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Rick Hansen Foundation Accessibility Certification™ (RHFAC)
Retrofits and Upgrades Cost Study

January 2024

“My vision of an inclusive and accessible world stems from my belief that, by removing attitudinal and physical barriers, people with disabilities can live life to the fullest by having the opportunity to participate in and contribute to society.”

Rick Hansen

hcma designs buildings, brands, and experiences that maximize positive impact. We believe human connections can solve the fundamental problems of our time, so we create solutions that ignite conversation and build compassionate communities. By shifting our perspective to learn from others, advocating for inclusive, accessible design, and striving to understand the deeper social context, we hope to contribute to a future where people and institutions come together to make a positive change.

Contents

1.0 Summary

1.0 Summary

Nearly half of Canadian adults have a permanent or temporary physical disability or live with someone who does[1] – a trend that's only expected to grow as the population ages. Despite an increasing awareness of these issues and efforts to remove barriers in new construction, many existing buildings remain inaccessible without the necessary upgrades to ensure meaningful access. This study explores the associated costs and strategies to retrofit existing buildings to achieve RHFAC Gold under the Rick Hansen Foundation Accessibility Certification™ (RHFAC) program version 3.0.

Purpose

The purpose of the study was to:

- Investigate the feasibility of retrofitting existing buildings to achieve RHFAC Gold by determining the cost and strategies for accessibility upgrades. In order to achieve RHFAC Gold the site must meet prerequisites and receive a minimum score of 80%.
- Identify key areas of improvement in existing buildings.
- Address questions of cost and perceived barriers to access through data and discussion.
- Support building owners and operators, accessibility and design professionals, advocates and decision-makers to work towards a more inclusive future for all.

1 https://www.rickhansen.com/sites/default/files/downloads/ari-research-jan-2019eng-final-accessible_1.pdf

Methodology

This study focused on two building typologies, office towers and Kindergarten to Grade 12 (K-12) schools, built between 1974 and 2019. It included 10 RHFAC rated sites from each building type, located in British Columbia and Ontario in or near large urban centres.

A prototype site for each typology was then developed and used to determine cost of retrofit.

The protypes developed were:

- a 22-floor office building (base building spaces only); and
- a secondary school building.

Estimated costs to achieve RHFAC Gold in the most cost-effective way were calculated as a percentage of the replacement cost of the building, as well as a cost-per-square-foot (or square metre) of gross floor area.

Costs were calculated in Spring 2023 by an independent cost consultant using a Class D estimate (+/- 25-30%) considering both BC and Ontario urban areas. They include 25% soft costs but exclude contingencies, escalation and GST.

Key findings

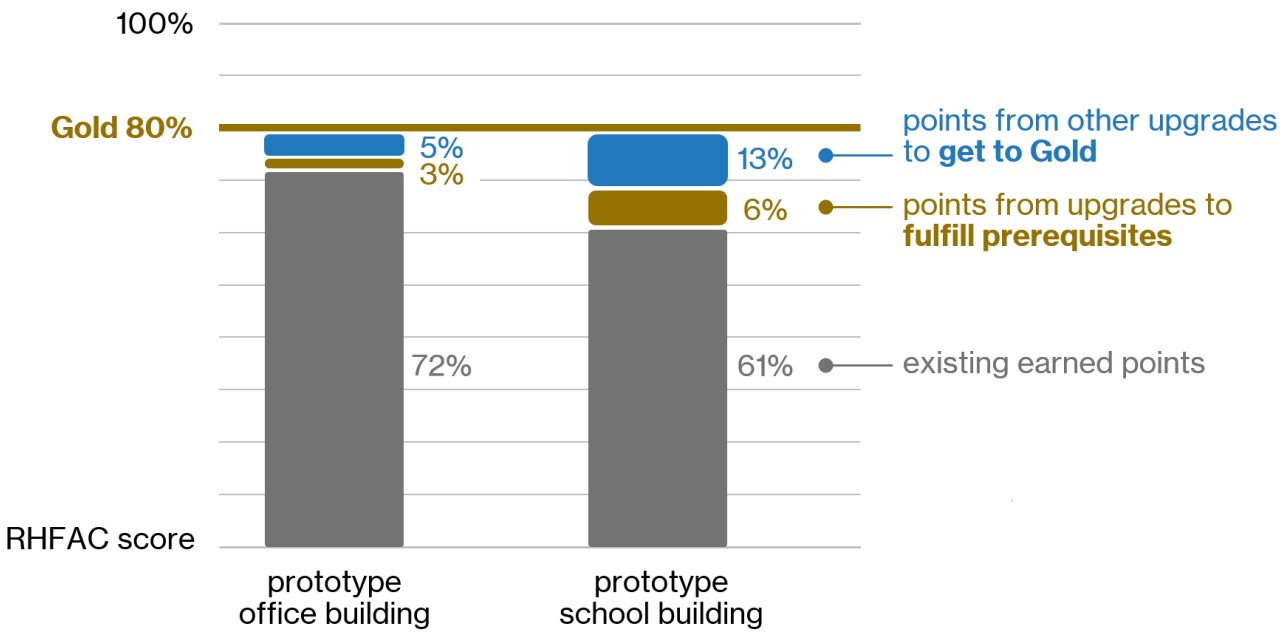
None of the 20 sample buildings included in the study met the threshold for RHFAC Gold

- None of the buildings met the RHFAC Gold prerequisites while rating scores ranged from 54% to 77%.

Both prototype buildings required upgrades to achieve RHFAC Gold

- The prototype office building did not meet RHFAC Gold prerequisites and scored 72%.
- The prototype school building did not meet RHFAC Gold prerequisites and scored 61%.

Figure 1 RHFAC rating scores for prototype buildings



Estimated costs to achieve RHFAC Gold ranged from $500k to $1.15 million

The estimated costs to achieve RHFAC Gold were:

- **$584,000** for the prototype office building.
- **$1,070,000** for the prototype school building.

Upgrade costs were only a fraction of replacement costs

The estimated cost to achieve RHFAC Gold was only a fraction of the replacement cost of the buildings:

- less than 0.5% of replacement cost or $1.50/ft² ($16.00/m²) for the prototype officing building.
- less than 1.5% of replacement cost or $9.00/ft² ($97.00/m²) for the prototype school building.

Table 1 Cost to achieve RHFAC Gold for prototype office and school buildings

Achieving RHFAC Gold (minimum score of 80%)

Prototype	Percent of replacement cost	Cost per unit of gross floor area	Cost/year – 5 years*	Cost/year – 10 years*	Cost/year – 15 years*
Office building	Less than 0.5%	$1.50/ft² ($16.00/m²)	$0.30/ft² ($3.00/m²)	$0.15/ft² ($1.50/m²)	$0.10/ft² ($1.00/m²)
School building	1.5%	$9.00/ft² ($97.00/m²)	$1.80/ft² ($19.00/m²)	$0.90/ft² ($9.00/m²)	$0.60/ft² ($6.50/m²)

*Amortization or completion of upgrades over time.

Interpreting the findings

Age of building did not predict RHFAC rating scores

While older school buildings in the study showed a relationship between age and RHFAC ratings scores, office buildings did not. One explanation for the variability is that accessibility features have been included to achieve building code compliance when owners and operators undertake other improvement projects.

Upgrade costs to increase accessibility varied widely including many cost-effective options

Upgrade options to increase accessibility for the prototype office and school buildings ranged from no cost to $1.15 million, with many upgrades coming in under $50,000 (see the appendix for a list).

Other important factors when considering what upgrades owners and operators may choose to undertake to improve meaningful access to their buildings include:

- life and safety
- dignity
- overall impact of upgrades
- integration with other currently planned upgrades

Strategic management can increase the feasibility of accessibility upgrades

While the study included only a small number of sample buildings and building types, it suggests the cost to retrofit existing buildings to provide the highest level of meaningful access, RHFAC Gold, does not have to be a significant barrier to implementation.

Some strategies to increase feasibility include:

- prioritize life and safety upgrades
- complete upgrades over time
- include accessibility as part of planned projects
- seek additional efficiencies through building area groupings

Applying the findings to other building types

When considered together, the representative prototype office and school buildings provide a wide range and number of space types – from repeated base building spaces only in the prototype office building, to science lab, music, theatre, and kitchen spaces in the prototype school.

2.0 Introduction

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2.1 Project background and objectives

The Rick Hansen Foundation (RHF) engaged **hcma** to explore the costs of retrofitting existing buildings to achieve Gold under the Rick Hansen Foundation Accessibility Certification™ (RHFAC) version 3.0.

The core technical reference of RHFAC version 3.0 is the 2018 edition of the Canadian Standards Association (CSA) "B651 Accessible Design for the Built Environment" standard.

The study considered the following hypotheses:

- New buildings are likely to be more accessible, and therefore achieve higher RHFAC rating scores than older buildings, due to the evolution of building codes;
- While retrofit costs can vary widely, many upgrades can be implemented cost-effectively;
- If managed strategically, through maintenance and planned projects, cost should not pose a significant barrier to implementing accessibility upgrades.

This study complements an earlier cost study led by **hcma** in 2020[2], which compared the cost to construct a new building to RHFAC Gold (RHFAC version 2.0). The previous study concluded that new builds could achieve RHFAC Gold with less than 1% additional construction cost.

[2] https://hcma.ca/wp-content/uploads/2020/01/2020.1.15-RHFAC-FINAL-Report-FULL-v4.pdf

2.2 Rick Hansen Foundation Accessibility Certification™ (RHFAC)

Program overview

Creating access to safe, inclusive, and accessible public spaces that ensure everyone can participate and live to their full potential, is the Rick Hansen Foundation's vision[3]. The RHFAC program supports RHF's vision by working to help improve accessibility of the built environment in Canada.

RHFAC is a rating system developed to help property owners and operators measure the level of meaningful access of their sites, and to promote increased access through the adoption of universal design principles.

Meaningful access is access that meets the real accessibility needs of all users of a site, regardless of their ability. Meaningful access recognizes that any given site needs to be judged on the overall user experience, rather than a simplified evaluation of physical access features.

RHFAC provides a snapshot of the level of meaningful accessibility of a particular site, using a holistic approach. Site owners and managers can then use this information to make positive changes to ensure more users of their facilities feel welcome.

Commercial spaces, public spaces, multi-unit residential buildings, and trails and pathways are some of the site types that can be rated under the RHFAC program.

[3] https://www.rickhansen.com/become-accessible

RHFAC Rating Survey

The RHFAC Rating Survey is a standardized questionnaire used to measure a site's level of meaningful access. To be certified, a site must meet certain certification prerequisites and achieve a rating score of at least 60% on the Rating Survey. There are over 500 accessibility data points rated in the RHFAC Rating Survey.

The survey incorporates best practices from several sources, including universal design principles and the Canadian Standards Association (CSA) "B651 Accessible Design for the Built Environment" standard.

The RHFAC survey is organized using 10 categories:

1. Vehicular Access
2. Exterior Approach and Entrance
3. Interior Circulation
4. Interior Services and Environment
5. Sanitary Facilities
6. Wayfinding and Signage
7. Emergency Systems
8. Additional Uses of Space
9. Residential Units
10. Trails and Pathways

Each of the 10 RHFAC categories (e.g., 1. Vehicular Access) contains a series of related key elements (e.g., 1.1 Parking), which are further broken down into features (e.g., 1.1.1 Number of designated spaces).

The points tallied through the RHFAC Rating Survey determine a site's final rating score, and along with the presence of a series of prerequisite features, define its corresponding certification level.

A site or building that fulfills all prerequisites and is scored:

- 60% – 79% receives an RHFAC Certified level.
- 80% or more receives an RHFAC Gold level.

Sites or buildings that receive a score below 60%, or do not meet the prerequisites, are not eligible to be certified under the RHFAC program.

The prerequisites for RHFAC Gold are:

- Designated accessible parking space(s), if parking is provided for Site users.
- Access to public transit, if the Site is located in an area serviced by transit.
- Accessible path(s) of travel leading to building or trail entrance and throughout the building or trail.
- An accessible primary entrance for public and staff (if separate).
- Access to all floors expected to be used by elevator or lift usable by everyone.
- At least one universal washroom.
- Emergency systems with visual and audible fire alarms in both public and private areas.
- Wayfinding strategies in place to navigate throughout the site.
- Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.
- Tactile markings for permanent room identification signs.
- Assistive listening and communication enhancement technologies, when applicable to the Site.
- Accessibility provision(s) for the key functional facilities of the Site.
- Accessible or adaptable residential unit(s) for each type of unit.

For more information on the RHFAC program, please visit the Rick Hansen Foundation website[4].

[4] https://www.rickhansen.com/become-accessible/rating-certification

3.0 Methodology

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3.1 Step by step methodology

To estimate upgrade costs associated with achieving RHFAC Gold certification for existing buildings, the study established a six-step process and prototypes for two building types, namely office buildings and schools.

Twenty sample buildings – 10 offices and 10 schools – were selected for the study using a "typical case" sampling method[5].

Buildings were selected to be as representative as possible of typical building design, qualities and conditions in the existing building stock, while reducing variables associated with building code, design contexts and construction costs.

Provincial building codes in Ontario and BC were first established in the period 1974-1975[6]. The provincial codes were based on the 1970 National Building Code[7], which for the first time, included code requirements for people with disabilities.

[5] "Comparison of convenience sampling and purposive sampling" (https://www.academia.edu/download/55796997/Comparison_Convenience_and_Purposive_Sampling-2016_4p.pdf)

[6] History of British Columbia Building Codes (https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/guides/history_of_the_codes_2015_update.pdf)

[7] Historical editions of Codes Canada publications 1941-1998 (https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/historical-editions-codes-canada-publications-1941-1998)

Step 1: Select building types

For the purposes of this study, two building types – offices and schools – were selected as they are:

- Consistent in fundamental design and types of spaces, regardless of the age of the building, and
- Common building types with extensive existing building stocks across Canada.

Step 2: Select sample buildings

Using building profiles already in the RHFAC database where possible, twenty buildings – 10 office buildings and 10 schools were selected for inclusion.

Factors considered included:

- in or near large urban centres (remote locations were not included in the study, as construction costs can prove more variable);
- in Ontario and British Columbia (to include some geographic diversity and based on availability within RHFAC database);
- representative of common sizes and features of the same building type (to increase consistency and comparability); and
- constructed between 1974-2019 (to evaluate a snapshot of accessibility trends over the past ~50 years).

These factors made the study, including the design of its methodology and the gathering and analysis of data, feasible within the defined scope of work.

Step 3: Gather and review RHFAC data

The study gathered RHFAC data for the 20 sample buildings in two ways:

- Using existing RHFAC rated site data, and
- Conducting additional RHFAC ratings where there was a gap in existing data.

Ratings and notes for the 20 sites were reviewed and analyzed to establish key characteristics of each of the two prototype buildings.

Step 4: Define representative prototype buildings

A representative prototype building for each of the building types was developed based on the average points, qualities, and conditions that were observed in the 10 office and school buildings, respectively.

The prototype office building is a 22-floor office tower built in 1990 with a 17,500 ft^2 (1,625 m^2) floor plate and an underground parking garage.

The prototype school building is a secondary school with two floors built in 1995. It has a size of 118,403 ft^2 (11,000 m^2) and an enrolment of 1,000 students.

Key steps to define each prototype building included:

A. Eliminating RHFAC features identified as "not applicable" in more than five (50%) of buildings.

B. Determining the average points earned for all applicable features and identifying which features earned:
   - maximum points
   - partial points and:
     i. Could therefore be upgraded.
     ii. Involved a high degree of architectural and organizational complexity to estimate the cost to upgrade and was therefore beyond the mandate of the study.
   - The overall RHFAC score the prototype earns.

C. Determining if the prerequisites for RHFAC Gold had been met.

After this process, prototype buildings were further defined through careful analysis of the earned points and notes from the 20 sample buildings, including key trends across decades and common building characteristics.

General information on size and space types for typical buildings in urban centres in Ontario and British Columbia was also considered.

Step 5: Identify and cost all upgrades

For each prototype building, upgrades that would be required to reach maximum available points for all applicable RHFAC categories were identified. These upgrades were then costed by a professional quantity surveyor, also known as a construction cost consultant/cost estimator.

For each feature and its upgrade:

- A high-level description was provided to the cost consultant.
- The cost consultant provided unit cost ranges.
- Unit quantities were based on the definitions and feature scoring of the prototype buildings.
- The cost was ignored if the upgrade of another feature also achieves its requirements. In this case, the points of those features were added to the costed feature.
- Average upgrade unit costs were used.

Step 6: Estimate cost to achieve RHFAC Gold

Using analysis of the estimated costing results, together with the RHFAC ratings, the minimum cost required for each of the representative prototype buildings to achieve RHFAC Gold was established. The minimum cost was determined by adding the least expensive upgrades to the prototype building score until the points exceeded the required RHFAC Gold threshold.

The costing results were analyzed alongside the prerequisites and feature points of the prototypes buildings' RHFAC Ratings to determine the minimum estimated cost of upgrades needed to achieve RHFAC Gold.

The analysis involved three steps:

A. Meeting prerequisites for RHFAC Gold
    - Determine which upgrades fulfill prerequisites for RHFAC Gold.
    - Calculate the combined cost of these required features.
    - Determine interim points score with required features.

B. Reaching an RHFAC rating score of 80%
    - Determine RHFAC points needed after the requisite upgrades to achieve a score of 80%.
    - Calculate the cost per RHFAC point gained for all other upgrades.
    - Sort upgrades by cost, per RHFAC point gained.
    - Calculate the combined cost of the least-costly upgrades that achieve the minimum amount of points.

C. Calculating the total cost of both the required upgrades and the least-costly upgrades to reach the needed points for a score of at least 80%.

3.2 Sample buildings

Overview of 10 sample office buildings

Table 2 below shares key information and the RHFAC scores for the 10 existing buildings used to establish the prototype office building. None of the sample office buildings achieved RHFAC Gold (minimum 80% score plus prerequisites for RHFAC Gold).

Table 2 Key information and RHFAC scores for existing office buildings used to create the prototype office building.

