July 15, 2020

ATTACHMENT B

Save-On-Foods Memorial Centre

Handrail Feasibility Study – Final Report

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2243-15396-05

Save-On-Foods Memorial Centre

Handrail Feasibility Study

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Document Ref. No.: 2243-15396-05

Contents

Appendices

1. Introduction

The City of Victoria (City) has requested that McElhanney Consulting Services Ltd. (MCSL) complete a Feasibility Study to review options for the installation of metal handrails at the Save-On-Food Memorial Centre (SOFMC) to enhance access for all patrons within the facility. The SOFMC was built in 2005 to the 1998 British Columbia Building Code (BCBC) and currently has twenty sets of stairs that provide access to seating for patrons as well as means of egress which require review.

As part of the Feasibility Study, there are two main objectives:

1. Review the current conditions and how they relate to current codes and regulations, and
2. Develop conceptual design options for the installation of railings on the access stairs, complete with cost estimates.

This Feasibility Study will explore the existing stairway system and develop conceptual handrail options, which will include commentary on preliminary design considerations and cost estimates for each option.

2. Background and Existing Information

2.1. Existing Reports and Documentation

The following documents were provided for the SOFMC:

- SOFMC Architectural Floor Plans
- The City's estimating policy.

2.2. Codes and Regulations

The following codes and supplementary regulations were reviewed as part of the handrail feasibility study:

- Province of British Columbia Building Code (BCBC), 2012
- Province of British Columbia Fire Code (BCFC), 2012
- British Columbia Building Access Handbook (2007), Illustrated Commentary on Access Requirements in the 2006 British Columbia Building Code
- National Building Code of Canada (NBCC), 2015

The BCBC, 2012 and BCFC, 2012 are intended to be written in a combined fashion such that information contained within one is not covered by the other as to avoid potential conflicts in regulatory practise. Fire code requirements pertaining to means of egress and handrails are located within the BCBC. The BC Building Access Handbook was also reviewed for any supplementary information pertaining to handrails that may impact the feasibility study.

The NBCC, 2015 contains new regulatory practices not yet adopted by the BCBC, 2012. As a result, the NBCC was reviewed to determine any new regulatory practices that may be adopted in the near future impacting the handrail feasibility study.

2.3. Common Practices

The following common practices were reviewed as part of the handrail feasibility study:

- Other facilities within British Columbia and Alberta
- 2004 City of Toronto Accessibility Design Guidelines & Accessibility for Ontarians with Disabilities Act (AODA)
- 2010 Americans with Disabilities Acts (ADA) Standards For Accessible Design

From a desktop study, BC Place and Rogers Arena within Vancouver, British Columbia and Rogers Place within Edmonton, Alberta were looked at to determine what railing systems are in place for the lower bowl aisles. BC Place and Rogers Arena were constructed in 1983 and 1995 respectively with BC Place having undergone extensive revitalization in 2010-2011. Currently, there are no intermediate railing systems provided in the lower bowls of either Arena. Rogers Place was constructed in 2016 and has implemented intermediate railing systems in its lower bowl aisles in accordance with the 2015 NBCC requirements.

The City of Toronto has undergone significant effort in developing their current and future accessibility guidelines. As part of this effort, in December of 2013, an amendment to the Ontario Building Code Act (Amending O. Reg 332/12) allowed additional provisions for accessibility to be incorporated. A cursory review of this amendment revealed that, with respect to handrails, there were no provisions made to handrails for aisles with stairs, only rails located on ramps providing access to fixed seating.

The AODA provides guidance for developing and establishing standards and regulations to achieve accessibility for Ontarians with disabilities with respect to goods, services, facilities, accommodation, employment, buildings and structures on or before January 2025. The AODA assists with the developments of such documents such as the City of Toronto Accessibility Design Guidelines, of which the most current version is 2004. The 2015 Design Guidelines are currently undergoing a revision process, so are not available for review at the time of writing this report, however, a copy of the 2004 Design Guidelines was reviewed for stairs and steps within interior routes. This document is not seen as legislation in the City of Toronto, and is only enforced as a guideline.

While not a regulatory Code in Canada, the ADA is a widely accepted document used to help develop and maintain building accessibility for individuals with disabilities and was included in the reviewed documents for this study.

2.4. Existing Access Stairs

The SOFMC contains twenty access stairways leading to both the lower and upper sections of the arena and servicing the existing seating areas providing a means of access during regular use and egress in an emergency. Access stairs alternate with seating access platforms where associated rise and runs of each tread or platform are in accordance with the BCBC. The current access areas provide sufficient guards and railings for access to and from the arena seating areas.

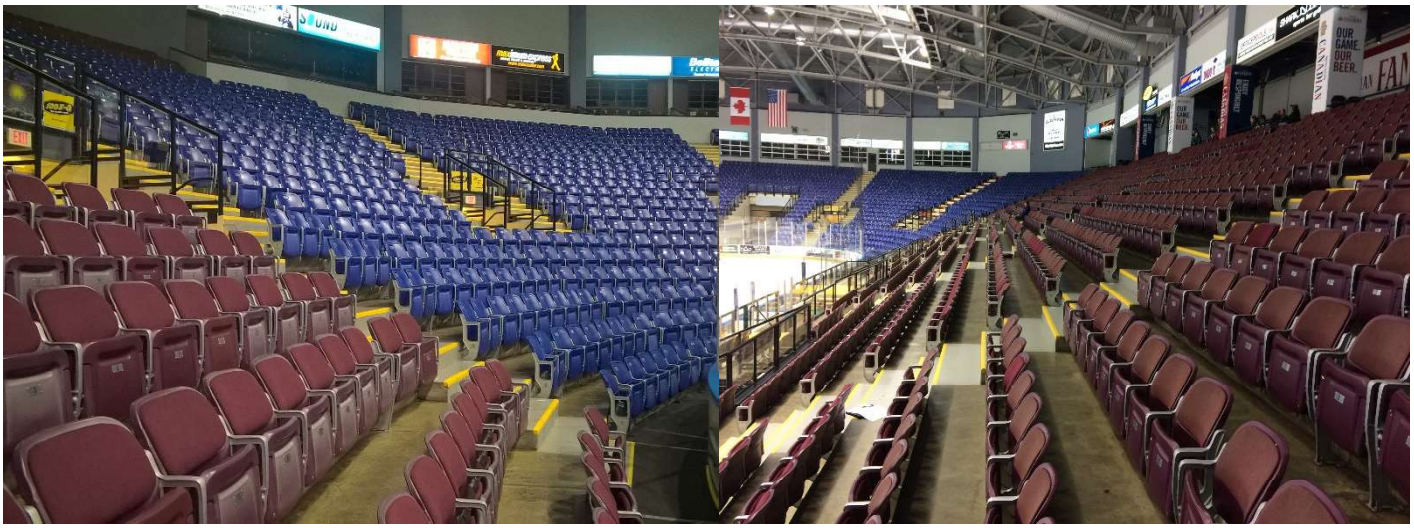


Figure 2.1 SOFMC Seating Layout and Access Stairs

The access stairs are currently 1830 mm wide from edge of seat to edge of seat with a consistent rise and run of 190 mm and 300 mm respectively. The platforms are also 1830 mm wide with a consistent rise and run of 190 mm and 540 mm respectively.

Other railing systems exist throughout the arena seating area at the lower and middle entrances and the wheelchair accessible areas in the upper sections. These railing systems consist of 45 mm diameter painted steel tubing and range from 780 mm to 850 mm in height for access via the lower and middle entrances. The upper guards around the wheelchair accessible areas consist of 50 mm square painted steel tubing at 660 mm in height to provide clear site lines from the upper section.

