Final Report

NOVA SCOTIA RECREATION FACILITIES AUDIT SUMMARY REPORT

Prepared for:

Nova Scotia Health Promotion
Physical Activity, Sport, and Recreation
and
Nova Scotia Transportation and Public Works
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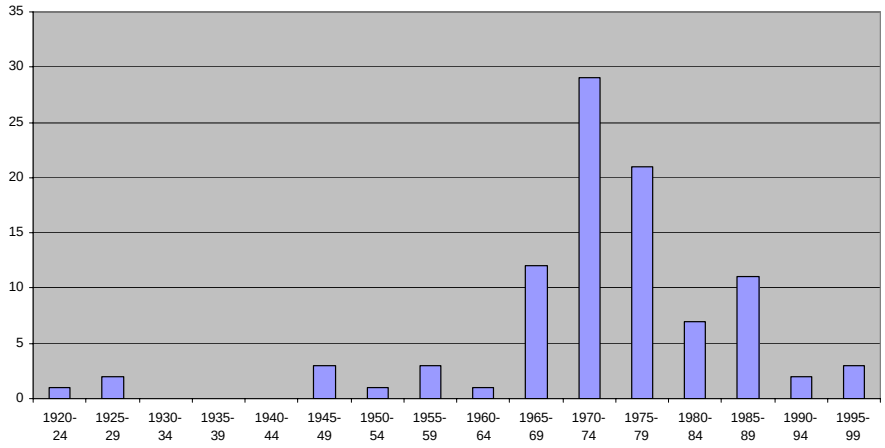
1. INTRODUCTION AND SUMMARY

1.1 OVERVIEW AND SCOPE

There is growing concern of a strong correlation between quality infrastructure and the delivery of sport and recreational services. Federal, provincial and territorial Ministers responsible for Sport, Physical Activity and Recreation identified sport and recreation infrastructure as their number one priority during their annual conference in Regina on August 4 and 5, 2005. They did so in the conviction that improved infrastructure will advance sport and physical activity in communities across the country while addressing critical health challenges and strengthening Canadian communities.



In Nova Scotia the majority of recreation facility construction occurred in the period between 1965 to 1980, as per following table, with the peak coming on line in the early seventies. It is estimated that about two thirds of existing sport and recreational facilities were constructed prior to 1975. It is recognized that age alone is not a reliable indicator of infrastructure condition; however it does indicate those facilities that are approaching 30 years are in need for major renovations if their useful life is to be extended

Many facility owners, already burdened by escalating operating costs, are not able to deal effectively with accumulating maintenance and repair items. With many of the physical plants reaching or exceeding their predicted life, the need for immediate, as well as planned, action was evident. Since the mid nineties there have been several dozen Facility Audit Studies co-ordinated jointly by the operator entity and Nova Scotian Health Promotion, Physical Activity, Sport, and Recreation. These were generally completed by independent consultants utilizing several engineering disciplines. The audits provided an overview of the facility based on document review, site inspections, non-intrusive testing, owner experience input, and in some instances involvement of manufacturers or constructors to further define shortcomings. They included life cycle forecasts to plan commitment of resources to replace the identified aging building components.

The structural failure of the Springhill arena roof in early 2001 under heavy snow loads, heightened the public awareness of the aging infrastructure. A program of roof structural analysis was commissioned through the engineering department at Dalhousie University. Of 24 facilities surveyed 20 were identified with structural problems warranting further investigation. That led to a number of facilities being identified as requiring immediate remedial attention. Bridgetown Arena was closed for a significant period in 2004 and similarly Lunenburg required immediate correction of such identified structural deficiencies.

Continuing to be proactive and not reactive, Nova Scotia along with provinces like Alberta and British Columbia has commenced undertakings to assess groupings of facilities to assess their current state as a prelude to establishing a plan for renovating or replacing facilities and processes therein. In the case of Alberta they based their assessment on a random, broad spectrum sampling (ie 40 facilities) and extrapolating it for all remaining facilities (303). This represented just under a 12% sampling ratio. In BC on the other hand they are attempting to inventory all their facilities. Those facilities which typically experience high levels of recreation / sport usage and are used for national/international focused sports, were first targeted. The grouping, at this initial stage, were Ice Arenas, Curling Rinks, Indoor Pools, and Outdoor Pools, with Alberta also including Multiplexes.

Alberta's June 30, 2002 study results estimated that to correct just three of the seven condition categories (1) critical, (2) Poor, and (3) Marginal which were within a five year remaining life would result in an average expenditure per facility of nearly $950,000. Listed by type of facility the results were as per table below.

Type of facility	Cost to upgrade conditions 1,2, &3 in $(2002)
Arenas	$ 814,000
Curling Rinks	$ 498,000
Indoor Pools	$ 1,075,000
Outdoor Pools	$ 307,000
Sportplexes	$1,271,000
Overall Average	**$ 944,000**

As a sobering note the Alberta report (2002) compared the provincial rehabilitation total of $272 million to the full replacement cost of these same facilities at $989 million. Interestingly the repair cost ratio resulting from these estimates is only a 17% of full replacement valuation. Therefore it makes good business sense to maintain existing facilities through refurbishment when at all possible.

The Nova Scotia Health Promotion (NSHP) through Nova Scotia Transportation and Public Works (NSTPW) called for inclusion of the above four types of facilities plus they added sports fields. The proposed process was to consist of reviewing the 26 existing building audit reports indicated; drawing general conclusions; evaluating the building envelope, structural, mechanical, electrical, site, and code related specifics in an attempt to identify similarities; edit for extraordinary aspects; compare and update capital costs to present day, and extrapolate to province wide facilities for each of indoor arenas, indoor pools, outdoor pools, curling clubs, and athletic fields. The database of listed facilities are enclosed in Appendix "A"

The indicated total number of facilities in each group are as follows:

Group	Municipal	Community / Board	Other *	Total
Ice Arenas	27	39	11	77
Curling Rinks	4	27	5	36
Indoor Pools	6	6	13	25
Outdoor Pools	15	9	2	26
Sports Fields				312

* *Other includes private, service group, provincial, university, first nation, or Canada Defence bases,*

The above table demonstrates that the majority of the facilities are not managed directly by municipal units and as such do not have a tax base to cover capital and operating expenses. Community board managed facilities are the single largest group and although some of the funding eventually comes from municipal units there is also the need for fundraisers of all types to operate these facilities as not-for-profit. Capital projects and large expenditures therefore typically require advance lead times to allow for fund raising and cost sharing applications to all three levels of government.

1.2 METHODOLOGY

No primary data collection nor site visits were to be completed within the mandate of this audit summary . Secondary information utilizing the twenty six (26) completed Building Audit reports provided by Nova Scotia Health Promotion, Sport & Recreation (NSHP) were to be used for completion of the audit summary document. The consultant was requested to formulate general conclusions about the nature, scale, and predicted costs (and predicted year required) of the rehabilitation requirements from review and analysis of the presented reports. There were a limited number of audit reports in some categories as per following:

When numbers of audits were limited (ie less than 10% of the total number of facilities within that category) anecdotal supportive data was utilized in an attempt to improve on the low capture percentage and some of the limited geographical coverage. The consultant utilized several building pre-design reports/audits that were also available to them:

Port Hood Arena (Included in discussion but not in spreadsheet summary as had a detailed pre-design report and rehabilation is complete with costs known.)
Lunenburg Curling Club (completed in 2004 so included to statistically improve results)
Shelburne Curling Rink (Included in discussion only as good capital cost data included)
Highlander Curling Rink (Included in discussion as good capital and O&M cost data)
Antigonish Arena (Completed in 2001, Included in spreadsheet and discussion)
Chedabucto Place (Guysborough) Outdoor Pool (Include in discussion as good capital cost data of a recently built facility)
Victoria park (Truro) Outdoor Pool (Include in discussion as good facility investigation and capital cost data from completed construction)

The database spreadsheet and life cycle costs were therefore based on the following numbers of facilities with the noted limitations:

Indoor Arenas (18)	Spanning 1996 to 2004; geographically representative, 23% of facilities.
Curling Rinks (3)	Spanning 1999 to 2002; geographically average, 8% of facilities.
Indoor Pools (2)	Spanning 1998 to 1999; geographically limited, 8% of facilities.
Outdoor Pools (3)	Spanning 1993 to 2003; geographically average, 12% of facilities.
Athletic Fields (3)	The reports were for multiple fields and total 81 withing the three reports; Spanning 1996 to 2004; geographically limited, not all life cycle costs included; 25% of facilities.

List of Building Audits analyzed in this study
Arenas

1.	Mabou Arena	1998
2.	Centre 200 (Sydney)	1997
3.	Inverness Arena	1997
4.	Cheticamp Arena	1997
5.	Sydney Mines Arena	1999
6.	Pictou Arena	2000
7.	Church Mem. Arena (Chester)	2000
8.	Bridgewater Arena	2003
9.	Baddeck Arena	2002
10.	Thornburn Arena	2001
11.	Canso Arena	2004
12.	Canning Arena	1997

13.	Berwick Arena	1997	
14.	Kingston Arena	1997	
15.	New Glasgow Arena	1996	
16.	Richmond Arena	1997	
17.	Dominion	2003	
18.	Antigonish (Additional)	2001	
Outdoor Pools			
1.	Windsor Pool	2003	
2.	Annapolis Royal Pool		1993
3.	Mulgrave Pool	2000	
Indoor Pools			
1.	Pictou Pool	1998	
2.	Northside Pool (CBRM)	1999	
Curling Clubs			
1.	Bridgewater Curling Club	1999	
2.	Chedabucto Curling Club	2002	
3.	Lunenburg Curling Club (additional)		2002
Athletic Fields			
1.	Yarmouth, Argyle and Clare Counties	1996	
2.	Shelburne and Area	2001	
3.	Annapolis Valley	2004	

1.2.1 Assessment of Completed Building Audit Reports

The facility Audit reports were generated by about thirteen varied Consultants. Although typically there is a consistency of service and completed reports follow a similar format, there are occurrences of variations in spreadsheet task classification. Photographs and a building plan are generally included to further substantiate the findings and resultant discussion on maintenance, rehabilitation, or replacement options. Recommendations are summarized with brief supportive data and most probable remediation outcomes indicated. Code related and Health & Safety shortcomings, barrier free access, deficiencies, deteriorated components, and life cycle extending tasks are itemized in rows in a spreadsheet format with the estimated cost and year of implementation indicated in the columns. This consultant, in an attempt to standardize results, undertook to reallocate the facility audit results under the following general categories for spreadsheet standardization:

Grounds & Site Services
Structural
Building Envelope (Exterior)
Building Interior
Barrier Free Access
Life Safety and Fire Systems
Mechanical Systems (Plumbing, HVAC, and Refrigeration)
Electrical Systems (service, distribution power, lighting, security, telecom and controls)
Energy and environmental
General (*which would include items not affixed or adjunct to the facility*).

1.2.2 Summary Overview

Since a primary task of this assignment is to generalize typical deficiencies and restorative tasks the first step was to develop a composite spreadsheet for each of the facility groupings. To make this manageable and capable of providing a single overview document several condensations of information were undertaken.

- The general categories inspected at each facility were maintained for consistency however specific items were combined therein. Various interior finish work is combined if it appears to be universally applicable for the majority of facilities.

- Where items involved various components of specific process equipment we tended to group these under that component (ie Refrigeration/ Brine Systems includes Pumps, motors, controls, and pipe headers).

- Some consultants include structural under the building envelope category however this consultant believes that it deserves a separate category; for example a roof membrane may need repair however would not be as critical or life safety concern as would the structural integrity of the truss support system. So foundations, columns, roof support assemblies, and in some cases bleacher supports have been extracted and grouped under the Structural Classification.

- Barrier Free Access which was put under Building exterior or interior classification by many facility audit reports is to be broken out into its own category.
- Tasks that are in the judgement of this review to be “one of a kind” or in relation to equipment not affixed to the building (ie such as Zambonis , ice scrapers, flooding equipment, pool appurtenances and the like) are maintained in the spreadsheet but in *italics* and not included in subsequent costing summaries.

- The date of the report and the actual costs estimated at the time of report release are listed in the first column.

- Costs were indicated in thousands to two decimal places to reduce column widths and thus allowing more facilities to be presented per sheet for ease of analysis.

- Costs were combined into twin column groupings based on implementation date (1 - 5 years & 6 - 10 years). It is argued that tasks beyond that time window are not of an urgency that demand inclusion in this summary of present state of facilities.

- Costs for the twin implementation period groupings were adjusted with an escalator from date of report to the predicted implementation period using a single average escalator constant "k" (cell C4) which although set at 2% at present is adjustable to allow modeling of more than one scenario. This brought the costs in the twin period columns to 2005 "present worth" values.

- Costs for each facility for the two implementation time period groupings are summed for each group as a sub-total and totalized for all tasks.

1.3 ANALYSIS and GENERALIZATION of REVIEW PHILOSOPHY/APPROACH

The categorization of rehabilitation tasks required some condensing as described in the previous section to make the analysis possible. It was the objective to provide the overview spreadsheet with as many facilities per page as possible so that a quick scan might identify similarities and variances among the data. This worked quite well for the pools and curling rinks due to the limited number and less categories of deficiencies versus arenas which had to fill several sheets.

All summary spreadsheets are appended in appendix "B".

The sports fields at first review appeared deficient as only one of three had the full costing spreadsheet included; with the remaining two having turf maintenance cost data only. This limited data at first was thought to affect the quality of the extrapolated data, and additional information was attempted to be procured for a university rugby field and soccer field renovation however was not forthcoming in time to incorporate. However with more detailed analysis of the descriptive information within the reports, and by incorporating other similar projects' information in this consultant's possession, it was possible to extrapolate credible figures to develop average facility cost data. No spreadsheet summary is appended as a table was developed within the body of this report.

2.0 ARENA FACILITY AUDIT SUMMARY

As per the pie chart in appendix "C", the three largest categories of proposed expenditure in the ten years following the report issue were Building Interior (26%); Exterior envelope (19%); and ice plant (19%). The eighteen arena audit allocated life cycle costs ranged from 300.42K at Dominion to 1,071.65 at Sydney's Centre 200; they summed to $12.05M with an average of $669.4K.

2.1 GROUNDS AND SERVICES

This was one of the smaller areas of deficiency correction with costs amounting to 4% of the total budget allocated. The average for all eighteen facilities was 26.79K. Parking lots & asphalt accounted for the majority(59%) of this category and was applicable for 66% of facilities. Most facilities were near the average except for four arenas in Berwick($33K), Canning ($30K), New Glasgow ($25K)and Richmond (30K) which had large requirements to provide gravel, curb & paving projects due to very poor conditions of their access roads and parking lots. Drainage problems also existed in 61% of the facilities to varying degrees of complexity averaging $6.2K or almost a quarter of the site remediation budget. Grounds maintenance, ($2.12K) and sidewalks($1.21K) were smaller budget items on average.

Conclusion: *The above average reflects several with relatively large infrastructure improvements to drainage and parking whilst a large number were near the norm statistically. Therefore the above 2005 present worth rounded up average of $27K would be a reasonable value to put forth on a province wide basis.*

2.2 BUILDING STRUCTURE

2.2.1 Frame & Roof Structure

The majority of the buildings were considered in to be in good structural condition with total estimated repair costs of $104K. Three of the facilities required significant repairs which ranged in estimated costs from $19K to $43K. The major repair items included rigid frame web reinforcement, wood roof beam repair, bearing wall replacement and wood column repair. The average repair costs for the eighteen facilities was approximately $5.8K. At the Bridgewater Facility, the roof truss repair, estimated at $23K was for the roof over a senior citizens drop in center. This is a totally separate facility operated by the Town but physically attached to the arena. If this cost was removed this would result in an average repair cost of approximately $4.5K

Conclusion: *Of note is the Bridgewater Facility had major roof truss repair work completed in 1987. Bridgetown and Spring Hill Arenas, which were not covered in this set of audited*

facilities but mentioned previously in this report, had major structural problems All three of these structures would be considered non-typical and we estimate that there may be 10% of the arenas in likewise condition. Therefore there may be four (4) additional structures that would require major structural repair at an estimated $300K each, which would average out at approximately $15.5K for the 77 arenas

Combining the above cost subsets would result in 77 arena total costs of $1,281,000 and an average of $16.6K per arena

2.2.2 Drainage

Drainage, as covered in this section, is for the control of water that is the effecting the stability of the foundation, interior slabs and or ice surface slabs. This was identified as a major issue affecting the ice surface slab at two (2) sites and a minor issue affecting the frost wall and or interior slabs at two (2) sites.