Sample office building	1	2	3	4	5	6	7	8	9	10
General										
Year built	1974	1978	1984	1988	1990	1990	2006	2007	2014	2015
Location	ON	ON	BC	ON	BC	ON	ON	BC	ON	BC
Underground parking	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Floors	n/a*	34	35	n/a*	21	5	15	6	30	24
RHFAC Rating										
RHFAC Rating Score	77%	62%	68%	76%	70%	72%	67%	67%	74%	72%
Prerequisites for RHFAC Gold met	No	No	No	No	No	No	No	No	No	No

* data on the number of floors was not available at the time of writing.

Overview of 10 sample school buildings

Table 3 below shares key information and the RHFAC rating scores for the 10 existing schools used to define the prototype school building. None of the existing schools met the threshold for RHFAC Gold because they did not meet the prerequisites for RHFAC Gold nor the minimum rating score of 80%.

Table 3 Key information and RHFAC scores for existing school buildings used to create the prototype school building.

Sample school building	1	2	3	4	5	6	7	8	9	10
General										
Year built	1977	1977	1985	1993	1995	1996	2005	2008	2010	2016
Location	BC	ON	ON	BC	ON	BC	ON	BC	ON	BC
Grades	6-8	6-8	K-8	6-8	9-12	9-12	K-8	K-8	9-12	9-12
# of students (enrolment)	641	548	310	577	1620	714	495	800	1230	1492
# of standard classrooms	22	17	20	21	30	19	21	27	37	25
Area (ft^2)	85,110	84,335	61,376	66,628	176,582	107,811	65,335	81,668	176,355	161,168
Area (m^2)	7,907	7,835	5,702	6,190	16,406	10,016	6,072	7,590	16,384	14,973
RHFAC Rating										
RHFAC Score	55%	57%	55%	57%	54%	61%	63%	64%	62%	69%
Prerequisites for RHFAC Gold met	No	No	No	No	No	No	No	No	No	No

3.3 Prototype buildings

Prototype office building

The prototype office building reflects the typical qualities and conditions of the base building space types, assessed across the 10 sample office buildings. It was defined as follows:

Table 4 Typical qualities and conditions of prototype office building

Key information	Program and space types
Office tower The prototype office building was defined as a mid-rise office tower (22 floors) to best reflect the sample buildings and to represent a common existing building. **Built in 1990** 1990 represents the median construction year of the 10 study office buildings. **17,500 ft² floorplate** (1,625 m²) **385,000 ft² gross floor area (GFA)** It has 22 floors and a 17,500 ft² floor plate size informed by the study office buildings as well as other office buildings in urban centres in British Columbia and Ontario. Its gross floor area was 385,000 ft². **$192.5 million replacement cost** Calculated at $500/ft²	**Base building spaces and features** • Main entrance • Lobby and reception desk • 2 escalators (lobby) • 1 ramp (lobby) • 1 stair (lobby) • 4 elevators • 2 exit stairs for tower • Doors to rooms and tenant spaces • 2 gendered multi-stall washrooms per floor • Shared circulation space on each floor • 4 floors of underground parking • 4 exit stairs in underground parking **Excluded** • Tenant spaces • Custodial spaces • Mechanical spaces • Storage spaces

Figure 2 Diagram of base building spaces with applicable RHFAC categories

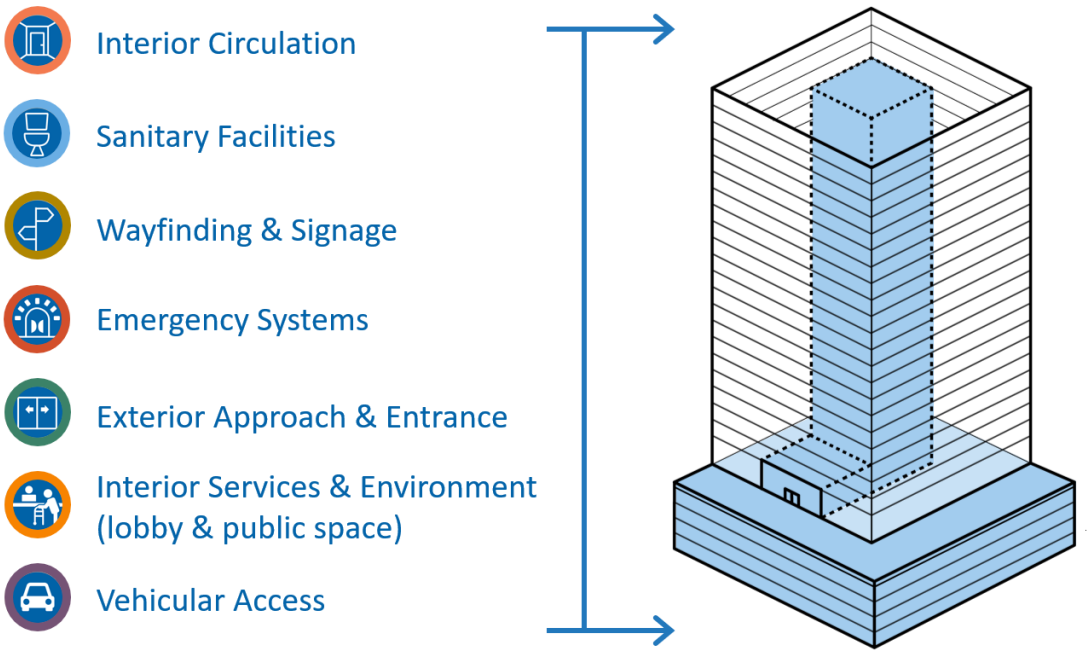
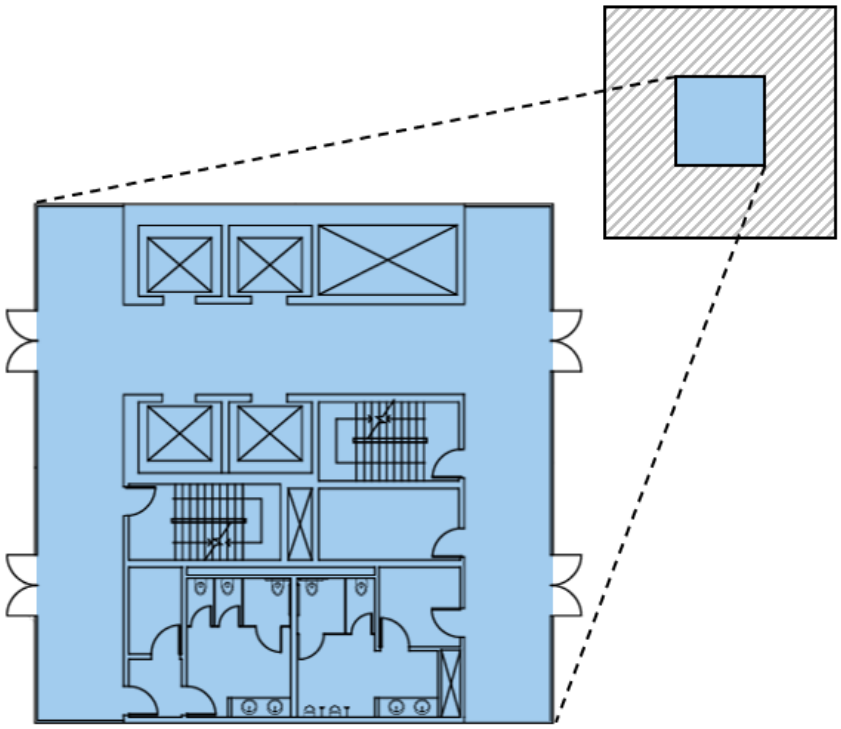


Figure 3 Diagram of repeated base building floor plate, with central core expanded for viewing



RHFAC Rating of the prototype office building

The prototype office building earned an RHFAC score of 72% and did not meet all prerequisites for RHFAC Gold.

The following table indicates which prerequisites were and were not met.

Table 5 Prerequisites for RHFAC Gold – Prototype office building

Prerequisites for RHFAC Gold	Fulfilled by prototype office building
Designated accessible parking space(s), if parking is provided for Site users.	yes
Access to public transit, if the Site is located in an area serviced by transit.	yes
Accessible path(s) of travel leading to building or trail entrance and throughout the building or trail.	yes
An accessible primary entrance for public and staff (if separate).	yes
Access to all floors expected to be used by elevator or lift usable by everyone.	yes
At least one universal washroom.	no
Emergency systems with visual and audible fire alarms in both public and private areas.	no
Wayfinding strategies in place to navigate throughout the site.	yes
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	no
Tactile markings for permanent room identification signs.	no
Assistive listening and communication enhancement technologies, when applicable to the Site.	no
Accessibility provision(s) for the key functional facilities of the Site.	yes
Accessible or adaptable residential unit(s) for each type of unit.	n/a

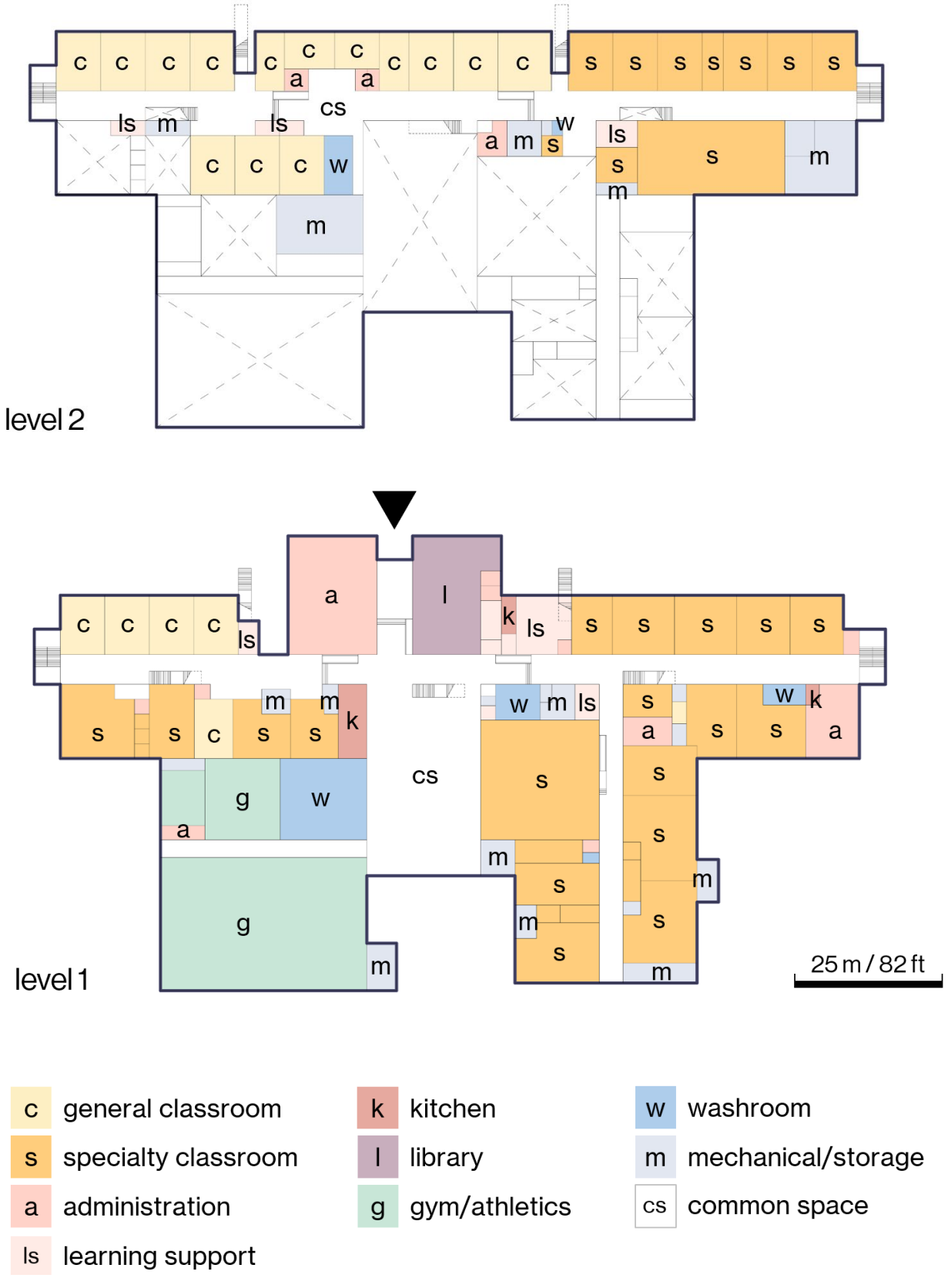
Prototype school building

The prototype school building was a detailed synthesis of space types and conditions across 10 existing schools. It was defined as follows:

Table 6 Space types and conditions of prototype school building

Key information	Program and space types	
Secondary school with two floors The prototype school was defined as a secondary school with two floors, including most of the program and space types encountered in the study schools. **Built in 1995** 1995 represents the median construction year of the 10 study schools. **Enrolment of 1,000 students** **118,403 ft²** (11,000 m²) Area size was determined by considering provincial area guidelines, based on a selected enrolment size of 1,000 students. This represents an average of the areas allotted by the BC Ministry of Education and Child Care and the Ontario Ministry of Education for the included program types. **$74 million replacement cost** Calculated at $625/ft²	**Learning + common spaces** • 19 standard classrooms • 4 portable classrooms • 7 science classrooms • 6 business/computer rooms • 1 library • 1 drama room/theatre • 2 visual arts rooms • 1 band room • 1 choral room • 3 practice rooms • 1 wood shop • 1 metal shop • 3 technical skills classrooms • 1 foods classroom • 1 textiles classroom • 1 life skills/learning support room • 1 multipurpose room/ cafeteria **Teaching + support spaces** • 11 teacher prep spaces • 1 staff lounge • 1 administrative area • 6 meeting rooms **Athletics + recreation** • 1 large gym • 1 small gym • 1 weight room • 2 student change rooms • 2 staff change rooms • 1 sports field • 1 exterior basketball court	**Sanitary facilities** • 4 universal (accessible) washrooms • 2 single-occupancy washrooms (not accessible) • 5 pairs of gendered multi-stall washrooms **Other** • 1 elevator • 1 servery (for food) • 1 medical room • 1 student store • Surface parking lot **Excluded** • Custodial spaces • Mechanical spaces • Storage spaces

Figure 4 Floor plan diagrams of prototype school building



RHFAC Rating of the prototype school building

The prototype school earned an **RHFAC score of 61% and did not meet all prerequisites for RHFAC Gold**.

The following table indicates which prerequisites were and were not met.

Table 7 Prerequisites for RHFAC Gold for prototype school building

Prerequisites for RHFAC Gold	Fulfilled by prototype school
Designated accessible parking space(s), if parking is provided for Site users.	yes
Access to public transit, if the Site is located in an area serviced by transit.	yes
Accessible path(s) of travel leading to building or trail entrance and throughout the building or trail.	yes
An accessible primary entrance for public and staff (if separate).	yes
Access to all floors expected to be used by elevator or lift usable by everyone.	yes
At least one universal washroom.	yes
Emergency systems with visual and audible fire alarms in both public and private areas.	no
Wayfinding strategies in place to navigate throughout the site.	no
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	no
Tactile markings for permanent room identification signs.	no
Assistive listening and communication enhancement technologies, when applicable to the Site.	no
Accessibility provision(s) for the key functional facilities of the Site.	no
Accessible or adaptable residential unit(s) for each type of unit.	n/a

3.4 Notes, assumptions and limitations

Sample office buildings

This study includes and analyzes the base building areas of office buildings. Base building areas include all common circulation routes, parking, entrances, lobbies, elevators, emergency exits, and washrooms.

Tenant spaces were excluded as tenants are responsible for the design and layout of the leased space. This means that the accessibility of these spaces vary widely depending on the commitment of the tenants towards access and inclusion.

In the case of office buildings, existing data from RHFAC database of ratings was used.

Sample school buildings

For schools, **hcma** worked with public school boards in British Columbia and Ontario to conduct new RHFAC ratings as data on this building typology was not available at the time of the study.

Designated RHFAC Professionals from the **hcma** team conducted ratings of 10 select schools in those two provinces in early 2023. Each rating was submitted for review and approved by an RHF Adjudicator to ensure consistency with the RHFAC program.

For sample school buildings, spaces used by students, teachers, administrative staff and visitors were included in the ratings, with a focus on areas for students in grades 6-12. Daycare areas and spaces dedicated solely to younger students were excluded.

All sample buildings are assumed to have been compliant with relevant building code at their time of design and construction.

Scoring

All upgrades were assumed to achieve maximum RHFAC feature points.

The prototype buildings assume a current snapshot of existing conditions, whether original in construction or modified over time.

The study did not determine or differentiate between original building features and those that have been updated over time. It is assumed that all buildings are maintained and upgraded to some degree and that the sample buildings will reflect the current conditions found typically in existing buildings.

The prototype buildings are assumed to be at a stage in their overall lifecycle where ongoing investment makes sense in relation to the building's anticipated lifespan.

Neither of the prototype buildings required upgrades to mitigate stairs to create access at main entrances or along interior paths of travel. This was primarily due to the age of the sample buildings upon which the prototype buildings were based.

For many older existing buildings, adding ramps and/or an elevator would be needed to create access to all spaces – and to fulfill prerequisites for RHFAC Gold. Retrofitting vertical circulation or other improvements triggering change to the building structure can be complex and could significantly increase the cost.

Prerequisites

Upgrades that fulfill prerequisites for RHFAC Gold were determined in collaboration with the Rick Hansen Foundation to ensure correct interpretation for office and school building types. These upgrades were limited to the minimum conditions needed to fulfill the prerequisites.

When only a portion of an RHFAC feature's requirements were needed to meet a prerequisite, only relevant cost and points were assigned to fulfilling the prerequisite.

The remaining cost and points available associated with upgrading the feature to achieve maximum points were added to the list of other upgrades.

Cost estimates

Estimated upgrade construction costs were calculated in Spring 2023 by an independent cost consultant using a Class D estimate (+/- 25-30%) considering both BC and Ontario urban areas. They include 25% soft costs but exclude contingencies, escalation and GST.

An audio systems consultant provided cost estimates for some communication technologies.