The access stairs running from the middle entrances to the lower entrances and upper sections of the arena are the focus of the feasibility study.

3. Key Design Issues

The access stairs within the SOFMC serve seating on both sides of the aisle preventing side rails as an option. As a result, optional handrails can be accomplished by providing them up the centre line of the stairs. Introduction of the handrails imposes new constraints on the existing dimensions of the stair system as outlined in the following sections.

3.1. Assessment Criteria

3.1.1. British Columbia Building Code 2012

Being the primary regulatory document pertaining to building safety in BC, the BCBC 2012 does not provide requirements for handrails in aisles with steps when used as access or means of egress. The existing stair width of 1830 mm accommodates the minimum 1100 mm specified in the BCBC Section 3.3.2.5. As the aisles serve more than sixty seats, reduction in the 1100 mm is not allowed. The introduction of a centre handrail would reduce the existing width to 890 mm, less than the required minimum.

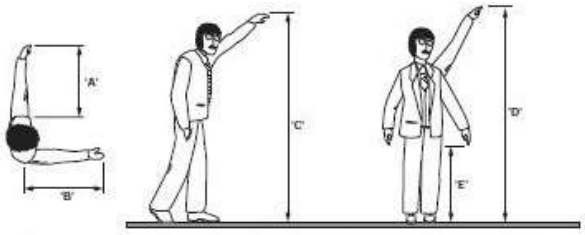
Optional handrails provided in addition to those required as per BCBC Section 3.4.6.5 (6), need not comply with minimum or maximum heights as prescribed for mandatory handrails allowing for multiple options to be explored. These options are provided in detail in **Section 4** of this report.

3.1.2. British Columbia Fire Code 2012

As prescribed in the BCBC, aisles, when pertaining to means of egress in BCBC Section 3.3.1.10 (Safety Within Floor Areas) shall be as per the BCFC. While not directly a floor area, Part 2, Section 2.7 of the BCFC prescribes a minimum aisle width of 1100 mm leading to an egress doorway which is met under the existing stair configuration. Further information on aisles and handrails in the BCFC default to the BCBC.

3.1.3. Building Access Handbook 2007

The Building Access Handbook provides no additional guidance on aisles or handrails pertaining to arenas or ice rinks as per Section 3.8.2.19. However, Appendix 2 of the Handbook provides illustrations on the comfortable reaches of fully ambulant persons as shown below in ***Figure 2.2.***



Key	Male (1)	Female (2)	Child (3)
A Side reach	727 mm	673 mm	524 mm
B Forward reach	638 mm	592 mm	462 mm
C High reach (forward)	1928 mm	1786 mm	1372 mm
D High reach (side)	2002 mm	1849 mm	1423 mm
E Low reach (side)	762 mm	665 mm	499 mm
Column 1	2	3	4

Notes to Table B.3.7.2.A. (1) Male height – 1740 mm
(2) Female height – 1605 mm
(3) Child (6–9 yrs) – 1245 mm

Figure 2.2 Reach of Ambulant Person

3.1.4. National Building Code of Canada 2015

The BCBC largely adopts and adapts the NBCC to meet the needs in BC. However, there are new requirements that have been introduced for handrails in aisles with steps in the NBCC 2015 that are in the process of being incorporated into the new BCBC. While not currently required in the BCBC 2012, handrails are mandatory in aisles with steps within the NBCC 2015. This new provision will likely be adopted in the next BCBC.

According to the NBCC 2015 Section 3.3.2.10 (1) & (2), aisles with a width of 1100 mm or more and serving seating on both sides will be required to provide a centre line handrail. That handrail shall:

1. Comply with standard handrail conformances seen in the BCBC Section 3.4.6.5,
2. Have gaps between 560 mm and 915 mm spaced at intervals not to exceed five rows,
3. Be between 865 mm and 1070 mm in height,
4. Have an immediate rail located 305 mm below the principal rail, and
5. Terminate in a manner that will not obstruct pedestrian travel or create a hazard.

The NBCC requirements, while not mandatory currently, have been considered in the conceptual design options in this report explored further in **Sections 4** and **5**.

3.2. Common Practise

3.2.1. City of Toronto Accessibility Design Guidelines

As discussed in **Section 2** of this report, the City of Toronto Accessibility Guidelines are not enforced legislation but provide some guidance on handrails for stairs and steps for indoor areas. From Section 2.2.7of the Design Guide: “Stairs and steps in normal public routes and paths should be safely usable by persons with limited mobility.” However, handrails in Section 2.2.7 are not specified but are recommended as barriers to hazards for persons with visual impairment.

3.2.2. Americans with Disabilities Acts 2010

As discussed in **Section 2** of this report, the ADA is an American regulation that is widely used to help develop and maintain building accessibility for individuals with disabilities but is not a mandatory regulation. Section 210 of the ADA specifies that handrails in stairs with steps are not required. However, if handrails are to be considered, they shall comply with ADA Section 505:

1. Handrails shall be between 865 mm and 965 mm high,
2. Located down the sides or centre of aisles, and
3. Should extend 305 mm past the end of the stairs.

These requirements of ADA Section 505 are in agreement with the current BCBC and NBCC with the exception of the rail extensions which would cause an obstruction or hazard at the base of the access stairs. The ADA requirements have been incorporated into the feasibility options.

4. Concepts

4.1. General

Five options were considered in the development of the feasibility study. For all options considering a railing, the railing would be provided along the centerline of the stairs. The following is a summary of the five options considered:

- Option 1A (BCBC Optional) – 765 mm tall steel tube handrail with two row intervals, twenty sets of stairs.
- Option 1B (BCBC Optional) – 765 mm tall steel tube handrail with four row intervals, twenty sets of stairs.
- Option 2A (NBCC Mandatory) – 865 mm steel tube handrail with two row intervals, twenty sets of stairs.
- Option 2B (NBCC Mandatory) – 865 mm steel tube handrail with four row intervals, twenty sets of stairs.
- Option 3 – Do nothing

The NBCC 2015 code allows for the rails to have horizontal gaps at intervals not exceeding five rows. In the SOFMC there are three different configurations of stairs, see below **Figure 4.1**:

1. Type 1 – Full height access from upper level to rink side seating, eight of twenty stair sets
2. Type 2 – Upper access stairs from the intermediate level to the upper level, four of twenty stair sets
3. Type 3 – Upper and lower access stairs from the intermediate level to the upper level, eight of twenty stair sets

