# Building Our Schools, Building Our Future

## A Report from the Expert Panel on Capital Standards

**JUNE 2010**

# 1. LETTER OF TRANSMITTAL

Karen Maxwell
Assistant Deputy Minister (A)
Elementary/Secondary Business & Finance Division
Mowat Block, 20th Floor
900 Bay Street
Toronto, ON
M7A 1L2

Dear Ms. Maxwell:

The Expert Panel is pleased to have been given the opportunity to analyze the current capital funding model, and present its recommendations for change to the Ministry.

The Expert Panel believes that the current benchmark approach for new schools has served the majority of school boards well; however, improvements are necessary, particularly for school boards constructing small elementary and secondary schools.

The Expert Panel is recommending that the current area per pupil benchmarks be increased at the elementary and secondary levels to reflect program changes that have occurred over the last decade.

At the elementary level, the area per pupil benchmark should be increased to reflect Early Learning for four-and-five year old students, community use of schools, and the increased level of special education programs and services.

At the secondary level, the area per pupil benchmark should be increased to reflect increased levels of technical education, community use of schools, and student success programs.

The Expert Panel is recommending that the areas per pupil be increased to a greater extent for small elementary and secondary schools, to ensure that all schools, regardless of size, are able to provide an equitable range of programs and services.

The Expert Panel is of the opinion that the cost per area recommended in this Report should allow school boards to build quality schools with energy efficient management systems, including sustainable facility environmental features.

The Expert Panel is of the opinion that the cost per area should be reviewed on a regular basis and adjusted to reflect the cost of construction in different geographic locations of the province.

There is some evidence that the cost per area to build small elementary and secondary schools is somewhat higher than that for larger schools; however, the Expert Panel did not have the cost database to substantiate the exact amounts. Therefore, the Panel recommends the Ministry develop the cost database to address this issue and adjust the cost per area accordingly.

Although the benchmarks in this Report, area per pupil and cost per area, have been developed based on a detailed analysis of instructional areas and construction costs, school boards should have the discretion to build the facilities they need to reflect local programs and services.

To assist boards in designing schools to meet their capital construction needs and stay within budget, the Expert Panel has developed area per pupil space templates for elementary, secondary, and Junior Kindergarten to Grade 12 schools. These three templates generate recommended areas, based on the experience of the Expert Panel members, for all instructional and administrative spaces identified in this Report. Boards simply need to enter the number of pupil places to be served and the template will generate a prototype for the number of classrooms required and a total gross floor area for the school. With the area standards generated by these templates, a board can easily explore various uses of space while ensuring it stays within the approved maximum gross floor area. Since last summer, boards have been required to complete these templates as part of the Ministry's accountability process when proceeding with new capital projects.

Similarly the Expert Panel has developed a Secondary School Credit and Classroom Generator to help boards determine the number of rooms required to deliver each type of secondary program class.

Collectively, the templates and generator build upon the Ministry's current per pupil place and gross floor area approach in allocating capital, by providing boards with the "tools" to identify and design space to best serve student needs and improve student achievement.

The members of the Expert Panel are pleased to share their collective professional expertise, garnered with the implementation of hundreds of school capital projects, to assist the Ministry of Education with the development of a new capital funding model.

Once again, the Expert Panel would like to thank the Ministry for this opportunity.

Sincerely,

Ralph Benson
*Chair, Expert Panel on Capital Standards*

Sandi Ackroyd | Kevin Bushell | Glenn Clarke | Giacomo Corbacio | Fred Chrystal

Gerry Cullen | Bryce Eldridge | Suzanne Labrecque | Lewis Morgulis | Luc Poulin

Paul Scinocca | Wolfgang Stumpf | Arnie Wohlgemut | Randy Wright

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## 2. MEMBERS OF THE EXPERT PANEL ON CAPITAL STANDARDS

**Ralph Benson, Chair**
Superintendent of Corporate Planning, York District School Board

**Sandi Ackroyd**
Assistant Manager, Plant Department, Rainbow District School Board

**Kevin Bushell**
Executive Officer, Facility Services & Capital Planning, Thames Valley District School Board

**Glenn Clarke**
Controller of Plant, Simcoe Muskoka Catholic District School Board

**Giacomo Corbacio**
Superintendent, Facility Management Services, Halton Catholic District School Board

**Fred Chrystal**
Superintendent, Planning and Facilities, Ottawa Catholic District School Board

**Gerry Cullen**
Superintendent of Facility Services, Halton District School Board

**Bryce Eldridge**
Superintendent of Plant, York Catholic District Board

**Suzanne Labrecque**
Directrice du secteur de l'immobilisation de l'entretien et de la planification, CSD du Centre-Sud-Ouest

**Lewis Morgulis**
Manager of Facility Planning, York District School Board

**Luc Poulin**
Directeur du Service des immobilisations, CSD catholique du Centre-Est

**Paul Scinocca**
Manager of Capital/Renewal Projects, Upper Grand District School Board

**Wolfgang Stumpf**
Manager of Design, Dufferin-Peel Catholic District School Board

**Arnie Wohlgemut**
Senior Manager Facility Services, Waterloo Catholic District School Board

**Randy Wright**
Controller, Planning & Accommodation, Peel District School Board

# 3. OVERALL APPROACH

In response to the Ministry mandate to the Expert Panel to review the Ministry's current Capital Standards, the Expert Panel has focused on not only the current capital benchmarks themselves, but also on the other factors which impact a school board's ability to build quality schools.

This Report recommends that the current benchmark approach for new schools, replacement schools and consolidations, which is based on an approved area per pupil and an approved cost per area, be retained but modified in order to address current circumstances.

Throughout this Report reference to "area" includes both square meters and square feet, and may be defined in terms of area per pupil or gross floor area.

***Area per Pupil***

The area per pupil should be a variable which increases as schools decrease in terms of total enrolment. The intent is that all schools, regardless of size, should have the facilities available to provide students with a reasonably equitable range of programs and services.

***Cost per Area***

The cost per area should reflect the typical mechanical, electrical, and architectural design specifications that would result in a school with a 40 years life expectancy, a standard within the school sector. The recommended cost benchmarks also provide for indoor mechanical, air-conditioning throughout, and efficient energy management systems, including sustainable facility environmental features.

The cost per area should be reviewed on a regular basis, and adjusted to reflect the cost of construction in different geographic locations of the province. The intent is that all school boards, regardless of location, should be able to build reasonably comparable schools.

***School Board Discretion***

Included within this Report are various area per pupil templates developed by the Expert Panel, expressed in terms of gross floor area, based on a detailed analysis of instructional areas – numbers and size of rooms, operational areas required in a school, and a gross up factor to reflect areas not measured directly (wall thickness, circulation, etc.). The detailed analysis is designed as a guideline to develop the area per pupil templates. Boards have discretion to design their schools based on provincial curriculum and local priorities. The Expert Panel is confident that excellent schools can be built within the area per pupil templates.

The cost per area identified reflects both construction costs and soft costs including architectural fees and disbursements, other professional fees, application fees and furniture and equipment. School boards will have very different views with respect to the specific distribution of costs within the overall cost per area that is being recommended. The two sets of variables being recommended – area per pupil and cost per area, will result in an overall level of approved expenditure to allow the construction of excellent schools throughout the province. Again, school boards should have the latitude to build more or less area per pupil at a lower or higher cost per area if they desire; however school boards should not exceed the overall level of approved expenditure based on the two variables.

It should be noted that the terms '*area per pupil'* and '*gross floor area'* are both terms used throughout this Report. The area per pupil is simply the gross floor area divided by the enrolment level. Approved expenditure could be based on either the gross floor area or the area per pupil

Enrolment is being used in this Report to mean the enrolment approved for capital funding purposes. It is very similar to school capacity; however, school capacity can vary as a result of the pupil distribution in the school, the specialized programs in the school, and the classroom loadings.

***Elementary and Secondary School Templates***

The Expert Panel has developed separate elementary and secondary school templates, with the elementary school template being designed to be used for schools with 200 or more pupil places, and the secondary school template being designed to be used for schools with 300 or more pupils. Elementary and secondary schools with fewer than 200 pupils and 300 pupils respectively should be addressed by the Ministry on an individual basis using the elementary and secondary school templates as guides.

> The **Elementary School Template** can be used by a board to determine the number and type of instructional areas to be included within a new school, and the size of the required operational and circulation areas within a proposed school. The Elementary School Template may be used to guide consultants and architects regarding the gross floor area to be built, and the proportion of the area to be set aside for instructional, operational and gross up areas required. The Ministry will be able to use the elementary program sheet to review a school boards request to construct new elementary schools and the proportion of space set aside for each anticipated use, and to approve the maximum gross floor area for funding purposes.
>
> The **Secondary School Template** can be used by a board to determine the number and type of specialized instructional areas to be included within the new school, and the size of the required operational and circulation areas within a proposed school. The Secondary School Template may be used to guide consultants and architects regarding the gross floor area to be built, and the proportion of the area to be set aside for instructional, operational and gross up areas required. The Ministry will be able to use the Secondary School Template to review a school boards request to construct new secondary schools and the proportion of space set aside for each anticipated use, and to approve the maximum gross floor area for funding purposes.

In the case of combined elementary and secondary schools (JK to 12), the elementary and secondary school templates have been integrated based on the assumptions described in Section 6 of this Report for schools ranging from 500 to 1,000 pupil places.

> The **Junior Kindergarten to Grade 12 School Template** can be used by a board to establish the number and type of elementary and secondary instructional spaces to be built, the number of common instructional areas to serve all grades, and the size of the required operational and circulation areas within a proposed Junior Kindergarten to Grade 12 school. The Junior Kindergarten to Grade 12 School Template may be used to guide consultants and architects regarding the gross floor area to be built, and the proportion of the area to be set aside for instructional, operational and gross up areas required. The Ministry will be able to use the Junior Kindergarten to Grade 12 Template to review a school boards request to construct new secondary schools and the

proportion of space set aside for each anticipated use, and to approve the maximum gross floor area for funding purposes.

### *School Sites and Servicing*

The normal range of site expenditures are included in the cost per area. These would typically include final grading, back-filling, landscaping, parking and curbs, hard and soft play areas, and on-site services.

Costs to acquire land, to provide services to the site, and prepare a site so that a school can be built are not included in the cost per area. These costs are eligible as Education Development Charges. School boards that cannot recover these costs under an Education Development Charges by-law may need financial assistance in this regard.

### *Ministry Approvals*

School Boards should present a business case for the size of school / enrolment level required for a multi-year period, with the Ministry approving the gross floor area and area per pupil for schools based on the application of the Elementary School Template, Secondary School Template, or Junior Kindergarten to Grade 12 School Template. The tables that follow in this Report are illustrative of the gross floor area and area per pupil for different enrolment levels. The actual gross floor area and area per pupil for each school project will be dependent on the approved enrolment level for such school, and the application of the relevant school template.

The approved level of expenditure for each school project would be determined by multiplying the approved gross floor area by the approved cost per area.

# 4. ELEMENTARY SCHOOL TEMPLATE – AREA PER PUPIL / GROSS FLOOR AREA

### *Review of Existing Facilities*

To establish the area per pupil benchmark for elementary schools, the Expert Panel reviewed data from schools constructed between 2004 and 2008. A survey was developed to collect basic data regarding the Gross Floor Area and enrolment, including detailed information on all of the rooms within elementary schools. The surveys included the grade range served, enrolment of the school and the number and type of rooms constructed.

The Expert Panel reviewed the categorization of each room type, and defined the elements associated with each room or space, so that the survey data could be analyzed in a consistent manner. In reviewing the spaces within elementary schools, the Expert Panel developed three categories:

- Instructional Areas – classrooms and teaching areas
- Operational Areas – administrative building system and staff spaces
- Gross Up Area – space not measured directly within schools such as corridors, hallways and wall thicknesses

### *Proposed Grade Structure for Elementary Schools*

The elementary school template was developed assuming that schools would be built to serve students from Junior Kindergarten (JK) to Grade 8. The template also assumes that the JK and Senior Kindergarten (SK) are full-time programs. While boards have operated schools with a variety of grade structures, the Expert Panel believes that developing a single standard for grade structure is the most effective way to develop an elementary school template; as a result a JK to Grade 8 structure was selected. The template is equally applicable for a JK to Grade 6 school, or a Grade 4 to 8 school, with the overall area being a function of enrolment, not grade structure.

### *Development of Elementary Template Components*

The elementary school survey data enabled the Expert Panel to develop space standards for each type of room within a school. Each specific room type was reviewed for inclusion in the template. The template assumes that all of the specific room types for Instructional Areas and Operational Areas listed in the table below should be included within each elementary school.