We are aware that frost heaving of the ice surface slab was an issue at the New Glasgow Arena as extensive drainage gravels and piping were installed during the replacement of the ice surface slab. Also the Pictou Arena is listed as a minor drainage issue based on cost but this has recently been identified as a more significant issue. This would result in four (4) arenas with drainage issues with costs averaging $18.5 to repair and one (1) at $3,500.00. This would result in a Total repair cost of $77.5K with an average repair cost of about $4.3K per arena for the eighteen (18) sites.

Conclusion: *The New Glasgow Arena is similar to a number of arenas that were sited based on a central location with adequate space for the facility and parking. In numerous cases these sites are lands that are low lying hence prone to drainage issues. In the older arenas, when there was no artificial ice, or in times when the season was shorter, frost did not penetrate deep enough to cause heave issues. Now with the requirement to have ice for longer periods of time due to extended seasons and summer hockey schools, frost heave has become an issue.*

As an average this is not a significant value but for the individual arena this can be a prohibitive cost that normally results in the arena putting up with poor ice conditions. The average of $4.3K per arena would be reasonable as this only impacts on 25 to 30% of arenas.

2.2.3 Foundations and Floor Slabs

All of the foundations were considered sound structures requiring minor maintenance. The floor slabs are more of an issue when the heaved portions are in the corridors. The average repairs cost was approximately $1.8K. The majority of these foundation and slab repairs were associated with drainage issues around the structure.

Conclusion: *This is a minor maintenance issue and would be virtually eliminated if adequate drainage is installed to resolve the ice surface slab and floor slabs problems. The average of $1.8K based on eighteen facilities is proposed as reasonable to assume for the remaining 59 unaudited arenas.*

2.2.4 Ice Surface Slab

The ice surface slabs covered under this section is replacement required by condition of slab. The replacement of slabs for meeting NHL ice surface dimensions has been covered in the building interior section in this report.

Only two (2) facilities reported the requirement to replace the ice surface slab. Minor repairs were recommended for three (3) other facilities. The average estimated cost for ice surface slab replacement was $308K. The repair and replacement costs for the eighteen (18) facilities averaged $35.2 K for a total repair costs of $633.5K.

Conclusion: *The average replacement cost for the ice surface slabs at $308K appears to be somewhat high based on the costs on recent projects but we would not recommend reducing this estimated value. Some facilities may require underslab heating or drainage which could increase the costs to this range. The average cost of $35.2K resulting from the eighteen (18) facility life cycle costing would be an appropriate average for extrapolation..*

2.3 BUILDING ENVELOPE

Roofs are certainly the larger element accounting for 49% of all remediation tasks required in the building envelope in the ten year period. It pertains to 83% of facilities and ranges in valuation from 4K to $236K with many typically being in the range of 85K to 95K. Because of the complexity of the roof assembly deficiencies and the variations used by the consultants in categorizing these deficiencies our review had to undertake some detailed review of this item.

First a differentiation between the structural elements and deck membrane was done by separating them out as it was felt to be important to recognize the specific problems that exist to be able to decide on what might be a normal condition in the remaining provincial arenas. Also some audits show relatively low cost repairs of application of an exterior sealant coat that would extend life by only a few years and was meant as a stop-gap measure until funds were available to complete the eventual membrane replacement. Also with insulation improvements being a big issue, both from an energy reduction and humidity control aspect, the roof replacement task can integrate that into the work scope whilst the exterior coating alone cannot achieve these adjunct outcomes.

Also whether because of delaying these roof repairs for budgetary reasons or because of 80% of the audited buildings being between 25 and 35 years of age, there is certainly a critical mass requiring full fledged replacement. It is therefore proposed that the average from the audits (ie $62K) is in fact low and $85K is recommended as being the low end of a typical roof membrane replacement . Generally the existent state of deterioration requires this work within the first five years. Failure to take corrective action reduces insulation integrity thereby impacting energy usage and more importantly impacting on structural integrity and even ice quality.

Doors and hardware were in fact the second largest cost deficiency at $31.7K on average and universally applicable to all audited arenas. The range of expenditures were broad from a few thousand to $124.8K however then highest grouping was in the mid teens and a few scattered at the 30K and 60K range. It is recognized that doors take a lot of usage and abuse and have a lifespan at only about 15 years so there is no reason to assume any valuation lower than the average these audits generated.

Wall systems were the third high needs group with an average cost allocation of $22.8K and listed on 89% of the audit results The majority of these arenas are steel siding although a few have portions of wood, bricktile, or brick/stone veneer. Steel tends to be aged , showing areas of deterioration, and exhibiting localized areas of failure but most audits judge it to be capable of limping along for another ten years life with some localized repairs and repainting. This would account for the eight facilities at cost estimates below $10K. So the average paint cost estimate of $7K is really largely a requirement of the wall system.

Windows were found to be in need of major repairs or replacement in 55% of the audited facilities at an average cost of $2.4K.. This budget item was typically from a few hundred to 10K. Many facilities are in their second generation (or even greater) of windows. Vinyl replacements may have a better record in terms of weathering albeit equally prone to other forms of damage to be expected in high use areas.

Conclusion: *Roofs are a major item as many require full membrane replacement and added insulation and some structural refurbishment in the process. Just for the deck membrane replacement an average budget allocation of $90K is recommended which as noted above is believed to be warranted based on review of the presented audit information and the knowledge that most buildings are 25 to 35 years of service. Most facilities require exterior cladding attention with the minimal being painting; however in about 40% of the aged buildings there is also some need of wall repair and localized replacement. An average of $ 28K includes the painting and replacement expectation ratios. Door and hardware will continue to be high maintenance and short life cycle and the eighteen audit average of $31.7K is suggested to be the norm. Windows, some foundation wall issues, and exterior stairs etc would require an additional $8K. Considering the age of most NS arenas the recommended total average of $157.7K for the exterior envelope is put forth which certainly exceeds the $126.9K indicated by the audit report*

averaging. However considering the average age of the typical facility it is warranted in the opinion of this reports authors.

2.4 BUILDING INTERIOR

This is a huge cost item in the average arena as it includes not only the interior building fin ish but also the ice surface, boards & glass, stands, change rooms, and washrooms. Three elements have been at play in regards to the ice and environs;

i) the deterioration of the components elements due to age and in some instances poor underdrainage causing frost heave.
ii) the fact that many are not in compliance with ice surface sizes (NHL being the preference)
iii) safety issues arising from non-compliant glass heights.

This category of elements results in an average ten year life cycle of almost $173K with a wide range from $13K (New Glasgow which recently had its ice surface replaced) to $556K (Bridgewater). The single largest component, Boards & Glass at $35.2K, is very much predictable due to the fact that 83% of facilities were identified as requiring it. Rehabilitations of recent years have certainly employed this upgrade for safety purposes and the average cost indicated is indeed relevant for the remaining provincial arenas.

The next highest areas of predicted expenditure were Change rooms ($25.9K) which along with associated washrooms($11.2) upgrades had significant impact on required budgets. Ceilings ($17.2K), mezzanines($12K) and other building layout renovations ($11.9K), canteens($9.3) floors($9.1K), walls ($8.1K), floor coverings ($6.3K), seats & grandstands ($6.1K), and doors & hardware($5.2)K round out the other greater than a thousand dollar areas of expenditure. Painting averaged just over $18K per facility based on 10 out of 18 having this requirement with a range of $1.6K to 147K with most in the teens.

Conclusion: *The eighteen audited facilities are believed to reflect the average age and condition of building interior category for arenas. With eighteen properties having been audited out of seventy seven, this average ten year cost estimate of $173K should be considered statistically correct. Much of this constitutes a combination of rehabilitation, code compliance, as well as upgrades to change rooms, canteens, mezzanines, and washrooms. However making facilities current to the users needs is very much a requirement as the 35 year old infrastructure with many small changes perhaps made over the years eventually requires a more substantial upgrade. When some required high priority tasks are recommended it makes sense to incorporate these broader upgrades at the same time to optimize capital costs and minimize facility down time and inconvenience to the patrons.*

2.5 LIFE SAFETY and FIRE PROTECTION

Many of the audits breakout fire protection as a separate mechanical grouping but for purposes of this review study it was combined within this category for consistency. Only two of the eighteen arenas audited required investment of $125K each for new systems and less than half required minor changes. These relatively good system conditions are probably the result of diligent fire marshal inspections resulting in appropriate and timely attention by owners. The average cost allocated to the four or so fire protection system sub-groups amounts to $15.6K on average.

Fire and smoke detector systems and fire alarm systems also tend to have deficiencies captured by annual compliance inspections or Fire marshal site visits which tend to capture any deficiencies. The resultant average valuation of $5.95K is therefore for upgrades and some component replacement. Emergency Lighting tended to be a fairly high cost item averaging $3.1K however this is not surprising in context of the many lighting deficiencies noted in the subsequent electrical discussion.

Surprisingly fire separation($6.5K ave) and fire stopping ($8.1K ave) shortcomings were substantial in nature in a very few locations but with costs of about $45K created a considerable impact on average. There is no reason to believe that this occurrence ratio is not statistically representative of the whole population so it should also be included in creating an average for non-audited facilities. Fire extinguishers and emergency breathing apparatus added an additional $1.32K to the average.

Conclusion: *The average generated by the eighteen facility audit appears to be statistically and factually representative. Although only two sprinkler systems are identified as requiring $125K each for major refurbishment, the future may hold a greater proportion of this as over half of the audited facilities will be approaching the 45 year life span. This can be considered typical in this more humid environment. Therefore it is proposed that the audit resultant average of $38.9K be increased by assuming 20% of total facilities will require complete refurbishment versus the 11% evident in these audits. This would add 13.5K to the average with the recommended resultant ten year budget of $52.4K.*

2.6 BARRIER FREE ACCESS

Some facility audits combined aspects of this into their exterior and interior categories when they were part of other required changes. For those specifically identified as being in this category the total average was $3.3K per facility as only seven of the eighteen had any assigned tasks. This is not surprising as many facilities would in the past ten years have already undertaken this compliance activity. In fact some of those requiring deficiency improvements such as missing visible strobe lights ,in addition to audible alarm annunciation, would already have undertaken the basic conversions and upgrades. Others that had completed barrier free access ramps, conversion of washrooms, and mezzanine access would not always have addressed parking

issues.

Conclusion: *Because such a large percentage of facilities were already in compliance. or almost there in a majority of items, this category is generally at the maintenance stage and/or requiring some improvements in areas previously missed. This should generally be considered as the norm in the unaudited remaining arenas in the province. The predicted life cycle ten year cost average of about $3.5K is therefore concluded as being reasonable.*

2.7 MECHANICAL SYSTEMS

2.7.1 Heating System

Space heating is generally electric since heated areas are typically minimal and spread throughout each facility. Hedonic systems are more difficult to operate with minimal savings to be had by centralizing the heat source. Fourteen of 18 arenas (78%) sampled need significant heating repairs/upgrades typically under $30 K for community arenas. Sydney's Centre 200 listed a cost of $150K for near future heating upgrades which could skew the average significantly. When considering community arenas only, the average budget per arena is about $11.5 K. Factoring in Sydney the average nearly doubles to $21.75K.

Recommendations: *Failures of heating system equipment are generally an annoyance with little impact on operations, since the heating is generally decentralized and relatively simple to maintain. No components are considered critical or long delivery items. A reasonable budget per arena, based on above figures, is about $12 K.*

2.7.2 Ventilation

Ventilation is more critical to reliable operation as failures could impact the operation significantly. Equipment included in this category are items such as general exhaust fans, air handling units, and air exchangers. All eighteen facilities reviewed had significant near term costs associated with ventilation ranging from as low as $2 K to $145 K for Sydney's Centre 200. Chester also listed relatively high ventilation costs at about $100 K. Except for Sydney and Chester the remaining arenas had generally listed costs at under $23 K. Average costs with Sydney included are about $21 K. Removing the data for Sydney, the average reduces significantly to $13.8 K.

Recommendations: *Ventilation system components can range from an annoyance to shut down of the arena operations for the more critical items. Maintenance and upgrade are certainly less critical than ice plant equipment. Some components can be subject to long delivery and therefore have significant impact on overall operation. The Sydney Centre 200 data would pertain to several other large complexes existent (ie including the Metro Centre) and are not an anomaly. It is suggested that the average be adjusted by an additional $5K for these few large facilities that are*

heading into their higher maintenance portion of their life cycle. The recommended budget figure of $19 K per arena is therefore put forth as reasonable.

2.7.3 Dehumidifiers

Dehumidification can have significant impact on operations during transition weather - high humidity and high outdoor temperature. Problems occur generally during large events with high humidity loads in the building and can result in cancellation or delays of events.

Dehumidification was identified as a near term repair/replace item in seven of 18 (39%) arena facilities. This equipment has a relatively short life span of about 15 years. Costs were predicted at $6 K to $36 K. Average costs were calculated to be $24.5K per arena. Five of 18 arenas do not have any dehumidification and tend to be located in the smaller communities. Those that did not list costs in the next ten years did however show significant costs in the 10 to 15 year period with a similar average.

Recommendations: *With the relatively large effect of equipment malfunction during critical times the budget should be at least the average shown above. Consideration should be given to those arenas with no dehumidification, i.e. new equipment purchases. Based on the above figures and comments, a budget figure of $25 K per arena should be adequate assuming 75% of the facilities have dehumidification equipment.*

2.7.4 Controls & Energy Management Systems (EMS)

This category includes controls and EMS for all mechanical systems (except ice plant) - ventilation, heating, dehumidification and to a lesser extent plumbing. Eleven of 18 facilities (61%) identified near term expenditures for this category. Costs ranged from a low of $2 K to $35 K. Average costs were $8.75 K when including the relatively high costs for Sydney. If Sydney is removed from the group, then average costs reduce to about $6 K. Nine of 11 facilities predicted costs of under $7 K.

Recommendations: *Historically controls and EMS for various mechanical equipment is relatively simplistic and there are potentially large savings to be had with investments in this category. Managing electrical space heating alone could reduce demand and energy costs in any arena. Staging large loads can also reduce demand charges, which are significant in each facility. Minimum budgets of $6 K should be made available however, to upgrade controls/EMS and make a significant impact on energy and demand cost, a more realistic overall average figure would be in the range of $13 K per facility.*

2.7.5 Refrigeration Plant

Four major categories were considered - Brine Systems, Control Systems, Heat Recovery Systems,

and the Ice Plant. Heat recovery is considered less critical to the overall reliability but must be maintained to reduce energy operating costs of each facility.

Only three of 18 facilities show near term costs associated with heat recovery. The range of expected costs was $10 K to $15 K with an average of $13 K.

Brine system costs were identified in thirteen of 18 facilities (72%). Range was determined to be as low as $1 K to a high of $35 K and average costs were calculated to be $12.5 K. These costs are primarily related to valves, pumps and headers. The remainder of the system, in ground tubes, are relatively long lived.

Control system costs were identified for 50% of the facilities at an average cost of $14.5 K. There are potentially large savings in power and demand if these controls are upgraded.

Ice plant equipment is perhaps the highest cost mechanical item at an average of $90 K for all eighteen facilities examined. Costs range widely from the samples starting at a low of $9 K up to a high of $175 K. This category includes large and costly equipment such as compressors, motors, chillers, and cooling towers. This equipment is as critical as the brine system. Without a reliable ice plant the ice surface will not be consistent and suitable for use.

Recommendations: *The ice plant and associated equipment are key to reliable operation. Upgrades to existing equipment and controls should be considered to reduce operating and energy costs. Average costs were found to be $90 K and all facilities examined were found to need some budget for near future upgrades.*

2.7.6 Plumbing and DHW Systems

Plumbing systems generally consist of the conventional sewage and domestic water supplies, however this category also includes the ice surface flooding water equipment. The flooding water equipment is the higher energy user whereas domestic hot water is somewhat lower and less critical to overall arena operation. Without consistent flooding water, the ice surface will quickly degrade beyond use.

Flooding and domestic hot water storage tanks have a relatively short life span of about ten years due to high usage. Fourteen of 18 arenas identified storage tanks as a near term upgrade. Costs to upgrade are relatively low at $4 K.

