Scarborough ON M1L 1V6	67,038	0.36	0.77	0.40	0.54	0.86
5	OLO Victory	70 Guestville Toronto ON M6N 4N3	67,619	0.68	0.89	0.74	0.79	0.84
6	OLO of Sorrows	32 Montgomery Road Toronto ON M8X 1Z4	67,457	0.65	0.63	0.64	0.40	0.51