**Table 1: Elementary Instructional and Operational Areas**

| Instructional Areas | Operational Areas |
|---|---|
| Kindergarten | General Office |
| Regular Classrooms | Staff Room and Staff Work Room |
| Art Room | Custodial Area |
| Science Room | Meeting Room |
| Unloaded Instructional Area | Kitchen |
| Resource Area | Academic Storage |
| Special Education Area | Washrooms |
| Gymnasium and Stage | Mechanical Spaces |
| Change Rooms | Chair Storage (in Gymnasium) |
| Library | Gymnasium Storage |

All rooms included in the template were given either an area based on a specified size or on an area per pupil. The recommended room sizes and area per pupil have been developed based on a series of discussions with the members of the Expert Panel. In some cases the areas reflect the average values for the schools reviewed. For many rooms, such as the regular classroom, a fixed area is recommended based on the data collected from the elementary school surveys. The net area size recommended for these rooms was based on the average room size from the surveys. For certain spaces, such as resource areas, an area per pupil was allocated to allow boards the flexibility to subdivide the space based on their program delivery template. For the gymnasium, an area per pupil was allocated along with a total minimum area. In establishing minimum space standards smaller schools can have facilities that allow for a range of curricular and co-curricular activities comparable to those facilities found in larger schools. The minimum area of a gymnasium allows a small school, for example, to provide an appropriate basketball court for student and community use.

***Classroom Requirement Assumptions***

The total number of classrooms generated by the elementary template is based on the enrolment of the school. Each elementary school is assumed to serve a JK to Grade 8 population. The number of students per grade is calculated by dividing the enrolment by ten which represents the total number of elementary grades in the template.

To calculate the total number of required classrooms to serve the students within an elementary school, the enrolment is divided by 23.5 and rounded up to the nearest whole classroom. This calculation accounts for the loading of Kindergarten rooms at 26, elementary classrooms at 23, and results in the school staying within the overall class size guidelines.

The number of Kindergarten classrooms is calculated by taking 20 per cent of the enrolment and dividing it by 26 students, and then rounding the result to the nearest whole classroom. The number of regular classrooms is calculated by subtracting the number of Kindergarten rooms and two specialized classrooms (i.e. art room and science room) from the total number of required classrooms.

The following table illustrates the number of classrooms generated by type for elementary schools of various sizes. The table is generated through application of the Elementary School Template in Section 8 of this Report.

**Table 2: Elementary Classrooms Generated**

| **Enrolment** | **200** | **300** | **400** | **500** | **600** | **700** | **800** |
|---|---|---|---|---|---|---|---|
| Kindergarten Rooms | 2 | 2 | 3 | 4 | 5 | 5 | 6 |
| Regular Classrooms | 5 | 9 | 13 | 16 | 19 | 23 | 27 |
| Art Room | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Science Room | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Number of Classrooms | 9 | 13 | 18 | 22 | 26 | 30 | 35 |

### *Instructional Areas*

Kindergarten

The Kindergarten is designed to be self contained and to provide full day programs for four and five year old students. The recommended space standard includes sufficient space for full-day programming, storage, self-contained washrooms, change area and a separate entrance. The recommended space is 1,200 square feet inclusive of all the elements identified above. This area has been designed to accommodate full-day instruction, an increase in class size, additional storage area, and additional staff within the classroom. The 1,200 square feet will have to be reviewed once school boards have greater experience with the implementation of full-day programs for four and five year old students.

Regular Classroom

The elementary school is comprised of a number of regular classrooms which are intended to deliver programs from grades 1 to 8. The number of regular classrooms calculated by the template is reduced by two to allow one room each to be designated for art and science. The area proposed for a regular classroom is 750 square feet.

Art Room

The art room is a large classroom space designed for the delivery of art programs. Each elementary school is provided with one art room. The room includes space for specialized storage, sinks and millwork to support the art program. The art room is intended to be loaded on a full time basis with classes when the room is not required to deliver specialized programs. The area proposed for the art room is 1,050 square feet.

Science Room

The science room is a large classroom space designed for the delivery of science and technology programs. Each school is provided with one science room. The room contains space for specialized storage, sinks and millwork to support the science program. The science room is intended to be loaded on a full time basis with classes when the room is not required to deliver specialized programs. The recommended space for the science room is 1,050 square feet.

Unloaded Instructional Area

The unloaded instructional area / classroom is a space where a number of itinerant specialized programs can be taught, such as instrumental music or second language training. This space is not loaded to allow flexibility in a school, and is based on two square feet per student with a minimum of 750 square feet.

Resource Area

Resource areas are smaller teaching spaces used to provide a range of withdrawal and support programs. The programs may be filled with different numbers of students or staff on a daily basis. Given the range of existing resource room sizes, flexibility is critical to allow boards to support students in a number of ways and the Expert Panel determined that resource areas should be provided based on an area per student basis. The space proposed for resource areas in the elementary template is 3.5 square feet per student and is not loaded.

Special Education Area

Special education rooms are teaching spaces used to provide a range of withdrawal or self contained programs for students. The provision of special education rooms varies from board to board. Given the range of needs, flexibility is critical to allow boards to support students; therefore, it is recommended that special education programs be provided on an area per student basis. It is recommended that 2 square feet per student, with a minimum of 750 square feet, be provided for each school. The space is not loaded and it can be flexibly divided to support a range of models and programs.

It should be noted that school boards can aggregate the unloaded instructional area, resource area and special education area, and use it in a flexible fashion. These three areas, which are all unloaded, in a school of 500 pupils would generate 3,750 square feet, which for example, could be used to create an instrumental music room of 1,150 square feet, a self-contained special education classroom of 1,000 square feet, and four resource rooms of 400 square feet.

Gymnasium and Stage

The gymnasium is used for physical education, and supports a range of curricular, co-curricular and community activities which require a large instructional space. The stage is used by the school for drama, music and performances, and is located adjacent to the gymnasium. The Expert Panel proposes that 10 square feet per student be provided for both the gymnasium and stage areas. It is also proposed that a minimum of 3,000 square feet of combined space be provided for schools less than 300 students, and 4,000 square feet of combined space be provided for schools with more than 300 students.

In addition to the main gymnasium area, two 400 square foot change rooms are included.

Library

The library is used for a number of curricular and extra-curricular purposes including reading, research and small group work. The library area includes the main reading area, the library collection, any attached audio visual (AV) room, librarian work room, seminar room, and computer area. The Expert Panel proposes that a standard of five square feet per student be established, and that the minimum size of a library is 1,800 square feet for schools less than 300 students, and 2,400 square feet for schools greater than 300 students. The spaces identified above are reflected in the recommended area. With the development of digital and electronic media there may be a reduced reliance on the storage of printed materials; therefore, the area defined for library could be flexibly planned for an alternative use.

The following table summarizes the proposed sizes for each of the Instructional Areas included in the Elementary Template:

| **Table 3: Elementary Space Standards for Instructional Areas** | | |
|---|---|---|
| ***Instructional Area*** | ***Size (m²)*** | ***Size (ft²)*** |
| Kindergarten | 111.47 | 1,200 |
| Regular Classroom | 69.67 | 750 |
| Art Room | 97.54 | 1,050 |
| Science Room | 97.54 | 1,050 |
| Unloaded Instructional Area | 0.19/student (min. 69.67) | 2.0/student (min. 750) |
| Resource Area | 0.33/student | 3.5/student |
| Special Education Area | 0.19/student (min. 69.67) | 2.0/student (min. 750) |
| Gymnasium and Stage | 0.93/student (min. 371.61 ≥300 students, min. 278.70 <300 students) | 10.0/student (min. 4,000 ≥300 students, min. 3,000 <300 students) |
| Change Rooms | 37.16 each | 400 each |
| Library | 0.46/student (min 222.96 ≥300 students, min. 167.22 <300 students) | 5.0/student (min. 2,400 ≥300, students min. 1,800 <300 students) |

***Operational Areas***

General Office

The general office is the administrative centre of an elementary school and performs a number of critical roles related to student supervision, records storage, and meeting space for the staff or administration with parents and students. The space is used by the administrative staff, students, visitors, and volunteers on a daily basis. The office includes the area of the principal's office, vice principal's office (where appropriate), guidance area, first aid area/health room, the Ontario Student Record (OSR) storage area, and workroom. The area of the office is based on 3.1 square feet per student with a minimum of 1,200 square feet and a maximum of 1,500 square feet.

Staff Room and Staff Work Room

The staff room and work areas includes any self contained washrooms, the kitchen area and all office spaces or work rooms used by the teaching staff within the school. The staff room and staff work areas are proposed to be 2.2 square feet per student, with a minimum of 750 square feet.

Custodial Area

The custodial areas include the custodial office, receiving area, custodial storage areas, recycling room, internal garbage room, storage areas for caretaking equipment, and slop or mop rooms. The proposed custodial area is 1.7 square feet per student, with a minimum of 400 square feet for each school.

Meeting Room

The meeting room is used by a number of internal departments within the board or external agencies working in partnership with the school, staff or its students. The proposed meeting room is 300 square feet for each school.

Kitchen

The kitchen supports a range of breakfast programs, school lunch programs, student nutrition and other food programs and is proposed to be 210 square feet for each elementary school. Kitchen facilities permit the heating, but not cooking, of food to support these programs.

Academic Storage

Academic storage has been added to the template based on 1.0 square feet per student. While the template addresses the provision of storage within a number of other curricular areas, general storage is an area that is required to support schools.

Washrooms

The washroom area includes regular student washrooms, unisex staff washrooms and barrier free washrooms, but excludes the washrooms within the Kindergarten room and staff washrooms located within the staff room. It is recommended that washrooms be provided based on 3.2 square feet per student. The space provided includes sufficient washroom capacity to meet the requirement of the building code, provides a measure of convenience for students within the school and includes the washroom capacity required for portable classrooms which may be placed on site.

Mechanical Spaces

The Expert Panel reviewed the provision of mechanical spaces within elementary schools and proposes that the area provided allow boards to build a centralized plant for heating, ventilation, and air conditioning. The amount of space proposed is 5.8 square feet per student with a minimum of 1,500 square feet for each school.

Gymnasium Storage

A gymnasium storage area of 330 square feet is included in the operational area, as well as a chair storage area of 130 square feet. These areas are in addition to academic storage recognized above.

The following table summarizes the proposed sizes for each of the Operational Areas included in the Elementary Template:

| Table 4: Elementary Space Standards for Operational Areas | | |
|---|---|---|
| **Operational Area** | **Size ($m^2$)** | **Size ($ft^2$)** |
| General Office | 0.29/student (min. 111.48, max. 139.35) | 3.1/student (min. 1,200, max. 1,500) |
| Staff Room and Staff Work Room | 0.20/student (min. 69.67) | 2.2/student (min. 750) |
| Custodial Area | 0.15/student (min. 37.16) | 1.7/student (min. 400) |
| Meeting Room | 27.87 | 300 |
| Kitchen | 19.5 | 210 |
| Academic Storage | 0.09/student | 1.0/student |
| Washrooms | 0.29/student | 3.2/student |
| Mechanical Spaces | 0.54/student (min. 139.35) | 5.8/student ( min. 1,500) |
| Chair Storage (in Gymnasium) | 12.08 | 130 |
| Gymnasium Storage | 30.66 | 330 |

***Gross Up Area***

The Gross Up Area is added to the instructional and operational areas in the template to arrive at the final gross floor area for the school. The elements within the Gross Up Area include:

- Corridors and hallways
- Entrances and entry vestibules
- Stairs and refuge areas
- Wall thickness

The survey data included considerable variance in the amount of Gross Up Area provided for each school, on both a percentage basis, and on an area per student: therefore, it was determined that the most appropriate method to address Gross Up Area is to recognize a percentage of the Instructional and Operational areas. Based on experience and judgement the Expert Panel recommends that the Gross Up Area be 38 per cent of the Instructional and Operational Areas used in the template.

***Elementary Template Summary***

Using the proposed enrolment, the Elementary Template calculates the maximum gross floor area and the area per pupil, which ranges from 107 square feet per student for an 800 pupil school, to 149 square feet per student for a 200 pupil school. The table below indicates the elementary enrolment and resulting gross floor area and area per student for schools ranging from 200 to 800 students in 50 student intervals.