Fixtures repair and upgrade is another significant expense associated arena operation. Fixtures were identified as in thirteen of 18 arenas sampled. Costs ranged widely from $1 K to $75 K. Average costs were relatively low at $17 K.

Other equipment considered were circulating pumps, fuel storage, general piping and valves, pipe insulation and well pumps/pressure tanks.

Recommendations: *Overall average budget per arena for all plumbing equipment listed above is about $32 K.*

2.8 ELECTRICAL SYSTEMS

The range of electrical task identified in the 18 audited facilities was from 1.35K to $91.42K with an average of 48,52K for the ten years period following the report. Generally most electrical equipment is able to last for 25 to 30 years and possibly even 35 years. The most common electrical related items that do not have a life expectancy of 35 years are:

1) ***Dehumidifiers:*** May of the smaller rinks do not have dehumidification at all and most of the ones that were so equipped used two CIMCO Humicon units located at diagonally opposite ends of the arena. These are usually rated 15 KW, 600 Volt unit with a 15 hp compressor, and 1 ½ hp for fan motor along with drain line heaters so that the total load for two units is in the vicinity of 40KW. These usually require repair at a cost of about $8500.00 each, or complete replacement at a cost of $14,000.00 each. The larger arenas like Center 2000 have been designed with dehumidification as part of their HVAC systems.

   Also we have been informed that some of the arenas are considering installing a central dissicant type dehumidification system to replace their Humicon units. This type of system would cost $90K to $100K to install which would normally be propane fueled and be supplied under mechanical equipment. We mention this here because some of the arenas do not have a large enough service to support the additional load for the Humicon (electrical) powered units.

2) ***Compressors:*** The average life of a compressor is about 12 years and they cost about $10,000 to rewind the motors and/or to repair the compressor itself.

3) ***Lighting:*** Several of the older arenas have outdated mercury vapor lighting fixtures over the ice area which need to be replaced; most feature metal halide lighting fixtures and some of those are rather old. Whenever these are to be replaced consideration should be given to the use of pulse start metal halide lamped fixtures and ballasts as their lumen (light) out put is 10% higher initially and their mean lumens approximately 35% higher which means that the lumen output does not drop off and tends to remain relatively constant , over 80% of the life of the lamp. When extinguished they restrike faster and have a 50% longer life expectancy.

Television cameras are being used in several arenas for broadcasting and require 850 lux on the vertical (players or performers) and 1250 lux on the (horizontal) ice surface for best results. This can be achieved most easily by a combination of side mounted light fixtures and suspended ones over the ice surface such as in the New Glasgow Stadium with the side mounted ones contributing about 50% of the total illumination at ice surface and 70% on the vertical. One other consideration is to provide motorized shields over the side mounted ones to provide 99% dimming when the over ice ones are off, thus allowing for the use of Trooper spot lights for ice shows for the larger arenas as opposed to dimming/ballasts on the (over ice) fixtures.

It was also noted that most of the arenas had not made the change from T12 fluorescent lamps and (standard) ballasts, to T8 lamps and electronic ballasts which are about 40% more energy efficient with a pay back period of 5 years. Consequently if the fluorescent fixtures are to be replaced they should be replaced with new T8 lamped fixtures with electronic ballasts in order to reduce energy consumption.

Exterior lighting, although not noted in the audit reports, is suggested by this author as being a deficiency in many area parking lots which should be addressed for safety reasons. Predicted costs would be between $3.5K to 10K depending on coverage area, but an average of $7K should be considered adequate.

Other Considerations

Several arenas have two and sometimes three electric services to a building, each being metered separately and each with a unique service charge although in such cases there is usually no Kw demand charge applied. We do not feel that N.S. Power Inc. will allow this practice to continue much longer and will probably require one service entrance and one demand meter which will have a single service charge along with a demand charge at a certain rate. Also in the event of a fire the main switch disconnects the entire building from one power source at one voltage which is a safer system. It may also reduce the overall electric bill due to the diversity between the various loads.

One recurring annual cost involves a fire alarm inspection required CAN-4-S536 Periodic Testing Standard, and it involves a $900.00 to $1500.00 yearly cost; this together with the cost of total lamp replacement in any year could amount to a $5K expenditure assuming that no other major maintenance was required for that year.

Conclusion: *The ten year period average figure of $48.5K quoted above would appear to be realistic. The potential future lighting upgrades at $30K expenditure are not assumed to be at a frequency warranting consideration. A $7K allowance for exterior lighting improvements to parking lot areas is however recommended. Dehumidification electrical provision would be an additional $28K for any of the smaller size arenas that wish to improve conditions in early*

Autumn or the late Winter or early Spring months. In the larger arenas it would probably be undertaken as a mechanical system upgrade, and be propane fired , which would free up some electrical capacity for other use. Including the exterior lighting but not any change from historic relamping in the interior and assuming dehumidification electrical in future required $5K would result in an average allocation of $60.5K.

2.9 ENERGY AND ENVIRONMENTAL REVIEW

As a general practice any equipment when replaced is more energy efficient. Energy management through DDC system control and scheduling have been investments undertaken by many facilities. However only a few facilities have heat recovery with the ice plant and HVAC systems generally not interfacing energy efficiently. Lighting is one area where the advantages of lower energy consumption and longer lamp/ballast life are recognized. It has been costed in the electrical items.

Ventilation continues to be a major problem with many dressing rooms, washrooms, and canteens needing upgrades but that has been costed in the mechanical section. Dehumidification as discussed in previous mechanical / electrical sections is a feature that is on the increase in facilities extending their season as well as dictated by multiuse requirements (ie hosting curling events for example) .

Conclusion: *The audit reports had no allocations specific to this category however included it within the mechanical and electrical reviews and recommendations tasks.. It is predicted that more attention to these aspects or merely installing and maintaining the building energy management systems that are becoming more common place will result in expenditures in the order of $5K per facility.*

Arenas Summary of costs

Category	Ten year cost ($2005 present worth)
Grounds & Services	$27K
Structural	$57.90K
Building Envelope (Exterior)	$157.7K
Building Interior	$173K
Life Safety & Fire Protection	$52.4K
Barrier Free Access	$3.5K
Mechanical Systems	$191K

Electrical Systems	$60.5K
Energy and Environmental	$5K
Total per facility	**$728.0K**

3.0 CURLING RINK FACILITY AUDIT SUMMARY

Of the 36 facilities in the province several are new facilities that were constructed in the past dozen years (Highlander, Clare, Shelburne, Lakeshore & Baddeck to name a few). Most facilities are however of much older vintage as there was little construction in the previous decade. Another factor is that the total number of sheets of ice in a given facility tends to reflect the small community size and that many of these facilities were constructed with volunteer effort and to meet minimal standards of the day. Three rinks have only 2 sheets, nine have 3 sheets, 18 have 4, two have 5, and three have 6 sheets. Competitive events leading to Provincial Championships generally require a minimum of four sheets to successfully host the required teams thus eliminating one third of the NS facilities from this standard of performance. However the competitive element is one factor and the recreational element involving over 6800 regular league members on at least a once per week outing paints a better picture of facility use. Needless to say, in spite of NS having advanced national and even world champions in the past few years this momentum is leading to more clubs putting in ice during the late summer or earlier in the fall for youth camps and elite curler training (Mayflower and Lakeshore in 2005) particularly as the Olympic trials are hosted in this province this year and the preparation for the 2007 winter games commence. This puts considerable more load on refrigeration plants and many facilities would not be able to sustain any warm weather operation.

Although only two audit reports were initially forwarded (Bridgewater and Chedabucto) the addition of Lunenburg's document completed by CJMacLellan in early 2004 helped bring the percentage up to almost 8.5% . Considering the Shelburne and Highlander pre-design and final construction information also available with this consultant, brought the percentage up to almost 14% of all facilities which makes the subsequent generalizations slightly more statistically representative in discussing the norm.

3.1 GROUNDS AND SERVICES

Grading and Drainage, Paving and Surfacing, and miscellaneous Site Services were not identified with deficiencies in any of the three studies. The writer from personal experience and site visits to at least 24 of the 35 NS curling facilities would dispute that this is indeed the case. Most have gravelled parking lots that have pothole entrances and areas prone to flooding around their building at the parking lot interface. These deficiencies are however more of a nuisance factor to patrons and not of a critical nature so with cost restraints and limited budgets these

areas tend to be omitted in annual maintenance considerations. As a Regional Director of the Nova Scotia Curling Association (NSCA) and a six year Board member of the Highlander Curling Club, one of the authors of this report (Harry Daemen, P.Eng.) can attest however that facility users do complain of these deficiencies and it likely does reduce membership slightly as they expect the approach appearance and roadway/parking to reflect a well maintained facility. The Highlander had to spend about $3500 four years ago for drainage improvements and adding gravel to portions of the lane and parking lot.

Capacity of parking is also limited at most curling rinks that are not affixed to arenas with shared parking. Mayflower, Halifax, Dartmouth, Truro, and Bridgewater are several examples where adjoining properties or streetside parking is required when bonspiels are held. Certainly any event that might attract spectators would be a challenge and this would be a deterrent to new inductees to the sport. It also poses a life safety issue in getting children and senior users into the facility as street crossings or letting passengers off on busy streets may be required. Children in particular tend to rush to the intended facility and may fail to be as diligent in safe crossing practices; conversely their parents are often preoccupied with negotiating a suitable parking location and also may be more lax in guiding them safely to their destination.

Municipally supplied water supplies are frequently not of the quality required for good ice surface requirements. Locations such as Liverpool have chronic quality deficiencies that even JetIce deionization systems can correct cost effectively. Most facilities utilize JetIce treatment which is leased and costs about $2K per annum.

Some rural facilities have on site wastewater disposal which, as noted in the Chedabucto report, do require septic tank pumping on five year intervals and as in their case refurbishment of the septic tank which was done after 30 years.

Conclusion: *Existing facilities should assume an allocation of about $5000 in each five year interval for access and parking refurbishment (ie $10K in ten years). Some of the parking space restraints that exist at about 15% of NS curling rinks will likely require capital infrastructure if the capacity to grow is to improve at those clubs. Costs would be in the order of $15K assuming land acquisition were possible so $2.25K should be allotted on average. Facilities with on site water and wastewater treatment services should allocate about $10K per ten year period. Since about 50% utilize water deionization equipment (JetIce systems) on average $6K should be allocated.*

3.2 BUILDING STRUCTURE

Foundations are a noted deficiency in the Bridgewater audit and the Chedbucto(Bolyston) facility having sand base rather than concrete floor slab has led to high flood water from the adjoining brook having lifter the curling surface causing considerable loss of curling opportunity

while corrective action was taken. There are still a number of sand surface rinks left in the province however their numbers are diminishing as most clubs recognize the advantages of concrete surfaces and even pre-painted markings. Pictou and Brookfield have in recent years undertaken floor slab replacements. The three sheet Highlander as an example, invested $6500 to provide most circle and lines and the background white pre-painted in a resilient epoxy product thereby reducing annual paining at about $800 while also avoiding the spring environmental impact of tainted drainage water on de-icing. More importantly this improvement has shaved six days (ie 50%) off their volunteer effort to put in ice in early October. With an ever decreasing volunteer base this is a significant factor as well as resulting in a $55/day savings in compressor costs generated by the later start date.

Gleaned from the audit reports, both Lunenburg and Bridgewater had substantial roof truss assembly deterioration in addition to the membrane replacement requirements. The structural portion of the roof assembly had an immediate to near term (ie <5 years) remaining life in 66% of the sampled facilities that were older than 25 years. The capital cost estimates were also in the order of $30K which represented from 15 to 25% of the total 10 year window projected refurbishing budget. Even newer facilities such as the Highlander with narrower 50 foot span wood truss system and asphalt roof had to manually shovel excessive snow loads from the roof during high snowfall years as the normal melting which occurs on residential facilities does not occur above ice sheds maintained at a temperature of 0C. Even some of the attached structures adjoining arenas have experienced heavier than predicted snow loadings which if not pressing the structural design capacity does result in ice dams and frequent leakage at the interconnecting flashing.

Conclusion: *Roof Assemblies tend to have a lower than normal life expectancy due to a number of factors which cause moisture ingress and snow loading . Although a few have already been identified with critical shortcomings one would expect the findings of the Dalhousie Engineering school study of two dozen facilities to indicate a significant future requirement. Considering that two thirds of facilities are eligible based on age of the structure an average allocation of $20K/rink in the ten year period would be appropriate .*

Also a significant history of crawl space floor assembly deterioration exists due to inadequate ventilation. Many corrections have already been made but as a generalization $3K per facility should be allocated for this reports action time frame.

Foundation drainage, remaining sand based rink conversions to concrete, and permanent ice surface epoxy painting (for reduced volunteer effort and environmental impact of used paint disposal) are anticipated to result in an average $6K per facility in the ten year expenditure program.

3.3 BUILDING ENVELOPE (Exterior)

This category was the largest cost component amounting to 32% of the ten year allocations (see pie chart in appendix "C"). Steel siding frequently used in a majority of these rinks, albeit aged and in many cases no longer very esthetically appealing, in most instance was deemed to be capable of another ten years life with some general maintenance and painting. Windows and doors & hardware were in all the audited facilities found to be in need of major repairs or replacement. There are generally very few windows in Curling facilities other than the lounge and adjunct washrooms, locker rooms, and kitchens. Doors both to the lobby and for ice shed egress were more significant . As a budget item the average was typically wide ranging (2K to 13K) which represents between 1 and 7% of the total estimate ten year budget commitment but would be a more substantial (ie 18%) on average of the exterior envelope costs.

Roofs are certainly the larger element in exterior envelope refurbishing estimated costs for facilities over 25 years of service. The membrane replacement represented about a $20K/sheet impact or about 25 to 65% of the overall ten year commitment budgets . Generally they are in a state of deterioration that this work is required within the first five years. Failure to take corrective action reduces insulation integrity thereby impacting energy usage and more importantly impacting on ice quality. In recent memory tournaments leading to provincial junior championships were impacted at the Stellar and Liverpool clubs as ice quality was affected by leak penetration. These are merely immediate inconveniences; the larger culprit being the corrosion of the structural roof assembly and supporting columns.

Conclusion: *Many of the facilities will require exterior cladding attention with the minimal being painting but in about 25% of the aged building also some wall repair and replacement. Although windows are minimally used in curling rinks they tend to age quickly in older building where vinyl products were not yet used. Their deterioration also often led to ingress of moisture into the wall cavity causing more extensive repairs. Doors appear to suffer from premature life spans approaching as low as 15 years. Roof membrane replacement can be anticipated on about 20% of the buildings at an average cost of $60K. Based on the three audited buildings the building exterior envelope averaged $60K for the 10 year period. Considering the age of most NS curling rinks, this would be expected to occur in about 75% of the facilities so a minimum of $45K should be allotted.*

3.4 BUILDING INTERIOR

The building interior category was a close second (16%) to the ice plant (15%) as demanding rehabilitation tasks in the ten year budgets. Floors (not including ice surface) was the major single element in this (Building Interior)category; both in places of assembly and on walkways aside the ice surface. This involves both underlayment and covering material replacement. Of the clubs over 25 years in operation 67% had requirements in this area ranging between $10K and $28K which represent between 4% and 21% of the total ten year estimated expenditures.

Even in newer facilities such as Shelburne and Highlander they had floor covering replacements in under six years in high traffic areas and this also impacted in high annual O&M budgets.

Washroom fixtures, furnishings, and interior finish although having a longer life cycle are prone to both aging and vandalism. There were significant deficiencies existing on 33% of older than 25 year facilities, which certainly had a dramatic financial impact in the year when refurbishment was required. In the case of Chedabucto its impact on this small two sheet rink was $37K (ie 26% of the ten year budgetary commitment).

Interior painting ,although a high frequency occurrence, is amenable to volunteer effort and generally costs less than $1000 every four or so years.

Conclusion: *The three audited facilities cost estimates averaged $29K in the building interior category over the first ten year period. While these audited buildings average 46 years life and thus do not reflect the average condition they certainly represent approximately a third of the facilities. Considering that the remaining are in most instances beyond 25 years it would not be unreasonable to allocate $25K on average age to cover the next ten year period.*

3.5 LIFE SAFETY & FIRE PREVENTION

Many of the two and three sheet rinks do not have fire sprinkler systems as they manage to be smaller than the base footprint requirement by code and they have single story lounges/washroom common areas. Also in many instances they are located in unserviced villages or rural locations away from municipal water supplies with the requisite fire fighting flow capacity.