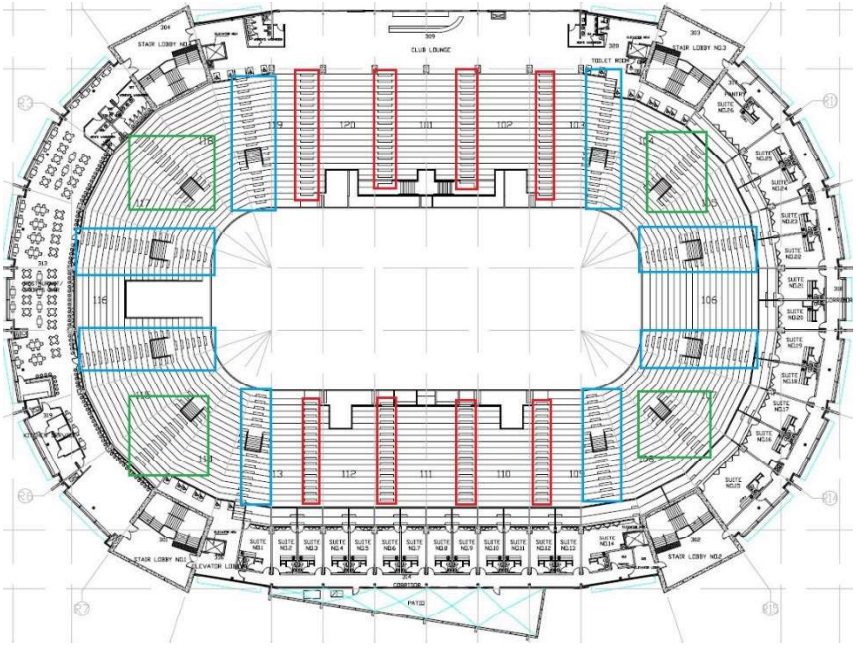


Figure 4.1 Stair Configurations in SOFMC

The upper and lower stair sections at the intermediate access locations service eleven and six rows of seats respectively while the full height access stairs service twenty-one rows of seats. These varying sections would require a combination of two, three, four or five gap intervals.

All five options consider impacts from the codes and regulations reviewed in this feasibility study and are described in further detail below.

4.2. Option 1

Handrail Option 1 was developed based off the BCBC 2012 and Building Access Handbook where-in no handrails are required, but will be provided. There are no minimum or maximum handrail dimensions as specified in the BCBC Section 3.4.6.5 (6), however, the minimum height was selected to be 765 mm based on:

- Similar hand rail systems in the SOFMC,
- Maximum "low hand reach (side)" as per ***Figure 2.2,*** and
- Minimized impact to sight lines.

No intermediate-height rail is provided in this option as it is not required and would further assist in minimizing the impact on sight lines. A combination of top and front face mounted anchorage systems was selected to allow for the rail to be installed outside of the trafficked areas directly leading to and from the seating areas reducing the encroachment of the handrails.

Within Option 1, two subsets, 1A and 1B explore the difference in rail spans over two rows of seats versus four rows of seats respectively. Option 1A would allow for flow between sides of the access stairs easily whereas Option 1B would be more economical but provide a more restricted flow of traffic from side to side. As per **Figure 4.1**, odd numbers of rows would result in a combination of two and three row gap intervals for Option 1A and three and four row gap intervals for Option 1B.

4.3. Option 2

Handrail Option 2 was developed based off the NBCC 2015 that has not currently been adopted by BC but will likely be incorporated into the next updated Building Code. The minimum handrail height was selected to be 865 mm based on the NBCC and ADA requirements but also matches similar railing systems currently in SOFMC. Using the minimum code required height will also help reduce impacts on sight lines.

Like Option 1, Option 2 utilizes a combination of top and front face mounted anchorage systems to allow for the rail to be installed outside of the trafficked areas with an additional intermediate rail required 305 mm below the top rail. Within Option 2, two subsets, 2A and 2B explore the difference in rail spans over two rows of seats versus four rows of seats respectively. Option 2A would allow for flow between sides of the access stairs easily whereas Option 2B would be more economical but provide a more restricted flow of traffic from side to side. As per **Figure 4.1**, odd numbers of rows would result in a combination of two and three row gap intervals for Option 2A and three and four row gap intervals for Option 2B.

Section 3.1.1 of this report shows that gaps provided in the railing be a minimum of 560 mm in width. The current platform tread length is 540 mm providing just under the minimum requirement. Without adjusting the existing stair system, this will be the largest gap that can be provided.

4.4. Option 3

The BCBC does not require handrails for the access stairs and as a result, Option 4 keeps the status quo, leaving the access stairs as-is.

5. Preliminary Cost Estimates

Preliminary cost estimates for investigated options have been prepared to a Preliminary Level (Class D ±30%). The following outlines the cost of the options considered in **Section 4.**

Table 1 below summarises the costs for the different feasibility options for the handrail installation on all twenty sets of stairs. Breakdown of the option costing below can be found in **Appendix B.**

Table 1: Handrail Option Cost Estimate Summary

Option	Cost
Option 1A (BCBC 765 mm Optional Handrails – 2 Row Intervals)	$64,750
Option 1B (BCBC 765 mm Optional Handrails – 4 Row Intervals)	$57,900
Option 2A (NBCC 865 mm Handrails – 2 Row Intervals)	$83,100
Option 2B (NBCC 865 mm Handrails – 4 Row Intervals)	$75,500
Option 3 (Do Nothing)	$-

For estimating purposes, Options 1A and 2A consider the combination of two and three row gap intervals while Options 1B and 2B consider the combination of three and four row gap intervals. Ultimately, if Option 1 or 2 are selected, a combination of the gap intervals will be required to meet the unique layout and variety of stairs within the SOFMC. Options 1A and 1B can be used as upper and lower estimates respectively for Option 1 style handrails. Similarly, Options 2A and 2B can be used for upper and lower estimates respectively for Option 2 style handrails.

Table 2: Handrail Option Maintenance Cost Estimate Summary

Option	Cost
Yearly Rail Maintenance	$1,600
Rail Replacement (5% of Total Every 5 Years)	$2,500

Table 2 shows the estimated annual cost for rail maintenance based on 10% of the rails requiring repainting or touch ups each year. Replacement costs consider that 5% of the rails will be required to be replaced every 5 years. These maintenance costs are shown in today's dollars and are not adjusted for inflation. Current maintenance programs on the existing railings in the SOFMC can be used to refine these estimates further if available to the City.

6. Risk Analysis

A weighted risk analysis or Multiple Account Evaluation (MAE) of the feasibility options has been undertaken using the information presented in **Sections 3, 4** and **5** to determine the most beneficial option to take forward. A summary of this analysis is seen in **Table 3** below.

Table 3: Risk Analysis of Handrail Options

Evaluation Criteria	Weighting	Option 1A	Option 1B	Option 2A	Option 2B	Option 3
		Score range = 1 – 5 (Poor, Fair, Good, Better, Best)				
Public Safety	35%	4	4	5	5	3
Code Compliance	20%	4	4	5	5	3
Capital Cost	10%	2	3	1	2	5
Sight lines Impact	10%	4	4	3	3	5
Accessibility	20%	4	3	4	3	4
Maintenance	5%	3	3	3	3	5
Weighted Total		3.75	3.65	4.10	4.00	3.70
Final Ranking (With CN Rail)						

From **Table 3** above, handrail Option 2A and 2B score highest with Option 2A scoring higher due to increased accessibility with a smaller gap interval spacing. Explanation of the scoring for the evaluation criteria is summarized below:

- **Risk Analysis Weighting** of the replacement options for each criterion are based on the author's subjective opinion and consensus and the above weighting is subject to the readers assessment of value for each category which can be adjusted. Public safety at 35% was considered to be of highest importance in assessing the impact of the handrail options. Accessibility and Code Compliance at 20% were considered to be of equal importance as handrail options had to provide improved access without impeding restriction to flow or contradicting Code requirements. While still valuable to the analysis, capital cost and sight line impacts were weighted at 10% each as they were considered to be secondary considerations to safety and accessibility. Maintenance was weighted at 5% as it was considered to have minimal impact on the handrail options as cleaning and maintenance equipment would likely be limited to hand operated tools within these areas.
- The **Public Safety** criterion was assessed solely considering the general improvement to safety that the option provides. The current stair system was rated as "good" as the stairs provide safe passage free of hazards with sufficient space to move freely in any direction. Option 1 offers additional safety in the handrail system as it provides a grabbable surface to assist in the case of general movement or emergencies. Option 2 provides additional safety with the addition of the intermediate-height rail.
- The **Code Compliance** criterion was assessed considering the Option's compliance to current codes covered in this study. All options presented are mostly compliant with the current BCBC as no handrails are required. Options 1 and 2, providing centre line hand rails, cut the effective stair width in half providing less (approximately 890 mm) than the 1100 mm minimum width required in the BCBC 2012. However, the NBCC 2015 allows for centreline rails, specifically on aisles with a width over 1100 mm, which will likely be adopted in future versions of the BCBC superseding the 1100 mm minimum width. Additionally, providing the row gap

intervals in the railing may alleviate the requirement of 1100 mm width as traffic can flow more freely from side to side on the stairs.