It should be noted that the area per pupil increases as the enrolment declines; however, it is not a straight line function in that the template includes minimum sizes for some instructional and operational spaces, and rounding assumptions to provide whole classrooms.

| Table 5: Elementary Gross Floor Area and Area per Pupil | | | | |
|---|---|---|---|---|
| Elementary Enrolment | Gross Floor Area | | Area per Pupil | |
| | m² | ft² | m² | ft² |
| 200 | 2,774.36 | 29,863 | 13.87 | 149 |
| 250 | 3,019.26 | 32,499 | 12.08 | 130 |
| 300 | 3,506.53 | 37,744 | 11.69 | 126 |
| 350 | 3,856.41 | 41,510 | 11.02 | 119 |
| 400 | 4,274.10 | 46,006 | 10.69 | 115 |
| 450 | 4,687.42 | 50,455 | 10.42 | 112 |
| 500 | 5,171.17 | 55,662 | 10.34 | 111 |
| 550 | 5,603.08 | 60,311 | 10.19 | 110 |
| 600 | 6,086.17 | 65,511 | 10.14 | 109 |
| 650 | 6,511.67 | 70,091 | 10.02 | 108 |
| 700 | 6,937.07 | 74,670 | 9.91 | 107 |
| 750 | 7,420.26 | 79,871 | 9.89 | 106 |
| 800 | 7,941.82 | 85,485 | 9.93 | 107 |

The template works best for schools with an enrolment of 200 students or greater. Therefore, it is recommended that for schools below 200 the Ministry identify an appropriate gross floor area and area per pupil on a case-by-case basis.

Although the template has been developed for a JK to Grade 8 school, the Expert Panel believes that the template can be applied to other school program structures such as a JK to Grade 6 or JK to Grade 3 school.

A JK to Grade 6 school configuration may require proportionately more space for the Kindergarten rooms, but may require fewer specialized classrooms. Similarly, a JK to Grade 3 school configuration may require significantly more space for the Kindergarten rooms, but may not require dedicated spaces for science and art, and could function with a smaller gymnasium subject to the sizes contained in the templates.

The Expert Panel believes that while the different grade configurations for elementary schools would require a different distribution of spaces, the overall area per pupil would be roughly comparable for schools with the same enrolment.

The Expert Panel also recognizes that schools built for a specific grade configuration and program will, over the life of the schools, likely be impacted by changes to grade configurations, proportion of specialized programs and significant enrolment fluctuations within any particular grade.

It should be noted that the approved enrolment for a school dictates the gross floor area to be approved. The actual capacity of the school will in all likelihood vary from the approved enrolment as a result of the pupil distribution in the school and the specialized programs in the school.

# 5. SECONDARY SCHOOL TEMPLATE – AREA PER PUPIL / GROSS FLOOR AREA

### *Review of Existing Facilities*

The Expert Panel reviewed data from secondary schools constructed between 2004 and 2008. A survey was developed to summarize basic data on the Gross Floor Area and capacity, as well as detailed information on all of the rooms within secondary schools. The surveys accounted for the capacity of the school and the number and type of rooms constructed.

The Expert Panel reviewed the categorization of each room type, and defined the elements associated with each room, so that the survey data would be captured in a consistent manner. In reviewing the spaces within secondary schools, the Expert Panel developed three broad categories:

- Instructional Areas – classrooms and teaching areas
- Operational Areas – administrative building system and staff spaces
- Gross Up Area – space not measured directly within schools such as corridors, hallways and wall thicknesses

### *Development of Secondary Template Components*

The data provided enabled the Expert Panel to develop space standards for each type of room within a school. Each specific room type was reviewed for inclusion in the template.

The template assumes that all of the specific room types for Instructional Areas and Operational Areas listed below will be included within a secondary school:

**Table 6: Secondary Instructional and Operational Areas**

| Instructional Areas | Operational Areas |
|---|---|
| Classrooms | General Office |
| Science Lab | Guidance Area |
| Business/Computer Room | Staff Room and Teacher Work Rooms |
| Music Room | Cooperative Education Office |
| Visual Arts/Performing Arts | Meeting Room |
| Technology Lab Large | Kitchen/Servery |
| Technology Lab Small | Custodial Areas |
| Family Studies | Academic Storage |
| Special Education Area | Washrooms |
| Resource Area | Mechanical Spaces |
| Gymnasium and Exercise Room | Gymnasium Storage |
| Change Rooms | |
| Cafeteria/Cafetorium | |
| Stage | |
| Library | |

### *Classroom Requirement Assumptions*

The classroom requirements of secondary schools are more complex to calculate than elementary schools due to the level of specialization of the classrooms and the range of programs offered within a secondary school.

The number of rooms generated within the secondary template is based on both the proposed enrolment of the school, and the number and distribution of credits that those students will be taking. The template is based on the assumption of providing a full range of regular and specialized programs and credits within the school.

The number of classrooms required is based on the following calculation:

$$\left[\frac{\text{Proposed enrolment} \times 7.5}{21}\right] \div 8 = \text{total classrooms}$$

The proposed enrolment is multiplied by the average number of credits per student (7.5), and then is divided by the average class size for a secondary school (21) to determine the number of sections created. The number of sections is then divided by the number of instructional periods for an academic year (8) and rounded to the nearest whole number.

The number of rooms required by subject specialization was reviewed and the Expert Panel developed a credit weighting by specialized subject area for secondary schools. The proportions recommended are set out in the table below. It reflects a composite school offering a typical amount of science, art and technology, and provides boards with significant levels of subject specialization, while recognizing that some schools may require more or less areas of specialization based on the particular program emphasis of a board.

The table below also illustrates the specialized classroom areas, the number of credits generated based on the credit weighting developed, and the number of rooms required by specialization. Because the template provides gymnasium and exercise facilities on an area per student basis with minimum areas, the classroom requirements for physical education are not provided separately in the table. The rooms are calculated by dividing the credits by 21 to recognize the section size, and by eight to recognize the number of instructional periods.

**Table 7: Secondary Classrooms Generated for a 1,000 pupil Secondary School**

| Specialized Subject Areas | Credits (%) | Credits Generated | Rooms Generated |
|---|---|---|---|
| Science Lab | 15 | 1,125 | 7 |
| Business/Computer Room | 5 | 375 | 2 |
| Visual Arts/Performing Arts | 10 | 750 | 4 |
| Technology | 10 | 750 | 4 |
| Physical Education | 6 | 450 | |
| Family Studies | 3 | 225 | 1 |
| Regular | 51 | 3,825 | 27 |
| **Total** | **100%** | **7,500** | **45** |

The template aggregates two specialized subject areas, arts and technological education, with a set of assumptions regarding the subset of programs within the specific subject area and the type and size of facilities required.

The Secondary School Template in Section 9 of this Report generates the classrooms to be built based on the approved enrolment and the credit assumptions. It also provides the gross floor area, and the net floor areas of all the instructional and operational areas within the school, that are addressed in subsequent tables.

The Secondary School Credit and Classroom Generator Model, described in another section of this Report, provides a detailed analysis of the specialized subject areas required for secondary schools based on the distribution of credits to be taken

### *Instructional Areas*

Regular Classrooms

The secondary school is comprised of a number of regular classrooms for programs including mathematics, English, French, history, geography, modern languages, civics, careers, law, sociology and health education. The number of regular classrooms calculated by the template is 51 per cent of the total number of classrooms required. The proposed size of a regular classroom is 750 square feet each.

Science Labs

The science lab is intended to deliver a range of programs including general science, biology, chemistry and physics. The Expert Panel recommends that a single standard be applied to all science labs. Science labs are proposed to be 1,250 square feet each in size and include a portion of the shared preparation room(s) associated with the labs and all storage within the room.

Business/Computer Room

The business/computer classroom includes areas for the use of computers for class instruction. The programs using these rooms include business, marketing, accounting, and computer studies. The Expert Panel recommends that the computer lab/business classroom be 1,040 square feet, and include any required storage within the room, excluding any Local Area Network (LAN) or hub rooms.

Music Room

A music room is designed for a range of programs including vocal music, instrumental music, keyboard music, music repertoire, and guitar. The room includes instrument storage, practice rooms and a main performance area. The Expert Panel recommends music rooms be 1,390 square feet each, inclusive of all storage and practice rooms, but excluding the area of the music office.

Visual Arts/Performing Arts

A visual/performing arts room is designed for a range of programs including art, drama, media arts, photography or dance. The specific room details required for each of the programs may be different with respect to the required height and associated ancillary spaces. These spaces

may include storage rooms, change rooms, dressing rooms, or kiln rooms depending on the specific program. The Expert Panel recommends that the arts rooms be 1,130 square feet including the required ancillary spaces for each type of arts program, but excluding the associated office area.

Gymnasium and Exercise Room

The gymnasium and exercise room are used for physical education programs and support a range of curricular, co-curricular and community activities which require a large instructional space. It is recommended that the provision of both gymnasium and exercise facilities be combined within the secondary school template. The recommended area of the gymnasium and exercise room is twelve square feet per student with a minimum of 7,000 square feet for a school less than 500 students, a minimum of 8,000 square feet for a school with 500 to 700 students, and a maximum size of 13,500 square feet for the combined gymnasium and exercise room for each secondary school, exclusive of the area for the physical education office. The Expert Panel also reviewed the provision of change rooms and storage to support the gymnasium and exercise room. Change rooms of 690 square feet each are to be provided in a secondary school, and include the area required for washroom facilities or showers. For schools with less than 700 students, two change rooms are provided, and for schools larger than 700 students four change rooms are provided.

Technology Education

Technology education facilities are very specialized and deliver a range of programs including:

- Transportation
- Construction
- Manufacturing
- Hospitality/Foods
- Communications
- Technological Design
- Computer Engineering
- Cosmetology
- Health Sciences
- Green Industries

The specific equipment, exhaust, ventilation, work space and safety requirements vary among programs and the Expert Panel determined that technological education facilities could be best addressed when aggregated into two categories based on size.

The larger technological education areas have bigger, more specialized equipment, which requires significant exhaust, dust control, specialized storage and larger ancillary facilities. The smaller technological education areas require access to computers, or more portable equipment with less stringent exhaust requirements.

**Table 8: Large and Small Secondary Technological Areas**

| Large Technological Education Area | Small Technological Education Area |
|---|---|
| Transportation | Communications |
| Construction | Technological Design |
| Manufacturing | Computer Engineering |
| Hospitality/Foods | Cosmetology |
| Green Industries | Health Sciences |

The large technological education area, based on the typical size of such facilities in the schools surveyed, is proposed to be 2,500 square feet, and the small technological education area is proposed to be 1,510 square feet. Each technological education area includes all specialized storage requirements within the room and all ancillary spaces, but excludes the office area.

Family Studies

The family studies room supports a range of programs offered including textiles, fashion, foods and nutrition. The room includes the instruction areas, project areas, space for relevant equipment, project storage and materials storage. The family studies room is proposed to be 1,230 square feet in size inclusive of all facilities identified above.

Special Education Area

Special education rooms are teaching spaces used for a range of withdrawal or self-contained programs for students and are not loaded. The provision of special education rooms varies from board to board. Given the range of needs, flexibility is critical to allow boards to support students; therefore, special education programs should be based on an area per student. It is recommended that 2.0 square feet per student, with a minimum of 750 square feet, be provided for each school.

Resource Area

Resource areas are smaller teaching spaces used for a range of withdrawal and support programs and are not loaded. These Resource Areas can also be used to support Student Success Programs. The programs may be filled with different numbers of students or staff on a daily basis. Given the range of existing resource room sizes, flexibility is critical to allow boards to support students in a number of ways; therefore, the Expert Panel recommends that resource areas be based on an area per student basis. The space proposed is 2.0 square feet per student with a minimum of 750 square feet for each school.

Cafeteria / Cafetorium

The cafeteria / cafetorium is used daily in conjunction with the servery for lunch and may also be used with greater hours of operation by students and staff during the day. It includes the main seating area, the associated storage area for chairs and tables, but excludes the servery, stage and other attached uses which are defined elsewhere in the template. Aside from the gymnasium, the cafeteria / cafetorium is usually the largest space within a secondary school and is used by the school for a number of curricular and extra-curricular purposes including performances, assemblies, large group instruction and meetings. The cafeteria /cafetorium is proposed to be 5.0 square feet per student with a minimum area of 2,500 square feet for a secondary school less than 500 students.

Stage

The stage is an area used to support the performing arts and is usually located adjacent to the cafeteria. It includes the area of the main stage, thrust stage area, all lighting control areas, dressing rooms and storage attached to the stage area, but excludes other attached rooms such as a theatre arts room or the cafeteria. The area of the stage is proposed to be 1,000 square feet for schools less than 500 students, and 1,500 square feet for schools greater than 500 students.