They do however generally comply with fire and smoke detector systems and fire alarm systems with auto-dial alarming systems. Annual Fire Marshall inspections tend to capture any deficiencies and most aged facilities have requirements for modifications to emergency egress doorways from the ice shed. Of the three audited facilities one required expenditures of under $4500 to correct air compressor (for dry system charging) and exit and emergency lighting. Albeit being an urgent requirement to remedy, this was relatively inexpensive at just under 2% of the total ten year estimated expenditures.

Where dry fire protection systems do exist air compressors and some valving/controls tend to need replacement at about a 15 year life span . Lunenburg was recommended at around $2500 and Bridgewater just had a replacement a year prior to the report at $600. Existing piping and sprinkler heads at the two equipped rinks audited (Bridgewater & Lunenburg) were in 40 and 28 years respectively in service. The dehumidified atmosphere external to the piping in curling rinks so equipped would likely explain this longevity. Replacement however when required was estimated at $192K for the Lunenburg four sheet facility at age 50 years. Shelburne extended

from the adjacent arena into their three rink facility at a cost of about $28K in 1999 which would be $32K in present day dollars.

Conclusion: *Allow about $4000 on a 15 year frequency for air compressor and control valve rehabilitation (ie $3K for 10 year window). Also assume that between 40 and 50 years service life can be expected on the sprinkler system and assume on average $10K plus 8K per sheet for refurbishment. Thus with a about a third of the facilities approaching the life expectancy and on average being four sheets the allocation should be $17K for the ten year upcoming timeframe.*

3.6 BARRIER FREE ACCESS

Although generally every facility constructed beyond 10 years ago has deficiencies in this regard, many have already made the renovations required to at least provide barrier free access to the common spaces. Access to the ice surface is generally not as compliant. Out of the three rinks audited two were identified as requiring upgrades; in the case of Chedabucto the washroom to barrier free conversion was included within the $30K *interior* renovation . The Bridgewater capital cost of just over $6000 represents just under 4% of the full ten year refurbishment program budget. Of the other two rinks included in this analysis in addition to those audited, the Highlander added their exterior access ramp when an addition was added eight years ago. Washrooms were fully compliant from the facilities initial construction in 1992. The new curling facility added to the arena in Shelburrne was constructed in full compliance.

Recommendation: *On average assume 50% of facilities over 15 years old are still in need of expenditures. Allow on average $6000 to achieve Barrier Free Access compliance. This should be considered for expenditure in the first five years of the ten year time frame.*

3.7 MECHANICAL SYSTEMS

The mechanical processes generally added significantly to the life cycle costs for the first ten year window with all three audited properties having significant requirements (28%, 7%, & 56% respectively of overall budget requirements) with an average facility budget of $35.3K. Most mechanical equipment actually has considerable predicted life spans with DHW heaters being an exception at 10-12 years and exhaust fans, brine pumps, chillers, and condenser units often being in the 15 year range. Other major items typically achieve a 25 to 35 year service life if properly maintained with minimal routine maintenance. The Chedabucto ice plant which is identified as a major expense in their 2002 audit was in fact 38 years old and still functioning. However considering that a failure would render the chilling plant out of service for two to three months resulted in the urgency to replacement .

HVAC averaged $19.1K with a broad range of $7K to $42K with the heating plant and

dehumidification needing upgrade in 67% of those audited. Interestingly the relatively new (ie 13 year old) Highlander already had to undertake dehumidification and ventilation improvements to arrest problems of dripping from ceilings and moisture accumulation in the attic. This phenomenon occurs at many curling rinks as the maritime winter with several mild periods per season frequently reverses the warm/cold side conditions. It has been known to cause moisture accumulation in attic insulation in several facilities, thereby making attic space air exchange rates a critical component in arresting structure damage therefrom. Proper ventilation of any crawl spaces is also a common problem and both Lunenburg and Chedabucto had floor joist and sub-flooring deterioration noted as outcomes from lack of proper Ventilation.

Plumbing ranged between $0.53K to 11.7K with an average of all three facilities of $6.4K and the DHW tankage, sump pumps, and washroom fixtures accounting for three quarter of that budget commitment.

The refrigeration systems were the most deteriorated of mechanical sub-systems with numerous deficiencies noted at all three audited facilities. Major ice plant component replacement accounted for 46% of total ten year expenditures for the small two sheet Chedabucto facility. Condensers, Brine system and controls were other singularly large capital items in another amounting to 17% of that rinks total. The average ice plant predicted expenditures was estimated at $26.5K. Even a relatively new plant such as that in the Highlander has experienced repair requirements to brine manifold tubing fittings and required condenser refrigerant replacement after a leak repair.

Conclusion: *The mechanical subgroup deficiencies for the three audited facilities averaging $33.1K in the first five year window and $18.4K in the next five. Although many facilities appear to have dealt with HVAC deficiencies in recent times the plumbing components including frequent DHW heater and fixture replacement continue to exist. Most importantly the ice plant components are generally exceeding their predicted life at the audited facilities with replacements being piecemeal on a last minute basis. This jeopardizes the ability to run the facility for its purposes and with replacement time being months for some components it could impact a major portion of a season. The anticipation that there will be an increase in this category for many clubs, leads to the recommendation to take the above audited average total of $51.5 in the ten year period as quite plausible.*

3.8 ELECTRICAL SYSTEMS

The range of electrical tasks identified in the three audited facilities was from 7.4K to $56.5K with an average of 24.9K for the ten year period following the report. This number would have been higher except one facility (Bridgewater) had its services (3 phase and single phase) replace in 1995 (40 year life). Most equipment (other than lights) is quite robust and is judged to have at least a 35 year life expectancy when installed in protected environments. Lunenburg had equipment of longer service life with original manufacturers no longer existing for spare parts

and a metering system out of compliance. Its three service entrances being contrary to portions of the electrical code and posing a life safety issue made this a priority and expensive deficiency costed in the first five year period. This is not an expense that is envisioned in most facilities.

General issues of access space in front of panels; overloaded circuits created by additions of equipment over the years, and inadequate receptacle allocation were universal in the three older facilities audited. Costs varied greatly with a low of 3K and a high of $43K. However in the latter a major item was receptacle upgrade and increased coverage to achieve code spacing in a 57 year old building which in itself was estimated at $20K. This is likely not to be considered a norm and $8000 for these upgrades may be more of an average. Light fixture deterioration in humid environments, particularly ballasts, and relamping also tended to be a significant expenditure to an average of just under $5K per facility.

Fire Alarm panel requirement was identified in one instance while the other two had routine maintenance, annual inspection/testing, and component failure allocations resulting in a cost estimate range of $750 to of $4.2K; Over the ten year period this could be expected to result in an average in the order of $8K.

More recent facilities such as the Highlander (1992) and Shelburne (1999) that were constructed to code have of course lesser deficiencies in the electrical categories. Fire alarm, security, auto door entrance systems, and lighting do however pose a more than average annual cost so even for the 15% of facilities of newer vintage the ten year costs would likely still be in the order of $10K. Controls for humidification and brine circulation systems as well as the refrigeration system tend to have a lifespan similar to the mechanical equipment and would likely incur about $6k on a 15 to 20 year basis. An allocation of say $4K on average for the first ten year window is appropriate.

Conclusions: *Because of the aged state of the three audited facilities, some adjustments have been made after reference to the two newer facilities of which the consultant was knowledgeable. Never-the-less average allocations for the ten year window should be service/distribution ($7K); lighting ($5K); receptacles($6K); fire alarm, public address, & security systems ($5K); controls ($4k); and power to large equipment when upgraded ($3K). This totals to a predicted average for electrical of $23.7K for the next ten year window. This compares reasonably with the $24.9K average for the three audited facilities, one of which had extraordinary conditions due to an outdated service.*

3.9 ENERGY AND ENVIRONMENTAL REVIEW

Most equipment when replaced is more energy efficient. Heat recovery is being considered in some instances however for most facilities the ice plant and associated ice shed equipment is quite divorced from the “warm side of the glass” equipment in terms of HVAC. Lighting is one

area where the advantages of lower energy consumption and longer lamp/ballast life are an issue. Newer facilities are varying from the traditional flourescent lamps in favour of high-bay prismatic metal halide however conversion would only be in order on major renovations of the roof system and if height allowed.

The discharge of paint when ice is removed in the spring is becoming an item of environmental attention. Facilities that have permanent painted concrete surfaces complete with circles and most markings have found significant savings in reduced volunteer time in putting in the ice in addition to annual savings in paint such that paybacks are in the order of five years. Typical costs are $2500 per sheet.

Ventilation continues to be a major problem; several of the audited facilities had experienced floor assembly rotting due to improper crawl space ventilation while others had attic assembly and insulation moisture impacts due to inadequate venting. Facilities that inspect these locations frequently have taken remedial action in time while others suffered the full scale deterioration to where component replacement was the only recourse. Typical costs are $1500 per facility.

The advent of the total smoking ban has alleviated many an apparent ventilation inadequacy in the lounge and locker room areas. However most facilities still do not achieve adequate air exchange to meet the ASHRAE fresh air requirements when hosting large bonspiels with the attendant audience in rather compact viewing areas. Some facilities have make-up air to displace exhausts from washrooms or kitchens that is unheated.; certainly they are candidates for heat recovery ventilators (HRV). Even facilities with HRVs sized for the peak rated capacity will tend to shut them down during normal operating conditions when the slightly cooler air flow is annoying to patrons seated below diffusers or to save heating costs. Multiple speed units would be a better solution to these situations or in-line heaters to reheat uncomfort factor. Aa average cost allocation to remedy these shortfalls in even a third of facilities estimated to be experiencing current problems is in the order of $2500.

Conclusion: *The audit reports had no allocations specific to this category however within the mechanical reviews noted lack of washroom, kitchen, and locker exhausts and inadequate fresh air make-up or heating plant improvements recommended upon life cycle replacement. It is predicted that more attention to these aspects will result in expenditures in the order of $3K per facility. Alternatives to the practice of paint disposal will likely cause expenditures that, when averaged over the facilities still functioning in this fashion, would be in the order of $7K . The total recommended ten year allocation for this category is $10K per facility.*

OVERVIEW:

Summing the above predicted ten year expenditures per facility category results in the following page table of average costs:

Curling Rinks

Category	**Ten year cost ($2005)**
Grounds & Services	$ 28.2K
Structural	$ 29.0K
Building Envelope (Exterior)	$ 45K
Building Interior	$ 25K
Life Safety & Fire Protection	$ 20K
Barrier Free Access	$ 6K
Mechanical Systems	$ 51.5K
Electrical Systems	$ 23.7K
Energy and Environmental	$ 10K
Total per facility	**$238.4**

4.0 INDOOR POOL FACILITY AUDIT SUMMARY

The table in appendix "A" shows the list , location, ownership, and date of construction (not known for all) of 25 facilities in the province. These pool facilities have an average age of 29 years with the most recently built even being 16 years. Appendix "C" has a pie chart of cost distribution by category and building exterior envelope consumes about 45% of the predicted ten year life cycle cost allocation. Certainly with the high heat and moist environment, these destructive effects reduce longevity of the building envelope. Furthermore the pool inner skin is prone to chemical degradation in addition to that of the water and users. Although only two audit reports were provided (Fisheries Training in Pictou and Northside Community in Sydney Mines) the consultant's knowledge of the St. F.X University, Port Hawkesbury SAERC, NSCC Strait Campus Nautical, and New Glasgow YMCA pools through the 2005 Canada Games inventory site visits has been included in these discussions albeit not in the life cycle costing. Also design involvement with the Liscombe Lodge facility has been included so that the discussion is based more on 25% of facilities rather than 8% which should improve the reliability of the data and identification of deficiencies relevant to all NS facilities.

4.1 GROUNDS AND SERVICES

Site related deficiencies averaged 8.18K and accounted for only 1.5% of the total refurbishing life cycle budget for the first ten year period. Asphalt paving of parking areas was the single largest element in the budget and pertained to both facilities . Drainage and site grading to divert stormwater currently impacting the building foundation was also existent at both sites. Sewer manhole surcharge was a health & safety priority at one site that had $2K allocated for investigation and possible correction. Painting of fences and miscellaneous metal stands and benches was noted improvement for the Pictou site .

Based on the non-audited facilities all have adequate parking with the rather great distance to the SAERC pool from the shared municipal and school parking lots. With the addition of the new Civic center this problem has only been escalated. Water and Sewer services tend not to be a problem for most as they are on Municipal services. St.FX has on occasion suffered from raw water turbidity however the new WTP under construction should remedy that in future. Liscombe Lodge because of on-site services does have to conserve on make-up water wastage and had to install a de-chlorination system and contact tankage at considerable cost.

Conclusion: *Each facility should allocate about $5000 in each five year interval for access and parking refurbishment. Facilities with on site water and wastewater treatment services should allocate about $3K per five year period; and general site painting and improvements for Handicapped parking another $2.5K for a ten year budget of* $21K.

4.2 BUILDING STRUCTURE

The two structures housing the pools were quite dissimilar; Pictou having a structural steel frame with exposed steel roof trusses, girts , and purlins with a steel roof deck whereas Sydney Mines had wood glulam arches with wood purlins and wood decking atop. The latter's wood structural components had severe delaminations and wood checks with the suggested solution requiring an epoxy ejection repair at a high priority schedule and capital cost estimate of $55K . Sagging purlins would require tie rods at a cost of $2K. The wood decking had also seen severe life reduction by the high humidity and expansion/contraction cycling; however its cost to repair is included in the roofing tasks included in the Building (Exterior). It should be noted this facility although built in 1976, was closed from 1986 and reopened in 1992 so its effective operating life is probably a bit shorter than the 22 years between construction and when evaluated in the 1998 audit.

The Pictou building steel structure was in good condition except for some localized rusting in the pool pavilion area; Concrete masonry shear walls cracking due to differential thermal movement and structural creep was included in this project to repair overall structural shortcomings and was estimated at $20K to be done within the first five years. The supporting members of the davit training platform were however more severely corroded due to nearness to pool chlorine environment and estimated at $10K to repair.

The St.F.X., SAERC and Liscombe pool pavilions also require substantial annual maintenance to stay abreast of structural steel or wood members deterioration by the humid and corrosive atmosphere. Where masonry & concrete is employed in these facilities that impact appears to be more manageable. These three pools (used for anecdotal discussion) did not have a complete audit undertaken so the exact structural condition is not know, but needless to say would tend to suffer more reduction in component longevity then might be expected in normal building environs.

Conclusion: *Based on these two sampled facilities and also substantiated by three anecdotal referenced indoor pools, the structural components tend to experience a shorter lifespan in the range of 25 years. An average ten year cost allowance of $ 45K would appear to be quite necessary for any given facility that currently exists.*

4.3 BUILDING ENVELOPE (Exterior)

Roof integrity was an immediate problem with the timber deterioration in the Northside facility as the sagging purlins and failing deck caused stress ridges which caused premature failure of the asphalt shingles. Inadequate cavity ventilation and use of non-galvanized steel staples were two other mitigating factors leading to a major refurbishing cost estimated at $187K. Even in the case of Pictou where the roof membrane was still considered in good condition with a remaining ten year life the cleaning and flood coating and flashing repair that was deemed necessary in the near

term was estimated at $30K and the eventual roof repair in year 15 at $100K The ST.FX roof was repaired several years ago and the Liscombe lodge is still in good condition as it is under 15 years old.

Exterior cladding where steel cladding was used in combination with clay brick veneer was deemed to need only de-rust and repaint and mortar repointed to restore at costs at less than $2.5K. Facia & facade components were generally in good condition and only required on average $2K. Doors and Windows as might be expected in the warm, humid, and Chlorine laden corrosive environment are short lived components with a maximum 15 year life expectancy. An allowance averaging $4.5K was judged sufficient for the two assessed facilities.

Conclusion: *Outside of the actual pool structure the exterior envelope is the highest cost area of rehabilitation averaging $216.63K (2005 present worth) for the two facilities for the ten year post audit period. Even two of the three anecdotal evidence facilities included in extending the statistical accuracy of the review, have had exterior rehab within their first 20 years of life. Although the value of repairs is not known it supports that this is an extremely critical facility cost component due to the warm, humid, chemical laden corrosive atmosphere. There would be no reason to therefore suggest an average anything below the actual indicated for these two facilities as most indoor pool structures are of a similar vintage.*

4.4 BUILDING INTERIOR

Floors were generally concrete slab on grade finished in some areas with paint, ceramic tile, and non-skid epoxy . Northside's were considered in excellent condition at the time of the audit while Pictou's were in poor condition and in need of $43.7K of resurfacing and refurbishment.