Features deemed to be highly complex – primarily due to building structural implications – were excluded from costing as they are context specific and cannot be easily estimated without input from engineering consultants.

High-level assumptions and reasoning regarding the prototype buildings informed which features were excluded. Lists of the excluded upgrades are provided in the appendix. Note that this list is not intended to be definitive.

Due to high complexity, some accessibility upgrades may be unlikely to be undertaken in specific buildings and contexts, instead requiring operational changes to ensure equitable access.

4.0 Results

4.0 Results

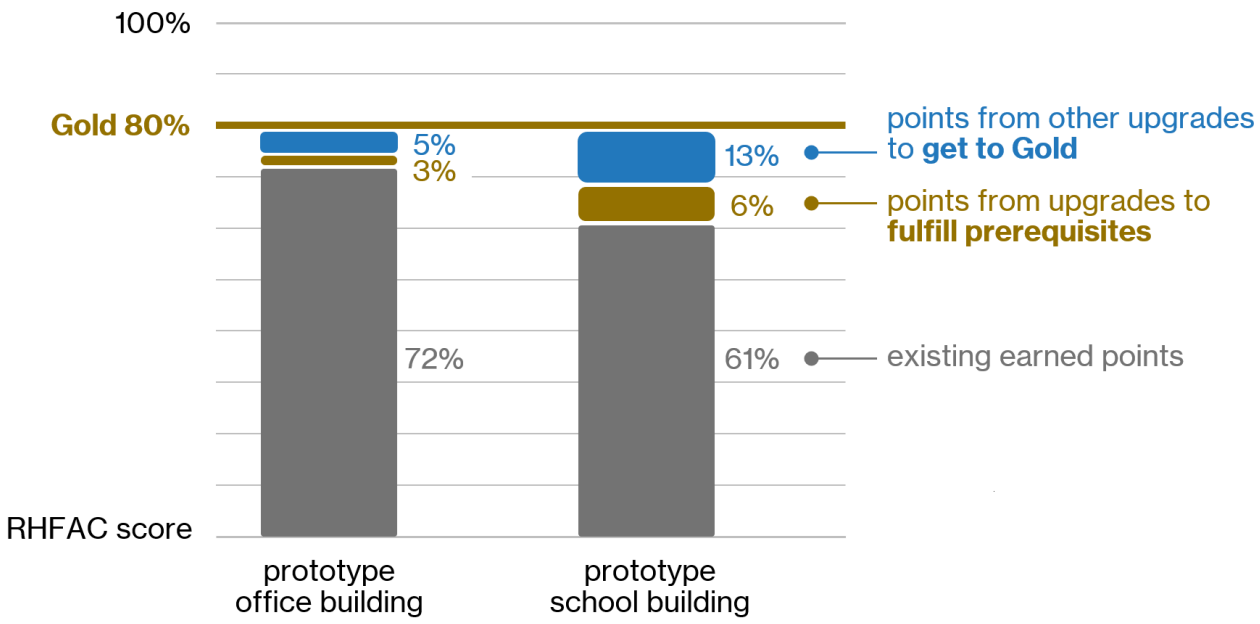
4.1 Overview of cost results

The estimated cost to achieve RHFAC Gold was **$584,000** for the prototype office building and **$1,071,000** for the prototype school building.

For each of the prototypes, the estimated costs included upgrades:

- to meet the prerequisites for RHFAC Gold.
- to meet the RHFAC Gold points threshold of 80%.

Figure 5 RHFAC rating scores for prototype buildings



The graph shows the prototype office building achieved an RHFAC rating score of 72%, while the prototype school building achieved 61%.

The prototype office building would achieve 3% from upgrades to fulfill prerequisites, with the final 5% needed to get to the 80% threshold from other upgrades.

The prototype school building would achieve 6% from the upgrades to meet prerequisites, with the final 13% to reach the 80% threshold for RHFAC Gold from other upgrades.

See the appendix for the full list of potential upgrades and estimated costs.

Table 8 Cost to achieve RHFAC Gold for prototype office and school buildings

Achieving RHFAC Gold (minimum score of 80%)

Prototype	Percent of replacement cost	Cost per unit of gross floor area	Cost/year – 5 years*	Cost/year – 10 years*	Cost/year – 15 years*
Office building	Less than 0.5%	$1.50/ft^2 ($16.00/m^2)	$0.30/ft^2 ($3.00/m^2)	$0.15/ft^2 ($1.50/m^2)	$0.10/ft^2 ($1.00/m^2)
School building	1.5%	$9.00/ft^2 ($97.00/m^2)	$1.80/ft^2 ($19.00/m^2)	$0.90/ft^2 ($9.00/m^2)	$0.60/ft^2 ($6.50/m^2)

*Amortization or completion of upgrades over time.

Figure 6 shows individual costs of all 97 required and additional prototype office building upgrades under $500,000. It also indicates the most cost-effective way to achieve RHFAC Gold.

Figure 6 Cost of upgrades for prototype office building

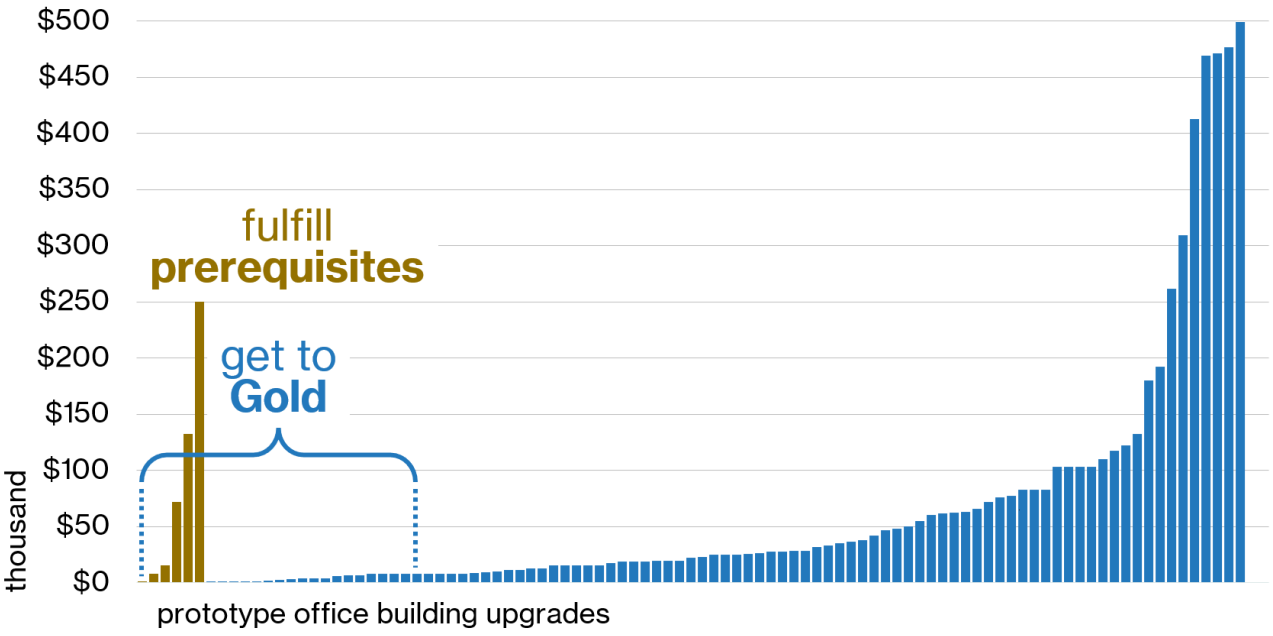
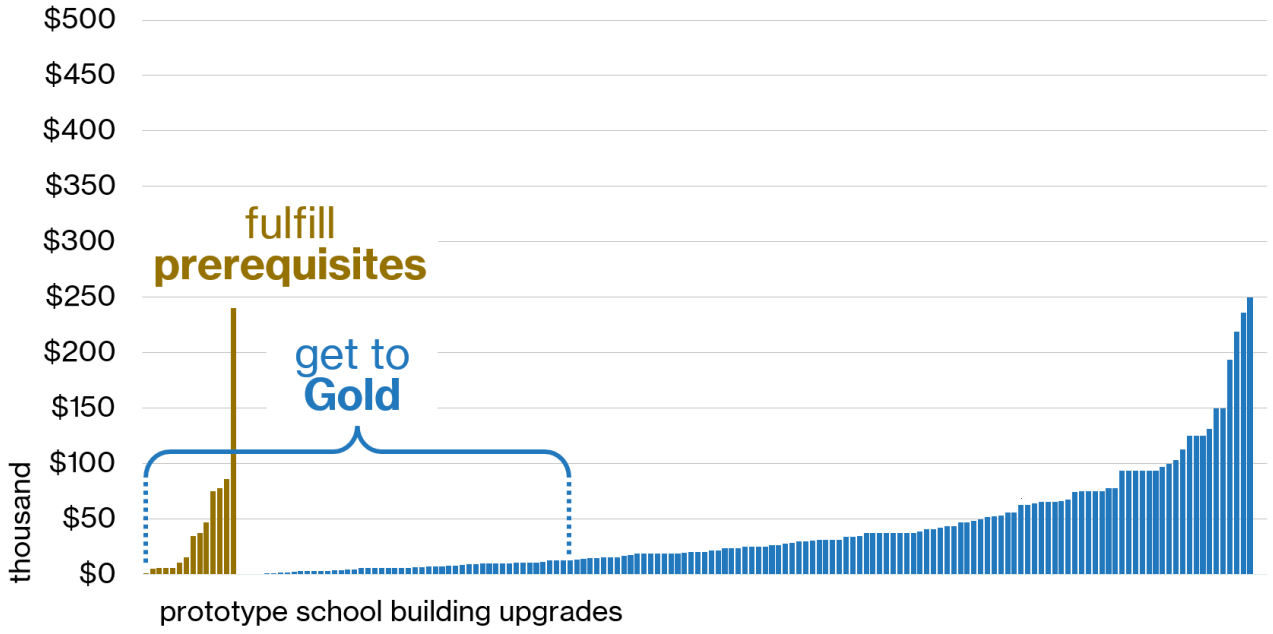


Figure 7 shows individual costs of all 165 required and additional prototype school building upgrades under $500,000 indicating the most cost-effective way to achieve RHFAC Gold.

Figure 7 Cost of upgrades for prototype school building



4.2 Estimated cost to achieve RHFAC Gold for the prototype office building

The estimated cost to achieve RHFAC Gold for the prototype office building was **$584,000**.

- **$479,000** to upgrade six features to meet prerequisites for RHFAC, increasing the RHFAC score from 72% to 75%. The six upgrades are described in Table 9.
- **$105,000** for the 19 least-costly additional office building upgrades, increasing the RHFAC rating score from 75% to the 80% RHFAC Gold score threshold. The 19 additional upgrades are described in Table 10.

Table 9 Upgrades to prototype office building to meet prerequisites for RHFAC Gold

Prerequisite for RHFAC Gold	Relevant feature number	Upgrade description	Estimated cost
Assistive listening and communication enhancement technologies, when applicable to the Site.	4.2.7	Add portable hearing loops at main reception and security desks in lobby.	$1,500
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	3.6.5	Add tactile attention indicators at top of interior lobby stair.	$7,800
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	2.3.5	Add tactile attention indicators at the top of exterior stairs.	$15,700
Emergency systems with visual and audible fire alarms in both public and private areas.	7.2.1	Add visual fire alarms to main circulation spaces of each floor and in underground parking.	$72,000
Tactile markings for permanent room identification signs.	6.2.2	Add/upgrade all permanent room identification signs for room and office doors to have braille and tactile elements.	$132,000
At least one universal washroom.	5.1.2	Add a universal washroom to the building.	$250,000

Table 10 Additional upgrades to prototype office building to meet score threshold for RHFAC Gold

Element	Feature	Upgrade description	Estimated cost
6.3 Directory Boards and Interactive Information Kiosks	6.3.3 Raised characters and symbols, and Braille where appropriate	Add braille lettering to directory board. Assume 1 location in main lobby.	$700
6.3 Directory Boards and Interactive Information Kiosks	6.3.2 Location of amenities where provided	Add additional directory signage with amenities. Assume 1 location in main lobby.	$700
6.3 Directory Boards and Interactive Information Kiosks	6.3.4 Accessible height and approach	Re-install existing directory board to appropriate clearances. Assume one location in main lobby.	$700
2.4 Building Entrances	2.4.14 Glazed doors have colour-contrasted strips or markings	Add colour contrasted markings on entrance doors (two heights). Assume one main entry per facility.	$900
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.5 Clear signage	Add signage indicating location of reception desk. Assume one desk in lobby.	$1,200
6.3 Directory Boards and Interactive Information Kiosks	6.3.1 Comprehensive relevant information	Add floor plan directional signage to display board. Assume one location in main lobby.	$1,900
3.4 Interior Ramps	3.4.5 Colour-contrasted and slip-resistant strip	Add colour contrasted slip resistant strip at top and bottom of each ramp run. Assume one ramp per main central area (e.g., lobby).	$2,200

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.13 Outward-opening doors	Add cane detector at outward opening main entry doors. Assume one main entry per facility.	$2,800
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.5 Door security and entry system is accessible and easy to use	Upgrade door security system to one that has audio and visual signals and contrasts with surrounding walls. Assume accessible installation height. Assume one main door security system.	$3,400
2.4 Building Entrances	2.4.7 Door security and entry system is accessible and easy to use	Upgrade existing security systems and provide phone number for text-to-text support. Assume one entry per facility.	$3,400
1.1 Parking	1.1.3 Dimensions of designated accessible spaces	Revise parking lines to provide designated access aisles. Assume four accessible stalls per building.	$3,700
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.2 Space for knee clearance at transaction points for public and staff	Provide knee space for both staff and public. Add folding panel to provide appropriate space. Assume 1 main reception/service desk.	$6,200
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.1 Desks/counters at accessible height or variety of heights	Revise design of reception desk to provide accessible height space for staff and visitors. Assume 1 main reception/service desk.	$6,200
3.2 Path of Travel	3.2.4 Open-plan areas are well defined and include tactile direction indicators	Provide tactile directional indicators to guide through large open-plan areas (i.e., main lobby). Assume one main lobby.	$7,800

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.5 Controls for manually activated power-operated doors	Adjust existing controls to have operable buttons at multiple heights (add additional lower control – hand and foot location). Assume one entry per facility.	$8,700
4.1 Lobby and Reception Areas	4.1.2 Location of key facilities easily identified	Add signage from lobby to primary elevators, stairs, and washrooms. Assume one primary lobby.	$10,900
5.1 Washrooms	5.1.24 Adult change table (if universal washroom)	Add power operated adult change table within one universal stall. Assume one added per building.	$12,500
3.7 Escalators and Moving Walkways	3.7.4 Visual and audible notifications at start and end	Add visual and audible signals at top and bottom of escalator. Assume two escalators per lobby.	$15,500
2.3 Exterior Stairs	2.3.6 Colour-contrasted and slip-resistant strip on nosing	Add colour contrasted slip-resistant strips on existing exterior stairs. Assume two exterior stair locations per facility.	$15,600

4.3 Estimated cost to achieve RHFAC Gold for the prototype school building

The estimated cost of school building upgrades to achieve RHFAC Gold for the school prototype was **$1,071,000**.

- **$651,000** to upgrade 14 features to fulfill prerequisites. This increased the RHFAC score from 61% to 67%. The 14 upgrades are described in Table 11.
- **$420,000** to upgrade the 50 least-costly additional features, increasing the RHFAC score from 67% to the 80% required to achieve Gold. The 50 additional upgrades are described in Table 12.

Table 11 Upgrades to prototype school building to meet prerequisites for RHFAC Gold

Prerequisite for RHFAC Gold	Relevant feature number	Upgrade description	Estimated cost
Assistive listening and communication enhancement technologies, when applicable to the Site.	4.2.7	Provide portable hearing loop system at reception desks. Prototype school has portable assistive hearing systems available for classrooms upon request (condition found in sample schools).	$1,200
Accessibility provision(s) for the key functional facilities of the Site.	4.4.4	Replace sink in kitchen areas, foods classroom, life skills/learning support room, art rooms, metal shop, wood shop, backstage area of theatre, visual art rooms and music room to be shallower with knee clearance. Assume only 2 sinks upgraded in foods room (not every station).	$5,200
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	1.1.7	Add tactile attention indicators to existing curb ramps.	$6,200

Prerequisite for RHFAC Gold	Relevant feature number	Upgrade description	Estimated cost
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	2.1.6	Add tactile attention indicators to existing curb ramps.	$6,200
Wayfinding strategies in place to navigate throughout the site.	6.1.1	Add/replace interior directional and blade signage.	$6,200
Wayfinding strategies in place to navigate throughout the site.	2.1.3	Add exterior directional signage.	$10,900
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	2.1.7	Add guardrail along unprotected hazard, paint in contrasting colour. Paint existing edge protection in contrasting colour.	$15,700
Tactile markings for permanent room identification signs.	6.2.1	Add/replace room signage to include braille and tactile elements.	$35,000
Accessibility provision(s) for the key functional facilities of the Site.	5.2.1	Modify existing universal washroom to include accessible shower.	$37,500
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	2.3.5	Add tactile attention indicators at top of 6 exterior stairs.	$46,900
Emergency systems with visual and audible fire alarms in both public and private areas.	7.2.1	Add visual fire alarm to all washrooms, offices, prep rooms, lounges and classrooms. Note: a portable vibrating pager system is a suitable alternative.	$75,000

Prerequisite for RHFAC Gold	Relevant feature number	Upgrade description	Estimated cost
Safety warning features, such as tactile attention indicators at the top of stairs, and cane-detectable features, if there are overhead or protruding hazards along the path of travel.	3.6.5	Add tactile attention indicators at top of 10 interior stairs.	$78,000
Accessibility provision(s) for the key functional facilities of the Site.	4.4.6	Redo counter/millwork to support accessible height sink and surface area with knee clearance, ensure clear space, and provide different height counter surfaces when possible. Upgrade area surrounding sink in kitchen areas, foods classroom, life skills/learning support room, visual art rooms, metal shop, wood shop, theatre dressing room, and music room. Assume only 2 stations upgraded in foods room. Fulfills requirements for 4.4.3 for accessible height sinks.	$86,200
Accessibility provision(s) for the key functional facilities of the Site.	8.1.1	Rebuild/adjust built-in desk or workstation to create accessible path of travel, clear space, and work surface in staff prep rooms, science labs, visual art rooms, foods room, metal shop, wood shop. Assume only 2 stations upgraded if multiple.	$240,800

Table 12 Additional upgrades to prototype school building to meet score threshold for RHFAC Gold.