Library

Secondary schools use the library for a number of curricular and extra-curricular purposes, including areas for computer access, small seminar spaces, research and general reading. The library includes the main reading area, the library collection, any attached AV room, librarian work rooms, seminar rooms and computer area. The Expert Panel recommends a standard of 4.0 square feet per student with a minimum area of 2,400 square feet for a school less than 500 students, and 2,800 square feet for a school between 500 and 700 students. The proposed area is to be inclusive of all of the areas identified above. With the development of digital and electronic media there may be a reduced reliance on the storage of printed materials; therefore, the area defined for library could be flexibly planned for an alternative use.

The following table summarizes the proposed sizes for each of the instructional areas included in the Secondary Template:

**Table 9: Secondary Space Standards for Instructional Areas**

| Instructional Spaces | Size ($m^2$) | Size ($ft^2$) |
|---|---|---|
| Classroom | 69.68 | 750 |
| Science Lab | 116.13 | 1,250 |
| Business | 96.62 | 1,040 |
| Music Room | 129.14 | 1,390 |
| Visual/Performing Arts Room | 104.98 | 1,130 |
| Technology Lab Large | 232.26 | 2,500 |
| Technology Lab Small | 140.28 | 1,510 |
| Family Studies Room | 114.27 | 1,230 |
| Special Education Area | 0.18/student (min. 69.68) | 2/student (min. 750) |
| Resource Area | 0.18/student (min. 69.68) | 2/student (min. 750) |
| Gymnasium and Exercise | 1.11/student (min. 650.32 <500 students, min. 743.22 >500 students, max. 1254.19) | 12/student (min. 7000 <500 students, min. 8000 >500 students, max. 13,500) |
| Change Rooms | 64.10 each | 690 each |
| Cafetorium and Stage | 0.46/student (min. 232.26 <500 students, min. 278.71 >500 students) plus 139.35 stage >500 students, 92.90 stage <500 students | 5/student (min. 2,500 <500 students, min. 3,000 >500 students) plus 1,500 stage >500 students, 1,000 stage <500 students |
| Library | 0.37/student (min. 222.97 <500 students, min. 260.13 >500 students) | 4/student (min. 2,400 <500 students, min. 2,800 >500 students) |

***Operational Areas***

General Office

The general office is the administrative centre of a secondary school and performs a number of critical roles related to student supervision, attendance, records storage and meeting space for the staff or administration with parents and students. The space is used by the administrative staff, students, visitors and volunteers on a daily basis. The office includes the area of the principal's office, vice principal's offices, health room, the Ontario Student Record storage area,

and workroom. The Expert Panel proposes that 2.3 square feet per student be provided and that the minimum area of the general office be 1,600 square feet.

Guidance Area

The guidance area contains the counselling offices, group guidance areas and resource areas for use by staff and students. The area of guidance is proposed to be 1.3 square feet per student, inclusive of all ancillary storage areas.

Staff Room and Teacher Work Rooms

The provision of staff work space in secondary schools is often organized along departmental lines, and there is a requirement to provide associated office areas within each department. Staff change facilities are also required in the physical education area to support a number of co-curricular activities. The staff room and work areas include any self contained washrooms, the kitchen area within the staff room, and all office spaces or work rooms used by the teaching staff within the school. The staff room and staff work areas are proposed to be 3.5 square feet per student.

Cooperative Education Office

A cooperative education office of 280 square feet is proposed to be used by the cooperative education department. This space supports the number of work place and experiential education programs that support secondary schools.

Meeting Room

A meeting room of 300 square feet is proposed to be used by a number of internal departments within the Board, or external agencies working in partnership with the school, staff or its students.

Kitchen / Servery

The kitchen and servery provides space for the preparation and distribution of food for the cafeteria and includes all food preparation, dishwashing, storage areas, freezers, fridges and all kitchen equipment areas. The kitchen and servery are proposed to be 1.1 square feet per student.

Custodial Areas

The custodial areas include the custodial office, receiving area, custodial storage areas, recycling room, internal garbage room, storage areas for caretaking equipment and slop or mop rooms. The custodial area is proposed to be 1.7 square feet per student.

Academic Storage

While the template addresses the provision of storage within a number of other curricular areas, general storage is an area that is required to support schools. Academic storage is proposed to be 1.0 square feet per student.

Washrooms

The washroom area includes regular student washrooms, unisex staff washrooms and barrier free washrooms but excludes the washrooms within the change rooms, staff washrooms located within the office, any staff work rooms or the main staff room. The space provided includes sufficient washroom area to meet the requirement of the Ontario Building Code, provides a measure of convenience for students on each floor within the school and includes the area required for portables which may be placed on site. The washroom area is proposed to be 3.2 square feet per student.

Mechanical Spaces

The recommended area provides for centralized mechanical spaces that includes both heating and ventilation. The amount of space proposed is 5.8 square feet per student.

Gymnasium Storage

A gymnasium storage area of 800 square feet has been included in the operational area. It is separate from other academic storage areas located within the school.

The following table summarizes the proposed sizes for each of the Operational Areas included in the Secondary Template:

**Table 10: Secondary Space Standards for Operational Areas**

| Operational Spaces | Area per Pupil | |
|---|---|---|
| | m² | ft² |
| General Office | 0.21/student (min. 148.64) | 2.3/student (min. 1600) |
| Guidance Area | 0.12/student | 1.3/student |
| Staff Room and Teacher Work Rooms | 0.33/student | 3.5/student |
| Cooperative Education | 26.01 | 280 |
| Meeting Room | 27.87 | 300 |
| Kitchen/Servery | 0.10/student | 1.1/student |
| Custodial Areas | 0.16/student | 1.7/student |
| Academic Storage | 0.09/student | 1.0/student |
| Washrooms | 0.3/student | 3.2/student |
| Mechanical Spaces | 0.54/student | 5.8/student |
| Gymnasium Storage | 74.32 | 800 |

***Gross Up Area***

The Gross Up Area is added to the instructional and operational areas in the template to arrive at the final gross floor area. The elements within the Gross Up Area include:

- Corridors and hallways
- Entrances, crush spaces and entry vestibules
- Stairs and refuge areas
- Wall thicknesses

Since the survey data showed great variance in the amount of Gross Up Area provided for each school, on both a percentage basis and on an area per student, it was determined that the most appropriate method is to recognize a percentage of the Instructional and Operational areas. The Expert Panel recommends that the average Gross Up Area be 42% of the instructional and operational space used in the template. The percentage used for secondary schools is greater than that for elementary schools because of the increased provision of student lockers, and the larger crush spaces and egresses required for the cafetorium and gymnasium.

***Secondary Template Summary***

Using the proposed enrolment, the Secondary Template calculates the maximum Gross Floor Area and the area per student, which ranges from 127 square feet per student for a 1,700 pupil school, to 171 square feet per student for a 300 pupil school. The table below indicates the secondary enrolment and resulting Gross Floor Area and Area per Student for schools ranging from 300 to 1,700 students in 100 student intervals.

It should be noted that the area per pupil increases as the enrolment declines; however, it is not a straight line function in that the template includes minimum sizes for some instructional and operational spaces, and rounding assumptions to provide whole classrooms.

**Table 11: Secondary Gross Floor Area and Area per Pupil**

| Enrolment | Gross Floor Area | | Area per Pupil | |
|---|---|---|---|---|
| | m² | ft² | m² | ft² |
| 300 | 4,777.07 | 51,420 | 15.92 | 171 |
| 400 | 5,961.31 | 64,167 | 14.90 | 160 |
| 500 | 6,958.25 | 74,898 | 13.92 | 150 |
| 600 | 7,953.89 | 85,615 | 13.26 | 143 |
| 700 | 9,040.49 | 97,311 | 12.91 | 139 |
| 800 | 10,408.11 | 112,032 | 13.01 | 140 |
| 900 | 11,461.82 | 123,374 | 12.74 | 137 |
| 1000 | 12,614.37 | 135,780 | 12.61 | 136 |
| 1100 | 13,786.81 | 148,400 | 12.53 | 135 |
| 1200 | 14,922.27 | 160,622 | 12.44 | 134 |
| 1300 | 15,967.99 | 171,878 | 12.28 | 132 |
| 1400 | 16,896.37 | 181,871 | 12.07 | 130 |
| 1500 | 18,072.71 | 194,533 | 12.05 | 130 |
| 1600 | 19,006.29 | 204,582 | 11.88 | 128 |
| 1700 | 20,119.36 | 216,563 | 11.83 | 127 |

The template works best for schools with an enrolment of 300 students or greater. Therefore, it is recommended that for schools below 300 the Ministry identify an appropriate gross floor area and area per pupil on a case-by-case basis.

Notwithstanding that the template has been developed for a Grade 9 to 12 school organization, the Expert Panel believes that the template can be applied to a Grade 7 to 12 configuration.

Although a Grade 7 to 12 school requires a different distribution of spaces, the overall area per pupil is comparable for Grade 9 to 12 schools with the same student enrolment capacity.

It is recognized that a secondary school built for a specific grade configuration and program may, over the life of the school, be impacted by changes to the grade configuration, proportion of specialized programs and significant enrolment fluctuations within any particular grade. As a result, the actual capacity of the school will, in all likelihood, vary from the approved enrolment of the school.

# 6. JUNIOR KINDERGARTEN TO GRADE 12 SCHOOL TEMPLATE – AREA PER PUPIL / GROSS FLOOR AREA

The Expert Panel has included provisions for the JK to Grade 12 template to address circumstances where boards serve isolated communities, rural communities, large geographic areas within a board, or a combination of these conditions, with a single school facility and administration. Typically these schools may be the only large facility in the community and therefore will also be seen as an important community facility.

In developing the template, the Expert Panel recognizes that the provision of some spaces would be based on the elementary and secondary components, and that other spaces within the school would be based on the combined population.

At the lower end of the range, a 500 pupil school serving JK to Grade 12 will have some limitations as to the range of specialized instructional spaces to support the secondary school population. This is due in part to the fact that at the lower end of the range, the secondary component is smaller than the minimum size contemplated in the Secondary School Template. Notwithstanding the size of the secondary component, a 500 pupil JK to Grade 12 school will include appropriately sized instructional spaces, and provide a gymnasium and cafetorium to support curricular, co-curricular and community activities.

The template for a combined elementary and secondary school has been developed based on the assumption that 66% of the enrolment will be comprised of the elementary JK to Grade 8, and 34% of the enrolment will be comprised of grades 9 to 12. The assignment of rooms is based on both elementary and secondary enrolment and mirrors that found in the previously outlined elementary and secondary school templates.

***Development of Junior Kindergarten to Grade 12 Template Components***

The template assumes that all of the specific room types for Instructional Areas and Operational Areas listed in the table below will be included within each JK to Grade 12 school:

**Table 12: JK to 12 Instructional and Operational Areas**

| Instructional Areas | Operational Areas |
|---|---|
| Kindergarten | General Office |
| Classroom - Elementary | Guidance Area |
| Science Room – Elementary | Staff Room and Teacher Work Rooms |
| Art Room – Elementary | Cooperative Education |
| Unloaded Instructional Area – Elementary | Meeting Room |
| Classroom – Secondary | Kitchen/Servery |
| Science Lab | Custodial Areas |
| Business/Computer Room | Academic Storage |
| Music Room | Washrooms |
| Visual Arts/Performing Arts | Mechanical Spaces |
| Technology Lab Large | Gymnasium Storage |
| Technology Lab Small | |
| Family Studies | |
| Special Education Area | |
| Resource Area | |
| Gymnasium and Exercise Room | |
| Change Rooms | |

| Table 12: JK to 12 Instructional and Operational Areas (cont'd) | |
|---|---|
| **Instructional Areas** | **Operational Areas** |
| Cafetorium | |
| Stage | |
| Library | |

***Instructional Areas***

The attributes of each instructional area are the same as those found in the elementary and secondary templates. The following table summarizes the proposed sizes for each of the instructional areas. The elementary space standards are used for those areas that exclusively serve an elementary population, while the secondary space standards are used for those areas which exclusively serve the secondary population.