Ceilings were the big problem at Northside with the strapped wood frame ceilings not providing the required 45 minute fire separation to the mezzanine and also lacking thermal insulation. Cost to upgrade was costed at $9.5K. Pictou had miscellaneous T bar ceiling that needed areas of repair as well as the areas of discoloration in the main pool area applied cellulose acoustic sparay-on treatment which was to be analyzed for bacterial growth potential. Total cost expenditure was estimated at under $3k assuming no major effort on the pool ceiling.

Walls were generally in need of only minor attention as both facilities had recently been stained/painted. Ceramic tile base was generally poor in the pool area. The average of $1.85 is therefore likely understated for the average facility**.**

Doors and hardware at one facility were generally worn out in high traffic areas and even steel frames rusting. Hardware although recently replaced was short lived as not appropriate quality materials for the corrosive humid environment in the pool and shower access areas. A cost estimate of almost $15K was required to refurbish .

Locker room equipment also tends to be of shorter life span because of the environment . The Pictou facility requires $10K of refurbishment in this regard. This would not be considered a normal requirement for the average facility based on review of the facilities at the three additional anecdotal evidence pools. The reserve fund for applied fittings of $5K per annum (ie $50K in ten tears) at Pictou is also perhaps overstated as the Northside facility had only $6.5K allocated for its ten year period which seems a more reasonable sum.

Conclusion: *Although specific needs can vary widely as evidenced by these two audited facilities and three additionally reviewed indoor pools it is unarguable that interior doors, ceilings, walls, and floors do have severely reduce life due to high moisture, temperatures, and chemical attack. The average of these two audited facilities at $84.1K would therefore be deemed reasonable to extrapolate to other NS indoor pools.*

4.5 LIFE SAFETY & FIRE PREVENTION

Both facilities were not sprinklered, had adequate fire extinguishers in place, and met egress requirements for specific maximum occupancy that seemed quite reasonable. Pictou however was identified as requiring stairs for egress from the davit platform and some emergency lighting ballast replacement and typical extinguisher maintenance attention for a total budget allocation of 7.5K. For Northside there were emergency lighting battery pack deficiencies and shortage of coverage at budget allocation of $1K and some detector deficiencies in the fire alarm system estimated at $2K.

Conclusion: *Because of annual inspections and a need to respond to fire marshal inspections these aspects of building maintenance seem to be well in control with a total average budget for the ten year period of $5.8K which should be considered an acceptable average.*

4.6 BARRIER FREE ACCESS

A large variance exists between the two audit repots reviewed; from nothing allocated at Northside as it received previous upgrading to $36.5K at Pictou for primarily upgrading all aspects of the washrooms and their fixtures and hardware . There was further a parking lot issue at Pictou requiring immediate attention.

Conclusion:.*Any facilities that have undergone any recent upgrades or renovations tend to assure that parking, building entry, and change room washroom/showers are made barrier free. Likely about half of the pool facilities would have already undertaken such rehabilitation so the average of $21K in the forthcoming ten years would be a reasonable expectation.*

4.7 MECHANICAL SYSTEMS

The mechanical processes generally added significantly to the life cycle costs for the first ten year window at each of audited properties. Plumbing was least significant varied from under $1K to 6K while HVAC was substantial at $78K to $127K. The heating and ventilating categories within this grouping contribute significantly; The boiler in Northside at just over 27 years of service is in need of replacement at an estimated cost of $23K while the breeching and chimney replacement requires another $7.7K within the first five years . At the Pictou facility is ventilation ($7.3K) and more specifically de-humidification ($60K) that are not surprisingly the costly expenditures.

Conclusion: *Mechanical equipment typically lasts at best 25 years, and more probably under 20 in most instances where the equipment is exposed to the corrosive atmosphere. The heating and ventilation combined averages of the two audited facilities at $63 would be expected to hold true for most non-audited provincial indoor pool facilities.*

4.8 ELECTRICAL SYSTEMS

The range of electrical tasks identified in the two audited facilities was from $14.58K (Northside) to $44.22 (Pictou) . The former requiring some conduit ($2K) and grounding($1.5K) at the service entry; minor distribution identification and fire stopping ($0.45K); as well as new metal halide luminares to replace defective Mercury vapour as well as add fixtures to achieve greater then 300 lux illumination levels. At Northside the wholesale replacement of the service switchboard ($20K), rewiring motor controls ($5K), panel “B” replacement ($2.5K), and lighting ($7.5K), with an additional capital expenditure for glazed areas for natural lighting ($20K).Each facility had minimal requirement for fire alarm or emergency battery pack replacement amounting to several thousand dollars allocated.

Conclusions: *Average allocations for the ten year window should be service/distribution ($3K); lighting ($11.8K); distribution ($1K); fire alarm, public address, & security systems ($3K); controls ($2k); and power to mechanical equipment when upgraded ($3K). This totals to a predicted average for electrical of $23.8K for the next ten year window.*

This is a bit low compared to the reasonable $29.K average for the two audited facilities so it is suggested that $30K be put forward as a more reasonable average as the accumulation of many small items does add up it would seem. Many service entrances are also in need of upgrades as the Victoria Pool project (not part of audit reports) demonstrated so the higher average will cover off potential additional cost in this regard.

4.9 ENERGY AND ENVIRONMENTAL REVIEW

Both facilities had considerable room for improvement in energy consumption as they exceeded the acceptable baseline by about 30% to 40% . Recommendations included pool blanket, heat pump dehumidification heat recovery, water/air temperature setbacks, and recirculating pumps control optimization. Only the blanket was costed at $5K and reference made to 5 to 8 year paybacks on the other potential improvements.

Air quality was generally acceptable with isolated areas requiring additional ventilation. Chemical storage was considered acceptable and not allocated any future project estimates in either report. Anecdotal evidence would suggest however that not all facilities are fully compliant so a well ventilated storage area should be included for about 50% of facilities which would result in an average budgeted item of $4K.

Conclusion: *Energy reduction projects should be considered as they are likely to have a shorter payback in today's escalating cost energy regime. Pool blankets, heat recovery as part of a dehumidification scheme, variable speed pumps, and scheduled temperature setbacks would require average expenditures at about double the average reflected by the two analyzed audits, therefore $14K is recommended to be allocated.*

4.10 POOL STRUCTURE & PROCESSES

Surprisingly both these audit reports do not list substantial structural/envelope issues with the pool proper, contrary to this consultant's understanding that there is considerable experience of problems with water stop on concrete pools and concrete / tile finish spelling in some pools within the province. However because the problem cannot be tolerated, immediate or annual O&M repairs likely stay on top of the situation. The decking however not being quite the urgency is often neglected and it was a $2K item at the Pictou facility. Filtration equipment, heaters, and pumps are also normally high maintenance and short lived (ie <15 year) items. Again because of crucial need to maintain these critical systems, these audits allocated only $5K on average in the ten year window. It is suggested that this category as a norm should be considerably higher at say three times this value (ie $15K)

Conclusion: *Most pool components and filtration/chemical treatment processes are the lifeblood of the facility and receive the required annual O&M attention so these audits indicated relatively small rehabilitation & replacement costs. However to make improvements in circulation rates, temperature control, and controls is often a deferred requirement and should be allocated a budget of $17K in combination with energy improvements.*

OVERVIEW:
Several items worth noting as an overview of indoor pool facilities;

- The move is to multi-pool type of facilities with play components to supplement the traditional lane swimming and diving venues. The Dartmouth Sportsplex and Port Hawkesbury SAERC facilities demonstrate the success of these added features.

- Adjoining fitness centres are the norm in new or renovated facilities. St.F.X. University, Dartmouth Sportsplex, and Cole Harbour place being examples. The latter two were referenced in the recent Clayton Park Northcliffe pool replacement study which was estimated at $14,5 million and garnered more public support and previous attempts to refurbish just the pool facility.
- There is a pent up demand for indoor pool facilities in many communities that is partially being met by private hotels who in the off season provide individual and family passes for use of their facilities. This is more a provision of a needed recreational service than economic viable adjunct to their operation.
- The Pictou Fisheries Training pool in this audit review is an example of multipurpose utilization of a facility. As part of the search for a syncronized swimming venue for the 2011 Canada Winter Games , this consultant realized the potential of the NSCC Strait campus nautical simulation pool which had the required configuration and overall depth requirements. This synergy of purposes should be contemplated for future indoor pools.

Summing the above predicted ten year expenditures per facility category:

Indoor Pools

Category	**Ten year cost ($2005)**
Grounds & Services	$ 21K
Structural	$ 45K
Building Envelope (Exterior)	$ 216.7K
Building Interior	$ 84.1K
Life Safety & Fire Prevention	$ 5.8K
Barrier Free Access	$ 21K
Mechanical Systems	$ 63K
Electrical Systems	$ 30K
Energy and Environmental	$ 14K
Pool Structure and Processes	$ 17K
Total per facility	**$517.6K**

5.0 OUTDOOR POOL FACILITY AUDIT SUMMARY

The table in appendix "A" shows the outdoor pool facilities location and type of ownership for 26 facilities in the province. The average pool age is not known however true to say that there has been a resurgence in upgrading, and in fact wholesale replacement, of facilities such as Truro Victoria Pool (reopened in 2004) and Windsor (currently tendering a design/build project). What were rectangular concrete structures with shallow entry on one side and diving boards on the other side have gravitated to freeform shapes with multiple venues (lanes, diving, wading, beach entry, tots heated area, slides etc.). Even more modest facilities such as the recently constructed Chedabucto Pool in Guysborough have multiple usage capability including starter platform and regulation lanes for competitive swimming meets as well as water slide and "Lazy L" shaped kiddie section with beach type entry and barrier free access.

Three audit reports were provided (Windsor, Annapolis, and Mulgrave) and these pools averaged 26 year of age with the Windsor pool being 38 years which is why it is currently being tendered for a complete replacement. Although two of the audits were recent vintage the Annapolis report is rather dated at 1993 so would not reflect current conditions. However the deficiencies would be representative of a facility with just ten years of service at the time of the audit. In fact the reflected age averages 19.6 years when adjusted for the dates of the audits so it likely understates the average condition with one aged pool and two under 13 years of service.

The pie chart of total expenditure by category is appended in "C". Total ten year rehabilitation cost estimates ranged from just under $16K to just over $173K with the pool structure in all three instances being the greatest percent of life cycle costs. Certainly the challenge evident for outdoor pools is overwintering without structural damage due to frost heave to decks and pool structure. Water treatment due to solar degradation of chemicals and high organic loadings due to rain and wind blown debris add to complexity as does heating and energy conservation O&M costs.

To augment the three audit reports (representing almost 12% of the total number of facilities) the consultant's involvement with the pre-design and design of the recently renovated Truro Victoria Park pool as well as design of the Trenton Steel Park and Canso pools has been considered . Also involvement as sub-consultants in the Liscombe Lodge and Keltic Lodge pool projects in recent years will be included to supplement discussion albeit not the actual numbers gleaned form the audit reports as summarized on the spreadsheet in appendix "B".

5.1 GROUNDS AND SERVICES

Site related deficiencies were identified for all three audited facilities and ranged from only $310 for minimal maintenance at Annapolis which utilized the adjoining schools access and parking . Mulgrave was identified as requiring the wood screening fence partially replaced at $16K while

the most substantial was $40K at Windsor for retaining wall and change house foundation stabilization. The average of 20.14K in 2005 escalated dollars accounts for a quarter of the total refurbishing life cycle budget for the first ten year period.

Conclusion: *The Windsor pool requirements are perhaps not average due to the siting of the pool requiring a 10 foot high retaining wall. However the Truro Victoria pool suffered from similar deficiencies prior to its replacement. It is recommended that 10% of facilities be assumed to have a similar requirement so on average allow $5K site stabilization or drainage issues. All facilities tend to require access and parking refurbishment be it asphalt or graveled surfaces so allow $8K on average for minimal activity in that regard . All of the audited facilities were municipally serviced with water and sewer however in the anecdotal subset the Chedabucto and Keltic pools utilize on-site water and wastewater disposal so this would suggest that for two out of seven the requirement to allow about $10K for these systems is appropriate; that would result in a norm of $3K. An overall average site and services budget of $ 16K should therefore be reasonable to assume for the remaining unaudited facilities.*

5.2 POOL and STRUCTURE

The bathhouses for outdoor pools tend to be uninsulated and unheated and thus prone to winter frost heave if there are any drainage problems on the site. Mulgrave being in service only 13 years at the time of the audit had minimal cracks to the floors and wall structures of its bathhouse and pool deck that required $2.4K.in repairs. Annapolis at 10 years into its life required a similar expenditure of $2.75K for its fiberglass wall panel leakage location and although not quantified it would take several thousand as a minimum for the eventual repair.

Windsor was the facility with significant damage to building foundations, floor slab, deck, and all aspects of the pool integrity. This combined totaled $56K with the majority of the tasks having an immediate urgency. Based on similar observations at the Victoria Park pool and knowing that Canso also had pool structure problems this large expenditure allocation would seem appropriate for all facilities over 15 years. Even the Chedabucto pool in the first two years of operation has suffered from deck heave and spalling in the upper areas of the pool walls where ice formation causes stresses and friction movement that affected not only the epoxy paint surface but the underlying concrete walls and particularly the upper coping.. So all ages of facility should be recognized as requiring significant investment to be maintained.

It will be interesting to observe the Truro Victoria Pool experience as it was constructed with a liner affixed to steel backer panels and a cavity for all piping and fittings to be accessed from below the deck. It is a technology imported from successful experience in western Canada. It certainly shows promise in overcoming some of the concrete walled pool shortfalls. It does lend itself to installation within an existing structure if all is well drained and sound to tie the panels into so may be a retrofit alternative.

Conclusion: *Based on these three sampled facilities and also substantiated by three anecdotal referenced pools, the structural components tend to experience a shorter life span in the range of 15 years. An average ten year cost allowance of $ 65K would appear to be quite necessary for any given facility that currently exists. It is interesting to note that in the case of Windsor the audit consultants highlighted that to achieve an additional ten year life extension would require an expenditure just over one third of complete replacement costs of a new pool. This raised the point of diminishing returns which might be reached on any facility that is over 35 years of age. Certainly Truro Victoria park also went that route while achieving a much more robust, esthetically pleasing, and multi-functional facility for the recreational and competitive swimming community.*

5.3 BUILDING ENVELOPE (Exterior)

With the outdoor pool bathhouses being relatively small and simplistic structures, all aspects of the building would experience similar deterioration as the indoor pools to doors, hardware, windows, soffits/facia, and roof in particular but costs would be significant lower due to scale. The predicted life cycle expenditures account for only 6% of the total ten year costs. The average of the two facilities reporting deficiencies was $6.9K which is likely a low number for utilizing as the Nova Scotia average. Canso has the advantage of being adjacent to the arena and sharing that building for change rooms and washrooms. That synergy of common facilities was partially employed at the Trenton Steeltown park pool and certainly was the case for Chedabucto which was specifically built adjoining the new school so locker rooms, showers, and auxiliary services could be co-shared.

The use of block or concrete panel wall structures appears to be robust enough for the over wintering of the elements as evidenced by these facilities. In newer projects such as Chedabucto tilt up or pre-cast sandwich panel seems to be cost effective. .

Conclusion: *Unlike indoor pools the exterior envelope of primarily the bathhouse structure is relatively small in area so less costly to maintain even if subject to winter vacancy derived damage. The average of $6.9 for the audited buildings with noted building envelope rehabilitation requirements is considered low for averaging purposes and was perhaps biased by two of the building being under 15 years of age. The recommendation is to use about $12K as a more reasonable provincial average as most facilities are older than the average of this subset.*

5.4 BUILDING INTERIOR

The building interior in these outdoor pools is quite spartan and as a result the cost allocation for deficiencies amounts to only $29.13 total for the three facilities which is 12% of the total predicted ten year expenditures. Floors were generally concrete slab on grade finished in most areas with only paint (minimal use of ceramic tile, and non-skid epoxy). The two under 15 year facilities (Annapolis and Mulgrave) interestingly had no identified deficiencies in any interior

category. The 38 year old Windsor facility on the other hand had almost every component requiring repairs and upgrades (ceilings $1.5K; Floors $12K, walls $4K, and washroom upgrades in partitions and showers $10.5K).