- The **Capital Cost** criterion was assessed solely considering the cost of supply and installation of the handrail systems. Odd row counts for each stair section type seen in **Figure 4.1** show that various row gap interval configurations will be required. As discussed in **Section 4**, the cost estimates have been undertaken for two or three row gap intervals for Options 1A and 2A and three or four row intervals for Options 1B and 2B to best provide an averaged cost for the handrail system and to better outline potential costs for other row gap intervals for other configurations. Smaller row gap intervals require more material, anchors and man-hours for installation driving up the cost. Option 2 is costlier than Option 1 with the addition of taller rails and the addition of an intermediate-height rail.
- The **Sight Lines Impact** criterion considered the overall rail impact on a person's view from the seating area. Option 3, leaving the stairs as-as, provides the best site lines. Option 1 provides reduced sight lines but with less impact than Option 2 as the rails have less overall height and no intermediate-height rail. Fewer or more row gap intervals may result in different sight lines and should be considered in the detailed design phase should the City move forward with installation of a railing system. Should the handrail options be explored further, mock-ups of the handrail options should be utilized prior to design to better establish actual impact on sight lines.
- The **Accessibility** criterion was assessed considering the impact to foot traffic and ease of access to seating from the aisles. The current stairs provide the greatest freedom of movement within the aisle but limit access to those persons requiring handrails to navigate. Options 1 and 2 provide handrails to increase access capabilities with options 1B and 2B rated as "good" instead of "better" due to the lower row gap intervals than Options 1A and 2A which would restrict horizontal movement from rows across the aisles.
- The **Maintenance** criterion was assessed considering the overall cost of maintenance to the City. These costs have been considered to be 10% of rails requiring touch ups each year with 5% of rails requiring replacement due to potential damage every 5 years. While Option 2 has more overall rail than Option 1, maintenance costs associated with this difference are seen to be minimal, so both options have been rated the same.

7. Closing

This report provides a Multipoint Account Evaluation (MAE) of 5 possible handrail options for the Save-On-Foods Memorial Centre. The report summarizes the economic, safety, code compliance, visual impact, accessibility and maintenance benefits and concerns of each option. It also provides preliminary cost and maintenance estimates for each option.

This report on the existing building and applicable regulatory Codes is intended to assist the City in evaluating the different options and help inform their decision for selecting which option to pursue further. It has been established that the existing stair system meets the current BC Building Code, its supplements and the ADA regulations often used as a supplementary guide. However, newer additions to the National Building Code of Canada reveal that handrails in stepped stair systems will be required indicating the direction that safety systems are heading for these applications. It is likely that the BC Building Code will adopt the handrail requirements stated within the National Building Code in future revisions.

Should the City choose to further explore or install optional railings at the SOFMC, as per the comprehensive MAE, Option 2, a new handrail built to the National Building Code standards has the highest overall score. This new handrail system is estimated to cost the City between $58,000 and $65,000 including a 20% contingency and allowance for engineering based on order of magnitude ±30%.

This report is focused on the regulatory and supplementary Codes applicable to handrails for stepped stair systems within the Save-On-Foods Memorial Centre. We recommend that the City consider the intended improvements to safety that the current National Building Code of Canada provides that will likely be adopted by the Province of British Columbia.

8. References

The following are references used during the writing of this report.

- “Province of British Columbia Building Code, 2012”
- “Province of British Columbia Fire Code, 2012”
- “National Building Code of Canada, 2015”
- “British Columbia Building Access Handbook (2007), Illustrated Commentary on Access Requirements in the 2006 British Columbia Building Code”
- “2010 Americans with Disabilities Acts (ADA) Standards For Accessible Design” & “Guidance on the 2010 ADA Standards for Accessible Design”
- “2004 City of Toronto Accessibility Design Guidelines”
- City of Victoria Estimating Policy

Appendix B – Preliminary Cost estimates

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CLASS D PRICE AND ASSOCIATED COST ESTIMATES
Option 1A

Schedule of Approximate Quantities and Unit Prices

Project No: 2243-15396-04 Feasibility Estimate 1/29/2018

Project Name: Save-On-Foods Memorial Centre Handrail Feasibility Study

TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES					
Item#	**Description of Work**	**Unit of Measure**	**Approx. Quantity**	**Unit Price**	**Extended Amount**
01	**Section 1 - Supply & Installation of Handrails**				
01.01	Supply of Handrails - Painted	KG	2675	$8.00	$21,400.00
01.02	Supply of Anchors	L.S.	100%	L.S.	$5,000.00
01.03	Installation of Handrails	L.S.	100%	L.S.	$19,750.00
	CLASS D PRICE ESTIMATE				**$46,150.00**
901.00	Contingencies (20%)			$ 9,300.00	
902.00	Engineering (20%)			$ 9,300.00	
	ASSOCIATED COST ESTIMATES				**$18,600.00**
	TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES				**$64,750.00**

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CLASS D PRICE AND ASSOCIATED COST ESTIMATES
Option 1B

Schedule of Approximate Quantities and Unit Prices

Project No: 2243-15396-04 Feasibility Estimate 1/29/2018

Project Name: Save-On-Foods Memorial Centre Handrail Feasibility Study

TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES					
Item#	**Description of Work**	**Unit of Measure**	**Approx. Quantity**	**Unit Price**	**Extended Amount**
01	**Section 1 - Supply & Installation of Handrails**				
01.01	Supply of Handrails - Painted	KG	2375	$8.00	$19,000.00
01.02	Supply of Anchors	L.S.	100%	L.S.	$3,800.00
01.03	Installation of Handrails	L.S.	100%	L.S.	$18,500.00
	CLASS D PRICE ESTIMATE				**$41,300.00**
901.00	Contingencies (20%)			$ 8,300.00	
902.00	Engineering (20%)			$ 8,300.00	
	ASSOCIATED COST ESTIMATES				**$16,600.00**
	TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES				**$57,900.00**

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CLASS D PRICE AND ASSOCIATED COST ESTIMATES
Option 2A

Schedule of Approximate Quantities and Unit Prices

Project No: 2243-15396-04 Feasibility Estimate 1/29/2018

Project Name: Save-On-Foods Memorial Centre Handrail Feasibility Study

TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES					
Item#	**Description of Work**	**Unit of Measure**	**Approx. Quantity**	**Unit Price**	**Extended Amount**
01	**Section 1 - Supply & Installation of Handrails**				
01.01	Supply of Handrails - Painted	KG	4250	$8.00	$34,000.00
01.02	Supply of Anchors	L.S.	100%	L.S.	$5,500.00
01.03	Installation of Handrails	L.S.	100%	L.S.	$19,800.00
	CLASS D PRICE ESTIMATE				**$59,300.00**
901.00	Contingencies (25%)			$ 11,900.00	
902.00	Engineering (20%)			$ 11,900.00	
	ASSOCIATED COST ESTIMATES				**$23,800.00**
	TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES				**$83,100.00**