For resource areas, the elementary standard applies to the elementary portion and the secondary standard applies to the secondary portion. For the gymnasium and exercise room, the secondary space standard is used, with the elementary minimum area provided. The ancillary spaces for the gymnasium use the secondary space standard. For the cafetorium, stage and library, the secondary space standards and minimum areas are used.

| Table 13: JK to 12 Space Standards for Instructional Areas | | |
|---|---|---|
| **Instructional Areas** | **Size ($m^2$)** | **Size ($ft^2$)** |
| Kindergarten | 111.48 | 1,200 |
| Classroom – Elementary | 69.68 | 750 |
| Science – Elementary | 97.55 | 1,050 |
| Art Room – Elementary | 97.55 | 1,050 |
| Unloaded - Elementary | 0.19/student (min. 69.68) | 2/student (min. 750) |
| Classroom Secondary | 69.68 | 750 |
| Science Lab | 116.13 | 1,250 |
| Business/Computer Room | 96.62 | 1,040 |
| Music Room | 129.14 | 1,390 |
| Visual Arts/Performing Arts | 104.98 | 1,130 |
| Technology Lab Large | 232.26 | 2,500 |
| Technology Lab Small | 140.28 | 1,510 |
| Family Studies | 114.27 | 1,230 |
| Special Education Area | 0.19/secondary student (min. 69.68) | 2/secondary (min. 750) |
| Resource Area | 0.32/elementary student and 0.18/secondary student | 3.5/elementary student and 2/secondary student |
| Gymnasium and Exercise Room | 1.11/student | 12/per student |
| Change Rooms | 64.10 each | 690 each |
| Stage | 139.35 | 1,500 |
| Cafetorium | 0.46/student | 5/student |
| Library | 0.37/student (min. 260.13) | 4/student ( min. 2,800) |

### *Operational Areas*

The attributes of each operational area are the same as those found for the Secondary School Template with the following exceptions:

- General office minimum area is based on the elementary template
- Elementary kitchen area is also included in the Operational Area

The following table summarizes the proposed sizes for each of the instructional areas included in the JK to 12 School Template:

**Table 14: JK to 12 Space Standards for Operational Areas**

| Operational Areas | Area per Pupil | |
|---|---|---|
| | m² | ft² |
| General Office | 0.28 (min. 111.48) | 3.1 (min. 1200) |
| Guidance Area | 0.12/student | 1.3/student |
| Staff Room and Teacher Work Room | 0.32/student | 3.5 student |
| Custodial Areas | 0.15 (min. 37.16) | 1.7 (min. 400) |
| Meeting Room | 27.87 | 300 |
| Kitchen | 19.5 | 210 |
| Gymnasium Storage | 74.32 | 800 |
| Servery | 0.10/student | 1.1/student |
| Academic Storage | 0.09/student | 1.0/student |
| Washrooms | 0.29/student | 3.2/student |
| Mechanical Areas | 0.53 | 5.8 |

### *Gross Up Area*

The Gross Up Area is added to the instructional and operational areas in the JK to Grade 12 template to arrive at the final gross floor area. The elements within the Gross Up Area include:

- Corridors and hallways
- Entrances, crush spaces and entry vestibules
- Stairs and refuge areas
- Wall thicknesses

The Expert Panel recommends that the secondary gross up of 42% be used for JK to Grade 12 schools. Since this template has all of the secondary features (student lockers, crush spaces, etc.) the larger gross up area is used.

### *Junior Kindergarten to Grade 12 Template Summary*

Using the proposed enrolment, the JK to Grade 12 template calculates the maximum Gross Floor Area and an area per pupil, which ranges from 126 square feet per pupil for a 1,000 pupil school, to 144 square feet per pupil for a 500 pupil school. The table below indicates the

enrolment for JK to Grade 12, the resulting Gross Floor Area and area per pupil for schools ranging from 500 to 1,000 students in 50 student intervals:

It should be noted that the area per pupil increases as the enrolment declines; however, it is not a straight line function in that the template includes minimum sizes for some instructional and operational spaces, and rounding assumptions to provide whole classrooms.

**Table 15: JK to 12 Gross Floor Area and Area per Pupil**

| Enrolment | Gross Floor Area | | Area per Pupil | |
|---|---|---|---|---|
| | m² | ft² | m² | ft² |
| 500 | 6711.13 | 72,238 | 13.42 | 144 |
| 550 | 7073.92 | 76,143 | 12.86 | 138 |
| 600 | 7647.87 | 82,321 | 12.75 | 137 |
| 650 | 8026.08 | 86,392 | 12.35 | 133 |
| 700 | 8628.56 | 92,877 | 12.33 | 133 |
| 750 | 9231.03 | 99,362 | 12.31 | 132 |
| 800 | 9635.62 | 103,717 | 12.04 | 130 |
| 850 | 10238.10 | 110,202 | 12.04 | 130 |
| 900 | 10702.06 | 115,196 | 11.89 | 128 |
| 950 | 11205.59 | 120,616 | 11.80 | 127 |
| 1,000 | 11709.13 | 126,036 | 11.71 | 126 |

Notwithstanding the template has been developed for a school with two thirds of the enrolment being defined as JK to Grade 8 elementary and one third as Grade 9 to 12 secondary, the Expert Panel believes the template can be applied to a different proportion of students in the elementary and secondary panels of the school.

The Expert Panel recognizes that a JK to Grade 12 school built for a specific grade configuration and program will, over the life of the school, be impacted by changes to the proportional enrolment in the elementary and secondary panel and the resulting proportion of specialized programs.

# 7. COST PER AREA – ELEMENTARY & SECONDARY LEVEL

In evaluating the Ministry's current cost benchmarks, the Expert Panel identified a sampling of representative schools, from amongst schools our members have recently built, that include features and specifications that the Panel believes should be included in future new school construction. Four key specifications that the Panel agreed should be accounted for in the cost benchmarks are:

- Typical mechanical, electrical and architectural design specifications that would result in a school with a 40 years life expectancy (a standard within the school sector)
- Indoor mechanical systems
- Efficient energy management systems, including sustainable facility environmental features
- Air-conditioning throughout

There are additional design specifications assumed within the recommended cost benchmarks beyond those listed above that are consistent with the representative schools identified by the Panel ranging from, for example, structure to flooring, millwork to paving and landscaping. A summary of the specifications assumed within the recommended cost benchmarks for both elementary and secondary schools is set out in Appendix A.

The sample specifications were then provided to a cost consultant, who priced the representative schools using December 2009 costing data. Based on the cost consultants analysis the Panel recommends an elementary benchmark of $172 per square foot and a secondary benchmark of $187 per square foot. The recommended kindergarten to Grade 12 school benchmark would be $179 based on a 66% elementary and 34% secondary split. The JK to 12 cost benchmark could also be adopted for use when building a grade 7 to 12 school

As with any cost benchmarks the recommended benchmarks represent average per square foot costs at a particular point in time that could be adjusted up or down based on various factors that impact cost; including market conditions and the cost of materials and labour. The cost benchmarks are based on the assumption that the new school is built within the Greater Toronto Area, where experience has shown that schools can be built most cost efficiently. The recommended cost benchmarks have not been adjusted to reflect the cost of construction in different geographic locations of the province as this was outside the mandate of the Panel.

Included within the Ministry's cost benchmark factors is funding for soft costs. The recommended cost benchmarks noted above also include funding for soft costs of up to fifteen per cent. Soft costs consist of the following expenses:

- Architectural fees
- Other fees, disbursements and permits
- Furniture and equipment
- Net GST

While it is recognized that furniture and equipment costs tend to be slightly higher in secondary schools compared to elementary schools, a common soft costs percentage of fifteen percent has been utilized. School boards have the flexibility to decide how best to prioritize spending within this category.

The recommended cost benchmarks provide for energy efficient management systems, including sustainable facility environmental features but do not include the costs associated with any type of green certification/commissioning.

Based on our collective experience, the Panel believes the cost per area to build small elementary and secondary schools is somewhat higher than that for larger schools. The group of schools constructed and/or reviewed by the Panel did not have the cost data base to confirm exact amounts. Therefore, it is recommended that the Ministry develop a cost data base to address this issue and adjust the construction cost benchmark accordingly.

The Panel notes that even with only one cost benchmark for each of elementary and secondary schools, boards building smaller schools would still benefit from a higher allocation than with the current benchmarks because the recommended area benchmarks increase as pupil places decrease, unlike the current area benchmarks that are the same regardless of pupil places.

Costs to acquire land, to provide services to the site, and prepare a site so that a school can be built are not included in the cost per area. These costs are eligible as Education Development Charges. School boards that cannot recover these costs under an Education Development Charges by-law may need financial assistance in this regard.

The benchmark factors should be reviewed regularly to ensure they reflect board costs, so the Expert Panel recommends that the Ministry regularly monitor and use consumer and/or construction indices, as well as feedback from boards to assist with determining when updates are appropriate.

# 8. ELEMENTARY SCHOOL TEMPLATE

The Elementary School Template generates, from the proposed enrolment for the school, the Gross Floor Area of the school, the total number of classrooms to be built, and provides the floor areas of all of the instructional and operational areas within the school. The Ministry or board can change the student enrolment for the school, and the applicable program information will be automatically adjusted.

While the Template is not prescriptive in terms of the provision of program spaces or the associated net floor areas for those spaces, it does provide a reasonable starting point for the design of an elementary school in terms of allocating the classrooms by type and number and by defining the other spaces to be constructed. Boards with less experience in designing new schools may find the net floor area assumptions valuable for discussions with architectural consultants, administrative and program staff and the public.

For certain spaces such as the unloaded instructional area, the resource area and the special education area, the template generates a floor area without specifying a number of rooms or room sizes. The template provides a board with flexibility for these spaces which can assist in the design of a number of spaces to meet the school board's program delivery methods within the total area generated by the template.

The net floor area generated for the gymnasium and stage, boards have the flexibility to design all of the area within the gymnasium with no stage, allocate a portion of the area to a stage and the balance to the gymnasium, or combine some of the areas identified above with the combined gymnasium and stage area.

The Operational Areas provided allow boards the flexibility to allocate sufficient space for all of the administrative and staff functions in the building. The space provided within the Elementary School Template includes sufficient washroom, custodial, and mechanical areas to meet the requirements of the Ontario Building Code and provide a measure of convenience for staff and students on each floor within the school.

| Table 16: Elementary School Template | | | | | | |
|---|---|---|---|---|---|---|
| **Enrolment** | | | | | 500 | |
| **Classrooms** | | | | | 22 | |
| **Grade Assumptions** | | | Students | | Divisor | |
| JK to Grade 3 | | | 250 | | | |
| JK-SK | | | 100 | | 26 | |
| 1 to 3 | | | 150 | | 23 | |
| Grade 4-8 | | | 250 | | 23 | |
| **Instructional Spaces** | Number | | Size m. | Size ft. | Floor Area m² | Floor Area ft² |
| Kindergarten | 4 | | 111.48 | 1,200 | 445.93 | 4,800 |
| Classroom | 16 | | 69.68 | 750 | 1114.84 | 12,000 |
| Art Room | 1 | | 97.55 | 1,050 | 97.55 | 1,050 |
| Science Room | 1 | | 97.55 | 1,050 | 97.55 | 1,050 |
| Unloaded Instructional Area | | | 92.90 | 1,000 | 92.90 | 1,000 |
| Resource Area | | | 162.58 | 1,750 | 162.58 | 1,750 |
| Special Education Area | | | 92.90 | 1,000 | 92.90 | 1,000 |
| Gymnasium | | | | | | |
| Gymnasium Area and Stage | 1 | | 464.52 | 5,000 | 464.52 | 5,000 |
| Change Rooms | 2 | | 37.16 | 400 | 74.32 | 800 |
| Library | 1 | | 37.16 | 2,500 | 37.16 | 2,500 |
| **Total Instructional Area** | | | | | 2875.35 | 30,950 |
| **Operational Space** | Square Meter/Feet per Student m² | Square Meter/Feet per Student ft² | Room Area m² | Room Area ft² | Floor Area m² | Floor Area ft² |
| General Office | 0.28 | 3.1 | | | 144.00 | 1,550 |
| Staff Room and Teacher Work Rooms | 0.2 | 2.2 | | | 102.19 | 1,100 |
| Custodial Areas | 0.15 | 1.7 | | | 78.97 | 850 |
| Meeting Room | | | 21.37 | 230 | 21.37 | 230 |
| Kitchen | | | 19.51 | 210 | 19.51 | 210 |
| Chair Storage (in Gymnasium) | | | 12.08 | 130 | 12.08 | 130 |
| Gymnasium Storage | | | 30.66 | 330 | 30.66 | 330 |
| Academic Storage | 0.09 | 1 | | | 46.45 | 500 |
| Washrooms | 0.29 | 3.2 | | | 148.64 | 1,600 |
| Mechanical Spaces | 0.52 | 5.8 | | | 268.03 | 2,885 |
| **Total Operational Area** | | | | | 871.90 | 9,385 |
| Total Operational and Instructional | | | | | 3747.24 | 40,335 |
| Gross Up Added (38% of Above) | | | | | 1423.95 | 15,327 |
| Gross Floor Area | | | | | 5171.20 | 55,662 |
| Area per Pupil | | | | | 10.34 | 111.32 |

# 9. SECONDARY SCHOOL TEMPLATE

The Secondary School Template is more complex than the Elementary School Template. The development of the number of specialized classrooms within the template is based on the credits generated for each of the instructional spaces. For schools with different program emphasis small fluctuations in the total floor area can result. The template does not alter the total number of classrooms to be built based on these variances, but there may be more or less classrooms of a particular size required. The default settings in the Secondary School Template, based on the typical distribution of credits in a composite school, provide a significant amount of specialized classroom space.