Locker room equipment is either non existent or few in quantity. The Truro Victoria park pre-design investigation indicated that this is a reason for many visitors to not use the facility as they have no secure location for belongings. Areas for parents to watch their children from shaded areas but near poolside as well as a picnic table eating area adjoining the facility were noted requirements in any upgrading of facilities to attract greater recreational use.

Conclusion: *Specific needs varied widely as evidenced by these three audited facilities and supplemented by the additionally reviewed outdoor pools. The newer facilities biased the valuations downward however it is recommended that the group average in this regard is likely still representative as the older facility had so many improvements required. The suggested average of $9.7K in present worth is put forth.*

Many facilities adjoin other recreational complexes and share infrastructure ; however it should be recognized that this average value is still appropriate as they will either share some percent of maintaining those facilities or it would be reflected in a lease arrangement charging back some portion of the completed work done for their mutual benefit.

5.5 LIFE SAFETY & FIRE PREVENTION

No fire protection sprinklers exists at these facilities (3 audited nor 4 anecdotal) although in some cases the adjoining building with which they share locker/washroom services may be. It would seem reasonable to allow several thousand in a ten year window to at least address pool emergency response equipment, emergency showers or eye washes in the chemical equipment rooms and the like.

Newer pools such as Chedabucto tend to provide a winter netting cover with tie-downs that would preclude anyone from falling through should they venture out onto an ice covered pool during its winter shutdown. This item has very limited life and would need replacement at almost a ten year frequency.

Conclusion: *In spite of no itemized costs from the three audited facilities it is still proposed that a reasonable expectation would be about $4K be allocated for safety related equipment either in the mechanical room chemical storage area or poolside rescue equipment. The winter safety cover (albeit equipped in a minimal number of facilities at this time) would need fairly frequent replacement and an average facility budget of $3K is proposed.*

5.6 BARRIER FREE ACCESS

Only one of the three audit repots reviewed have any task requiring funding in the ten year window of this analysis. Windsor allocated $11K for a barrier free washroom ($6K) and adding a pool lift seat ($5K). This generated an average of 5% of the total life cycle ten year budgets allotted. Newer facilities constructed in the past few years such as Guysborough Chedabucto or Truro Victoria Park have provision either by lifts or zero entry. Even provision of portable lifts or their life being short lived due to usage would reasonably require $3K for the review period on average. Although many facilities have been implementing these varied barrier free projects in recent years it would likely still be a requirement for 2/3 of facilities. Certainly even those in current compliance would require some upgrades or refurbishment in a ten year period.

Conclusion:. *Recently constructed facilities or those renovated tend to assure that parking, facility entry ramps, and locker/washroom/showers are made barrier free. Current design of "Beach" or "Zero Entry" certainly facilitates pool entry otherwise some such as Trenton have incorporated in-water ramps or Chedabucto with its broad concrete stair for small totsand adjoining ramp. As a minimum retrofit at the remaining unaudited outdoor pools a portable lift chair should be costed. Budget allocations for the ten year period are suggested to average $ 9K for the typical Nova Scotia outdoor pool facility.*

5.7 MECHANICAL SYSTEMS

The mechanical pool processes were included under the pool specific category so only plumbing and heating/ventilation would tend to remain. This and the spartan approach to most outdoor bathhouses perhaps explains why these combined categories summed to $25K for the three facilities and represents 6% and 4% respectively of total budget allocations. Plumbing was comprised of fixture replacement, some piping (floor drains and backflow preventors), hot water tank replacement, and restoring insulation. All fixtures in a public facility with winterization requirements should be expected to have premature failures.

Ventilation of mechanical and chemical storage rooms as well as exhaust fan replacement were the common HVAC deficiency tasks.

Conclusion: *With plumbing and ventilation equipment lasting at best 20, and in most instances about 15 years due to the impact of winterization and vandalism to fixtures, this category should be increased somewhat from the audits spreadsheet which had one newer facility without any items and the other with only $5.7K. The average of the two reported facilities may better be used to generate an average of $12.6K.*

5.8 ELECTRICAL SYSTEMS

The electrical tasks identified in the three audited facilities amounted to only 3% of the total predicted life cycle budget. Each facility had some identified tasks with the older Windsor facility highest at 4.06K present worth while Annapolis was assessed at 1.68K and Mulgrave at

$0.99K. This latter small figure being only lighting which is always a requirement in a moist environment such as exists around showers and pool change rooms. Receptacles and control panels in the distribution were also generally allotted under $1K costs. The only item of consequence was in the older Windsor switchboard which would require $3K to replace.

Conclusions: *The average allowance for all electrical items within the bathhouse as gleaned from the three audit results averages only $2.3K. This is arguably a low end figure considering the deterioration that occurs during the lengthy winter shutdowns and unheated environment in most of the bathhouses. Average allocations for the ten year window should be more in the $5K area even for these rather small buildings and recognizing that some share services with adjoining buildings .*

The three audits did not address issues such as pool underwater lighting and exterior pool area lighting that has become the norm in more recent construction as operators realize the revenue potential and increased recreational usage with expanding hours of operation. The Truro Victoria Park and Chedabucto pool's pre-design studies recognized these attributes as being important and also opening up potential of hosting evening special events. As facilities incorporate these outdoor lighting systems (ie exterior wall and pole mounted usually with light sensors) the costs of maintaining will escalate. Underwater lighting has always been prone to premature failure due to corrosive attack causing leakage and would easily require $5K in a ten years window for those pools so equipped. Since the number of facilities having these lighting features poolside are still low as a percent of the norm ,it is proposed that a doubling of the above average figure is quite plausible so an allowance of $10.3K is proposed.

The new code requirement for pools with rebar and even the metallic pool panels in the new type of access cavity liners with its steel backing require elaborate grounding and monitoring which will tend to add some costs to those facilities in the future also it is postulated. A minimal value of $3K is proposed to apply on average.

5.9 ENERGY AND ENVIRONMENTAL REVIEW

Energy conservation is a big issue for outdoor pools whether heated or not. If heated it results in operating cost savings and if unheated it makes the pool more usable for early and late season as well as early morning swimming instruction or competitive lane swimming practice or meets. No identified projects or costs were declared in the three audits, however it is suggested as a minimum that pump control improvements and pool blanket requirements be included. New pools such as Chedabucto were provided with complex pool covers and portable rollers which will require maintenance in addition to eventual replacement. Some will occur within a ten year window; this item has been addressed in the Life Safety costing summary..

Conclusion: *Energy reduction projects tern to have an advantageous payback in today's*

escalating cost energy regime. Pool blankets, variable speed pumps, and scheduled temperature setbacks would require average expenditures at$8K.

5.10 POOL STRUCTURE & PROCESSES

The range in these audit reports are from $12K to $58K with the newer facilities better representing the normal expenditure of about $28K. This category comprises the greatest portion (ie 40%) of the total ten year expense pie chart. Some of the issues have been addressed in the pool related structural in section 5.2 above wherein it was carried as a budget life cycle item already as it best fits that category.

Filtration, chemical disinfection, and recirculation are components that do belong in this category and appear to average a respectable $7.2K. This appears low based on typical experience that these systems have a lifespan under 15 years however is in line with the indoor pools averaging $5K . The outdoor pools see more piping and fitting failures due to winter freeze damage, UV degradation of skimmers , and the filters have much higher loading rates due to windborne debris.

As more and more outdoor pools add features such as slides this item will require considerable expense. Only the Mulgrave audit allocated $5.8K for this item. Again based on experience of recent constructed facilities (Truro Victoria park and Guysborough Chedabucto) these are very expensive structures and will be prone to weathering as they cannot be dismantled for winter storage out of the elements.

Conclusion: *With the pool structural components covered in 5.2 this category allocates $7.2K for filtration/chemical treatment processes to assure these crucial items are maintained in good operation. Slides and other such appurtenances that are becoming the norm at more recently constructed facilities are expected to add on average $6K. They may not be applicable to many of the facilities however they are a big ticket item cost wise. A budget of $13.2K is suggested as a realistic ten year allocation.*

OVERVIEW:

Several items worth noting as an overview of outdoor pool facilities;

- The impact of age is quite evident in the three properties audited ; there appearing to be a breakpoint at about 35 years where infrastructure rehabilitation should be forfeited in lieu of a more wholesale replacement utilizing only the land, site services and parking etc.
- The move is to multi-pool type of facilities with play components to supplement the traditional lane swimming and diving venues. The recently refurbished Truro Victoria Parl pool is an example of that initiative to bolster recreational and competitive use. The current Windsor pre-design reflects most of these same requirements following broad

community input on user needs.

- Additionally adjoining fitness centres are the norm in new or renovated facilities. Chedabucto Place in Guysborough being an example of the synergy that can exist between a school in this instance and the pool. Canso has the connection to its arena to also reduce costs of change room, locker, canteen, and washroom facilities by co-sharing these service areas.
- Since these outdoor pools also provide the only venue for water safety training in most communities their import should not be underestimated. Some commercial establishments have programs of allowing local use of their outdoor pools and there are reported programs in Berwick and Lunenburg areas where private residential pools are even used for these instructional swim lessons.

Summing the above predicted ten year expenditures per facility category:

Outdoor Pools

Category	**Ten year cost ($2005)**
Grounds & Services	$ 16K
Structural (including pool)	$ 65K
Building Envelope (Exterior)	$ 12K
Building Interior	$ 9.7K
Life Safety & Fire Protection	$ 7K
Barrier Free Access	$ 9K
Mechanical Systems	$ 12.6K
Electrical Systems	$ 13.3K
Energy and Environmental	$ 8K
Pool Structure and Processes	$ 13.2K
Total per facility	**$165.8K**

6.0 SPORTS FIELDS AUDIT SUMMARY

Three sports field audits were provided for review. Although at first glance that appeared to represent only 1% sampling of all those in the province, review of the documents indicated that:

- The 1996 Yarmouth, Argile, and Clare study covered sixteen fields.
- The 2001 Shelburne & Area study covered 9 fields .
- The 2003 Annapolis Valley District study was scoped to cover 81 fields but in the end included 56 facilities to some degree .

So the apparent statistical coverage appeared to increase to 81/312 or approximately 26%; However geographically the coverage was all in south shore and western region . Additionally out of those three two (ie Shelburne and Annapolis Valley District) were horticultural in nature with cost estimates relating primarily to soil and turf maintenance. Some overview information from the Yarmouth and area study give some indication of categories of relevance so that the results from the Shelburne and Annaplois studies can be put into context;

Yarmouth , Argyle & Clare (Ten year Life cycle costs in thousands of dollars)

Description	Report Cost (1996)	Years 1 - 5 Present worth at k=2%	Years 6 - 10 Present worth at k=2%	% of 10 year
Topsoil removal	$ 5K	$ 5.98 K		5.4%
Importation of drainage & fill	$ 12 K	$14.34 K		13.1%
Top Soil & grade	$ 40 K	-	$ 47.80 K	43.5%
Seed & Turf	$ 10 K		$ 11.95 K	10.8%
Seating	$ 5 K		$ 5.98 K	5.4%
Parking	$ 20K	$ 23.9 K		21.8%
Total	$ 92K	$ 44.22 K	$ 65,73K	100%

From the above sixteen field Yarmouth study the overall results indicated a total expenditure of $109.95K resulting in an average of $6.87K per field.

The Shelburne study (9 fields) found that five required significant drainage and topsoil improvements before being reinstated with turf. The cost estimate on average for materials (assumed volunteer labour) was $2.7K - $3.7K per facility; This in contrast to the $10K allocated in the Yarmouth study which did assume contracted labour. Therefore an adjustment

to an average $6.5K is proposed. Also this audit reported four requiring washroom, lights, and seating improvements.

The Annapolis study resulted in the specific review of nineteen soccer fields stretching from Mount Uniacke in Hants County through the Annapolis valley to Clare in Digby and also rated a total of 56 out of possible 81 facilities on their level of auxiliary amenities. The compilation of those ratings were as per following table. The rankings were:

- "A" - full tier #1 compliance;
- "B" - access to WR, fenced, lighting & 50+ parking;
- "C" - washroom and 25 minimum parking ; and
- "D" - no WR and <25 parking.

Description	A	B	C	D	NR
Turf	8	15	21	12	25
Safety	10	24	16	6	25
Amenities	32	18	5	0	25

The observation from the table is that 18 out of 56 (32%) certainly would require the level of grandstand development and lighting/parking improvements costed in the table above for an average cost of $5K+$20K= $25K. If the parking upgrade were kept to gravel reinstatement a 25 car facility with perimeter ditch drainage would be about $10K. To provide minimal WR/changeroom would be expensive since there facilities are obviously not adjacent to a serviced facility which could be used. On-Site disposal would add about $15K to the WR provision; A project completed by this consultant at the New Glasgow Week's sports field and for the Town of Canso would suggest that $20K is easily expended on even spartan facilities on a concrete frost wall and slab floors. So taking this cost total of $70K for that fraction of facilities suggests a cost average of $22.4K.

This consultants involvement with the Cobequid Educational Centre Soccer field rehabilitation in 2002 which involved some erosion stabilization and generally a full topsoil and reseeding program resulted in a total budget of $22.8K which is midway between the Yarmouth and Shelburne estimates .

Conclusion: *From the above discussion and adjustment to the data as presented in the three reports representing about 25% {ie [(16+9+56)/312]} of listed fields it would appear that a typical sport field repair and modernization to basic amenities and standards of safety would require on average between the $6.87K per field *16 in the Yarmouth Study; the $6.5K *9 for the Shelburne study, and the $22.4K * 56 for the Annapolis Valley study for an overall adjusted average of $17.5K per field.*

OVERVIEW COMMENTS:

In the body of the report mention was made of the ability to vary the escalator "k" factor. The 2% chosen in computing present worth (2005 $) was deemed to fairly represent the cost of living index in recent years. Because most of the audits were in fact done in the last half dozen years, this generalization does we contend, reflect the escalation factor quite reasonably.

However construction and rehabilitation projects that we have been involved with over that same period generally increased at a higher rate than the cost of living due partially to there being a high number of projects occurring in the province hence decreasing competitiveness in bids. In addition time schedules for particularly upgrades and major rehabilitation projects tend to be fast tracked and compressed into the summer season for most projects; just at a time when constructors are at their busiest. The result has been higher cost escalations.

In an attempt to reflect the possible impact of these varying "k" factors the spreadsheet had this factor run at 2.5% and 3.0% and the following tables summarizes all three scenarios.

Summing the above predicted ten year expenditure average per facility category:

Analyzed Facilities (with varying escalator "k")

Category	**Ten year cost ($2005 present worth) at 2.0% escalation**	**Ten year cost ($2005 present worth) at 2.5% escalation**	**Ten year cost ($2005 present worth) at 3.0% escalation**
Arenas	$ 728.0K	$ 749.26K	$ 771.13K
Curling Rinks	$ 238.4K	$ 243.38K	$ 248.46K
Indoor Pools	$ 517.6K	$ 534.51K	$ 551.89K
Outdoor Pools	$ 165.8K	$168.49K	$ 171.24K
Sports Fields	$ 17.5K	$18.29K	$ 19.11K

As can be appreciated where the time since the audit is lengthy (ie such as sports fields) the escalator impact is greater. Based on the time gap for some of the reports and given the above discussions that construction costs have generally outpaced the cost of living escalator index, it is recommended that k= 3% be the most probable budget figure to carry forth in planning a province wide rehabilitation of sport and recreation infrastructure.

TEN YEAR LIFE CYCLE COSTS (All Provincial Facilities)

Category	# of facilities	Total cost estimate in 2005 dollars(M) k=2%	Total cost estimate in 2005 dollars(M) k=3%
Arenas	77	$ 56.06M	$ 59.38M
Curling Rinks	36	$ 8.58M	$ 8.95M
Indoor Pools	25	$ 12.94M	$ 13.80M
Outdoor Pools	26	$ 4.31M	$ 4.45M
Sports Fields	314	$ 5.50M	$ 6.00M
TOTAL FOR NOVA SCOTIA		$87.39M	$92.58M

The range of life cycle costs to update all predicted ten year priority items in the above noted Nova Scotia sport and recreation facilities is therefore estimated to be between $88M and $93M.