Element	Feature	Upgrade description	Estimated cost
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.10 Clear space on outside and inside of door	Relocate furniture and waste bins to open existing clear space at doors. Assume 1/5 of doors obstructed by moveable bins, furniture, and other items. Assume no cost to move items. Fulfills upgrade requirements for 03.01.08.	$0
4.3 Waiting Areas, General Seating, Meeting Rooms, and Lounges	4.3.2 Arrangement of seating with clear space	Rearrange furniture to create clear space. Assume 40 pieces of furniture to be rearranged. Assume no cost to move items.	$0
8.6 Cafeterias, Restaurants and Bars	8.6.2 Accessible path of travel	Rearrange furniture to ensure adequate clear widths and turning areas. Assume no cost to move items.	$0
8.9 Fitness Centre	8.9.1 Accessible path of travel	Rearrange equipment to ensure adequate clear widths and turning areas. Assume no cost to move items.	$0
5.2 Showers	5.2.4 Floor surface is stable, firm, and non-slip	Redo staff shower floors due to shower pans material being slip hazard. Assume two staff show zones at 20 sq ft each.	$1,000
3.3 Corridors and Hallways	3.3.6 Glazed walls have colour-contrasted strips or markings	Add contrast strip on glazed wall at two heights. Assume 500 ft of glazing.	$1,200
8.12 Mail Service	8.12.3 Clear signage for mailboxes	Revise staff mailbox name signs to include larger lettering, tactile characters, and braille. Assume one zone.	$1,900
3.4 Interior Ramps	3.4.4 Level landings with clear space	Move obstructing furniture/objects. Adjust door swing to not open into ramp landing space where possible or add swing path indicators. Assume minority of doors can be adjusted to swing inwards. Assume $800 per ramp. Assume two ramps/school.	$2,000

Element	Feature	Upgrade description	Estimated cost
1.1 Parking	1.1.3 Dimensions of designated accessible spaces	Revise parking lines to provide designated access aisles.	$2,800
2.4 Building Entrances	2.4.15 Vision panels (if provided)	Replace exterior door with visions panel at secondary entrances with best practice model. Assume four secondary entrances (assume cafeteria entrances mostly glazed and don't have vision panels).	$3,000
3.5 Elevators	3.5.12 Emergency communication systems	Add/replace two-way communication emergency system, compatible with assistive listening systems. Provide text-to-text communication system. Assume one elevator area. Assume high cost to include text-to-text system or plan.	$3,100
3.3 Corridors and Hallways	3.3.1 Clear width	Add convex mirror at priority area sharp corners. Removal or modification of sharp corners are not feasible for retrofits. Assume five priority areas sharp corners.	$3,100
2.1 Exterior Pathways to Facilities on Site	2.1.4 Path is level or low-gradient slope (when not accommodated by a ramp)	Install handrail on sloped pathways exceeding 5% to main building entry. Assume for rear sloped area near cafeteria. Assume side and mid rails.	$3,100
5.1 Washrooms	5.1.16 Urinals are colour contrasted with adjacent surface	Install tactile and contrasting centerline indicators for each urinal in washroom. Revise colour of wall behind urinals to provide colour contrast. Assume eight urinals.	$3,500
3.5 Elevators	3.5.4 Hall call buttons are accessible and at accessible height	Add tactile elements (e.g., arrows), braille lettering, and tactile characters indicating hall call button. Assume two areas, one/floor, low cost.	$3,700
3.5 Elevators	3.5.19 Well-illuminated cab interior and elevator lobbies	Increase lighting level in elevator cab. Assume one elevator cab.	$4,000
5.1 Washrooms	5.1.11 Toilets at appropriate height and have back supports	Add backrest or toilet seat cover to toilet. Assume need for 10-14 accessible toilets.	$4,400

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.3 Washroom identification signage	Replace washroom door signage at accessible height. Best practice signage including raised symbols and braille. Assume 11 zones.	$4,800
2.4 Building Entrances	2.4.5 Controls for manually activated power-operated doors	Replace existing button. Add button for power entrance door to accessible location and height. Assume three entrances with power operators.	$5,600
8.12 Mail Service	8.12.2 Mailboxes at accessible heights	Add additional staff mailboxes at accessible height. Assume one zone.	$5,600
3.5 Elevators	3.5.17 Doors are colour contrasted with surroundings	Repaint interior elevator doors or use vinyl wall sticker to provide contrast with surroundings and/or minimize glare.	$5,600
7.2 Fire Alarm Systems and Equipment	7.2.5 Emergency notification systems	Provide special emergency notification systems for people with hearing/visual impairments to enhance emergency procedures. Assume $5,000 cost for system with multiple fobs.	$6,200
3.5 Elevators	3.5.13 Audible elevator components	Add/replace audio system to indicate elevator cab arrival, button pressing, location, and direction of travel of elevator cab. Assume two areas.	$6,200
3.5 Elevators	3.5.18 Mirror in rear of elevator cab (if not flow-through type)	Add mirror along rear wall of elevator cab. Assume one elevator area.	$6,200
2.4 Building Entrances	2.4.7 Door security and entry system is accessible and easy to use	Replace/add door security system with accessible features. Add sign with phone number for text-to text support. Assume door security system at 5/7 entrances.	$6,200

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.8 Door security and entry system is easily identified and conveniently located	Assume existing consoles have accessibility features. Add paint to outline security system on surrounding surface for increased contrast. Relocate existing door security systems to be at optimized location, height. Assume door security system at 5/7 entrances.	$6,200
5.1 Washrooms	5.1.14 Power outlet near toilet	Add outlet or rough-in for power outlet beside each single-occupancy toilet. Modified from beside every accessible toilet due to heightened privacy desires. Assume single-occupancy toilets.	$6,400
5.2 Showers	5.2.9 Fold-down shower seat	Install fold-down shower seat. Assume for staff showers only. Assume two.	$6,900
4.4 Kitchens	4.4.5 Sink faucet is easy to use or automatic	Replace kitchen faucet with easy-to-use accessible model. Assume all 10 kitchen zones (including all foods classroom stations), plus 6 zones for 2 art rooms, metal shop, woodshop, backstage sink, music room.	$7,000
5.2 Showers	5.2.3 Grab bars at appropriate heights and locations	Install two vertical and two horizontal grab bars in shower. Assume two student zones and two staff zones.	$7,500
8.2 Public Assembly Areas	8.2.7 Assistive listening and communication enhancement technologies	Provide sound field system. Assume 1 system needed due to size of theatre.	$7,500
5.1 Washrooms	5.1.13 Toilet paper dispensers at appropriate height and locations	Replace toilet paper dispensers with open-roll model in proper location and/or re-install at appropriate height and location. Assume all 31 toilets, therefore 31 dispensers.	$7,700

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.15 Accessible urinals with clear space	Relocate one urinal and its flush control per boys/men's washroom to accessible height. Add two grab bars to lower urinal. Add privacy screens between urinals. Assume one urinal in each washroom containing urinals to be upgraded.	$9,400
5.2 Showers	5.2.2 Roll-in shower	Remove low threshold to create roll-in shower. Assume for student change rooms. Assume 2 student zones for girls/boys, 2 staff zones for men/women.	$10,000
1.1 Parking	1.1.5 Clear signage	Repaint accessible stall markings on stall surface. Add vertical stall signage. Add directional signage in parking lot going to/from entry and designated accessible stalls. Assume 1 sign package.	$10,000
5.1 Washrooms	5.1.7 Entry door and toilet stall door have accessible hardware	Upgrade standard washroom entry/stall door handles/locks/D pulls. Replace button operator for universal washroom locking system, add signage with instructions for use. Assume 50% of all stalls/doors need upgrading.	$10,000
7.3 Evacuation Instructions	7.3.1 Evacuation instructions on non-reflective surface	Replace evacuation instructions to have large, clear, contrasting information, on non-glare surfaces that contrast with surroundings, include tactile floor plan diagram, include tactile information and braille. Assume seven signage zones in building. Fulfills upgrade requirements of 07.03	$10,900
5.2 Showers	5.2.8 Shower accessories at accessible height and within reach	Move soap holder or create recessed soap holder/shelf at accessible height. Add hooks at accessible height/location. Assume 8 total for students and staff showers.	$11,000
5.1 Washrooms	5.1.24 Adult change table (if universal washroom)	Add power-operated adult change table within one universal washroom.	$12,500

Element	Feature	Upgrade description	Estimated cost
5.2 Showers	5.2.10 Adult change table	Add power-operated adult change table to shower/change room. Assume one adult change table added to area near change rooms, in addition to one in universal washroom.	$12,500
8.2 Public Assembly Areas	8.2.2 Number and location of accessible seating spaces	Revise public assembly areas to create dispersed accessible seating with required front and side clear space and adjacent space for companion seating. Update accessible seating to be adaptable with movable/removeable armrest. Provide signage to and at accessible seating. Assume school has no designated accessible seating in fixed seating theatre. Assume first seating row is partial providing area to create designation. Assume one zone.	$12,500
5.1 Washrooms	5.1.17 Sink and counter at recommended height with knee clearance	Upgrade drain under sink to be offset. Add shelf at sink. Assume for 23 sinks in multi-stall washrooms.	$14,400
5.1 Washrooms	5.1.12 Toilet flushing mechanisms are within easy reach	Adjust manual flush override (for existing automatic flush toilet) to be on transfer side, or upgrade toilet to automatic flush mechanism and easy-to-use manual override control on transfer side. Assume flush not on transfer side for 7/14 accessible toilets.	$15,300
2.2 Exterior Ramps	2.2.5 Colour-contrasted and slip-resistant strip	Provide colour-contrasted and slip-resistant strips at top and bottom of each run. Assume 2 portable ramps.	$15,600
8.6 Cafeterias, Restaurants and Bars	8.6.9 Vending and dispensing machines are accessible	Replace vending machine with accessible model. Assume one zone.	$17,300
8.9 Fitness Centre	8.9.3 Raised stretching mat	Provide raised stretching platform. Assume one zone.	$18,800

Element	Feature	Upgrade description	Estimated cost
3.4 Interior Ramps	3.4.5 Colour-contrasted and slip-resistant strip	Add/replace contrasting and slip-resistant strip to top and bottom of ramp. Assume for all 6 ramp zones, top and bottom. Assume low cost.	$18,700
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.1 Desks/counters at accessible height or variety of heights	Redesign/purchase new furniture for reception desk to provide accessible height space and knee clearance for staff and visitors. Redesign reception area to create clear space. Rearrange furniture/movable obstacles to create clear space in front of reception desks. Ensure desks are colour contrasting with surroundings. Assume four zones including office reception, library reception, and two other zones (e.g., student store window, health/counselling area reception).	$25,200
7.1 Emergency Exits and Areas of Refuge	7.1.5 Evacuation chair or similar equipment available and easily understood	Purchase evacuation chairs to provide in each exit stairwell. Assume one for each second-floor exit stair landing.	$28,700
8.6 Cafeterias, Restaurants and Bars	8.6.4 Variety of seating available	Replace fixed seating tables with flexible tables and seating with options (i.e., firm padding, armrests/backrests, colour contrasting with surroundings). Add some seating with options with firm padding, armrests/backrests, colour contrasting with surroundings. Provide some lower bar areas/tables at accessible height. Assume one open multi-purpose/cafeteria area (multiple tables in one area).	$34,800

5.0 Discussion

5.0 Discussion

The study considered the following hypotheses:

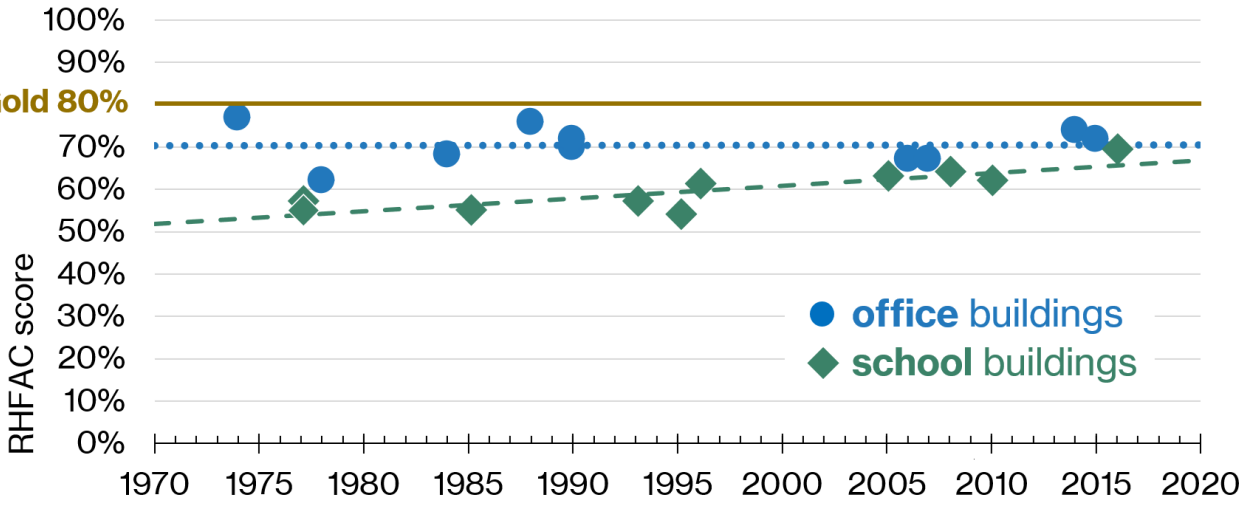
- Newer buildings are likely to be more accessible, and therefore achieve higher RHFAC rating scores than older buildings, due to the evolution of building codes;
- While retrofit costs can vary widely, many upgrades can be implemented cost-effectively; and
- If managed strategically, through maintenance and planned projects, cost should not pose a significant barrier to implementing accessibility upgrades.

5.1 Age of building did not predict RHFAC rating scores

While older school buildings in the study showed a relationship between age and RHFAC ratings scores, office buildings did not. Figure 8 below shows RHFAC Rating scores and year of construction for the 10 sample office buildings and 10 sample school buildings.

As renovations and retrofits generally require building permits, one explanation for the variability is that accessibility features have been included to achieve building code compliance when owners and operators undertake other improvement projects.

Figure 8 RHFAC Rating scores for sample office and school buildings



5.2 Upgrades included many cost-effective options

Upgrade options to increase accessibility for the prototype office and school buildings ranged from no cost to $1.15 million, with many upgrades coming in under $50,000 (see the appendix for a list).

Some of the most cost-effective upgrades include:

- moving furniture and other obstacles
- updating signage (e.g., braille, tactile characters, mounting height)
- adding colour contrast (e.g., stair nosings, painting obstructions)
- adding assistive listening technology (e.g., portable hearing loop)
- adding/updating power door operators/controls
- adding seating
- adding kick plates
- adding/updating door handles and handrails

While cost is an important factor when considering what upgrades owners and operators may choose to undertake to improve meaningful access to their buildings, there are other equally important considerations including prioritizing:

- life and safety
- dignity
- overall impact of upgrades
- integration with other currently planned upgrades

5.3 Strategic management can increase feasibility

While the study included only a small number of sample buildings and building types, it suggests the cost to retrofit existing buildings to provide the highest level of meaningful access, RHFAC Gold, does not have to be a significant barrier to implementation.

Prioritize life and safety upgrades

It may be possible to garner support and funding for upgrades that address previously-identified issues and barriers, especially when they affect life safety, health or sanitation.

Complete upgrades over time

Completing upgrades by amortizing their costs over time can reduce funding barriers.

With a phased implementation strategy over an amortization period of 10 years, the cost per year to retrofit the office building to RHFAC Gold was $\$0.15/ft^2$ ($\$1.50/m^2$) per year. For the school building, it was $\$0.90/ft^2$ ($\$10.00/m^2$) per year.

See the appendix for a full list of the upgrades with cost estimates.

Include accessibility as part of planned projects

Examples include:

- Repaving or redesign of exterior parking lot can address other areas like paths of travel.
- Replacement of fixtures and door hardware because of age.
- Cosmetic and interior design changes done for aesthetic or other reasons can include accessibility upgrades.

Seek additional efficiencies through building area groupings

Creating groupings of upgrades based on a building area or theme of impact creates the opportunity to holistically target specific barriers and issues. Examples include:

- **Washrooms and change rooms**

  Washroom and change room upgrades should be considered from a holistic perspective. This may involve adjusting layouts, clearances and accessories in all single-occupancy washrooms (as well as multi-stall areas), creating an accessible shower, providing an adult change table, or providing a universal washroom option in as many washroom blocks as possible.

  Other types of upgrades for washrooms and change rooms that are most impactful when applied consistently throughout a building include updating specific features such as sinks, faucets, dispensers, and/or dryers.

- **Arriving at and entering a building**

  This may involve creating a best practice vehicle drop-off zone or parking area, creating an accessible path of travel to the main entrance, providing additional wayfinding features and sheltered seating at the main entrance, adding a power door operator and ensuring the activation buttons are evident and conveniently located.

- **Emergency systems and evacuation equipment**

  This may involve features such as visual fire alarms, signage and wayfinding, the height of activation controls for emergency alarms, or adding emergency call buttons to washrooms.

- **Lobby**

  This may involve updating all desks, furniture, lighting, flooring, and directory information.

5.4 Applying findings to other building types

The study findings can be used to understand the work required to create meaningful access in buildings whose type and construction year are outside the scope of the study.

When considered together, the representative prototype office and school buildings provide a wide range of space types in both numbers available and frequency – from repeated base building spaces only in the prototype office building, to science lab, music, theatre, and kitchen spaces in the prototype school.

As such, other building types not included in the study could fall within the estimated cost range of the prototype buildings to upgrade to RHFAC Gold.