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CLASS D PRICE AND ASSOCIATED COST ESTIMATES
Option 2B

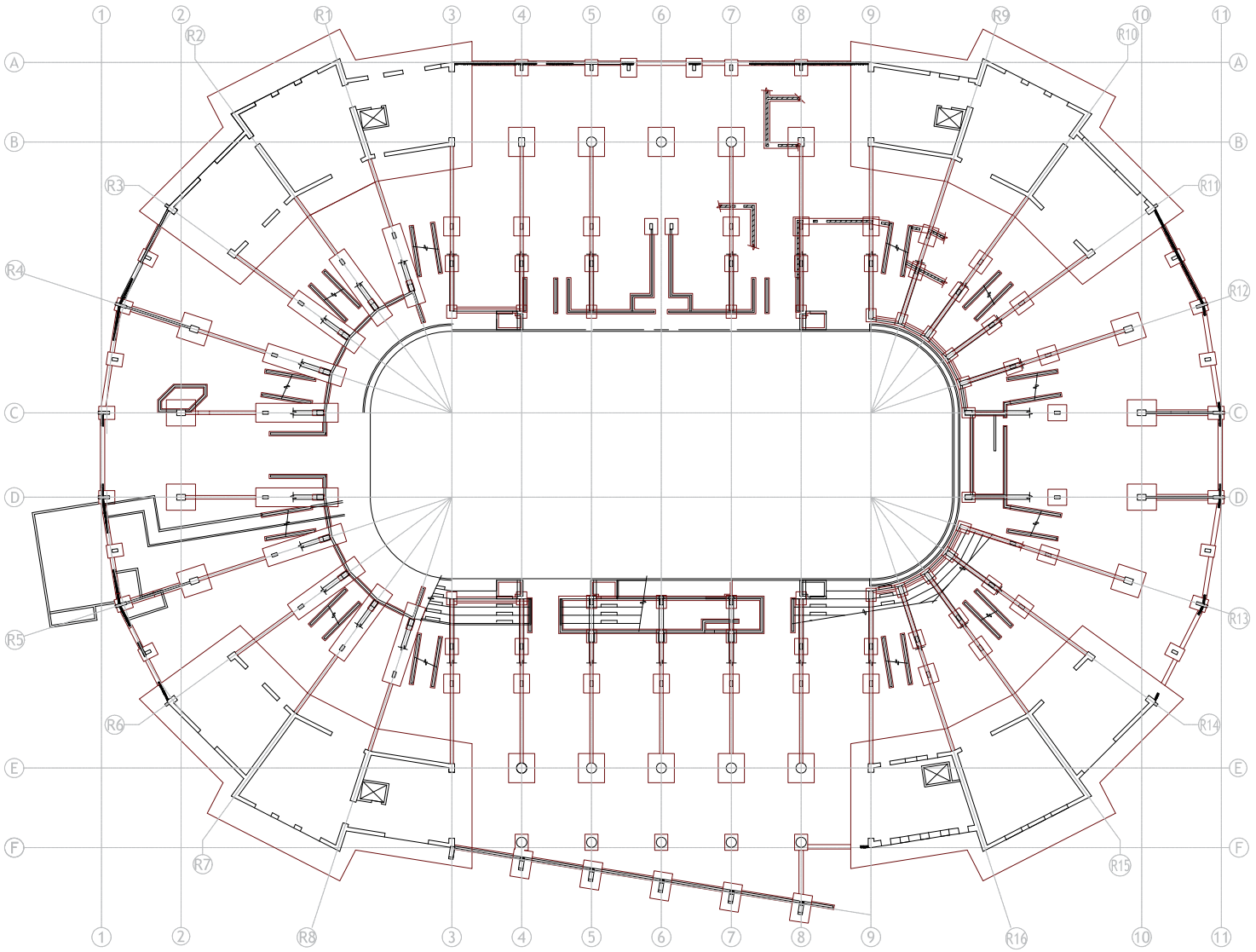
Schedule of Approximate Quantities and Unit Prices

Project No: 2243-15396-04 Feasibility Estimate 1/29/2018

Project Name: Save-On-Foods Memorial Centre Handrail Feasibility Study

TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES					
Item#	**Description of Work**	**Unit of Measure**	**Approx. Quantity**	**Unit Price**	**Extended Amount**
01	**Section 1 - Supply & Installation of Handrails**				
01.01	Supply of Handrails - Painted	KG	3900	$8.00	$31,200.00
01.02	Supply of Anchors	L.S.	100%	L.S.	$4,200.00
01.03	Installation of Handrails	L.S.	100%	L.S.	$18,500.00
	CLASS D PRICE ESTIMATE				**$53,900.00**
901.00	Contingencies (20%)			$ 10,800.00	
902.00	Engineering (20%)			$ 10,800.00	
	ASSOCIATED COST ESTIMATES				**$21,600.00**
	TOTAL CLASS D PRICE AND ASSOCIATED COST ESTIMATES				**$75,500.00**