The Secondary School Template generates the Gross Floor Area of the school, the total number of classrooms to be built, and provides the net floor areas of all of the instructional and operational areas within the school. A board can change the proposed enrolment for the program and the applicable program information will be adjusted automatically. The Secondary School Template may be used in conjunction with the Secondary School Credit and Classroom Generator, which is provided in a following section in the Report.

However, for purposes of the Secondary School Template, the template has been developed on the basis of the typical distribution of credits taken by secondary school students in a composite school. It should be noted that if a school board has a different distribution of credits taken by its secondary school students, the total number of approved classrooms would not change, but the Secondary School Credit and Classroom Generator would create a different mix of classrooms with resultant implications for gross floor area and area per pupil. The Expert Panel, however, does not believe these differences are significant enough to warrant incorporating these adjustments in the Secondary School Template.

While the Secondary School Template is not prescriptive in terms of the provision of program spaces or the associated sizes of those spaces, it does provide a reasonable starting point for the design of a secondary school in terms of allocating the classrooms by type and number, and by defining the other spaces to be constructed. Boards with less experience in designing new schools may find the net floor area assumptions valuable for discussions regarding the design of a new school with architectural consultants, administrative and program staff and the public.

The allocation of rooms by subject specialization provides average net floor areas for the design of each room. A board has the flexibility to design rooms of different sizes within the overall floor area provided. For example, the two large Technology rooms totalling 5,000 square feet can be divided into a transportation lab of 3,000 square feet and a construction lab of 2,000 square feet. Similarly boards will have the flexibility to allocate and design the resource area(s) more effectively to utilize the 2,000 square feet provided.

The Operational Areas provided allow boards the flexibility to allocate sufficient space for all of the administrative and staff functions in the building. The floor area provided within the Secondary School Template includes sufficient washroom, custodial, and mechanical areas to meet the requirements of the Ontario Building Code and provide a measure of convenience for staff and students on each floor within the school.

| Table 17: Secondary School Template | | | | | | |
|---|---|---|---|---|---|---|
| **Enrolment** | | | | | | **1,000** |
| **Credit Assumptions** | **%** | | **Credits** | | **Rooms** | |
| | | | | | **45** | |
| Science | 15 | | 1,125 | | 7 | |
| Business | 5 | | 375 | | 2 | |
| Arts | 10 | | 750 | | 4 | |
| Technology | 10 | | 750 | | 4 | |
| Physical Education | 6 | | 450 | | | |
| Family Studies | 3 | | 225 | | 1 | |
| Regular | 51 | | 3,825 | | 27 | |
| **Instructional Spaces** | **Number** | | **Size** | | **Floor Area** | |
| | | | m. | ft. | m² | ft² |
| Classroom | 27 | | 69.68 | 750 | 1881.29 | 20,250 |
| Science Lab | 7 | | 116.13 | 1,250 | 812.90 | 8,750 |
| Business/Computer Room | 2 | | 96.62 | 1,040 | 193.24 | 2,080 |
| Music Room | 1 | | 129.14 | 1,390 | 129.14 | 1,390 |
| Visual Arts/Performing Arts | 3 | | 104.98 | 1,130 | 314.94 | 3,390 |
| Technology Lab Large | 2 | | 232.26 | 2,500 | 464.52 | 5,000 |
| Technology Lab Small | 2 | | 140.28 | 1,510 | 280.57 | 3,020 |
| Family Studies | 1 | | 114.27 | 1,230 | 114.27 | 1,230 |
| Special Education Area | | | 185.81 | 2,000 | 185.81 | 2,000 |
| Resource Area | | | 185.81 | 2,000 | 185.81 | 2,000 |
| Gymnasium and Exercise Room | | | 1114.84 | 12,000 | 1114.84 | 12,000 |
| Change Rooms | 4 | | 64.10 | 690 | 256.41 | 2,760 |
| Cafeteria/Cafetorium | 1 | | 464.52 | 5,000 | 464.52 | 5,000 |
| Stage | 1 | | 139.35 | 1,500 | 139.35 | 1,500 |
| Library | 1 | | 371.61 | 4,000 | 371.61 | 4,000 |
| **Total Instructional Area** | | | | | **6909.20** | **74,370** |
| **Operational Areas** | **Square Meter/Feet per Student** | | **Room Area** | | **Floor Area** | |
| | m² | ft² | m² | ft² | m² | ft² |
| General Office | 0.21 | 2.3 | | | 213.67 | 2,300 |
| Guidance Area | 0.12 | 1.3 | | | 120.77 | 1,300 |
| Staff Room and Teacher Work Rooms | 0.33 | 3.5 | | | 325.16 | 3,500 |
| Cooperative Education Office | | | 26.01 | 280 | 26.01 | 280 |
| Meeting Room | | | 27.87 | 300 | 27.87 | 300 |
| Gymnasium Storage | | | 74.32 | 800 | 74.32 | 800 |
| Kitchen/Servery | 0.10 | 1.1 | | | 102.19 | 1,100 |
| Custodial Areas | 0.16 | 1.7 | | | 157.93 | 1,700 |
| Academic Storage | 0.09 | 1 | | | 92.9 | 1,000 |
| Washrooms | 0.30 | 3.2 | | | 297.28 | 3,200 |
| Mechanical Spaces | 0.54 | 5.8 | | | 536.05 | 5,770 |
| **Total Operational Area** | | | | | **1974.15** | **21,250** |
| Total Operational and Instructional | | | | | 8883.35 | 95,620 |
| Gross Up Added (42% of Above) | | | | | 3731.01 | 40,160 |
| Gross Floor Area | | | | | 12614.36 | 135,780 |
| Area per Pupil | | | | | 12.61 | 135.8 |

# 10. JUNIOR KINDERGARTEN TO GRADE 12 SCHOOL TEMPLATE

The JK to Grade 12 School Template generates the Gross Floor Area of the school, the total number of classrooms to be built, and provides the floor areas of all of the Instructional and Operational areas within the school for both the elementary and secondary portion of the school. A board can change the student population number for the program, and the cells of the program sheet will be automatically populated.

While the JK to Grade 12 School Template is not prescriptive in terms of the provision of program spaces or the associated sizes of those spaces, it does represent a reasonable starting point for the design of a JK to Grade 12 school by allocating the classrooms by type and number and defining the other spaces to be constructed. Boards with less experience in designing new schools may find the area assumptions valuable for discussions regarding the design of a new school with architectural consultants, administrative and program staff and the public.

The attributes of each instructional area are the same as those found for either the elementary or secondary templates. The elementary space standards are used for those areas that exclusively serve an elementary population. The secondary space standards are used for those areas which exclusively serve the secondary population.

The Operational areas provided allow boards to allocate with flexibility, sufficient space for all of the administrative and staff functions in the building. The space provided within the JK to 12 School Template includes sufficient washroom, custodial, and mechanical areas to meet the requirements of the Ontario Building Code and provide a measure of convenience for staff and students on each floor within the school.

| Table 18: JK-12 School Template | | | | | | |
|---|---|---|---|---|---|---|
| **Enrolment** | | | | | | **500** |
| Elementary Students | | | | | | 335 |
| Elementary Classrooms | | | | | | 15 |
| Secondary Students | | | | | | 167 |
| Secondary Credits | | | | | | **1,249** |
| **Credit Assumptions** | **%** | | **Credits** | | **Rooms** | |
| Science | 15 | | 187 | | 1 | |
| Business/Family Studies | 7.5 | | 94 | | 1 | |
| Arts | 10 | | 125 | | 1 | |
| Technology | 10 | | 125 | | 1 | |
| Physical Education | 6 | | 75 | | | |
| Regular | 51.5 | | 643 | | 4 | |
| **Instructional Spaces** | **Number** | | **Size** | | **Floor Area** | |
| | | | m. | ft. | $m^2$ | $ft^2$ |
| Kindergarten | 3 | | 111.48 | 1,200 | 334.45 | 3,600 |
| Classroom Elementary | 10 | | 69.68 | 750 | 696.77 | 7,500 |
| Science - Elementary | 1 | | 97.55 | 1,050 | 97.55 | 1,050 |
| Art Room - Elementary | 1 | | 97.55 | 1,050 | 97.55 | 1,050 |
| Unloaded Instructional Area - Elementary | | | 69.68 | 750 | 69.68 | 750 |
| Classroom Secondary | 4 | | 69.68 | 750 | 278.71 | 3,000 |
| Science Lab | 1 | | 116.13 | 1,250 | 116.13 | 1,250 |
| Business/Computer Room | 1 | | 96.62 | 1,040 | 96.62 | 1,040 |
| Music Room | 0 | | 129.14 | 1,390 | 0.00 | 0 |
| Visual Arts/Performing Arts | 1 | | 104.98 | 1,130 | 104.98 | 1,130 |
| Technology Lab Large | 0 | | 232.26 | 2,500 | 0.00 | 0 |
| Technology Lab Small | 1 | | 140.28 | 1,510 | 140.28 | 1,510 |
| Family Studies | 0 | | 114.27 | 1,230 | 0.00 | 0 |
| Special Education Area | | | 92.90 | 1,000 | 92.90 | 1,000 |
| Resource Area | | | 139.87 | 1,506 | 139.87 | 1,506 |
| Gymnasium and Exercise Room | | | 557.42 | 6,000 | 557.42 | 6,000 |
| Change Rooms | 4 | | 64.10 | 690 | 256.41 | 2,760 |
| Stage | 1 | | 139.35 | 1,500 | 139.35 | 1,500 |
| Cafeteria / Cafetorium | 1 | | 232.26 | 2,500 | 232.26 | 2,500 |
| Library | 1 | | 260.13 | 2,800 | 260.13 | 2,800 |
| **Total Instructional Area** | | | | | **3711.06** | **39,946** |
| **Operational Spaces** | **Square Meter/Feet per Student** | | **Room Area** | | **Floor Area** | |
| | $m^2$ | $ft^2$ | $m^2$ | $ft^2$ | $m^2$ | $ft^2$ |
| General Office Elementary and Secondary | 0.21 | 2.3 | | | 106.84 | 1,200 |
| Guidance Area Secondary | 0.12 | 1.3 | | | 20.11 | 216 |
| Staff Room and Teacher Work Rooms | 0.33 | 3.5 | | | 162.58 | 1,750 |
| Cooperative Education Office | | | 26.01 | 280 | 26.01 | 280 |
| Meeting Room | | | 27.87 | 300 | 27.87 | 300 |
| Gymnasium Storage | | | 74.32 | 800 | 74.32 | 800 |
| Kitchen / Servery | 0.10 | 1.1 | | | 102.19 | 550 |
| Custodial Areas | 0.16 | 1.7 | | | 78.97 | 850 |
| Academic Storage | 0.09 | 1 | | | 46.45 | 500 |
| Washrooms | 0.30 | 3.2 | | | 148.64 | 1,600 |
| Mechanical Spaces | 0.54 | 5.8 | | | 268.03 | 2,885 |
| **Total Operational Area** | | | | | **1062.01** | **10,931** |
| Total Operational and Instructional | | | | | 4773.07 | 50,877 |
| Gross Up Added (42% of Above) | | | | | 2004.69 | 21,368 |
| Gross Floor Area | | | | | 6777.75 | 72,245 |
| Area per Pupil | | | | | 13.56 | 144.5 |

# 11. SECONDARY SCHOOL CREDIT AND CLASSROOM GENERATOR

The programming of a secondary school is more complex than programming the spaces within an elementary school due to the specialization of classroom spaces, the range of class sizes based within those rooms and the length of the school day.

In an elementary school, the specialized classrooms, which include the Kindergarten, science room and art room, are occupied by classes on a full time basis. In a secondary school, classrooms are occupied on a period by period basis. Specialized rooms need to be occupied for the majority of the school day in order to justify their creation and retention for that use.

The specialization of classrooms for programs in secondary schools typically results in a room type that may not be suitable for a wide range of programs within it. For example, a transportation lab with auto hoists, mounted tools and equipment, specialized ventilation and power, and concrete surfaces will not be usable for other programs such as art, drama, music, math, or physical education without significant modifications.