Key considerations that may impact relative cost include:

- Construction year.
- Upgrades already completed.
- Location in relation to large urban centres due to higher transportation and construction costs in remote and rural areas.
- The number and types of spaces to upgrade in the building, including specialized spaces.
- The number of floors and whether the floor plan is repeated across floors.
- If retrofitting vertical circulation (i.e., adding an elevator) or other major structural changes.

6.0 Appendix

6.0 Appendix

6.1 List of costed upgrades for the prototype office building

The cost of individual upgrades ranged from **$700 to $1,143,700.** This includes upgrades to fulfill prerequisites and all other costed upgrades.

Of the 99 upgrades:

- 64 features (65%) cost $50,000 or less.
- 13 features cost between $50,000-$100,000.
- 22 features cost over $100,000.

As well, 14 additional potential upgrades were not costed, as an upgrade of other features also achieves their requirements.

The following is a list of all 99 costed upgrades for the prototype office building, in order of increasing cost.

Costs were calculated in Spring 2023 using a Class D estimate (+/- 25-30%) by an independent cost consultant considering both BC and Ontario urban areas. They include 25% soft costs but exclude contingencies, escalation and GST.

Table 13 List of costed upgrades for the protype office building

Element	Feature	Upgrade description	Estimated cost
6.3 Directory Boards and Interactive Information Kiosks	6.3.3 Raised characters and symbols, and Braille where appropriate	Add braille lettering with directory board. Assume 1 location in main lobby.	$700
6.3 Directory Boards and Interactive Information Kiosks	6.3.2 Location of amenities where provided	Add additional directory signage with amenities. Assume 1 location in main lobby.	$700
6.3 Directory Boards and Interactive Information Kiosks	6.3.4 Accessible height and approach	Re-install existing directory board to appropriate clearances. Assume 1 location in main lobby.	$700

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.14 Glazed doors have colour-contrasted strips or markings	Add colour contrasted markings on entrance doors (2 heights). Assume 1 main entry per facility.	$900
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.5 Clear signage	Add signage indicating location of reception desk. Assume 1 desk in lobby.	$1,200
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.7 Assistive listening and communication enhancement technologies	Add assistive listening systems at reception desk. Assume 2 systems, one for security desk and one for additional application.	$1,200
6.3 Directory Boards and Interactive Information Kiosks	6.3.1 Comprehensive relevant information	Add floor plan directional signage to display board. Assume 1 location in main lobby.	$1,900
3.4 Interior Ramps	3.4.5 Colour-contrasted and slip-resistant strip	Add colour contrasted slip resistant strip at top and bottom of each ramp run. Assume 1 ramp in lobby.	$2,200
2.4 Building Entrances	2.4.13 Outward-opening doors	Add cane detector at outward opening main entry doors. Assume 1 main entry per facility.	$2,800
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.5 Door security and entry system is accessible and easy to use	Upgrade door security system to one that has audio and visual signals and contrasts with surrounding walls. Assume accessible installation height. Assume 1 main door security system.	$3,400
2.4 Building Entrances	2.4.7 Door security and entry system is accessible and easy to use	Upgrade existing security systems and provide phone number for text-to-text support. Assume 1 entry per facility.	$3,400

Element	Feature	Upgrade description	Estimated cost
1.1 Parking	1.1.3 Dimensions of designated accessible spaces	Revise parking lines to provide designated access aisles. Assume 4 accessible stalls per building.	$3,700
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.8 Clear opening width of doors and doorways	Widen doors on parking levels in elevator vestibules. Assume widening of 2 doors for vestibule entry on P1.	$5,600
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.2 Space for knee clearance at transaction points for public and staff	Provide knee space for both staff and public. Add folding panel to provide appropriate space. Assume 1 main reception/service desk	$6,200
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.1 Desks/counters at accessible height or variety of heights	Revise design of reception desk to provide accessible height space for staff and visitors. Assume 1 main reception/service desk	$6,200
3.5 Elevators	3.5.4 Hall call buttons are accessible and at accessible height	Relocate elevator cab control buttons to accessible heights in existing elevators. Assume 4 elevators per typical building.	$7,500
3.2 Path of Travel	3.2.4 Open-plan areas are well defined and include tactile direction indicators	Provide tactile directional indicators to guide through lobby.	$7,800
3.6 Interior Stairs	3.6.5 (A) Tactile attention indicators (truncated domes)	Add contrasting tactile attention indicators (truncated domes) at top of stairs. Assume 1 main lobby stair.	$7,800
2.1 Exterior Pathways to Facilities on Site	2.1.7 Edge protection	Add edge protection to exterior path drop-off areas (i.e., tactile indicator and colour contrasting). Assume 1 entrance area.	$7,800

Element	Feature	Upgrade description	Estimated cost
2.1 Exterior Pathways to Facilities on Site	2.1.8 No obstacles on path and overhead, or obstacles are cane detectable and high contrast	Add cane detectable markers on obstacles. Assume 1 entrance area.	$7,800
2.1 Exterior Pathways to Facilities on Site	2.1.9 Convenient and understandable pathway to facilities	Provide colour and tactile direction indicators from exterior to buildings. Assume 1 entrance area.	$7,800
2.4 Building Entrances	2.4.2 Entrance is easily identified	Provide distinguishable features around main entrance (i.e., signage or feature colour). Assume 1 primary entry.	$7,800
4.5 Acoustic Considerations	4.5.1 Sound damping and background noise	Add additional sound dampening within lobby. Assume 1 main lobby.	$7,800
4.6 Illumination and Building Systems	4.6.7 Windows are glazed or fitted with material to reduce glare	Add anti-glare features within large lobby windows. Assumed 1 main lobby.	$7,800
2.4 Building Entrances	2.4.5 Controls for manually activated power-operated doors	Adjust existing controls to have operable buttons at multiple heights (add additional lower control – hand and foot location). Assume 1 entry.	$8,700
3.7 Escalators and Moving Walkways	3.7.5 Accessible stop button	Provide accessible emergency stop buttons for escalators. Assume 2 escalators in lobby.	$9,400
5.1 Washrooms	5.1.16 Urinals are colour contrasted with adjacent surface	Revise colour of walls behind urinals to provide colour contrast. Assume 1 male washroom per floor.	$9,600
4.1 Lobby and Reception Areas	4.1.2 Location of key facilities easily identified	Add signage from lobby to primary elevators, stairs, and washrooms. Assume 1 main lobby.	$10,900

Element	Feature	Upgrade description	Estimated cost
3.4 Interior Ramps	3.4.7 Edge protection	Provide protective barrier visually contrasting. Assume 1 ramp in lobby.	$10,900
2.4 Building Entrances	2.4.17 Seating	Add exterior seating near main entrance (e.g., bench). Add 1 area.	$12,500
2.1 Exterior Pathways to Facilities on Site	2.1.13 Seating	Provide variety of exterior seating with accessible features (including backrest and armrests). Assume 1 seating area near entrance.	$12,500
5.1 Washrooms	5.1.24 Adult change table (if universal washroom)	Add power operated adult change table within one universal stall. Assume 1 added.	$12,500
3.7 Escalators and Moving Walkways	3.7.4 Visual and audible notifications at start and end	Add visual and audible signals at top and bottom of escalator. Assume 2 escalators in lobby.	$15,500
2.3 Exterior Stairs	2.3.5 Tactile attention indicators (truncated domes)	Add colour contrasted tactile attention indicators at top and bottom of exterior stairs. Assume 2 exterior stairs.	$15,600
2.3 Exterior Stairs	2.3.6 Colour-contrasted and slip-resistant strip on nosing	Add colour contrasted slip-resistant strips on existing exterior stairs. Assume 2 exterior stairs.	$15,600
3.7 Escalators and Moving Walkways	3.7.3 Colour-contrasted nosings and side edges	Add colour contrasted strips on sides of escalators. Assume 2 escalators in lobby.	$15,600
2.3 Exterior Stairs	2.3.7 Riser height and tread depth	Repair inconsistent riser heights on existing exterior access stairs. Assume 2 exterior stairs.	$15,600

Element	Feature	Upgrade description	Estimated cost
3.3 Corridors and Hallways	3.3.3 No obstacles on path and overhead, or obstructions are cane detectable and high contrast	Apply colour contrasted paint to obstructing object and install cane-detectable guard. Assume two zones.	$15,600
3.5 Elevators	3.5.18 Mirror in rear of elevator cab (if not flow-through type)	Add mirror along rear wall of elevator cab. Assume 4 elevators.	$17,500
3.4 Interior Ramps	3.4.6 Handrails	Add/replace accessible height continuous, ergonomic, contrasting handrail (one side), with extensions where possible. Assume 1 ramp in main lobby.	$18,700
3.5 Elevators	3.5.12 Emergency communication systems	Provide visual (text) emergency two-way communication system. Assume 4 elevators.	$18,700
2.1 Exterior Pathways to Facilities on Site	2.1.3 Clear signage (if required for expected usage)	Add signage identifying accessible pathway(s) to main entrance. Assume 1 signage package near main entry.	$18,700
5.1 Washrooms	5.1.3 Washroom identification signage	Provide tactile signage with raised symbols, letters, and braille, beside each washroom door. Assume 2 washrooms per floor. Assume 22 floors.	$19,200
5.1 Washrooms	5.1.17 Sink and counter at recommended height with knee clearance	Add pipe insulation on accessible washroom sink. Remove all knee skirting below countertops. Assume 2 washrooms per floor. Assume 22 floors.	$19,200
5.1 Washrooms	5.1.5 Minimum force required to open entry door	Upgrade doors for easier swing to access washrooms. Assume 2 washrooms per floor. Assume 22 floors.	$19,200

Element	Feature	Upgrade description	Estimated cost
2.1 Exterior Pathways to Facilities on Site	2.1.2 Surface is firm, stable, and slip resistant	Patch specific areas of exterior pathways to eliminate tripping hazards and pooling of water. Assume 1 entrance is repaired.	$21,900
7.1 Emergency Exits and Areas of Refuge	7.1.4 Emergency exit and door to area of refuge are colour contrasted with surrounding	Apply colour-contrast paint to exit doors. Assume 44 building exit doors (two per floor) and 16 parkade exit doors (four per floor).	$22,500
3.5 Elevators	3.5.15 Handrails	Add/replace elevator cab handrail with contrasting ergonomically design and install at accessible height. Assume 4 elevators.	$25,000
1.1 Parking	1.1.5 Clear signage	Add directional signage in parking lot indicating entry to designated accessible stalls and ticket machines. Assume 1 signage package.	$25,000
4.1 Lobby and Reception Areas	4.1.5 Seating where expected to wait	Provide upgraded furniture at a variety of heights/sizes within lobby space. Assume 2 types of seating areas in main lobby.	$25,000
7.2 Fire Alarm Systems and Equipment	7.2.4 Firefighting and first-aid equipment at accessible height and location	Re-locate fire extinguishers, defibrillators (AEDs) and first aid kits to accessible height. Assume 1 fire extinguisher per office floor (x22) and 2 per parkade floor (x 4), 4 AEDS total.	$25,500
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.16 Kick plates on doors	Add kickplates to main doors. Assume 4 tenant space doors per floor. Assume 21 floors.	$26,200
5.1 Washrooms	5.1.13 Toilet paper dispensers at appropriate height and locations	Replace toilet paper dispensers with open-roll model in proper location and/or re-install at appropriate height and location. Assume 5 toilets per floor. Assume 22 floors.	$27,500
3.5 Elevators	3.5.10 Controls inside elevator cab at accessible height and location	Add second control panel on side wall, installed at accessible height. Assume 4 elevators.	$27,500

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.3 Power-operated door or easy-to-open door	Replace main entry door with automatic sliding door. Assume 1 entry area.	$28,100
2.3 Exterior Stairs	2.3.12 Well-illuminated (if required for expected usage)	Add lighting for exterior stairs. Assume 2 exterior stairs.	$28,100
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.13 Doors are colour contrasted with adjacent surfaces	Add contrast to interior doors (i.e., paint or glazing indicators). Assume 4 tenant space doors per floor. Assume 21 floors.	$31,500
6.2 Room Identification Signage	6.2.1 Room identification signage is used to identify spaces where useful	Add/replace room signage. Assume 2 additional signs per floor. Assume 22 floors.	$33,000
7.2 Fire Alarm Systems and Equipment	7.2.3 Fire alarm pulls at accessible height and location	Lower height of fire emergency alarm pulls. Assume 2 locations per office floor (x21 floors), five locations in lobby.	$35,200
3.5 Elevators	3.5.16 Colour contrast between interior cab floor and wall, with no glare	Repaint/redo material of elevator cab walls to provide contrast with floor to minimize glare. Alternatively, replace elevator cab flooring to be light colour to reduce glare. Assume 4 elevators.	$36,200
2.3 Exterior Stairs	2.3.4 Handrails	Add/replace accessible height, continuous, ergonomic, contrasting handrail, with extensions where possible. Assume 2 exterior stairs.	$37,500
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.12 Door handles are U-shaped lever style or equivalent	Replace doorknobs with U-shaped levers colour-contrasted with door material. Assume 4 tenant space doors per floor. Assume 21 floors.	$42,000

Element	Feature	Upgrade description	Estimated cost
7.3 Evacuation Instructions	7.3.2 Evacuation instructions in large print and high contrast	Print large evacuation instructions throughout building. Assume 1 zone per floor (assume 22 floors) and two zones per parkade floor (assume 4 floors).	$46,900
5.1 Washrooms	5.1.11 Toilets at appropriate height and have back supports	Add backrest or toilet seat cover to toilet. Assume 5 toilets per floor. Assume 22 floors.	$48,100
3.5 Elevators	3.5.13 Audible elevator components	Add/replace audio system to indicate elevator cab arrival, button pressing, floor, and direction of travel of elevator cab. Assume 4 elevators.	$50,000
5.1 Washrooms	5.1.14 Power outlet near toilet	Add outlet or rough-in for power outlet beside each single-occupancy toilet. Assume 2 accessible stalls per floor. Assume 22 floors.	$55,000
1.1 Parking	1.1.1 Number of designated accessible spaces	Convert stalls on P1 near secondary entrances to accessible parking stalls by repainting lines. Assume 4 existing accessible stalls, 300 spaces overall. Add 8 accessible stalls for 12 total.	$60,000
5.1 Washrooms	5.1.12 Toilet flushing mechanisms are within easy reach	Adjust manual flush override (for existing automatic flush toilet) to be on transfer side, or upgrade toilet to automatic flush mechanism and easy-to-use manual override control on transfer side. Assume 1 toilet per floor. Assume 22 floors.	$61,900
1.1 Parking	1.1.12 Payment systems are convenient and accessible (if paid parking)	Adjust display screens and add two-way communication to parking meters or replace system. Assume 1 system upgraded/replaced.	$62,500
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.15 Vision panels (if provided)	Replace/upgrade solid doors to have best practice vision panels. Assume 4 tenant space doors per floor. Assume 21 floors.	$63,000

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.19 Automated or easy-to-operate plumbing fixtures and accessories	Revise paper towel and soap dispensers to be automated. Assume 4 soaps dispensers and 2 paper towel dispensers per floor. Assume 22 floors.	$66,000
1.1 Parking	1.1.6 Safe pedestrian pathways within parking lots	Create/redo pathway connecting accessible stalls to path of travel to entrance. Add markings on pavement to create marked path of travel from accessible stalls to path of travel to entrance. Assume for 1 area.	$71,900
7.2 Fire Alarm Systems and Equipment	7.2.1 Visual fire alarms throughout facility and where people might expect to be alone	Add visual fire alarms to room/area. Assume two per floor for washrooms. 44 total over 22 floors.	$72,000
4.6 Illumination and Building Systems	4.6.6 Building controls are at accessible heights	Relocate building control to accessible height (e.g., light switch, thermostat, wall-mounted phone). Assume 2 washroom light switches per zone. 44 total over 22 floors.	$75,600
5.1 Washrooms	5.1.7 Entry door and toilet stall door have accessible hardware	Upgrade standard washroom entry/stall door handles/locks/D pulls. Assume 2 entry doors per floor, 5 stall doors per floor (3 women's, 2 men's). Assume 22 floors.	$77,000
5.1 Washrooms	5.1.15 Accessible urinals with clear space	Relocate 1 urinal and its flush control per boys/men's washroom to accessible height. Add 2 grab bars to lower urinal. Add privacy screens between urinals. Assume 1 per floor. Assume 22 floors.	$82,500
5.1 Washrooms	5.1.22 Emergency call button	Add emergency call button system to washroom with accessible toilet or single occupancy washroom (every washroom). Assume 1 per washroom or accessible stall. Assume 2 per floor. Assume 22 floors.	$82,500

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.10 Grab bars at appropriate height and locations at toilets	Revise height and dimensions of grab bars in accessible stalls. Assume 2 accessible stalls per floor. Assume 22 floors.	$82,500
6.1 General Wayfinding and Signage	6.1.5 Lettering, numerals and symbols are clearly visible	Replace signage with larger font. Fulfills other signage requirements for: 6.1.6; 6.1.7; 6.1.9; 6.2.2. Assume 22 floors.	$103,100
6.1 General Wayfinding and Signage	6.1.1 Directional signage is comprehensive and clearly visible	Add/replace directional signage for access through main spaces. Assume 22 floors.	$103,100
6.1 General Wayfinding and Signage	6.1.2 Blade signage is used to supplement overhead signage where useful	Add blade signage in major circulation routes throughout building. Assume 1 zone per floor. Assume 22 floors.	$103,100
6.1 General Wayfinding and Signage	6.1.3 Wayfinding includes a variety of techniques	Add identifying location items (i.e., paint treatment on walls). Assume 22 floors.	$103,100
5.1 Washrooms	5.1.23 Child change table at accessible height	Add child change table in each washroom location. Assume 2 washrooms per floor. Assume 22 floors.	$110,000
5.1 Washrooms	5.1.18 All washroom accessories at accessible heights and locations	Replace dryer, paper towel dispenser, and soap dispenser with automatic model in accessible location or reinstall existing in accessible location. Assume 5 stalls per floor and 4 sinks per floor. Assume 22 floors.	$117,600
7.2 Fire Alarm Systems and Equipment	7.2.5 Emergency notification systems	Provide special emergency notification systems for people with hearing/visual impairments to enhance emergency procedures. Assume 1 per floor including parkade. Assume 26 floors.	$121,900