Appendix C – Existing SOFMC Floor Plans



SAVE ON FOODS MEMORIAL CENTRE FOUNDATION PLAN

BUILDING NAME	ROOM NO.	ROOM DESCRIPTION

PAPER DRAWING SCAN DATE

NO.	REVISION DESCRIPTION	DATE

CORPORATION OF THE CITY OF VICTORIA
ENGINEERING DEPARTMENT

THE CITY OF VICTORIA

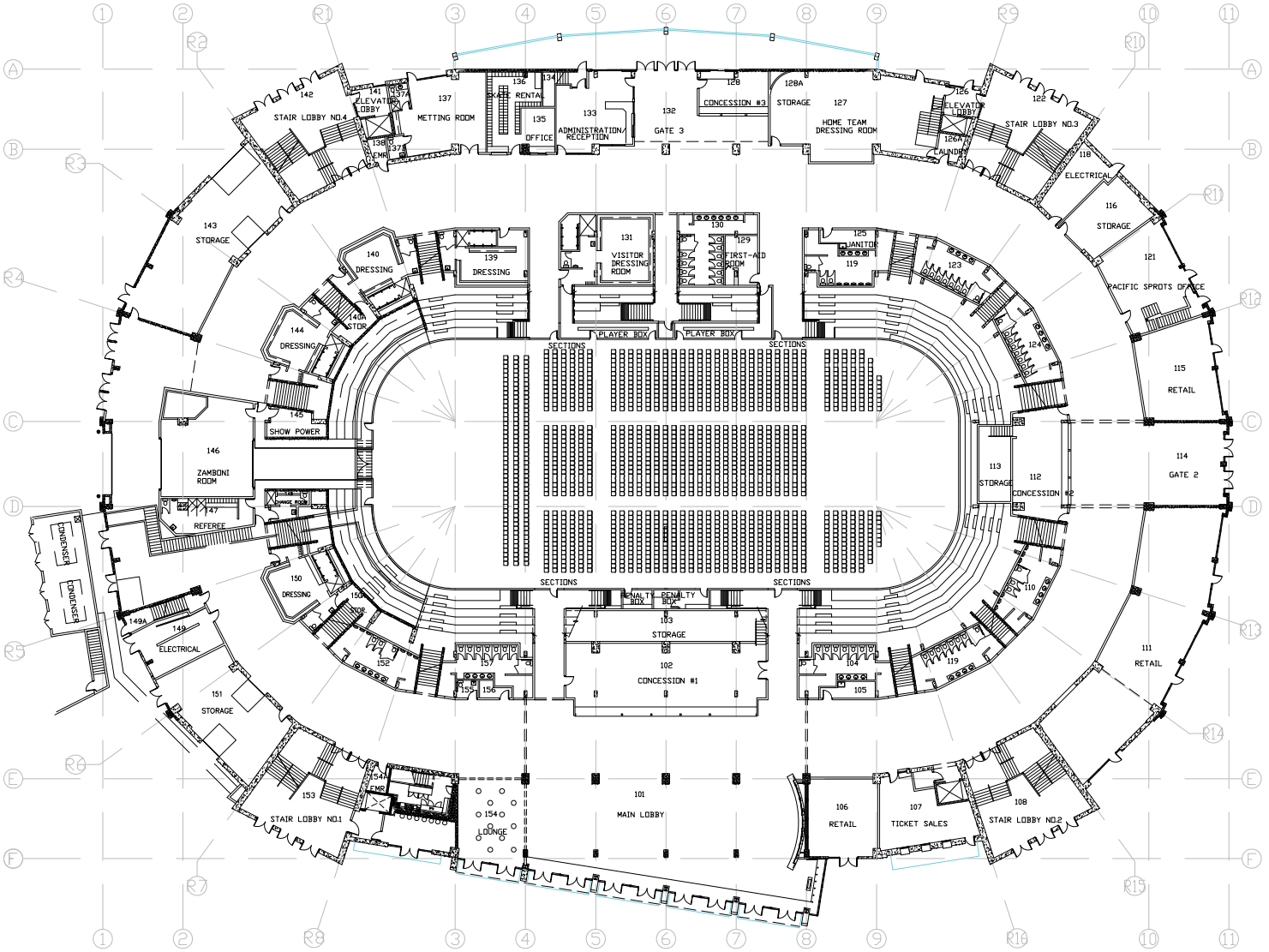
DWG. TITLE
SAVE-ON-FOODS MEMORIAL CENTRE

DWG. NAME CONVENTION
REC-SOFMC-ARCH-FOUND

ADDRESS
1925 BLANSHARD ST.

FACILITIES

SCALE	SHT. No.
1:200	1 of 5
DATE	DRAWING NUMBER
2008-05-27	F-0096



SAVE ON FOODS MEMORIAL CENTRE LEVEL 1 FLOOR PLAN

BUILDING NAME	ROOM NO.	ROOM DESCRIPTION

PAPER DRAWING SCAN DATE

NO.	REVISION DESCRIPTION	DATE

CORPORATION OF THE CITY OF VICTORIA
ENGINEERING DEPARTMENT

THE CITY OF VICTORIA

DWG. TITLE
SAVE-ON-FOODS MEMORIAL CENTRE

DWG. NAME CONVENTION
REC-SOFMC-ARCH-LVL1

ADDRESS
1925 BLANSHARD ST.

FACILITIES

SCALE	SHT. No.
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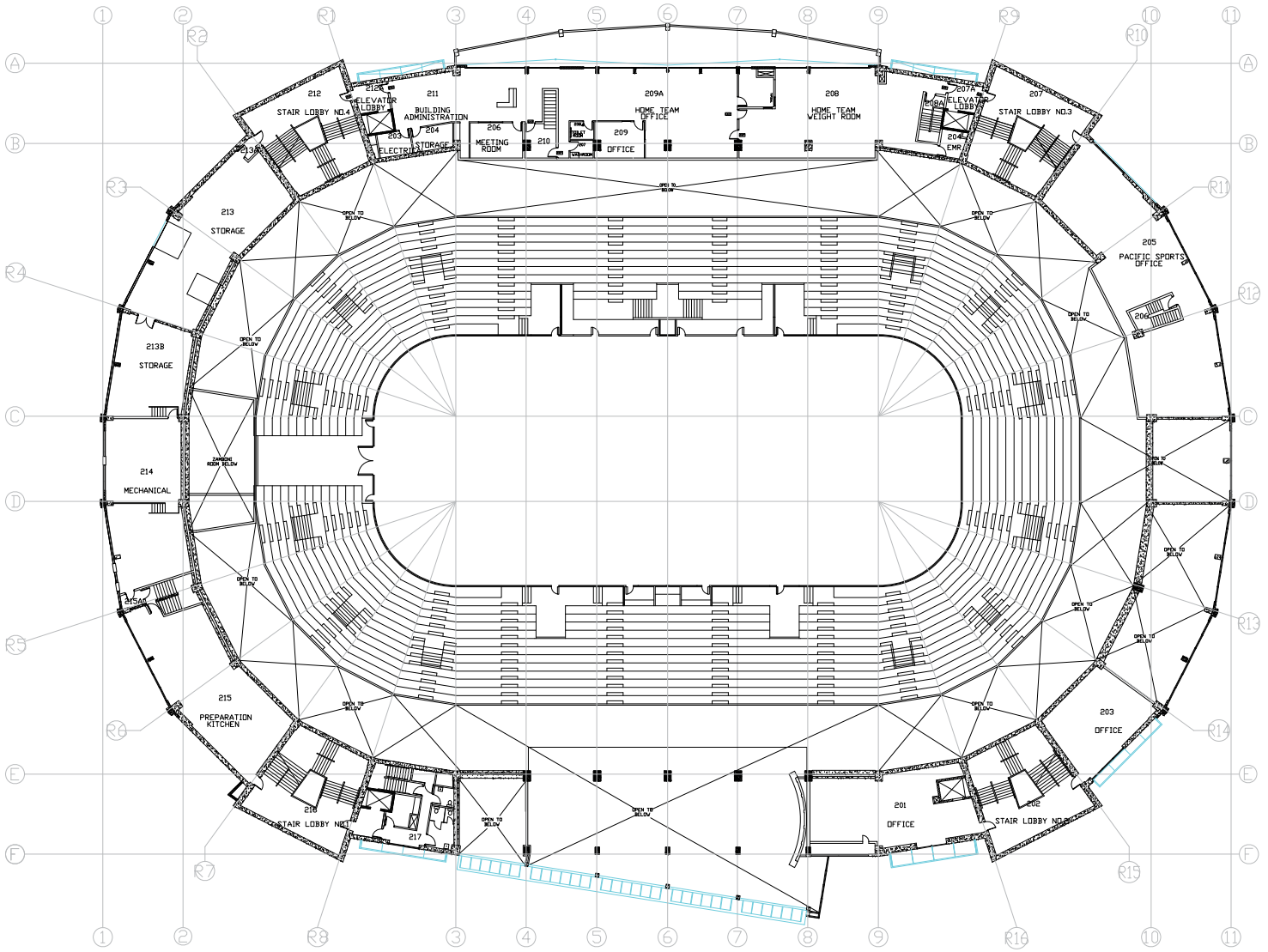
DATE	DRAWING NUMBER
2008-06-03	F-0097



SAVE ON FOODS MEMORIAL CENTRE LEVEL 2 FLOOR PLAN

BUILDING NAME	ROOM NO.	ROOM DESCRIPTION

PAPER DRAWING SCAN DATE

NO.	REVISION DESCRIPTION	DATE

CORPORATION OF THE CITY OF VICTORIA
ENGINEERING DEPARTMENT

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DWG. NAME CONVENTION
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ADDRESS
1925 BLANSHARD ST.