A credit is granted in recognition of the successful completion of a course that has been scheduled for a minimum of 110 hours. Credits are granted by a principal on behalf of the Minister of Education and Training for courses that have been developed or approved by the ministry. For this document, a credit represents one student enrolled in one course.

In a secondary school the number of credits generated, which is defined as the number of courses students enrol in, for each term, dictates the space requirements for a school. The threshold for creating a specialized classroom space is calculated based on the number of sections that require the space.

A minimum of 85 credits is required to generate a single specialized space, within a particular discipline, in the secondary school template. In order to generate a single specialized space, four sections with a minimum of 21 students in each section, plus 1 additional student is required. The 85 credits therefore rounds up to 1 full classroom. The number of periods assumed in each schedule is eight (for both a full year and semestered calendar).

The Secondary Credit and Classroom Generator establishes the number of specialized rooms and the proportion of those rooms to be built. It uses the course calendar information available for a single school or group of schools to assess the number of rooms required to deliver a range of programs.

The Secondary Credit and Classroom Generator was developed as a tool to assist school boards in selecting the number and type of classroom spaces to be constructed within a secondary school. This tool is used to determine the number of specialized rooms and to determine which program spaces will be shared or self contained within the school.

*Credit Data*

Data to be used can be secured from a variety of sources and can be entered as section data, raw credit data or weighted credit data. Each method has advantages:

- Section Data summarizes the number of sections of a course and the students per section. The challenge in using section data is that the size of the sections created by schools may vary by department.

- Raw Credit Data indicates the course, the maximum number of students and number of students enrolled. The data does not necessarily count the credit weight being taken. In this case the data for Civics and Careers needs to be halved, and some courses such as cooperative education may not be weighted heavily enough.
- Weighted Credit Data indicates the course, the credit value, the number of students enrolled and the total credits being taken. This data is the most complete set and usually requires additional manipulation.

The Credit Generator does not use credit completion data since the completion data is lower than the enrolment data due to withdrawals or failures, and therefore presents an incomplete picture of the credits being taken.

A data capture table below summarizes the credit data by type of course within a school and provides data critical to understanding a program.

This table indicates that for music, in a school of 1000 students, a total of 360 credits are being taken in four specific music courses and that the credit weight is 0.36 credits of music per student within the school:

**Table 19: Sample Credit Data for Music**

| Music | Code | 9 | 10 | 11 | 12 | Total | Student |
|---|---|---|---|---|---|---|---|
| | AMG | | | 50 | 45 | 95 | 0.10 |
| | AMR | | | 65 | | 65 | 0.07 |
| | AMU | 50 | 100 | | | 150 | 0.15 |
| | AMV | 50 | | | | 50 | 0.05 |
| | Other | | | | | 0 | 0 |
| | **Total** | **100** | **100** | **115** | **45** | **360** | **0.36** |

For each subject area within a school, secondary credit data can be captured and analyzed on a per student basis to determine the proportion of space required for each subject area. The Secondary School Template recognizes seven areas of subject specialization as shown in the table below. A number of the specific subjects within each subject area of specialization are also outlined.

**Table 20: Area of Subject Specialization**

| Science | Business | Arts | Technological Education | Physical Education | Family Studies | Regular Classrooms |
|---|---|---|---|---|---|---|
| Biology | Marketing | Dance | Communications | Outdoor Ed | Fashion | Cooperative Ed |
| Chemistry | Accounting | Drama | Computer Eng | Exercise Science | Foods | English |
| General Science | | Music | Construction | | Parenting | French |
| Physics | | Theatre Arts | Cosmetology | | Textiles | Geography |
| | | Visual Art | Green Industry | | | Health |
| | | | Health Sciences | | | History |
| | | | Integrated Tech | | | Humanities |
| | | | Manufacturing | | | Learning Strategies |
| | | | Tech Design | | | Math |
| | | | Transportation | | | Politics |
| | | | | | | Religion |

The specific number of credits per student within any one of these subject areas may vary from school to school and from year to year. The Secondary Credit and Classroom Generator allows schools to address the number of credits per student and the total credits taken within a specific school.

The secondary template is built on the assumption that 7.5 credits per student are taken and the credit generator can be run based on a higher or lower number of credits per student based on the experience of the board.

The sample school included in the Secondary School Credit and Classroom Generator table below is based on an enrolment of 1,200 students and 7.5 credits per student. If the school were to offer religion as a credit, other programs would have to have the credits per student reduced to remain at 7.5 credits per student. The Secondary School Credit and Classroom Generator recognizes that the 0.25 credit per student for civics and careers is a compulsory credit.

The areas highlighted within the following table including the proposed enrolment, and the credits per student require inputs from the board using the credit generator. As a result the credit specialization data may look different for each school reviewed, and may fluctuate slightly over time as subject areas experience growth and decline within a school.

**Table 21: Secondary School Credit and Classroom Generator**

| Sample Secondary School Enrolment | 1,200 | | | | |
|---|---|---|---|---|---|
| Grade | 9 | 10 | 11 | 12 | Total |
| Students Per Grade | 300 | 300 | 300 | 300 | 1,200 |
| Credits Taken | 2,250 | 2,250 | 2,250 | 2,250 | 9,000 |
| Students | 1,200 | | Credits/Student | | 7.5 |
| **Program** | | **Credits per Student** | **Credits** | **Divisor** | **Sections** |
| Math | | 1.00 | 1,200 | 21 | 57 |
| English | | 1.00 | 1,200 | 21 | 57 |
| Science | | 1.13 | 1,350 | 21 | 64 |
| French, Modern Languages | | 0.27 | 324 | 21 | 15 |
| History, Classical Studies | | 0.37 | 444 | 21 | 21 |
| Geography | | 0.30 | 360 | 21 | 17 |
| Politics, Law | | 0.28 | 336 | 21 | 16 |
| Civics/Careers* | | 0.25 | 300 | 21 | 14 |
| Learning Strategies | | 0.10 | 120 | 21 | 6 |
| Humanities | | 0.15 | 180 | 21 | 9 |
| Visual Art | | 0.25 | 300 | 21 | 14 |
| Performing Art | | 0.10 | 120 | 21 | 6 |
| Music | | 0.40 | 480 | 21 | 23 |
| Technological Education | | 0.75 | 900 | 21 | 43 |
| Physical Education | | 0.45 | 540 | 21 | 26 |
| Family Studies | | 0.23 | 270 | 21 | 13 |
| Business/Computer | | 0.38 | 450 | 21 | 21 |
| Cooperative Education | | 0.10 | 120 | 21 | 6 |
| Religion** | | | 0 | 21 | 0 |
| Total | | 7.50 | 8,994 | | 428 |
| * *Compulsory Credits* | | | | | |
| ** *Catholic Schools only* | | | | | |
| **Specialization Based on Course Above** | | **% of Credits** | **Credits** | **Rooms** | |
| Science | | 15.0% | 1,350 | 8 | |
| Business | | 5.0% | 450 | 3 | |

| Specialization Based on Course Above | % of Credits | Credits | Rooms | |
|---|---|---|---|---|
| Arts | 10.0% | 900 | 5 | |
| Technology | 10.0% | 900 | 5 | |
| Physical Education | 6.0% | 540 | | |
| Family Studies | 3.0% | 270 | 2 | |
| Regular | 51.0% | 4,590 | 31 | |
| Total | 100.0% | 9,000 | 54 | |

## 12. ADDITIONS AND ALTERATIONS/RENOVATIONS

Over the last decade there have been a significant number of new schools built within the province. While there will always be the need for new schools, most Panel members agree that a significant percentage of capital construction in the next few years will likely be for additions and alterations/renovations.

The Expert Panel supports the current approach to funding additions based on the new construction parameters, but since this Report recommends a sliding scale area benchmark the question arises as to what area benchmark should be applied. It is recommended that the area benchmark be based on the proposed enrolment after the addition is complete. For example, a 100 pupil place addition to an existing 400 pupil place elementary school generates an area benchmark of 111 square feet per pupil which is the recommended area benchmark for a 500 pupil place school.

Under the various capital programs the Ministry has introduced over the last several years, approval of major alterations/renovations have been assessed on a case-by-case basis due to the range of variance in cost that typically does not bear a direct connection to the number of pupil places being created. A key assumption made by the Ministry, that the Expert Panel supports, is that an alteration/renovation, no matter how extensive, should not cost more than it would to construct the school that is being proposed for alteration/renovation. If this were not the case it would make little sense to proceed with the alteration/renovation. Therefore recognizing that alterations/renovations cannot be easily categorized based on cost, the Expert Panel recommends that the Ministry continue to review funding for major renovations/alterations on a case-by-case basis.

# 13. RECOMMENDATIONS

***The Expert Panel Recommends:***

1. That the Ministry adopt a variable approach to area benchmarks so that the area benchmarks increases as the school size decreases.

2. That the Ministry adopt the Elementary, Secondary, and Junior Kindergarten to Grade 12 cost per area benchmarks recommended in the Report in developing its capital approval / funding mechanisms: $172 Elementary, $187 Secondary, and $179 Junior Kindergarten to Grade 12.

3. That the Ministry adopt the Elementary School Template, Secondary School Template, and Junior Kindergarten to Grade 12 School Template recommended in the Report in developing its capital approval / funding mechanisms.

4. That school boards utilize the school templates to assist in designing their schools and staying within their overall budget.

5. That school boards share the school template data with their consultants and architects as a guide regarding the gross floor area to be built, and the proportion of the area to be set aside for instructional, operational and gross-up areas.

6. That school boards utilize the Secondary School Credit and Classroom Program Generator to help determine the required number and types of rooms to deliver their respective secondary school programs.

7. That the Ministry develop a cost data base to determine the relative per area costs to build small elementary and secondary schools, and adjust the construction cost benchmarks accordingly.

8. That the Ministry review the construction cost benchmarks on a regular basis, and adjust them accordingly to reflect current market prices.

9. That the cost per area benchmarks be adjusted by the Ministry to reflect the different geographic locations within the province.

10. That the Ministry adopt the recommendations in the Report regarding school additions and renovations.

11. That the Ministry provide financial assistance to school boards, where necessary, with respect to the costs to acquire land, to provide services to a site, and prepare a site so that a school can be built. These costs are eligible EDC expenditures for school boards eligible to pass an Education Development Charges By-Law.

# 14. APPENDIX A

***Elementary school***

Structure and Finishes - 55%[1] of the construction budget[2]

Structure

- In general structure is load bearing concrete block masonry with steel columns and beams at large span open area.

- Footings are cast in place concrete strip footings for exterior walls and load bearing interior walls. Cast in place concrete pad footings at columns. Foundation walls are reinforced concrete block masonry. There are no basement floor areas.

- Ground floor construction is 4 inch (+/-) concrete slab on grade and granular base. Slab thickening is included under non-load bearing partition walls. Second floor is constructed of pre-cast hollow core concrete slab with concrete topping. Roof structure is comprised of open web steel joist supporting 1 ½" steel deck, using acoustic steel deck in the gym and as appropriate elsewhere.

Exterior Enclosure

- Exterior walls are generally cavity construction over 80% of the wall surface consisting of concrete block masonry backup wall: air/vapour barrier (blueskin or equal); 3 inch rigid insulation and standard size clay brick veneer over approximately 80% of the wall area and prefinished metal siding over 20% of the overall cavity construction. Pre-finished metal siding at mechanical penthouse and roof screens.
- Generally exterior walls will form a nominal parapet around the building.

Glazing

- Double glazed aluminium windows (20% of wall area). Glazed curtain wall at main entrance.
- Pre-finished aluminium louvers as required.

[1] *These percentages are provided for illustrative purposes only. No two capital projects are ever exactly the same, but these percentages can serve as general approximations to assess where costs may be too high considering the construction budget and the total project budget.*

[2] *The construction budget is a sub-set of the total project budget that does not include soft costs (e.g. architect fees, furniture and equipment).*

Roofing

- Roofing is predominantly a built-up 4-ply bituminous system complete with fibreboard, insulation, and vapour retarder.
- Localized area of 2-ply modified bitumen may be appropriate.
- Parapets are masonry capped with pre-finished metal flashings.
- Concrete pavers to provide access to service areas.

Interior partitions

- Interior partitions are typically latex painted concrete block wall construction.
- A limited use of wall board products on metal partitions appropriate for protected areas (such as offices).
- Washrooms, stairs, and service areas are block painted with epoxy wall coating.

Doors

- Interior doors are painted steel skinned honeycomb hollow metal doors in hollow metal frames. Doors come with vision panels. Exterior doors are generally insulated, hollow metal steel doors in hollow metal frames. Main entrance doors are glazed aluminium.