Element	Feature	Upgrade description	Estimated cost
6.2 Room Identification Signage	6.2.2 Sign includes Braille and characters/symbols that are raised	Add signage with raised symbols and braille. Fulfills upgrade requirements for 6.1.5.	$132,000
6.2 Room Identification Signage	6.2.3 Sign at recommended height	Re-install signage to be at appropriate height. Assume 8 signs per floor. Assume 22 floors.	$132,000
7.1 Emergency Exits and Areas of Refuge	7.1.5 Evacuation chair or similar equipment available and easily understood	Purchase evacuation chair for building exit stairwell (multiple for tall buildings). Assume all floors including parkade except ground level.	$179,700
5.1 Washrooms	5.1.8 Entry door and toilet stall door are colour contrasted with adjacent surfaces	Re-finish washroom stall entry doors to provide colour contrast to walls/surfaces. Assume 2 entry doors per floor, 5 stall doors per floor (three women's, two men's). Assume 22 floors. Assume steel partitions.	$192,500
5.1 Washrooms	5.1.2 Universal washrooms	Add 1 universal washroom to the building.	$250,000
5.1 Washrooms	5.1.4 Power-operated door or screen wall entry	Add power operator to all washroom entries that are not screen wall or locked open. Assume 2 washrooms per floor. Assume 22 floors.	$261,200
4.6 Illumination and Building Systems	4.6.2 Lighting levels are consistent throughout site	Provide additional lighting within some corridor spaces. Assume corridor space on all floors. Assume 22 floors.	$309,400
5.1 Washrooms	5.1.6 Clear opening width of entry and toilet stall doors	Widen entry doors to accessible stalls/washrooms. Assume 2 entry doors and 2 stall doors per floor. Assume 22 floors.	$412,500

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.21 Colour contrast between floor and wall, and fixtures	Re-paint or retile areas where accessories are located. Assume 136 linear ft of wall space for men's and women's washroom design, x 9 ft tall. Assume 22 floors.	$471,200
3.6 Interior Stairs	3.6.5 (B) Tactile attention indicators (truncated domes)	Add contrasting tactile attention indicators at top of exit stairs. Note this is not required to fulfill prerequisites. Assume 2 exit stairs above ground (22 floors). Assume 4 exit stairs below ground (4 floors).	$468,700
3.6 Interior Stairs	3.6.6 Colour-contrasted and slip-resistant strip on nosing	Add/replace colour-contrasting slip-resistant nosing strip that slightly wraps down riser. Assume 2 exit stairs above ground (22 floors). Assume 4 exit stairs below ground (4 floors). Assume 1 lobby stair.	$476,600
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.1. Power-operated door or open entry	Add power operator on main circulation interior doors and install buttons at 2 heights. Assume 4 doors into tenant spaces per floor. Assume 21 floors.	$498,700
4.6 Illumination and Building Systems	4.6.1 Flooring, walkway, ramp, and stairway surfaces are well illuminated	Assume 2 exit stairs above ground (22 floors). Assume 4 exit stairs below ground (4 floors). Assume 1 stair, 1 ramp, 2 escalators in lobby.	$700,000
3.6 Interior Stairs	3.6.4 Handrails	Add/replace accessible height continuous, ergonomic, contrasting handrail (one side), with extensions where possible. Assume 2 exit stairs above ground (22 floors). Assume 4 exit stairs below ground (4 floors). Assume 1 stair in lobby.	$1,143,700

Features excluded from costing of prototype office building upgrades

The following features involved a high degree of architectural and operational complexity to estimate the cost to upgrade. They are beyond the mandate of the study to estimate costs to achieve RHFAC Gold for existing buildings.

Note that this list is not intended to be definitive but to instead indicate some accessibility upgrades may be implausible for some buildings and contexts. In this case, operational strategies should be used to meet the same objectives.

Table 14 Features excluded from costing of prototype office building upgrades

Element	Feature number	Feature name	Reason for exclusion
Parking	1.1.9	Height clearance (if sheltered or parkade)	Not feasible to retrofit height clearance of underground parking including its structure and building systems.
General Vehicular Access	1.2.1	Passenger drop-off and pick-up zones (if required for expected usage)	Creation of drop-off zone along city streets in urban centres involves coordination with and approval by city departments. Outside scope of study.
General Vehicular Access	1.2.2	Public transit (if area is serviced)	Public transit stop upgrades are determined by the city. Outside building site and scope of study.
Building Entrances	2.4.1	Entrance(s) required to be accessible	Prototype building meets requirement to have an accessible primary entrance. Upgrades excluded as they would apply to secondary entrances that have stairs onto sidewalks with no feasible space for an accessible re-design.
Building Entrances	2.4.12	Clear space on exterior and interior of door	Auto door openers and their opening times are more likely to upgrade instead of undertaking a vestibule redesign.
Path of Travel	3.2.1	No level changes within a storey or single floor	Prototype building has level change in lobby only. Unlikely to eliminate level change due to extent of required renovations.
Path of Travel	3.2.2	Access to all facilities expected to be used	Unlikely to renovate to reduce complexity some paths of travel to meet requirements for maximum points, for example in parking garage.
Interior Ramps	3.4.1	Slope	Unlikely to retrofit to due to space required for ramp length to meet slope required for maximum points.

Element	Feature number	Feature name	Reason for exclusion
Interior Ramps	3.4.2	Clear width	Ramp in prototype building meets minimum width requirements. Not plausible to retrofit to meet requirements for maximum points due to space and context constraints.
Elevators	3.5.9	Interior dimensions and floor surfaces	Prototype building elevator meets minimum requirements. Not plausible to upgrade to flow-through design to meet requirements for maximum points.
Interior Stairs	3.6.9	Nosing design	Requires redesign and rebuild of all stairs to meet requirements for maximum points.
Lobby and Reception Areas	4.1.3	Washroom facilities adjacent to lobby and reception area	Unlikely to relocate and rebuild washrooms located on main floor to meet location requirements for maximum points.
Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.4	Clearly visible from entrance doors with direct route	Unlikely to relocate and rebuild reception desk in lobby to meet location requirements for maximum points.
Washrooms	5.1.1	Number of accessible washrooms adequate for expected use	Creation of a universal washroom fulfills prerequisites for RHFAC Gold. Unlikely to renovate existing washrooms on each floor to be accessible to meet requirements for maximum points due to space required and loss of fixtures to accommodate those changes.
Washrooms	5.1.9	Clear space for maneuvering and transfer	Unlikely to renovate existing washrooms on each floor to be accessible to meet requirements for maximum points due to space required and loss of fixtures to accommodate those changes.
Emergency Exits and Areas of Refuge	7.1.1	Designated area of refuge in multi-level building	Unlikely to renovate to create area of refuge in unleased space due to space and context constraints. Emergency protocols can help mitigate risk.
Emergency Exits and Areas of Refuge	7.1.2	Area of refuge has adequate clear space for expected usage	Unlikely to renovate to create area of refuge in unleased space due to space and context constraints. Emergency protocols can help mitigate risk.
Emergency Exits and Areas of Refuge	7.1.6	Ground-level emergency exit is accessible	Upgrades excluded as they apply to exits that have a step or stairs onto sidewalks with no feasible space for an accessible re-design to meet requirements for maximum points.

6.2 List of costed upgrades for the prototype school building

The cost of individual upgrades ranged from **$0 to $678,100.** This includes upgrades to fulfill prerequisites and all other costed upgrades.

Some of the upgrades have no associated cost, as they involve modifications to the environment that do not require equipment, materials, or prolonged or skilled labour. These upgrades involve moving obstructing objects such as garbage bins, or rearranging furniture to increase the clear space or path of travel width between them.

Of the 167 upgrades:

- 4 have no cost
- 117 features (58%) cost $50,000 or less
- 31 features cost between $50,000-$100,000
- 15 features cost over $100,000

Thirty-five additional potential upgrades were not costed as an upgrade of other features also achieves their requirements.

The following is a list of all 167 costed upgrades for the prototype school building, in order of increasing cost.

Costs were calculated in Spring 2023 using a Class D estimate (+/- 25-30%) by an independent cost consultant considering both BC and Ontario urban areas. They include 25% soft costs but exclude contingencies, escalation and GST.

Table 15 List of costed upgrades for the prototype school building

Element	Feature	Upgrade description	Estimated cost
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.10 Clear space on outside and inside of door	Relocate furniture and waste bins to open existing clear space at doors. Assume 1/5 of doors obstructed by moveable bins, furniture, and other items. Assume no cost to move items.	$0
4.3 Waiting Areas, General Seating, Meeting Rooms, and Lounges	4.3.2 Arrangement of seating with clear space	Rearrange furniture to create clear space. Assume 40 pieces of furniture to be rearranged. Assume no cost to move items.	$0
8.6 Cafeterias, Restaurants and Bars	8.6.2 Accessible path of travel	Rearrange furniture to ensure adequate clear widths and turning areas. Assume no cost to move items.	$0

Element	Feature	Upgrade description	Estimated cost
8.9 Fitness Centre	8.9.1 Accessible path of travel	Rearrange equipment to ensure adequate clear widths and turning areas. Assume no cost to move items.	$0
5.2 Showers	5.2.4 Floor surface is stable, firm, and non-slip	Redo staff shower floors due to shower pans material being slip hazard. Assume 2 staff show zones at 20 sq ft each.	$1,000
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.7 Assistive listening and communication enhancement technologies	Provide portable hearing loop system at reception desk. Assume $500 for portable hearing loop system and a simple text-to-text system. Assume two zones for office and library.	$1,200
3.3 Corridors and Hallways	3.3.6 Glazed walls have colour-contrasted strips or markings	Add contrast strip on glazed wall at two heights. Assume 500 ft of glazing.	$1,200
8.12 Mail Service	8.12.3 Clear signage for mailboxes	Revise staff mailbox name signs to include larger lettering, tactile characters, and braille. Assume 1 zone.	$1,900
3.4 Interior Ramps	3.4.4 Level landings with clear space	Move obstructing furniture/objects. Adjust door swing to not open into ramp landing space where possible or add swing path indicators. Assume minority of doors can be adjusted to swing inwards. Assume 2 ramps/school.	$2,000
1.1 Parking	1.1.3 Dimensions of designated accessible spaces	Revise parking lines to provide designated access aisles.	$2,800
2.4 Building Entrances	2.4.15 Vision panels (if provided)	Replace exterior door with visions panel at secondary entrances with best practice model. Assume 4 secondary entrances (assume cafeteria entrances mostly glazed and don't have vision panels).	$3,000
3.3 Corridors and Hallways	3.3.1 Clear width	Add convex mirror at priority area sharp corners. Assume 5 priority areas sharp corners.	$3,100

Element	Feature	Upgrade description	Estimated cost
2.1 Exterior Pathways to Facilities on Site	2.1.4 Path is level or low-gradient slope (when not accommodated by a ramp)	Install handrail on sloped pathways exceeding 5% to main building entry. Assume for rear sloped area near cafeteria. Assume side and mid rails.	$3,100
3.5 Elevators	3.5.12 Emergency communication systems	Add/replace two-way communication emergency system, compatible with assistive listening systems. Provide text-to-text communication system. Assume 1 elevator area.	$3,100
5.1 Washrooms	5.1.16 Urinals are colour contrasted with adjacent surface	Install tactile and contrasting centerline indicators for each urinal in washroom. Revise colour of wall behind urinals to provide colour contrast. Assume 8 urinals.	$3,500
3.5 Elevators	3.5.4 Hall call buttons are accessible and at accessible height	Add tactile elements (e.g., arrows), braille lettering, and tactile characters indicating hall call button. Assume 2 areas, 1 per floor.	$3,700
3.5 Elevators	3.5.19 Well-illuminated cab interior and elevator lobbies	Increase lighting level in elevator cab. Assume one elevator cab.	$4,100
5.1 Washrooms	5.1.11 Toilets at appropriate height and have back supports	Add backrest or toilet seat cover to toilet. Assume for 10 accessible toilets.	$4,400
5.1 Washrooms	5.1.3 Washroom identification signage	Replace washroom door signage at accessible height. Best practice signage including raised symbols and braille. Assume 11 zones.	$4,800
4.4 Kitchens	4.4.4 Knee clearance under sink	Replace sinks with shallower depth basins to allow knee clearance. Assume 12 sinks total in staff areas, foods classroom, life skills/learning support room, art rooms, metal shop, woodshop, backstage sink, music room.	$5,200
2.4 Building Entrances	2.4.5 Controls for manually activated power-operated doors	Replace existing button. Add button for power entrance door to accessible location and height. Assume 3 entrances with power operators.	$5,600

Element	Feature	Upgrade description	Estimated cost
8.12 Mail Service	8.12.2 Mailboxes at accessible heights	Add additional staff mailboxes at accessible height. Assume 1 zone.	$5,600
3.5 Elevators	3.5.17 Doors are colour contrasted with surroundings	Repaint interior elevator doors or use vinyl wall sticker to provide contrast with surroundings and/or minimize glare.	$5,600
6.1 General Wayfinding and Signage	6.1.1 Directional signage is comprehensive and clearly visible	Add/replace directional and blade signage. Assume 2 signage zones in building. Assume low cost as audio/technological enhancements not expected for building type. New signage assumed to be installed in all relevant building areas and to fulfill all directional signage design requirements, from font size to use of pictograms, therefore fulfilling requirements for: 3.5.1; 4.2.4; 6.1.2; 6.1.4; 6.1.5; 6.1.6; 6.1.7; 6.1.8; 6.1.9	$6,200
1.1 Parking	1.1.7 Curb ramps (if level change en route to exterior pathway)	Add tactile attention indicator (TAI) with truncated domes to existing curb ramp. Assume 2 curb ramps exist but do not have TAIs.	$6,200
2.1 Exterior Pathways to Facilities on Site	2.1.6 Curb ramps (if level change en route to entrance)	Add TAI at curb ramps. Assume 2 areas.	$6,200
7.2 Fire Alarm Systems and Equipment	7.2.5 Emergency notification systems	Provide special emergency notification systems for people with hearing/visual impairments to enhance emergency procedures. Assume $5,000 cost for system with multiple fobs.	$6,200
2.4 Building Entrances	2.4.7 Door security and entry system is accessible and easy to use	Replace/add door security system with accessible features. Add sign with phone number for text-to text support. Assume door security system at 5/7 entrances.	$6,200
2.4 Building Entrances	2.4.8 Door security and entry system is easily identified and conveniently located	Assume existing consoles have accessibility features. Add paint to outline security system on surrounding surface for increased contrast. Relocate existing door security systems to be at optimized location, height. Assume door security system at 5/7 entrances.	$6,200

Element	Feature	Upgrade description	Estimated cost
3.5 Elevators	3.5.13 Audible elevator components	Add/replace audio system to indicate elevator cab arrival, button pressing, location, and direction of travel of elevator cab. Assume 2 areas.	$6,200
3.5 Elevators	3.5.18 Mirror in rear of elevator cab (if not flow-through type)	Add mirror along rear wall of elevator cab. Assume 1 elevator area.	$6,200
5.1 Washrooms	5.1.14 Power outlet near toilet	Add outlet or rough-in for power outlet beside each single-occupancy toilet. Assume 6 single-occupancy toilets only.	$6,400
5.2 Showers	5.2.9 Fold-down shower seat	Install fold-down shower seat. Assume for staff showers only. Assume 2.	$6,900
4.4 Kitchens	4.4.5 Sink faucet is easy to use or automatic	Replace kitchen faucet with easy-to-use accessible model. Assume 16 in staff areas, foods classroom, life skills/learning support room, art rooms, metal shop, woodshop, backstage sink, music room.	$7,000
8.2 Public Assembly Areas	8.2.7 Assistive listening and communication enhancement technologies	Provide sound field system. Assume 1 system needed due to size of theatre.	$7,500
5.2 Showers	5.2.3 Grab bars at appropriate heights and locations	Install two vertical and two horizontal grab bars in shower. Assume 2 student zones and two staff zones.	$7,500
5.1 Washrooms	5.1.13 Toilet paper dispensers at appropriate height and locations	Replace toilet paper dispensers with open-roll model in proper location and/or re-install at appropriate height and location. Assume for all 31 toilets.	$7,700
5.2 Showers	5.2.11 Well-illuminated	Add additional lighting to shower/area. Assume for student and staff shower areas, assume 320 sq ft.	$8,000

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.6 Emergency power or fail-safe systems for power-operated doors	Add emergency power source to power-operated entrance door. Assume for all 7 entrances.	$8,700
5.1 Washrooms	5.1.15 Accessible urinals with clear space	Relocate 1 urinal and its flush control per boys/men's washroom to accessible height. Add 2 grab bars to lower urinal. Add privacy screens between urinals. Assume 1 urinal in each washroom containing urinals to be upgraded, 3 total.	$9,400
3.5 Elevators	3.5.15 Handrails	Add/replace elevator cab handrail with contrasting ergonomically design and install at accessible height. Assume 1 elevator area.	$9,700
1.1 Parking	1.1.1 Number of designated accessible spaces	Convert stalls near secondary entrances to accessible parking stalls. Assume 2 additional stalls created.	$10,000
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.12.b Door handles are U-shaped lever style or equivalent	Replace doorknob with U-shaped lever contrasted with door material. Assume 1/8th of doors to be upgraded. Assume other doors hardware is appropriate and enhancing colour contrast is not feasible.	$10,000
1.1 Parking	1.1.5 Clear signage	Repaint accessible stall markings on stall surface. Add vertical stall signage. Add directional signage in parking lot going to/from entry and designated accessible stalls. Assume 1 sign package.	$10,000
5.1 Washrooms	5.1.7 Entry door and toilet stall door have accessible hardware	Upgrade standard washroom entry/stall door handles/locks/D pulls. Replace button operator for universal washroom locking system, add signage with instructions for use. Assume 50% of all stalls/doors need upgrading, 17 total.	$10,000