FACILITIES

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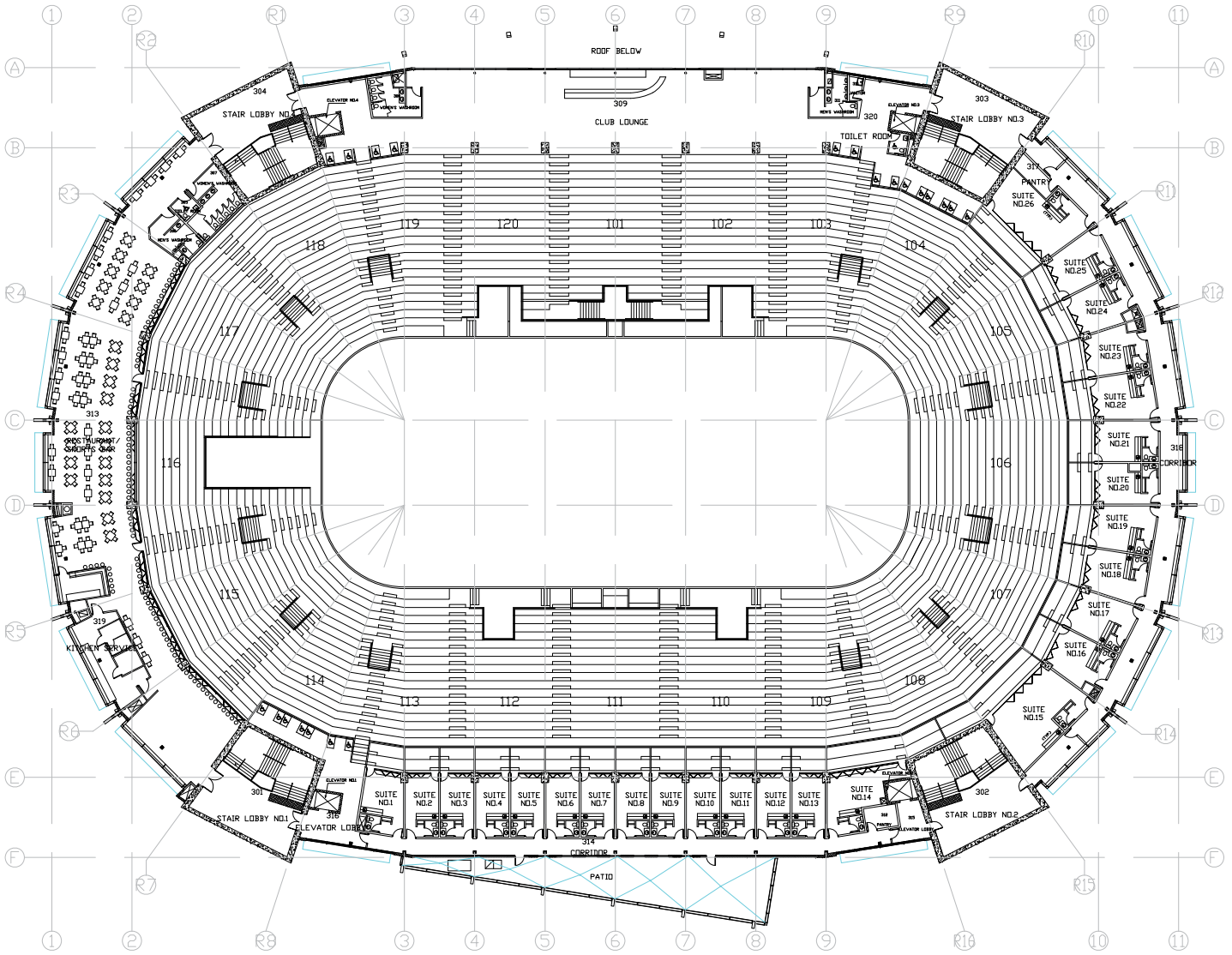

SAVE ON FOODS MEMORIAL CENTRE LEVEL 3 FLOOR PLAN

BUILDING NAME	ROOM NO.	ROOM DESCRIPTION

PAPER DRAWING SCAN DATE

NO.	REVISION DESCRIPTION	DATE

CORPORATION OF THE CITY OF VICTORIA
ENGINEERING DEPARTMENT

THE CITY OF VICTORIA

DWG. TITLE
SAVE-ON-FOODS MEMORIAL CENTRE

DWG. NAME CONVENTION
REC-SOFMC-ARCH-LVL3

ADDRESS
1925 BLANSHARD ST.

FACILITIES

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DATE	DRAWING NUMBER
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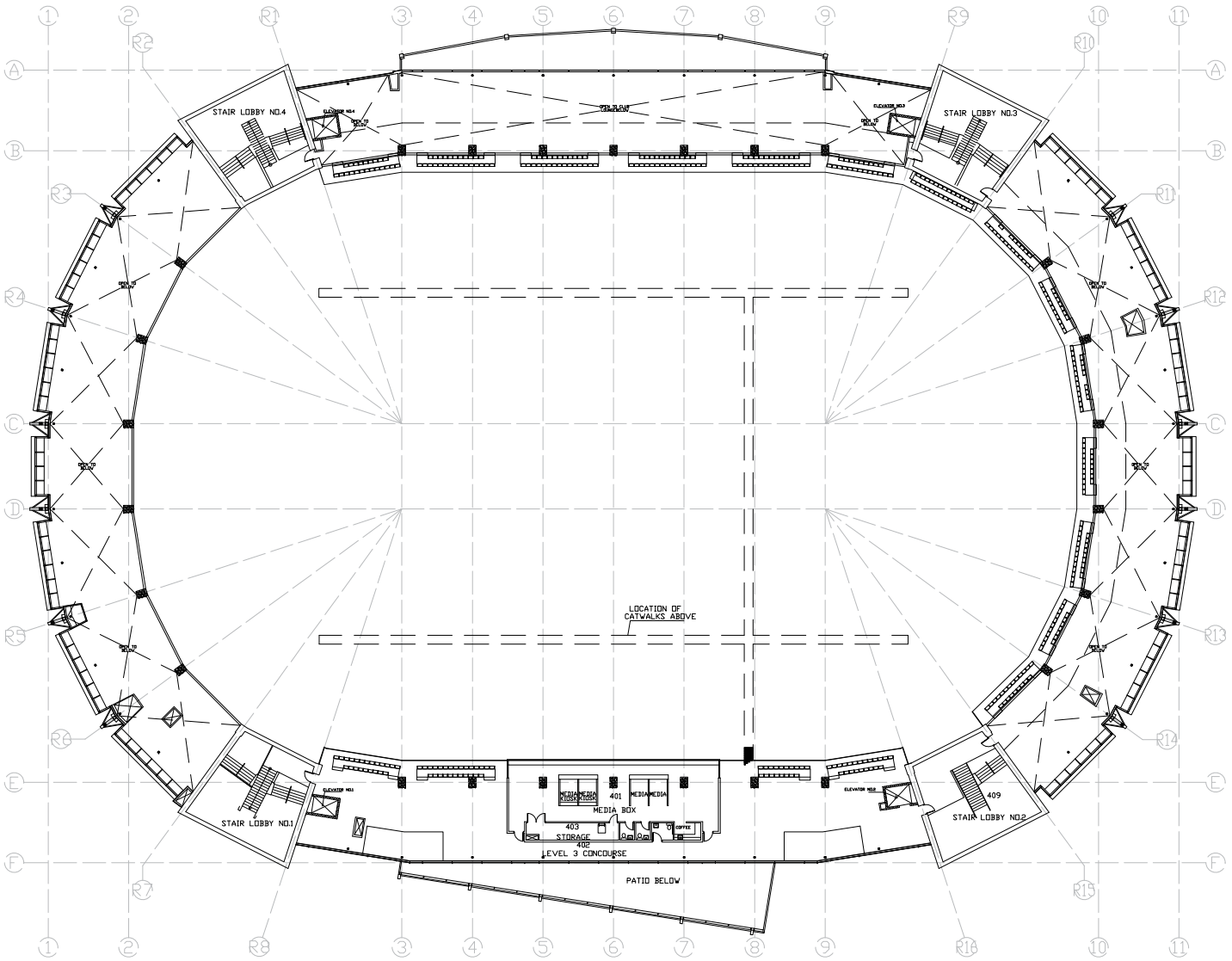