APPENDIX A

FACILITY LISTS

ARENAS

	Description	Ownership	Location	Year Built
1	Halifax Forum	Town	Halifax	1926
2	Centennial Arena	Board	Halifax North	1966
3	St. Mary's Arena	University	Halifax	1966
4	Devonshire Arena	Town	Halifax North	1971
5	Dr. G.L. LeBrun Centre	Town	Bedford	1972
6	Bowles Arena	Town	Dartmouth East	1972
7	Gray Arena	Town	Dartmouth North	1972
8	Sackville Arena	Board	Sackville	1973
9	Musquodoboit Hbs. Arena	Board	Musquodoboit Hbr.	1973
10	Metro Centre	Province	Halifax	1974
11	Spryfield Lions Rink	Board	Spryfield	1974
12	Cole Harbour Place	Town	Cole Harbour	1975
13	I.W. Akerly Campus	Province	Dartmouth	1976
14	Dartmouth Sportsplex	Town	Dartmouth	1982
15	Dalhousie Arena	University	Halifax	1983
16	St. Margaret's Bay Arena	Board	Tantallion	1985
17	Sackville Sport Stadium	Board	Sackville	1989
18	Shannon Park Arena	Can. Forces	Dartmouth North	
19	North Sydney Comm. Forum Society	Board	North Sydney	1947
20	Port Hawkesbury Civic Center	Town	Port Hawkesbury	2004
21	Centennial Arena	Town	Sydney	1967
22	Whitney Pier Arena	Board	Sydney	1968
23	Inverness Arena	Board	Inverness	1972

	Description	Ownership	Location	Year Built
41	Amherst Stadium	Town	Amherst	1959
42	Kentville Arena	Town	Kentville	1967
43	Colchester Legion Stadium	Town	Truro	1967
44	Springhill Arena	Town	Springhill	1972
45	Newport District Arena	Board	Brooklyn	1973
46	Glooscap District Arena	Board	Canning	1974
47	North Shore Arena	Board	Tatamagouche	1974
48	Oxford Arena	Town	Oxford	1974
49	West Kings Arena	Board	Kingston	1975
50	Don Henderson Sportsplex	Board	Brookfield	1975
51	West Colchester Arena	Board	Debert	1977
52	Exhibition Arena	Board/Town	Windsor	1980
53	Parrsboro Arena	Service Clb	Parrsboro	1987
54	East Hants Sportsplex	Board	Lantz	1989
55	Acadia U. Arena	University	Wolfville	1990
56	St.F.X.U. Arena (twin pad)	University	Antigonish	2000
57	New Glasgow Arena	Town	New Glasgow	1946
58	Antigonish Arena	Town/Comm	Antigonish	1971
59	Trenton Arena	Town	Trenton	1972
60	Hector Arena	Town	Pictou	1972
61	Ivor MacDonald Mem. Arena (District 13)	Board	Thorburn	1972
62	Westville Miners Sports Centre	Board	Westville	1975
63	Canso and Area Arena	Town	Canso	1979

24	Mabou Arena	Board	Mabou	1972
25	New Waterform Comm. Centre	Board	New Waterford	1974
26	Port Hood Arena	Board	Port Hood	1974
27	Sydney Mines Comm. Centre	Board	Sydney Mines	1974
28	Victoria Highland Civic Centre	Board	Baddeck	1975
29	Whycocomagh Arena	Board	Whycocomagh	1975
30	Richmond County Arena	Board	Louisdale	1976
31	County Arena	Town	Coxheath	1977
32	North Inverness Rec. Centre	Board	Cheticamp	1978
33	Dominion & District Comm. Centre	Board	Dominion	1979
34	Northern Victoria Community Centre	Board	Cape North	1979
35	Centre 200	Town	Sydney	1986
36	Canada Games Complex	University	UCCB	1986
37	Eskasoni Arena	First Nations	Eskasoni	1993
38	Bayplex	Board	Glace Bay	1996
39	Berwick Arena	Board	Berwick	1953
40	Greenwood Arena	Can. Forces	Greenwood	1955

64	St. Mary’s Rink	Board	Sherbrooke	1997
65	Stellarton Arena	Town	Stellarton	1972
66	Lunenburg Memorial Arena	Town	Lunenburg	1926
67	Bridgewater Arena	Town	Bridgewater	1948
68	Mariners Centre	Town	Yarmouth	2002
69	Church Memorial Rink	Board	Chester	1967
70	Middleton & District Rink	Board	Middleton	1969
71	Queens Memorial Arena	Board	Liverpool	1971
72	Shelburne County Arena	Board	Shelburne	1972
73	Bridgetown & District Memorial Arena	Board	Bridgetown	1974
74	Universite Sainte-Anne Rink	University	Pointe de l’Eglise	1975
75	Digby Area Arena	University	Town	Digby
76	Barrington Mun. Arena	Mun. District	Barrington	1995
77	Exhibition Youth Arena	Board	Lawrencetown	1967

Major Facilities - Curling Clubs

	Name	Location
1	Amherst Curling Club	Amherst
2	Baddeck Curling Club	Baddeck
3	Barrington Regional Curling Club	Barrington
4	Berwick Curling Club	Berwick
5	Bluenose Curling Club	New Glasgow
6	Bridgetown Curling Club	Bridgetown
7	Bridgewater Curling Club	Bridgewater
8	Brookside Curling Club	River Hebert
9	Brookside Curling Club	
10	Canso Curling Club	Canso
11	CFB Halifax Curling Club	Halifax
12	Chedabucto Curling Club	Boylston,
13	Chester Curling Club	Chester
14	Clare Curling Club	Meteghan
15	Dartmouth Curling Club	Dartmouth
16	Digby Curling Club	Digby
17	Glooscap Curling Club	Kentville
18	Greenwood Curling Club	Greenwood
19	Halifax Curling Club	Halifax

	Name	Location
20	Highlander Curling Club	Antigonish
21	Lakeshore Curling Club	Lower Sackville
22	Liverpool Curling Club	Liverpool
23	Lunenburg Curling Club	Lunenburg
24	Mayflower Curling Club	Halifax
25	Middleton Curling Club	Middleton
26	New Caledonian Curling Club	Pictou
27	Schooner Curling Club	Sydney
28	Shelburne Curling Club	Shelburne
29	Stellar Curling Club	Stellarton
30	Strait Area Community Curling Club	Port Hawkesbury
31	Sydney Curling Club	Sydney
32	Truro Curling Club	Truro
33	Westville Curling Club	Westville
34	Windsor Curling Club	Windsor
35	Wolfville Curling Club	Wolfville
36	Yarmouth Curling Club	Yarmouth
35	Wolfville Curling Club	Wolfville
36	Yarmouth Curling Club	Yarmouth

Major Facilities - Indoor Pools

		Ownership	Location	Year of Construction	Age
1	War Memorial Pool	University	Wolfville		
1	Cumberland YMCA Pool	Board	Amherst	1986	19 yrs
2	St.F.X.U Pool	University	Antigonish	1975	30 yrs
3	Scotia Pool	NSAC/Prov	Bible Hill	1967	38 yrs
4	Northcliff Pool (indoor)	Town	Clayton Park	1871	34yrs
5	Cole Harbour Place	Board	Cole Harbour	1988	17yrs
6	Dartmouth Sportsplex	Board	Dartmouth	1982	23yrs
7	Shearwater Pool	Can. Forces	Dartmouth		
8	Centennial Pool	Town	Halifax	1967	38yrs
9	Dalplex	University	Halifax	1979	26yrs
10	Nautical Pool	NSCC Strait Campus	Port Hawkesbury	1987	18yrs
11	Halifax Hospital		Halifax		
12	Stadicona Pool	Can. Forces	Halifax		
13	Halifax YMCA	Board	Halifax		
14	East Hants Swimming Pool	Mun.	Milford	1972	33
15	Pictou YMCA (pool)	YMCA	New Glasgow	1971	34
16	Northside Community Pool	Town	Sydney Mines	1977	28
17	Pictou Fisheries Pool	DOF/Town	Pictou	1985*	20
18	Coast Guard College	Federal	Point Edward	1983	22
19	Universite Sainte-Anne Pool	University	Pointe-de-l'Eglise	1975	30
20	SAERC Pool	Town	Port Hawkesbury	1977	28
21	Sackville Sport Stadium	Board	Sackville	1989	16
22	William Spry Pool	Town	Spryfield	1985	20
23	Cape Breton Family YMCA	Board	Sydney	1940	65
24	Kiwanis Pool	Service Clb	Sydney	1975	30
25	Liscombe Lodge	Nova Scotia	Liscombe Mills	1993	12

Major Facilities - Outdoor Pools

		Location	Ownership
1	The Pines Resort Swimming Pool	Digby	Province
2	Bridgetown Recreational Swimming Pool	Bridgetown	non-Private
3	Lawrencetown Fire Department Swimming Pool	Annapolis, Subd. B	Non-Private
4	Caledonia Swimming Pool	Caledonia (Queens Co.)	Public
5	Milton Swimming Pool	Liverpool	Public
6	Howard J. Langille Pool (1984)	Annapolis Royal	Public
7	Middleton Swimming Pool	Middleton	Public
8	Bridgewater Swimming Pool	Bridgewater	Public
9	Chester Lido Pool	Chester	Public
10	Jubilee Park	Mahone Bay	Public
11	Lunenburg Swimming Pool	Lunenburg	Public
12	Church Street	Kings, Subd. A	Public
13	Fitness Centre	Kings, Subd. A	Public
14	Windsor Centennial Pool (1967)	Windsor	Public
15	Truro Centennial Pool	Truro	Public
16	Victoria Park Pool (Rebuilt 2004)	Truro	Public
17	Amherst Dickey Park	Amherst	Public
18	Lions Pool (outdoor)	Bedford	non-Public
19	Canso Pool (1992)	Canso	Public
20	Colby Village Outdoor Pool	Dartmouth	Public
21	Needam Centre Pool	Halifax	Public
22	Mulgrave (outdoor) Pool (1987)	Mulgrave	Public
23	St. Margaret’s Bay (outdoor) Pool	Tantallon	Public
24	Trenton Steeltown Park Pool (1994)	Trenton	non-Public
25	Keltic Lodge Pool	Ingonish	Province
26	Chedabucto Place Pool (2003)	Guysborough	Public

SPORTS FIELDS

	CD	CDCSD	RECOUTLET	OUTLET_NAM	GAZNAME
1	01	01004	field	Clark's Harbour Softball field	Clark's Harbour
2	01	01001	Softball Field	6W athletic Ball Field	Centreville
3	01	01008	Soccer Field	Albert Acker Memorial Field	Shelburne
4	01	01001	Soccer Field	Barrington Municipal High School	Barrington Passage
5	01	01001	Softball Field	Blanche Field	Cape Negro
6	01	01006	Baseball Field	C.G.C. Ballfield	Gunning Cove
7	01	01004	Ballfield	F.A. Brannen	Clark's Harbour
8	01	01001	Baseball Field	Fisherman's Memorial Ballfield	Sherose Island
9	01	01001	Soccer Field	Forest Ridge Academy	Barrington
10	01	01001	Softball Field	Glenwright Memorial Field	Oak Park
11	01	01008	Soccer Field	Hill Crest Academy	Shelburne
12	01	01006	Baseball Field	Kenneth MacApline Memorial Ballfield	Jordan Bay
13	01	01006	Ballfield	Lion's Club Ballfield	Shelburne
14	01	01009	Baseball Field	Lockeport & Area Volunteer Athletic Field	Lockeport
15	01	01009	Soccer Field	Lockeport & Area Volunteer Athletic Field	Lockeport
16	01	01006	Baseball Field	Lower Ohio Ballfield	Lower Ohio
17	01	01001	Softball Field	Nickerson/Smith Memorial Field	Shag Harbour
18	01	01006	Ballfield	NS Youth Centre -Field 1	Shelburne
19	01	01006	Ballfield	NS Youth Centre Field 2	Shelburne
20	01	01006	Ballfield	NS Youth Centre Field 3	Shelburne
21	01	01006	Soccer Field	NS Youth Centre, Soccer Field	Shelburne
22	01	01006	Field	NSCC Shelburne Campus - Soccer Field	Shelburne
23	01	01001	Softball Field	Ralph "Creamer" Atwood Memorial Field	Barrington
24	01	01008	Ballfield	Roger Grovestien Recreation Complex	Shelburne
25	01	01006	Baseball Field	William G. Speery Memorial Ballfield	West Green Harbour
26	01	01001	Baseball Field	Woods Harbor Ballfield Complex	Upper Woods Harbour
27	02	02001	Softball/Minor Base	Amirault's Hill Ballfield	Amiraults Hill
28	02	02001	Minor Baseball Fie	Argyle Ballfield	Lower Argyle
29	02	02001	Baseball Field	Argyle Ballfield	Lower Argyle
30	02	02001	Soccer Field	Belleville School Soccer Field	Belleville
31	02	02006	Softball Field	Broad Brook Park	Yarmouth
32	02	02006	Baseball Field	Broad Brook Park	Yarmouth
33	02	02004	Soccer Field	Carleton Elementary School	Carleton
34	02	02004	Baseball Field	Carleton School	Carleton
35	02	02006	Soccer Field	Central School	Yarmouth
36	02	02001	Softball/Minor Base	East Pubnico Ballfield	Middle East Pubnico
37	02	02006	Baseball Field	Gateway Field	Yarmouth
38	02	02004	Soccer Field	Hebron Elementary School Soccer Field	Hebron
39	02	02004	Baseball Field	Hebron School	Hebron
40	02	02004	Soccer Field	Herbon Elimentary School Soccer Field	Hebron
41	02	02006	Softball Field	Kempt Street Field	Yarmouth
42	02	02004	Baseball Field	Kemptville Ballfield	Kemptville
43	02	02004	Softball Field	Kemptville Recreation Commission Ballfield	Kemptville
44	02	02004	Soccer Field	Maple Grove Educational Centre	Hebron
45	02	02004	Baseball Field	Maple Grove Eduction Centre	Hebron
46	02	02006	Baseball Field	Milton Field	Yarmouth
47	02	02006	Softball Field	Milton Field	Milton
48	02	02006	Softball Field	NSCC Burridge Campus	Yarmouth
49	02	02001	Sports Field	Parc des Jeunes	Lower Wedgeport
50	02	02001	Baseball Field	Parc des Jeunes	Lower Wedgeport
51	02	02001	Softball/Minor Base	Plymouth School Ballfield	Plymouth