Flooring

- Porcelain tile in corridors
- Ceramic tile in washrooms
- Epoxy paint to mechanical & receiving areas
- Athletic flooring in gymnasium
- Remainder of flooring within classroom and other areas, vinyl composite tile with rubber base.
- Carpet is employed in the Library and partially within the General Office area.

Ceilings

- Ceilings are primarily lay-in acoustic tile, with localized areas of gypsum board suspended ceiling (up to 5% of the overall ceiling area). Some service and storage areas are exposed to structure.
- Acoustic steel deck in the gymnasium.

Millwork

- Millwork is constructed of melamine faced particleboard, and finished veneer core plywood in special use areas. Millwork cost is approximately 2% of the construction budget.
- Classrooms equipped with lower cabinet, countertop and uppers.
- Full height, open shelving in library.
- Whiteboards, chalkboards and tack-boards are provided in all instruction spaces.

Fitments & Equipment

- Washrooms are complete with metal toilet partitions, wash- fountains, mirrors, hand dryers and other washroom accessories.
- Coat racks for students are employed throughout with lockers provided for senior students.
- Gymnasium is equipped with motorized and fixed basketball backstops, divider curtain/folding panel partition
- Hydraulic elevator serving all floors.
- The school also has integrated security, public address, telephone, and data systems.
- Metal treads and risers for stairs with steel wall rails and balustrades.

Mechanical and Electrical - 32%[3] of the construction budget[4]

Mechanical system

- The HVAC system consists of a central heating and cooling plant, with the exception of the office, library and gymnasium served by package rooftop units.
- The central air handling unit providing ventilation air is complete with a heating coil (or a modulating gas valve), a cooling coil and heat recovery on the exhaust air.
- Heating is provided via high efficiency gas-fired sectional cast iron hot water boilers. Perimeter heat in classrooms and wall-mounted fully recessed force flow heaters in corridors and vestibules. Surface mounted/fully recessed convectors in washrooms, storage rooms and ceiling suspended hot water unit heaters in Sprinkler Room and Mechanical Room.

[3] *These percentages are provided for illustrative purposes only. No two capital projects are ever exactly the same, but these percentages can serve as general approximations to assess where costs may be too high considering the construction budget and the total project budget.*

[4] *The construction budget is a sub-set of the total project budget that does not include soft costs (e.g. architect fees, furniture and equipment).*

- Cooling is provided by a central chiller
- The building automation system (BAS) is direct digital control (DDC) capable of integrating multiple building functions, including equipment supervision and control, alarm management, energy management and trend data collection.
- Water supply is via municipal supply with backflow prevention. Hot water is provided by gas fired high efficiency domestic water heaters.
- Water provided to required areas and also to art room, music room, labs and kindergarten areas. Sinks are not typical in every classroom.
- Sanitary drainage system is connected to the municipal sanitary sewer.
- Stormwater drainage is connected to the municipal storm sewer. The school utilizes controlled flow roof drains to lessen the impact on municipal services.

Sprinklers

- The school is fully sprinklered and connected to the alarm system.
- Concealed pendent sprinkler heads are employed in common areas (corridors, washrooms, gymnasium change rooms).
- Semi-recessed pendent sprinkler heads with white two piece escutcheons are used in all other areas with dropped ceilings.
- In areas without dropped ceilings, upright sprinkler heads are used.
- Portable fire extinguishers are placed throughout the school within cabinets.

Electrical

- Electrical receptacles as per building code.
- Classroom, corridor and office lighting, combination of 1x4 and 2x4 fluorescent tube fixtures.
- Exit fixtures - 2-watt LED
- Emergency lighting – 12 volt with local rechargeable batteries

Site Work - 13%[5] of the construction budget[6]

Site Development

- Mechanical/Electrical site services
- Includes on-site rough grading, seeding, sodding and landscaping
- Heavy duty asphaltic concrete for all parking and driveways with poured concrete curbing, medium duty asphalt for play areas.
- Soccer field and/or baseball diamond
- Garbage enclosure , flag pole, bicycle racks and signage and miscellaneous appurtenances typical on site
- Construction of site work and mechanical and electrical services form approximately 11.5% of the cost of the building

[5] *These percentages are provided for illustrative purposes only. No two capital projects are ever exactly the same, but these percentages can serve as general approximations to assess where costs may be too high considering the construction budget and the total project budget.*

[6] *The construction budget is a sub-set of the total project budget that does not include soft costs (e.g. architect fees, furniture and equipment).*

# APPENDIX A

***Secondary School***

Structure and Finishes - 48%[7] of the construction budget[8]

Structure

- In general structure is steel frame construction with concrete block masonry exterior and interior walls.

- Footings are cast in place concrete strip footings for exterior and interior load bearing walls, and cast in place concrete pad and pier footings for interior steel columns. Foundation walls are reinforced concrete block masonry. There are no basement floor areas.

- Ground floor construction is 4 inch (+/-) concrete slab on grade and granular base. Slab thickening is included under non-load bearing partition walls. Upper floors are constructed of open web steel joists on steel frame supporting composite structural steel deck and concrete topping. Pre-cast hollow core concrete slabs with concrete topping are an option as appropriate. Roof structure is comprised of open web steel joist on steel frame supporting 1 ½" steel deck, using acoustic deck in the gym, theatre, and as appropriate elsewhere.

Exterior Enclosure

- Exterior walls are generally cavity construction over 70% of the wall surface consisting of concrete block masonry backup wall: air/vapour barrier (blueskin or equal); 3 inch rigid insulation and standard size clay brick veneer over approximately 90% of the wall area and pre-finished metal siding over 10% of the overall cavity wall construction.

- Generally a nominal parapet around the building will be formed using the wall construction typical for the exterior enclosures.

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[8] *The construction budget is a sub-set of the total project budget that does not include soft costs (e.g. architect fees, furniture and equipment).*

Glazing

- Double glazed aluminium windows (30% of wall area). Glazed curtain wall at main entrances.
- Pre-finished aluminum louvers as required.

Roofing

- Roofing is predominantly a built-up 4-ply bituminous system complete with fibreboard, insulation, and vapour retarder.
- Localized area of 2-ply modified bitumen may be appropriate.
- Parapets are masonry capped with pre-finished metal flashings.
- Concrete pavers to provide access to service areas.

Interior partitions

- Interior partitions are typically latex painted concrete block wall construction.
- Wall board products on metal partitions appropriate for protected areas (such as offices).
- Washrooms, stairs, and service areas are block painted with epoxy wall coating.

Doors

- Interior doors are painted steel skinned honeycomb hollow metal doors in hollow metal frames. Doors come with vision panels. Doors at main entrances are glazed aluminium. Exterior main doors are generally insulated, hollow metal steel doors in hollow metal frames. Metal overhead doors are incorporated in shop areas as required.

Flooring

- Porcelain tile in corridors
- Ceramic tile in washrooms
- Epoxy paint over concrete for shop areas and mechanical & receiving areas
- Sprung solid hardwood floor in gymnasium(s)
- Resilient cushioned floor in dance studio and weight room
- Remainder of flooring within classroom and other areas, vinyl composite tile with rubber base.
- Carpet is employed in the Library, theatre arts room, and instrumental music room and partially within the General Office area.

Ceilings

- Ceilings are primarily lay-in acoustic tile, with localized areas of gypsum board suspended ceiling (up to 5% of the overall ceiling area). Shop areas and some service and storage areas are exposed to structure.
- Acoustic steel deck in the gymnasium.
- Acoustic treatment to theatre arts and music room

Millwork

- Millwork is constructed of melamine faced particleboard, and finished veneer core plywood in special use areas. Millwork cost is approximately 1.25% of the construction budget.
- Classrooms equipped with lower cabinet, countertop and uppers.
- Music room has storage cabinets
- Science room equipped with upper cabinet, lower cabinets with counter top and storage units.
- Full height, open shelving in library and book storage, as well as free-standing shelving.
- Whiteboards, chalkboards and tack-boards are provided in all instruction spaces.

Fitments & Equipment

- Washrooms are complete with metal toilet partitions, wash- fountains, mirrors, hand dryers and other washroom accessories. Mirrors provided in exercise rooms.
- Lockers for students are provided throughout the school.
- Gymnasium is equipped with motorized and fixed basketball backstops, divider curtain / folding panel partition and telescopic seating
- Kitchen and servery are equipped.
- Science wing equipped with fume hood connected to separate exhaust system,
- Acid storage cabinets and flammable storage cabinets for science labs, construction shop, and auto shop.
- Hydraulic elevator serving all floors.
- Metal treads and risers for stairs with steel wall rails and balustrades.
- The school also has integrated security, public address, telephone, exterior CCTV, cable TV, security systems and data systems.

Mechanical and Electrical - 42%[9] of the construction budget[10]

Mechanical system

- The HVAC system consists of central heating and cooling plants, with the exception of the office, library and gymnasium served by dedicated units employing direct expansion cooling.
- Central air handling units providing ventilation air is complete with a heating coil (or a modulating gas valve), a cooling coil and heat recovery on the exhaust air.
- Heating is provided via high efficiency modular gas-fired hot water boilers. Perimeter heat in classrooms and wall-mounted fully recessed force flow heaters in corridors and vestibules. Surface mounted/fully recessed convectors in washrooms, storage rooms and ceiling suspended hot water unit heaters in Sprinkler Room and Mechanical Room.
- Typically ventilation is set up as a VAV system with terminal reheat coils. Dedicated office system may be VVT with reheat as appropriate.
- Cooling is provided by a central chiller
- The building automation system (BAS) is direct digital control (DDC) capable of integrating multiple building functions, including equipment supervision and control, alarm management, energy management and trend data collection. It has the capacity to heat building with radiant heat while unoccupied and using reheat coils while occupied.
- Water supply is via municipal supply with backflow prevention and water softener. Hot water is provided by gas fired high efficiency domestic water heaters.
- Water fountains are non-refrigerated.
- Water provided to required areas and also to art room, music room, labs, including science labs and service areas. Sinks are not typical in every classroom.
- Sanitary drainage system is connected to the municipal sanitary sewer.
- Stormwater drainage is connected to the municipal storm sewer. The school utilizes controlled flow roof drains to lessen the impact on municipal services.

Sprinklers

- The school is fully sprinklered and connected to the alarm system.

[9] *These percentages are provided for illustrative purposes only. No two capital projects are ever exactly the same, but these percentages can serve as general approximations to assess where costs may be too high considering the construction budget and the total project budget.*

[10] *The construction budget is a sub-set of the total project budget that does not include soft costs (e.g. architect fees, furniture and equipment).*

- Concealed pendent sprinkler heads are employed in common areas (corridors, washrooms, gym and change rooms).
- Semi-recessed pendent sprinkler heads with white two piece escutcheons are used in all other areas with dropped ceilings.
- In areas without dropped ceilings, upright sprinkler heads are used.
- Portable fire extinguishers are placed throughout the school within cabinets.

Electrical

- Primary service to pad mounted transformer.
- Secondary service feeds main service equipment in electrical / mechanical room from transformer.
- Electrical distribution equipment including metering cabinet, service ductwork, switchboards, motor control centre(s), branch distribution and circuit panels.
- Conduit for future outdoor front yard illuminated sign.
- Surge protection for circuits serving sensitive equipment.
- Electrical receptacles as per building code.
- Classroom, corridor and office lighting, combination of 1x4 and 2x4 fluorescent tube fixtures.
- Gymnasium lighting – specialty T5 high output fixtures.
- Exit fixtures 2-watt L.E.D. fixtures
- Emergency lighting – 12 volt with local rechargeable batteries
- Exterior wall pack HID lighting controlled by time clock and photocell.

Site Work - 10%[11] of the construction budget[12]

Site Development

- Mechanical/Electrical site services
- Includes on-site rough grading, seeding, sodding and landscaping
- Heavy duty asphaltic concrete for all parking and driveways with poured concrete curbing, medium duty asphalt for play areas.
- Two exterior basketball courts.
- Full irrigated playing field, soccer and football posts and baseball diamond and cage.

[11] *These percentages are provided for illustrative purposes only. No two capital projects are ever exactly the same, but these percentages can serve as general approximations to assess where costs may be too high considering the construction budget and the total project budget.*

[12] *The construction budget is a sub-set of the total project budget that does not include soft costs (e.g. architect fees, furniture and equipment).*

- Flag pole, bicycle racks and signage and miscellaneous appurtenances typical on site.
- Pole mounted HID lighting in parking areas and traffic areas.
- Construction of site work and mechanical and electrical services form approximately 10% of the cost of the building
- Stone dust running track