Element	Feature	Upgrade description	Estimated cost
5.2 Showers	5.2.2 Roll-in shower	Remove low threshold to create roll-in shower. Assume for student change rooms. Assume 2 student zones for girls/boys, 2 staff zones for men/women.	$10,000
5.1 Washrooms	5.1.8 Entry door and toilet stall door are colour contrasted with adjacent surfaces	Re-finish washroom stall/entry door to provide colour contrast to walls/surfaces. Assume paint steel partitions. Assume all partition stall doors need painting and entry doors do not, 24 total.	$10,500
2.4 Building Entrances	2.4.2 Entrance is easily identified	Add distinguishing colour and signage to main entrance. Assume for main front entrance.	$10,900
2.1 Exterior Pathways to Facilities on Site	2.1.3 Clear signage (if required for expected usage)	Add directional signage. Assume 1 zone for main entrance area.	$10,900
7.3 Evacuation Instructions	7.3.1 Evacuation instructions on non-reflective surface	Replace evacuation instructions to have large, clear, contrasting information, on non-glare surfaces that contrast with surroundings, include tactile floor plan diagram, include tactile information and braille. Assume 7 signage zones in building. Fulfills upgrade requirements for all evacuation instruction features of element 7.3.	$10,900
5.2 Showers	5.2.8 Shower accessories at accessible height and within reach	Move soap holder or create recessed soap holder/shelf at accessible height. Add hooks at accessible height/location. Assume 8 total for students and staff showers.	$11,000

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.18 All washroom accessories at accessible heights and locations	Replace dryer, paper towel dispenser, and soap dispenser with automatic model in accessible location or reinstall existing in accessible location. Replace high or tilted mirrors with fixed mirrors at accessible height. Assume 1/3 of all washroom accessories need adjusting. Assume 6 accessories per single-occupancy washroom (of which there are 6). Assume 3 accessories/toilet in multi-stall washrooms (of which there are 25). Assume 111 total.	$11,600
5.1 Washrooms	5.1.24 Adult change table (if universal washroom)	Add power-operated adult change table within one universal washroom. Assume $10,000 as unit cost.	$12,500
5.2 Showers	5.2.10 Adult change table	Add power-operated adult change table to shower/change room. Assume 1 adult change table added to a universal space.	$12,500
8.2 Public Assembly Areas	8.2.2 Number and location of accessible seating spaces	Revise public assembly areas to create dispersed accessible seating with required front and side clear space and adjacent space for companion seating. Update accessible seating to be adaptable with movable/removeable armrest. Provide signage to and at accessible seating. Assume school has no designated accessible seating in fixed seating theatre. Assume first seating row is partial providing area to create designation. Assume 1 zone.	$12,500
2.2 Exterior Ramps	2.2.7 Edge protection	Paint curb/edge protection to add colour contrast. Assume for 2 portable ramps.	$12,500

Element	Feature	Upgrade description	Estimated cost
5.2 Showers	5.2.5 Colour contrast between shower tile floor and wall	Retile walls to provide additional contrast. For student showers only. Assume 100 sq ft. for each floor, approximately 300 sq ft wall space each. Fulfills upgrade requirements for 5.2.4.	$13,500
5.1 Washrooms	5.1.17 Sink and counter at recommended height with knee clearance	Upgrade drain under sink to be offset. Add shelf at sink. Assume for 23 sinks in multi-stall washrooms.	$14,400
4.3 Waiting Areas, General Seating, Meeting Rooms, and Lounges	4.3.6 Assistive listening and communication enhancement technologies	Provide two new portable sound field systems in addition to existing portable system available upon request.	$15,000
8.11 Change Rooms	8.11.2 Surface is firm, stable, and slip resistant	Replace flooring with light coloured, non-glare, anti-slip flooring. Assume each change room is 500 sq ft. Assume 2 change rooms (total 1,000 sq ft.).	$15,000
5.1 Washrooms	5.1.12 Toilet flushing mechanisms are within easy reach	Adjust manual flush override (for existing automatic flush toilet) to be on transfer side, or upgrade toilet to automatic flush mechanism and easy-to-use manual override control on transfer side. Assume flush not on transfer side for 7/14 accessible toilets.	$15,300
8.9 Fitness Centre	8.9.7 Well-illuminated	Add additional lighting. Assume 2 zones for entire weight/fitness room.	$15,600
2.1 Exterior Pathways to Facilities on Site	2.1.7 Edge protection	Add guardrail along unprotected hazard, paint in contrasting colour. Paint existing edge protection in contrasting colour.	$15,600
2.2 Exterior Ramps	2.2.5 Colour-contrasted and slip-resistant strip	Provide colour-contrasted and slip-resistant strips at top and bottom of each run. Assume 2 portable ramps.	$15,600

Element	Feature	Upgrade description	Estimated cost
8.6 Cafeterias, Restaurants and Bars	8.6.9 Vending and dispensing machines are accessible	Replace vending machine with accessible model. Assume 1 zone.	$17,300
5.2 Showers	5.2.7 Hand-held adjustable showerhead within easy reach	Move or fix hand-held shower head installation in student showers. Add hand-held and adjustable shower head at accessible height for staff showers. Assume 4 showers.	$17,500
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.7 Minimum force required to open doors with sufficient opening time	Adjust pressure on door closer to make it easier to open. Assume 1/5th of doors needs adjusting, 30 total.	$18,700
4.6 Illumination and Building Systems	4.6.8 Drinking fountains are accessible	Replace drinking fountain with accessible model/height. Assume mix of accessible and inaccessible drinking fountains, replace 50%, 4 total.	$18,700
8.2 Public Assembly Areas	8.2.9 Access to all backstage facilities	Ensure backstage facilities are accessible. Upgrade sinks and toilet to be accessible in single-occupancy washroom backstage, add grab bars.	$18,700
3.4 Interior Ramps	3.4.5 Colour-contrasted and slip-resistant strip	Add/replace contrasting and slip-resistant strip to top and bottom of ramp. Assume for all 6 ramp zones, top and bottom.	$18,700
2.1 Exterior Pathways to Facilities on Site	2.1.8 No obstacles on path and overhead, or obstacles are cane detectable and high contrast	Paint colour-contrast markings on obstacles. Assume 6 areas.	$18,700
3.5 Elevators	3.5.10 Controls inside elevator cab at accessible height and location	Add control panel on side wall. Assume 1 panel added on 1 side wall.	$18,700
8.9 Fitness Centre	8.9.3 Raised stretching mat	Provide raised stretching platform. Assume 1 zone.	$18,800

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.13 Outward-opening doors	Add swing path markings for 4/7 outward-opening doors. Add cane-detectable feature/guards for 3/7 outward-opening doors.	$19,700
5.1 Washrooms	5.1.21 Colour contrast between floor and wall, and fixtures	Re-paint or retile areas where accessories are located. Assume 100 sq ft per washroom, for all 16 washrooms (1,600 sq ft total).	$20,000
4.4 Kitchens	4.4.1 Approach to kitchen is accessible	Install power-operated door with visibility panel and contrasting colour (do not double-count with interior circulation). Assume all 4 kitchens and kitchenettes.	$20,000
4.4 Kitchens	4.4.9 Accessible storage options	Add D-pull to drawer/cabinet. Add flexible storage options (e.g., circular shelving, pull-out drawers/cabinet adapters). Assume all 10 kitchen zones including all foods classroom stations.	$20,000
3.5 Elevators	3.5.16 Colour contrast between interior cab floor and wall, with no glare	Repaint/redo material of elevator cab walls to provide contrast with floor to minimize glare. Alternatively, replace elevator cab flooring to be light colour to reduce glare. Assume 1 elevator area.	$21,900
8.1 Workstations	8.1.2 Chairs are adjustable	Remove fixed seats from fixed workstations in applicable classrooms. Provide adjustable-height chair. Assume for science classrooms, wood shop, metal shop, food classroom, life skills/learning support. 8 rooms total. Assume 4 adjustable seats in each, 32 total. Assume adjustable seat provided for/moved to other classrooms as needed.	$22,000
2.1 Exterior Pathways to Facilities on Site	2.1.9 Convenient and understandable pathway to facilities	Provide colour, texture, and tactile direction indicators from exterior to buildings. Assume for 3 most-used entrances.	$23,400

Element	Feature	Upgrade description	Estimated cost
8.3 Exhibit Spaces	8.3.7 Alternative media for all descriptive information	Provide alternative formats such as large print, audio, and braille versions of exhibit information/content. Assume 5 zones.	$23,400
2.3 Exterior Stairs	2.3.3 Level landings with clear space and at regular intervals	Add paint to indicate swing path. 2 exterior stair landings of main school do not have clear space due to outward door swings. Eliminate slope and rough surface of some lower exterior stair landings. Assume 3 stair zones.	$23,400
2.1 Exterior Pathways to Facilities on Site	2.1.1 Clear width	Fill in cutouts along path of travel to create uniform predictable surface. Relocate built-in obstacles and obstructions. Assume quantity equivalent of 2 zones.	$25,000
3.2 Path of Travel	3.2.4 Open-plan areas are well defined and include tactile direction indicators	Redo flooring and/or provide textural markings/differences as guide through large open-plan area (e.g., lobby). Assume upgrades needed in open plan areas including multi-purpose/cafeteria, library, main lobby. Assume 2,000 sq ft of upgraded flooring/indicators.	$25,000
8.3 Exhibit Spaces	8.3.1 Accessible path of travel	Move benches blocking access to display cases/content. Reposition moveable frames and objects. Relocate/rebuild display cases at accessible heights and locations when necessary. Assume 5 zones.	$25,000

Element	Feature	Upgrade description	Estimated cost
4.2 Reception Desks, Service Counters, and Self-Service Transaction Kiosks	4.2.1 Desks/counters at accessible height or variety of heights	Redesign/purchase new furniture for reception desk to provide accessible height space and knee clearance for staff and visitors. Redesign reception area to create clear space. Rearrange furniture/movable obstacles to create clear space in front of reception desks. Ensure desks are colour contrasting with surroundings. Assume 4 zones including office reception, library reception, and 2 other zones (e.g., student store window, health/counselling area reception).	$25,200
4.4 Kitchens	4.4.10 Variety of seating and table options	Add seating options with armrests, different width seating. Assume 20 seats.	$26,200
5.1 Washrooms	5.1.10 Grab bars at appropriate height and locations at toilets	Add fold-down grab bar on transfer side of accessible toilets. Assume at each accessible toilet. Assume 14 accessible toilets.	$26,200
4.4 Kitchens	4.4.7 Microwave mounting height accessible and safe	Add pull-out surface underneath counter where microwave located. Assume all 10 kitchen zones including all foods classroom stations.	$28,100
7.1 Emergency Exits and Areas of Refuge	7.1.5 Evacuation chair or similar equipment available and easily understood	Purchase evacuation chairs to provide in each exit stairwell. Assume 1 for each second-floor exit stair landing, 4 total.	$28,700
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.15 Vision panels (if provided)	Replace/upgrade door to have best practice vison panel. Assume 1/4 doors have vision panels and need upgrading. Assume 40 doors total.	$30,000

Element	Feature	Upgrade description	Estimated cost
8.5 Outdoor Recreation Areas	8.5.1 Accessible pathways to all facilities and amenities	Relocate obstructing objects on path of travel. Build new exterior accessible pathway (assume no grade change). Assume portions of pathways to outdoor recreation amenities need to be made accessible. Assume 200 ft length and 6 ft wide (1,200 sq ft total)	$30,000
5.1 Washrooms	5.1.4 Power-operated door or screen wall entry	Add power operator to all washroom entries that are not screen wall or locked open. Assume multi-stall washrooms are locked open with screen wall, and only 1 (universal) single-occupant washroom has an automatic door opener. Assume 7 single-occupancy and staff washrooms without door opener.	$30,600
4.4 Kitchens	4.4.11 Well-illuminated	Add task lighting in kitchen area. Assume all 10 kitchen zones including all foods classroom stations.	$31,200
8.3 Exhibit Spaces	8.3.9 Well-illuminated	Add additional lighting in/at display cases. Assume 5 zones.	$31,200
8.2 Public Assembly Areas	8.2.8 Access to stage by performers/speakers and audience	Build ramp to front of stage to provide access from front of house and for audience. Add marking to perimeter of the stage to clearly identify with colour contrasted and/or tactile material. Provide adjustable height, accessible podium. Assume top cost range to include podium and stage markings.	$31,200
6.1 General Wayfinding and Signage	6.1.3 Wayfinding includes a variety of techniques	Add identifying location items (i.e., paint treatment on walls). Assume 10 zones.	$31,200
8.9 Fitness Centre	8.9.2 Number/variety of accessible fitness equipment	Provide accessible fitness equipment. Assume 1 zone contains multiple fitness machines.	$34,400

Element	Feature	Upgrade description	Estimated cost
8.6 Cafeterias, Restaurants and Bars	8.6.4 Variety of seating available	Replace fixed seating tables with flexible tables and seating with options (i.e., firm padding, armrests/backrests, colour contrasting with surroundings). Add some seating with options with firm padding, armrests/backrests, colour contrasting with surroundings. Provide some lower bar areas/tables at accessible height. Assume one open multi-purpose/cafeteria area (multiple tables in one area).	$34,800
6.2 Room Identification Signage	6.2.1 Room identification signage is used to identify spaces where useful	Add/replace room signage. Include braille and tactile elements. Assume 140 rooms signs (not including washrooms, addressed in 5.0). Fulfills tactility, height, and location upgrade requirements for: 6.2.2; 6.2.3; 6.2.4	$35,000
5.2 Showers	5.2.6 Water control mounted on wall at accessible height	Replace shower control with accessible model and install at accessible height. Assume 8 showers for students and staff.	$35,000
2.4 Building Entrances	2.4.1 Entrance(s) required to be accessible	Redo 2 secondary entrance areas to make them accessible. Assume 2/7 entrances are not accessible due to flight of stairs (five steps at each).	$37,500
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.16 Kick plates on doors	Add kickplate to door. Assume most (4/5ths) of doors do not have kickplates. Assume 120 doors total.	$37,500
8.2 Public Assembly Areas	8.2.6 Stairs and steps	Add colour contrast/slip resistance on stair nosings. Add handrails on walls at theatre seating stairs. Assume 2 zones. Assume each half of the theatre counts as 1 flight and therefore 1 zone.	$37,500
5.2 Showers	5.2.1 Number of accessible showers adequate for expected use	Modify existing universal washroom to include accessible shower space. Assume 1 zone.	$37,500

Element	Feature	Upgrade description	Estimated cost
3.2 Path of Travel	3.2.2 Access to all facilities expected to be used	Create door between adjacent spaces (assume CMU wall construction). Add ramp with landing on inside of door to mitigate partial level change. Assume 1-6 steps of rise for ramps. Assume a few isolated areas not accessible due to lack of connection to second floor and elevator access, such as gym mezzanine room and theatre lighting/A.V. room.	$37,500
4.3 Waiting Areas, General Seating, Meeting Rooms, and Lounges	4.3.8 Floor finishes are firm and slip resistant, with no glare or busy patterns	Replace dark resilient flooring/carpet to be lighter in colour. Assume 2,500 sq ft. Fulfills flooring upgrade requirements for corridors for 3.3.4 and reduction of glare requirements for 4.6.4.	$37,500
2.2 Exterior Ramps	2.2.6 Handrails	Add handrails to sloped zone outside cafeteria. Replace handrails on 2 portable ramps to have proper extensions and colour contrast. Assume 2 portable ramps.	$37,500
7.2 Fire Alarm Systems and Equipment	7.2.4 Firefighting and first-aid equipment at accessible height and location	Move furniture/objects obstructing emergency equipment. Re-locate fire blankets, defibrillators, and first aid kits to accessible height/location. Replace latch hardware on fire extinguisher cabinet to be accessible and easy to operate. Assume 30 total. Assume low/no cost for moving furniture.	$37,500
2.3 Exterior Stairs	2.3.2 Surface is firm, stable, and slip resistant	Patch stair surface to eliminate tripping hazards. Assume 50% of exterior stairs need upgrading. Assume 5 exterior stairs total.	$39,100
2.4 Building Entrances	2.4.3 Power-operated door or easy-to-open door	Replace main entry door with automatic sliding door (if possible due to design). Add operators to 4/5 entrances that do not have one. Assume 4/7 entrances do not have power operators, plus main doors replaced with sliding doors.	$40,600

Element	Feature	Upgrade description	Estimated cost
2.1 Exterior Pathways to Facilities on Site	2.1.2 Surface is firm, stable, and slip resistant	Patch specific areas of exterior pathways to eliminate tripping hazards and pooling of water. Assume all main paths need some patching and refinishing. Assume quantity equivalent of 2 zones	$40,600
3.6 Interior Stairs	3.6.9 Nosing design	Modify projecting nosings of stair design to be sloped to riser or rounded/beveled to prevent tripping. Assume half of equivalent of 6 floor-to-floor flight zones, so 3 zones.	$42,200
8.11 Change Rooms	8.11.1 Accessible path of travel	Modify entrance walls and condition to create accessible entry with adequate widths. Add automatic door opener to entry door. Assume 2 zones for change rooms.	$43,700
2.4 Building Entrances	2.4.17 Seating	Add exterior bench seating under shelter with back support and arm rest. Assume at all 7 entrance areas.	$43,700
7.1 Emergency Exits and Areas of Refuge	7.1.3 Clear signage for emergency exit and area of refuge	Update/add illuminated wayfinding signage for emergency exits and areas of refuge. Include tactile features and braille. Assume for 10 general school zones.	$46,900
3.6 Interior Stairs	3.6.6 Colour-contrasted and slip-resistant strip on nosing	Add/replace colour-contrasting slip-resistant nosing strip that slightly wraps down riser. Assume equivalent of 6 floor-to-floor flight zones.	$46,900
2.3 Exterior Stairs	2.3.5 Tactile attention indicators (truncated domes)	Add contrasting tactile attention indicators (truncated domes) at top of stairs. Assume for 5 stair zones including for portables.	$46,900
7.2 Fire Alarm Systems and Equipment	7.2.3 Fire alarm pulls at accessible height and location	Add tamper-proof cover to fire alarm pull to prevent accidental activation. Move emergency alarms/stops in some rooms (e.g., shop, metal working) to accessible height and location. Assume 120 fire alarm pulls total. Assume 15 emergency activation pulls/buttons not accessible.	$48,700