SAVE ON FOODS MEMORIAL CENTRE LEVEL 4 FLOOR PLAN

BUILDING NAME	ROOM NO.	ROOM DESCRIPTION

PAPER DRAWING SCAN DATE

NO.	REVISION DESCRIPTION	DATE

CORPORATION OF THE CITY OF VICTORIA
ENGINEERING DEPARTMENT

THE CITY OF VICTORIA

DWG. TITLE
SAVE-ON-FOODS MEMORIAL CENTRE

DWG. NAME CONVENTION
REC-SOFMC-ARCH-LVL4

ADDRESS
1925 BLANSHARD ST.

FACILITIES

SCALE	SHT. No.
1:200	5 of 5
DATE	DRAWING NUMBER
2008-06-03	F-0100

Appendix D – City of Victoria Estimating Policy

CITY OF VICTORIA	**Capital Project Cost Estimate Development Policy**	
		Page 1 of 4

CHAPTER:	Corporate Administration	
SECTION:	Finance	
SUBJECT:	Capital Project Cost Estimate Development Policy	
AUTHORIZED BY:	City Manager	
EFFECTIVE DATE:	January 1, 2017	**REVISION DATE:**
REVIEW FREQUENCY:	Every two years	

1. PURPOSE / OBJECTIVES

The purpose of the Capital Project Cost Estimate Development Policy is to help ensure the quality and reliability of cost estimates for financial and project delivery needs by establishing:

- Principles for developing cost estimates;
- Standard costing factors (i.e. contingencies, administration costs, legal costs, financing costs);
- Requirements for lifecycle cost estimates; and
- Requirements for engaging outside expertise on cost estimation.

The Capital Project Cost Estimate Development Policy directly supports the City's commitment to continual improvement in financial planning and sustainability.

2. APPLICATION

This policy applies to the development of the Financial Plan, but should also be applied to project management, budget approvals, and to the development of business cases for new capital project proposals. This policy excludes fleet capital.

3. POLICY STATEMENTS

A. All cost estimates will be developed according to the following guiding principles:

- **Quality**: Prepared using industry recognized practices that cover a comprehensive list of project requirements and costing parameters that suit the decision or stage of the project.

- **Comprehensive**: The preparation of cost estimates for City projects should be comprehensive and completed in collaboration with all applicable departments and engage external expertise when appropriate.
- **Interdisciplinary Expertise**: Prepared by individuals in the appropriate disciplines with knowledge, skill and experience in estimating for the range of factors affecting the project.
- **Reliability**: Prepared using repeatable and defendable practices including the use of thorough archives for future consideration.

B. Administrative decisions to bring forward cost information to Council on projects will be made once a project is well defined and clarity on the cost estimate type/level is clearly defined.

C. Staff will consult with other service and infrastructure departments throughout the project development process, starting from the project conceptualization stage, to incorporate all cost factors into the cost estimate (i.e. construction costs are only one aspect).

D. Staff will exercise professional judgement and consider industry best practices to determine the uncertainties of a project and develop cost estimates that suit the appropriate project decision by applying contingencies as outlined in Table 1 of Schedule A.

    a. When cost estimating expertise is not readily available or limited within the City, staff will engage with external cost estimating experts and incorporate project-specific cost considerations or when significant project risks emerge, such as those outlined in Table 2 of Schedule A.

E. Lifecycle cost estimates, including identification of on-going additional [new] maintenance and operational costs will be identified when new assets are added or services are expanded as part of the asset management plan.

F. To enable the continuous improvement of the quality of project cost estimates, staff are required to:

- Maintain a comprehensive framework of capital and life-cycle costing factors that covers internal and external costs;
- Maintain an ongoing database of actual cost expenditures for the purposes of historical cost estimating and asset valuation; and
- Complete, upon request, a comparative report of select capital projects including their budget estimates and actual costs for projects at the discretion of the City Manager.

4. BACKGROUND

Taxpayers and ratepayers expect high levels of skill and quality in the delivery of effective municipal services. Cost estimates are integral to stable finances as they frame the monetary impact of projects, including whether they pass a business case test and provide an appropriate return on the investment. Council decision making often relates to reliability and accuracy of cost estimates prepared by Staff and consultants. Inaccurate cost estimates for notable capital projects can erode public trust and negatively frame the overall investment and its outcomes.

Council direction through cost estimate policies recognizes the technical challenge in approximating and therefore offers further definition and additional resources to Staff. The aim of this policy is to build confidence in municipal finance decisions and provide stability to the cost of service delivery to taxpayers.

5. REVISION HISTORY

None

Attachment 3: Capital Cost Estimate Policy

Schedule A: Cost Estimate Classes, Contingencies and Project Risk Factors

Table 1: Cost Estimate Classes and Guidance on Contingency Factors

Estimate Level	Cost Estimate Name	Typical Administrative Need	Contingency Factor* Based on Project Uncertainty	
			Low Uncertainty	High Uncertainty
-	Conceptual	Varies; Business Case (if required)	35% ←----------→ 50%	
	Planning	5 Year Financial Plan		
D	Preliminary	Annual Financial Plan/Budget Approval	25% ←----------→ 35%	
C	60% Design	For Information	15% ←----------→ 30%	
B	90% Design	For Information	10% ←----------→ 15%	
A	Pre-Tender	Varies	Up to 15%	
	IFC	Varies	Up to 10%	

*As a percentage of the estimated total cost of the project, including all direct and indirect costs such as administration, project management, consulting fees and construction.

Table 2: List of High-Risk Factors that Warrant Project Specific Contingencies Regardless of the Scale of Initial Cost Estimates

Attachment 3: Capital Cost Estimate Policy

Cost Estimate Certainty: High-Risk Factors	Example(s)
A. High cost estimates	- Any large-scale capital project
B. Land acquisition or title considerations	- Unresolved land trust
C. Archaeological potential or atypical environmental remediation yet to be determined	- Site with historical significance but unknown artifacts - Stored hazardous materials/soil contamination
D. Irregular construction projects not typical of the municipality	- Major bridges
E. Contractual obligations to affected parties	- Unresolved tenure agreements for existing community facilities - Unusual procurement structure
F. Probable geotechnical issues	- Subsurface pockets of rock - Unexpected groundwater conditions
G. Significant change in quantities of work	- Number of water meters to repair
H. Market forces influencing demand or local pricing for key items	- Price of steel or PVC at times of commodity market volatility
I. Evolving regulations or inter-agency collaboration	- Increase in standards to suit emerging trends
J. Expedited cost estimate	- Emergency issue
K. Facilities Renovations	- Unknown asbestos in walls - Unknown condition of assets
L. Underground Infrastructure	- Location of asset - Age of asset
M. Financial	- Exchange rate changes - Unknown cost escalations for future builds

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