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.1 Number of accessible washrooms adequate for expected use	Adjust partition layout in multi-stall washrooms to create accessible stalls (may lose a fixture) or ensure adequate dimensions for existing accessible stalls. Assume additional 2 zones have accessible stalls that do not meet requirements. Fulfills clear space upgrade requirements for 5.1.9.	$50,000
5.1 Washrooms	5.1.25 Well-illuminated	Add additional lighting within washrooms. Assume 2,070 sq ft. washrooms total space over both floors.	$51,700
8.1 Workstations	8.1.3 Desk height is adjustable	Provide adjustable-height desks. Assume 30 desks distributed across administrative offices and upon request.	$52,500
2.2 Exterior Ramps	2.2.1 Slope	Construct new exterior ramp with running slope of 5% or less with curbs and handrails. Demolish existing ramp. Revise ramp/landing to provide larger or more level landing. Assume for 2 existing portable ramps.	$53,100
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.9 Level threshold	Redo door threshold to be as flush/mitigated as possible. Assume 1/5 of door thresholds are near the max of 13mm and beveled. Assume 30 thresholds total.	$56,200
3.4 Interior Ramps	3.4.2 Clear width	Widen ramp (where possible and adjacent to open space) for two-way traffic. Assume widening of 3 ramps to 1,100 mm.	$56,200
1.1 Parking	1.1.6 Safe pedestrian pathways within parking lots	Create/redo pathway connecting accessible stalls to path of travel to entrance. Add markings on pavement to create marked path of travel from accessible stalls to path of travel to entrance. Assume for 1 area. Assume high cost to create safe path in front of stalls.	$62,500

Element	Feature	Upgrade description	Estimated cost
8.5 Outdoor Recreation Areas	8.5.2 Seating	Add a variety of seating options, including seats with and without armrests and backrests. Include clear space in front of and beside seating. Assume 5 areas.	$62,500
8.11 Change Rooms	8.11.4 Accessible lockers	Add hooks at accessible height/location. Revise change room layout to ensure benches do not block clear space in front of hooks or lockers. Revise seating to provide armrest options. Assume 2 zones for change rooms.	$64,400
1.1 Parking	1.1.11 Shelter for designated accessible spaces	Create shelter structure over accessible stalls. Assume for existing 3 stalls.	$65,600
4.3 Waiting Areas, General Seating, Meeting Rooms, and Lounges	4.3.5 Tables at accessible height with knee clearance	Replace desk/table for accessible model with adequate knee clearance and with rounded corners. Assume 10 zones. Fulfills upgrade requirements for tables to be stable with rounded edges for 4.3.4.	$65,600
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.1. Power-operated door or open entry	Add power operator on interior door and install buttons at two heights. Assume 10 doors prioritized for openers, including into office, theatre, art rooms, shops, music room, life skills/learning support classroom, etc. Assume gym and library have existing power operators based on audited schools.	$65,600
5.1 Washrooms	5.1.19 Automated or easy-to-operate plumbing fixtures and accessories	Upgrade plumbing fixtures to be automatic. Assume 26 faucets. Assume 37 accessories, another 1/3 as described for feature 5.1.8. Flush mechanism for 1/2 accessible toilets addressed with 5.1.12, so remaining toilet count upgrade is 25. Total potential accessories and plumbing fixtures to be upgraded to automatic is 88.	$66,000

Element	Feature	Upgrade description	Estimated cost
2.4 Building Entrances	2.4.16 Well-illuminated (if site expected to be lit)	Add additional entrance lighting below eye level. Assume for all 7 entrances.	$67,800
8.1 Workstations	8.1.6 Well-illuminated and task lighting is available	Provide task lighting. Assume 70 total for desks including teacher desks within classrooms, library, health room, admin workstations, staff prep spaces. Multiple lighting fixtures provided in classrooms/specialty student areas. Fulfills upgrade requirements for 4.6.3.	$74,400
5.1 Washrooms	5.1.22 Emergency call button	Add emergency call button system to washroom with accessible toilet or single occupancy washroom (every washroom). Add one to each washroom. Assume 16 washrooms total.	$75,000
2.1 Exterior Pathways to Facilities on Site	2.1.12 Well-illuminated (if site expected to be lit)	Install supplementary bollard lighting along building entrance pathway. Assume 3 main routes to entrances.	$75,000
2.1 Exterior Pathways to Facilities on Site	2.1.13 Seating	Add exterior seating with backrest and armrests to rest areas. Resurface rest area with different textured/colour-contrasted paving material. Assume 6 areas added.	$75,000
7.2 Fire Alarm Systems and Equipment	7.2.1 Visual fire alarms throughout facility and where people might expect to be alone	Add visual fire alarm to room/area. Assume existing visual alarms are provided in lobby, corridors, and some main areas. Assume 100 total for all washrooms, offices, prep rooms, lounges, classrooms. Note: an acceptable alternative is to purchase portable vibrating pager systems for users with vision and hearing disabilities.	$75,000
4.5 Acoustic Considerations	4.5.2 Volume of speakers and voice paging systems adjustable per area	Install room-level volume control to speaker system for adjustability and control. Assume all 60 school zones.	$75,000

Element	Feature	Upgrade description	Estimated cost
3.6 Interior Stairs	3.6.5 Tactile attention indicators (truncated domes)	Add contrasting tactile attention indicators (truncated domes) at top of stairs. Assume 10 individual or partial flights for tactile attention indicators.	$78,100
2.3 Exterior Stairs	2.3.6 Colour-contrasted and slip-resistant strip on nosing	Add/replace colour-contrasting slip-resistant nosing strip that slightly wraps down riser. Assume for all 10 stair zones including for portables.	$78,100
4.1 Lobby and Reception Areas	4.1.2 Location of key facilities easily identified	Provide additional wayfinding strategies such as contrasting flooring within lobby and reception area highlighting key facilities (e.g., elevators, stairs, washrooms, and main building spaces). Assume 10 zones. Fulfills upgrade requirements for 6.1.1.	$78,100
4.4 Kitchens	4.4.6 Counter surfaces at accessible height	Redo kitchen counter/millwork to have multiple heights, providing accessible height surface area and sinks with knee clearance and clear space. Assume 12 zones total for kitchen zones for staff areas and stations in foods classroom, plus zones for art rooms, metal shop, woodshop, backstage sink, music room.	$86,200
2.1 Exterior Pathways to Facilities on Site	2.1.10 Clearly marked pedestrian crossings	Create raised crossing. Provide additional alerts (i.e., flashing lights and audible signal). Provide painted crosswalk markings. Assume 1 area (access to main entrance from parking). Fulfills upgrade requirements of 2.1.3.	$93,700
2.3 Exterior Stairs	2.3.4 Handrails	Add/replace accessible height, continuous, ergonomic, contrasting handrail (side or mid rail), with extensions where possible. Assume half of stair zones to be upgraded including stairs to portables, 5 total.	$93,700

Element	Feature	Upgrade description	Estimated cost
5.1 Washrooms	5.1.6 Clear opening width of entry and toilet stall doors	Widen entry door to washroom. Assume multi-stall washrooms held open. Assume accessible stall doors okay with and open outwards. Assume 6 doors.	$93,700
1.1 Parking	1.1.8 Pedestrian crossings	Add surface markings to create crosswalk. Create curb ramp aligned with crosswalk. Add lights and audible signals. Assume 1 crosswalk to be created.	$93,700
8.1 Workstations	8.1.5 Outlets and switches are at accessible heights	Raise power outlet to be at desk height. Assume approximately 60 classrooms, 15 administration desks, plus teacher prep areas. Assume multiple outlets in some classrooms and spaces. Assume total of 150.	$93,700
1.2 General Vehicular Access	1.2.1 Passenger drop-off and pick-up zones (if required for expected usage)	Create designated drop-off area. Add surface markings to create access aisle for drop off. Add signage. Add seating. Add shelter over drop-off and seating. Create curb ramps with tactile attention indicators. Assume 1 area.	$93,700
2.3 Exterior Stairs	2.3.12 Well-illuminated (if required for expected usage)	Add additional lighting to exterior stairs. Assume for all 10 stair zones including for portables.	$96,900
7.1 Emergency Exits and Areas of Refuge	7.1.6 Ground-level emergency exit is accessible	Create exterior ramp at exit to mitigate step(s) at some ground-level emergency exits. Assume 4/13 ground-level exits have 1 or more steps.	$100,000
3.4 Interior Ramps	3.4.6 Handrails	Add/replace accessible height continuous, ergonomic, contrasting handrail (one side), with extensions where possible. Assume for all 6 ramp zones.	$103,100

Element	Feature	Upgrade description	Estimated cost
3.6 Interior Stairs	3.6.4 Handrails	Add/replace accessible height continuous, ergonomic, contrasting handrail (one side), with extensions where possible. Per flight/story. Assume equivalent of 6 floor-to-floor flight zones.	$112,500
4.5 Acoustic Considerations	4.5.1 Sound damping and background noise	Add additional sound dampening (e.g., lobby, classroom, office). Assume 10 priority zones need sound dampening.	$125,000
3.3 Corridors and Hallways	3.3.8 Seating (if long hallway)	Replace/add seating with armrest and width options. Replace flooring in resting area with different flooring material. Assume 10 areas.	$125,000
8.5 Outdoor Recreation Areas	8.5.3 Shelter	Create sheltered areas next to courts/fields. Assume 2 areas.	$125,000
2.4 Building Entrances	2.4.11 Level threshold	Redo entrance threshold to be as flush or beveled as possible. Recess entrance mat. Assume for all 7 entrance areas. Assume high cost to recess mats.	$131,200
1.1 Parking	1.1.10 Well-illuminated (if site expected to be lit)	Add additional overhead lighting in parking lot. Add lighting fixtures below eye level in parking lot. Assume 2 areas.	$150,000
4.6 Illumination and Building Systems	4.6.4 Interaction between lighting and surfaces minimizes glare	Replace resilient flooring to reduce glare. Assume replacement of 10% of school area, or 10,000 sq ft.	$150,000
4.6 Illumination and Building Systems	4.6.2 Lighting levels are consistent throughout site	Add additional lighting (e.g., hallway, stair, classroom). Assume inadequate lighting in some areas, hallways, and classrooms. Assume 20 zones of 500 sq ft. Fulfills upgrade requirements for lighting levels in building overall including the areas in features: 3.3.9; 3.4.8; 3.5.19; 3.6.12; 4.6.1	$193,700

Element	Feature	Upgrade description	Estimated cost
4.3 Waiting Areas, General Seating, Meeting Rooms, and Lounges	4.3.1 Variety of seating types	Add seating options with firm padding, rounded edges, and armrests in waiting/lounge areas and classrooms. Assume 5 zones including administration office waiting area, 2 meeting rooms, library, and staff lounge. Assume additional 30 zones covering all remaining classrooms and prep rooms. 35 zones total.	$218,700
4.6 Illumination and Building Systems	4.6.6 Building controls are at accessible heights	Relocate building control to accessible height (e.g., light switch, thermostat, wall-mounted phone). Assume 2 controls per 140 rooms. Assume 140 zones.	$236,200
8.1 Workstations	8.1.1 Accessible path of travel and maneuvering space	Rebuild/adjust built-in desk or millwork to create accessible path of travel, clear space, and sink area at accessible height with knee clearance. Assume 1 desk and/or sink rebuilt to be accessible height with knee clearance per room. Assume 11 rooms total for staff areas, art rooms, drama makeup room, foods room, science labs, wood shop, metal shop. Note: standalone sinks (not in full workstations) in these spaces covered in element 4.4.	$240,800
7.1 Emergency Exits and Areas of Refuge	7.1.1 Designated area of refuge in multi-level building	Add separate lighting, ventilation, and communication systems to designated areas of refuge. Create designated area of refuge in 2 stairwells with space to accommodate at least 1 person in a wheelchair.	$250,000
5.1 Washrooms	5.1.2 Universal washrooms	Add 1 universal washroom to each washroom cluster without an existing universal washroom. Assume universal washroom added to administrative office area, 1 first-floor washroom cluster, and 1 second-floor washroom cluster. Assume 3 total.	$562,500

Element	Feature	Upgrade description	Estimated cost
3.1 Interior Doors and Doorways (not including Washrooms)	3.1.8 Clear opening width of doors and doorways	Widen door to provide greater clear width. Most door clear widths are 800-850 mm. Assume 50% of all doors need widening based on average of audited schools (excluding washroom doors). Assume 70 total.	$678,100

Features excluded from costing of prototype school building upgrades

The following features involved a high degree of architectural and operational complexity to estimate the cost to upgrade. They are beyond the mandate of the study to estimate costs to achieve RHFAC Gold for existing buildings.

Note that this list is not intended to be definitive but to instead indicate some accessibility upgrades may be implausible for some buildings and contexts. In this case, operational strategies should be used to meet the same objectives.

Table 16 Features excluded from costing of prototype school building upgrades

Element	Feature number	Feature name	Reason for exclusion
General Vehicular Access	1.2.2	Public transit (if area is serviced)	Public transit stop upgrades are determined by the city. Outside building site and scope of study.
Path of Travel	3.2.1	No level changes within a storey or single floor	Unlikely to eliminate level changes within a storey due to extent of required renovations.
Interior Ramps	3.4.1	Slope	Unlikely to retrofit to due to space required for ramp length to meet slope required for maximum points.
Elevators	3.5.5	Clear opening width of door	Prototype building elevator meets minimum requirements. Upgrading to a cab with a larger door opening width to meet requirements for maximum points would require major structural renovation and expansion of elevator shaft.
Elevators	3.5.9	Interior dimensions and floor surfaces	Prototype building elevator meets minimum requirements. Prototype building elevator meets minimum requirements. Not plausible to upgrade to flow-through design or increase cab and therefor shaft size to meet requirements for maximum points.
Interior Stairs	3.6.3	Level landings with clear space and at regular intervals	Requires expansion, redesign and rebuild of all stairs to meet requirements for maximum points.
Lobby and Reception Areas	4.1.1	Logical arrangement of circulation routes and facilities	Modification to location of key facilities to meet requirements for maximum points would involve major redesign and rebuild of the building.

6.3 Example upgrades estimated to cost $50,000 or less for prototype buildings

The 25 upgrades described in the following table were estimated to cost under $50,000 for the prototype office building as well as the prototype school building. Their assumed unit cost ranges are provided as estimates only and are to be verified on a project-by-project basis. They are provided for information only to illustrate potentially cost-effective upgrades.

Unit cost ranges were provided by an independent cost consultant in Spring 2023 and include soft costs but exclude contingencies, escalation and GST. They were calculated for office and school building types in major urban centres in British Columbia and Ontario.

Table 17 Example upgrades estimated to cost $50,000 or less for prototype buildings

Feature number	Feature name	General update description	Assumed unit cost range
1.1.3	Dimensions of designated accessible spaces	Revise parking stall lines to provide designated access aisles.	$625 - $1,250 per stall
1.1.5	Clear signage	Repaint stall markings and add vertical and directional signage.	$10,000 - $30,000 per sign package
2.1.2	Surface is firm, stable, and slip resistant	Patch/redo areas of exterior pathways.	$3,125 - $37,500 per entrance area
2.1.8	No obstacles on path and overhead, or obstacles are cane detectable and high contrast	Add colour contrast to obstacles along exterior pathways.	$3,125 – $12,500 per entrance area
2.3.5	Tactile attention indicators (truncated domes)	Add tactile attention indicators to exterior stairs.	$3,125 - $12,500 per stair flight
2.4.2	Entrance is easily identified	Add distinguishing colour, features, and signage to building entrance.	$3,125 - $18,750
2.4.3	Power-operated door or easy-to-open door	Add power operator to entrance door.	$5,000 - $8,125 per door
2.4.5	Controls for manually activated power-operated doors	Relocate/add buttons, replace worn ones.	$625 - $1,875 per door
2.4.17	Seating	Add seating at building entrance under shelter.	$6,250 - $18,750 per seating area
3.1.12	Door handles are U-shaped lever style or equivalent	Replace inaccessible hardware.	$375 – 625 per door

Feature number	Feature name	General update description	Assumed unit cost range
3.1.16	Kick plates on doors	Add kickplate to door.	$125 - $500 per door
3.4.5	Colour-contrasted and slip-resistant strip	Add contrasting and slip-resistant strips to ramps.	$3,125 – $12,500 per ramp
3.5.10	Controls inside elevator cab at accessible height and location	Add additional control panel on side wall of cab.	$12,500 - $18,750 per cab
3.5.13	Audible elevator components	Add/replace audio system.	$3,125 – $7,500 per elevator
3.5.15	Handrails	Add/replace elevator cab handrails.	$625 - $18,750 per cab
4.2.1	Desks/counters at accessible height or variety of heights	Upgrade reception desk to be accessible for staff and visitors.	$3,125 - $9,375 per zone
4.2.7	Assistive listening and communication enhancement technologies	Provide portable hearing loop at reception desk.	$450 - $650 each
5.1.3	Washroom identification signage	Upgrade washroom signage.	$250 - $625 per sign
5.1.11	Toilets at appropriate height and have back supports	Add backrest or secure toilet seat cover.	$250 - $625 per toilet
5.1.13	Toilet paper dispensers at appropriate height and locations	Replace or reinstall toilet paper dispenser.	$125 - $375 each
5.1.16	Urinals are colour contrasted with adjacent surface	Create visual contrast and centreline indicator for urinal.	$250 - $625 per urinal
5.1.17	Sink and counter at recommended height with knee clearance	Upgrade drain under sink to be offset. Add shelf at sink.	$250 - $625 per sink
5.1.24	Adult change table (if universal washroom)	Add power-operated adjustable height adult change table.	$12,500 - $18,750 each
7.2.4	Firefighting and first-aid equipment at accessible height and location	Re-locate emergency equipment and replace hardware on extinguisher cabinets.	$250 - $1,250 each
7.3.1	Evacuation instructions on non-reflective surface	Upgrade evacuation signage.	$625 - $2,000 per zone

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