52	02	02001	Soccer Field	Plymouth School Soccer Field	Plymouth
53	02	02004	Soccer Field	Port Maitland School	Port Maitland
54	02	02004	Baseball Field	Port Maitland School Ball Field	Port Maitland
55	02	02001	Softball/ Minor Bas	Pubnico North Ballfield	West Pubnico
56	02	02001	Softball/Minor Base	Pubnico South Ballfield	Lower West Pubnico
57	02	02001	Baseball Field	Quinan Ballfield	Quinan
58	02	02001	Baseball Field	SAR #1 Ballfield	Ste. Anne du Ruisseau
59	02	02001	Baseball Field	SAR #2 Ballfield	Ste. Anne du Ruisseau
60	02	02006	Baseball Field	Small gateway Baseball Field	Yarmouth
61	02	02006	Baseball Field	St Ambrose Baseball Field	Yarmouth
62	02	02001	Baseball Field	Surette's Island Ballfield	Surettes Island
63	02	02001	Baseball Field	Tusket Ballfield	Tusket
64	02	02001	Baseball Field	Wedgeport Fisherman's Memorial Park Ass	Wedgeport
65	02	02001	Soccer Field	Wedgeport Fisherman's Memorial Park Ass	Wedgeport
66	02	02001	Soccer Field	West Pubnico School Soccer Field	West Pubnico
67	02	02006	Soccer Field	Yarmouth Consolidated Memorial High Sch	Yarmouth
68	02	02006	Baseball Field	Yarmouth Recreation Baseball Fields	Yarmouth
69	02	02006	Softball Field	Yarmouth Recreation Softball Field	Yarmouth
70	03	03004	Baseball Field	Bear River Ballfield	Bear River
71	03	03001	Baseball Field	Clare Social Club / Community Sport Compl	Little Brook
72	03	03001	Baseball Field	Concession Ballfield	Concession
73	03	03004	Baseball Field	Conway Field	Conway
74	03	03004	Baseball Field	Criket Field	Weymouth
75	03	03006	Baseball Field	Don Brown Memorial Ball Field	Digby
76	03	03001	Baseball Field	Ecole Jean-Marie Gay	Saulnierville
77	03	03001	Soccer Field	Ecole Secondaire de Clare	Meteghan River
78	03	03001	Baseball Field	Ecole Secondaire de Clare	Meteghan River
79	03	03001	Soccer Field	Ecole Stella Maris	Saulnierville
80	03	03004	Baseball Field	Freeport Ballfield	Freeport
81	03	03001	Baseball Field	Havelock Ballfield	Havelock
82	03	03001	Baseball Field	Salmon River Ballfield	Salmon River
83	03	03001	Baseball Field	St. Bernard Ballfield	St. Bernard
84	03	03004	Baseball Field	Tiverton Ballfield	Tiverton
85	04	04008	Softball Field	Beach Meadows Softball Field	Beach Meadows
86	04	04001	Softball Field	Beech Hill/Hunts Point Softball Field	Hunts Point
87	04	04008	Softball Field	Buckfield Community Hall	Buckfield
88	04	04006	Baseball Field	Hank Snow Playground	Liverpool
89	04	04008	Softball Field	Harmony Softball Field	Harmony
90	04	04001	Baseball Field	Hunts Point Multi-Purpose Court	Hunts Point
91	04	04006	Baseball Field	Liverpool Baseball Club Inc.	Liverpool
92	04	04006	Softball Field	Liverpool Little League Field	Liverpool
93	04	04001	Softball Field	Mersey Point Softball Field	Mersey Point
94	04	04001	Baseball Field	Milton Ball Field	Milton
95	04	04001	Baseball Field	Milton Community Park	Milton
96	04	04008	Baseball Field	Port Medway Ball Field	Port Medway
97	04	04008	Baseball Field	Port Medway Ballfield	Port Medway
98	04	04001	Softball Field	River Head Road Softball Park	River Head
99	04	04008	Baseball Field	Seaside Recreational and Community Centr	Beach Meadows
100	04	04006	Softball Field	Thorbourne Park/Liverpool Softball Field	Liverpool
101	05	05008	Baseball Field	Annapolis Royal Ball Field	Annapolis Royal
102	05	05009	Softball Field	Church Field	Bridgetown
103	05	05009	Baseball Field	Lawrencetown and District Recreation Com	Lawrencetown

104	05	05016	Field	MacDonald Field	Middleton
105	05	05012	Softball Field	Memorial Park	Bridgetown
106	06	06006	softball field		Lunenburg
107	06	06006	Soccer Field		Lunenburg
108	06	06009	Ballfield (2)	Aspotogan Recreation Association	Blandford
109	06	06009	Baseball Field	Aspotogan Recreational Ball Field	East River
110	06	06009	Ballfield	Basin Recreation Park	Chester Basin
111	06	06008	Baseball Field	Bayview Community School	Mahone Bay
112	06	06001	Soccer Field	Centre Consolidated School	Centre
113	06	06009	Sports Field	Chester Area Middle School	Chester
114	06	06009	Soccer Field	Chester Area Middle School	Chester
115	06	06009	Baseball Field	Chester Basin Recreational Park	Chester Basin
116	06	06009	Baseball Field	Chester Memorial Park	Chester
117	06	06009	Ballfield (undersize	Church Memorial Park	Chester
118	06	06009	Soccer Field	Forest Heights Community School	Chester Basin
119	06	06009	Soccer Field	Forest Heights Community School	Chester Basin
120	06	06009	Soccer Field	Gold River / Western Shore Elementary Sch	Gold River
121	06	06009	Softball Field	Gold River / Western Shore Elementary Sch	Gold River
122	06	06009	Sports Field	Gold River/Western Shore Elementary Scho	Gold River
123	06	06009	Ballfield	Good Times Recreation Association	East River
124	06	06009	Baseball Field	Good Times Recreation Ball Field	East River
125	06	06001	Soccer Field	Hebbville Academy	Hebbville
126	06	06008	Baseball Field	Jubilee Park	Mahone Bay
127	06	06004	Baseball Field	Kinsmen Athletic Field	Bridgewater
128	06	06004	Softball Field	Kinsmen Athletic Field	Bridgewater
129	06	06004	Soccer Field	Kinsmen Athletic Field	Bridgewater
130	06	06004	Soccer Field	LaHave Street Fields	Bridgewater
131	06	06004	Baseball Field	LaHave Street Fields	Bridgewater
132	06	06006	Soccer Field	Lunenburg Soccer Field	Lunenburg
133	06	06006	Softball Field	Lunenburg Softball Field	Lunenburg
134	06	06008	Baseball Field	Mahone Bay School Gymnasium	Mahone Bay
135	06	06004	Baseball Field	Michelin Social Club	Bridgewater
136	06	06009	Baseball Field	Mill Cove Heritage Trust	Mill Cove
137	06	06009	Ballfield (2)	Mill Cove Heritage Trust	Mill Cove
138	06	06001	Soccer Field	Municipal Activity and Recreation Complex (	Dayspring
139	06	06001	Baseball Field	Municipal Activity and Recreation Complex (	Dayspring
140	06	06001	Soccer Field	New Germany Elementary School	New Germany
141	06	06001	Soccer Field	New Germany Rural High School	New Germany
142	06	06009	Sports Field	New Ross Consolidated School	New Ross
143	06	06009	Baseball Field	New Ross Consolidated School	New Ross
144	06	06009	Soccer Field	New Ross Consolidated School	New Ross
145	06	06001	Soccer Field	Newcombville Elementary School	Newcombville
146	06	06004	Soccer Field	Park View Education Centre	Bridgewater
147	06	06001	Soccer Field	Pentz Elementary School	Pentz
148	06	06001	Baseball Field	Petite Riviere Elementary School	Petite RiviFre
149	06	06001	Soccer Field	Petite Riviere Elementary School	Petite RiviFre
150	06	06001	Soccer Field	Riverport Elementary School	Riverport
151	06	06001	Soccer Field	West Northfield Elementary School	West Northfield
152	07	07004	Ball Field	"A" Ball Field	Berwick
153	07	07004	Ball Field	"B" Ball Field	Berwick
154	07	07001	Softball Field	14 Wing	Greenwood
155	07	07001	Baseball Fields	14 Wing	Greenwood

156	07	07024	Soccer Field	Acadia University	Wolfville
157	07	07024	Soccer Field	Acadia University	Wolfville
158	07	07024	Soccer Field	Acadia University	Wolfville
159	07	07024	Soccer Field	Acadia University	Wolfville
160	07	07024	Soccer Field	Acadia University	Wolfville
161	07	07024	Soccer Field	Acadia University	Wolfville
162	07	07024	Football Field	Acadia University	Wolfville
163	07	07011	Soccer Field	Evangeline Middle School	New Minas
164	07	07011	Baseball field	Lion's Field - Lockhart and Ryan Memorial F	New Minas
165	07	07004	Little League Field	Little League Field	Berwick
166	07	07011	Soccer Field	Lockhart and Ryan Memorial Park	New Minas
167	07	07011	Baseball field	Miller Field - Lockhart and Ryan Memorial P	New Minas
168	07	07004	Ball Field	Minor Ball Field	Berwick
169	07	07011	Soccer Field	New Minas Elementary	New Minas
170	07	07024	Baseball Field	Rotary Field	Wolfville
171	07	07024	Soccer Field	Rotary Field	Wolfville
172	07	07004	Soccer Field	Soccer Field	Berwick
173	08	08001	Soccer Field	Brooklyn District School	Newport
174	08	08002	Soccer Field	College Rd Soccer Field	Windsor
175	08	08001	Soccer Field	Dr Arthut Hines District School	Summerville
176	08	08001	Softball Field	Eldridge Rd Recreation Site	Falmouth
177	08	08001	Soccer Field	Eldridge Rd Recreation Site	Falmouth
178	08	08002	Baseball Field	Elmcroft Playground and Ballfield	Windsor
179	08	08002	Softball Field	Elmcroft Playground andf Ballfield	Windsor
180	08	08001	Soccer Field	Falmouth District School	Falmouth
181	08	08001	Soccer Field	Hants West Rural High School	Newport
182	08	08001	Soccer Field	Irishman's Rd Recreation Site	Gypsum Mines
183	08	08001	Soccer Field	Newport Station District School	Newport
184	08	08001	Baseball Field	St. Croix Recreation Site	St. Croix
185	08	08001	Soccer Field	Three Miles Plain District School	Three Mile Plains
186	08	08002	Baseball Field	Tremain Cresent Ballfields	Windsor
187	08	08002	Soccer Field	Windsor Regional High - Fields	Windsor
188	10	10012	Baseball Field	Bass River Ballfield	Bass River
189	10	10008	Baseball Field	Belmont Ballfield	Belmont
190	10	10008	Baseball Field	Bible Hill Ballfields	Bible Hill
191	10	10001	Baseball Field	Brookfield Ballfield	Brookfield
192	10	10008	Baseball Field	Debert Ballfields	Debert
193	10	10012	Baseball Field	Five Islands Ballfields	Five Islands
194	10	10012	Baseball Field	Great Village Ballfields	Great Village
195	10	10001	Baseball Field	Hilden Ballfields	Hilden
196	10	10012	Baseball Field	Londonderry Ballfield	Londonderry
197	10	10008	Baseball Field	Mill Brook Ballfield	Mill Brook
198	10	10008	Baseball Field	North River Ballfields	North River
199	10	10006	Soccer Field	NSCC Truro Sport & Wellness Center	Truro
200	10	10001	Baseball Field	Old Barns Ballfield	Old Barns
201	10	03001	Baseball Field	Salmon River Ballfields	Salmon River
202	10	10002	Baseball Field	Stewiacke Ballfields	Stewiacke
203	10	10008	Baseball Field	Tatamagouche Ballfields	Tatamagouche
204	10	10006	Baseball Field	Town of Truro Ballfields	Truro
205	10	10001	Baseball Field	Upper Stewiacke Ballfields	Upper Stewiacke
206	10	10006	Baseball Field	Valley Recreation Park Ballfield	Truro
207	10	10006	Baseball Field	Willow St School Ballfield	Truro

208	11	11011	Baseball Field	Amherst Robb's Centennial Park	Amherst
209	11	11008	Sport fields	Springhill Junior/Senior High School	Springhill
210	11	11008	Sport fields	West End Memorial School	Springhill
211	13	13008	Baseball Field	Athletic Field	Mulgrave
212	13	13008	Baseball Field	Athletic Field	Mulgrave
213	13	13008	Baseball Field	Athletic Field	Mulgrave
214	13	13004	Soccer Field	Black Duck Cove Day Park	Dover
215	13	13006	Baseball Field	Camp Glasgow	Canso
216	13	13004	Baseball Field	Canso Curling Club	Hazel Hill
217	13	13006	Baseball Field	Canso High School Gymnasium	Canso
218	13	13006	Baseball Field	Canso Pool	Canso
219	13	13006	Baseball Field	Canso Sports Complex	Canso
220	13	13006	Baseball Field	Canso Sports Complex	Canso
221	13	13006	Baseball Field	Canso Sports Complex	Canso
222	13	13006	Baseball Field	Canso Sports Complex	Canso
223	13	13006	Baseball Field	Center Town Park	Canso
224	13	13008	Baseball Field	Cesale Street Playground	Mulgrave
225	13	13006	Baseball Field	Fanning Memorial Elementary School	Canso
226	13	13004	Soccer Field	Guysborough Fish & Game Facility	Guysborough
227	13	13008	Baseball Field	Marie Peeples Park	Mulgrave
228	13	13008	Baseball Field	Meadowbrook Hill Community Playground	Mulgrave
229	13	13008	Baseball Field	Mill Pond Park	Mulgrave
230	13	13008	Baseball Field	Mulgrave and Area Community Pool	Mulgrave
231	13	13008	Baseball Field	Mulgrave Youth Center	Mulgrave
232	13	13006	Baseball Field	Seniors' Citizens Shamrock Club	Canso
233	13	13008	Baseball Field	Venus Cove Park	Mulgrave
234	14	14006	Baseball Field	Afton Ball Field	Afton
235	14	14006	Baseball Field	Anthony MacDonald Recreational Park	Aulds Cove
236	14	14002	Soccer Field	Antigonish Regional High School	Antigonish
237	14	14002	Baseball Field	Antigonish Regional High School	Antigonish
238	14	14001	Baseball Field	Arisaig Ball Field	Arisaig
239	14	14001	Baseball Field	Ashdale Ball Field	Ashdale
240	14	14002	Soccer Field	Braemore Elementary School	Antigonish
241	14	14002	Soccer Field	Columbus Field	Antigonish
242	14	14006	Baseball Field	Dagger Woods Ballfield	Pomquet
243	14	14002	Baseball Field	Dr. Hugh MacPherson Elementary	Antigonish
244	14	14006	Baseball Field	Harve Boucher Ballfields	Havre Boucher
245	14	14006	Baseball Field	Harve Boucher School	Havre Boucher
246	14	14006	Baseball Field	Heatherton Ball Fields	Heatherton
247	14	14001	Baseball Field	Lanark Ball Field	Lanark
248	14	14006	Baseball Field	Landrys Ball Field	Pomquet
249	14	14006	Baseball Field	Linwood Ball Field	Linwood
250	14	14001	Baseball Field	Lower South River Ball Fields	Lower South River
251	14	14006	Baseball Field	Monastery Ball Field	Monastery
252	14	14006	Soccer Field	Monastery Recreational Facility	Monastery
253	14	14002	Football Field	Oland Center	Antigonish
254	14	14002	Soccer Field	Oland Center	Antigonish
255	14	14002	Baseball Field	Oland Center	Antigonish
256	14	09036	Baseball Field	Pleasantdale Ball Park	Pleasant Valley
257	14	14006	Baseball Field	Pomquet fire Dept. Ball Field	Pomquet
258	14	14006	Baseball Field	Rev. H.J. MacDonald School	Heatherton
259	14	14001	Soccer Field	St Joseph's Recreation Facility	St. Joseph

260	14	14006	Soccer Field	St. Andrew's Ball & Soccer Fields	St. Andrews
261	14	14006	Baseball Field	St. Andrews Ball & Soccer Fields	St. Andrews
262	14	14001	Baseball Field	St. Joseph's Recreation Facility	St. Joseph
263	14	14006	Baseball Field	Tracadie Ball Fields	Tracadie
264	14	14006	Baseball Field	Tracadie School	Tracadie
265	15	15002	Baseball Field	Crandall Stick	Port Hawkesbury
266	15	15002	Soccer Field	Summit Park Recreation Area	Port Hawkesbury
267	15	15002	Football Field	Summit Park Recreation Area	Port Hawkesbury
268	15	15002	Baseball Field	Summit Park Recreation Area	Port Hawkesbury
269	16	16006	Soccer Field	Filex Marchand School	Louisdale
270	16	16006	Baseball Field	Filex Marchand School	Louisdale
271	16	16011	Baseball Field	Johnstown Community Recreation Associati	Johnstown
272	16	16006	Softball Field	River Bourgeois Community Services Socie	River Bourgeois
273	16	16001	Baseball Field	St. Joseph Playgrounds	Petit-de-Grat
274	17	17030	Soccer Field	Atlantic St Soccer Field	Sydney
275	17	17030	Baseball Field	Bernie Mac Neil	Sydney
276	17	17030	Baseball Field	Black Diamond	Sydney
277	17	17030	Baseball Field	Brookshaven Recreation Facility	Prime Brook
278	17	17030	Soccer Field	Brookshaven Recreation Facility	Prime Brook
279	17	17030	Baseball Field	Brown Street Complex	Sydney Mines
280	17	17030	Baseball Field	Cantley Village Park	Coxheath
281	17	17030	Soccer Field	Cantley Village Park	Coxheath
282	17	17030	Baseball Field	Comeron Bowl	Glace Bay
283	17	17030	Baseball Field	Coxheath Park	Coxheath
284	17	17030	Soccer Field	Coxheath Park	Coxheath
285	17	17030	Baseball Field	Dave Rose	North Sydney
286	17	17030	Soccer Field	Dominion St. Fields	Sydney
287	17	17030	Baseball Field	East Bay Legion Ball Field	East Bay
288	17	17030	Baseball Field	Floral Heights Recreation	Sydney
289	17	17030	Soccer Field	Floral Heights Recreation	Sydney
290	17	17030	Baseball Field	Fulton Avenue Ball Field	Westmount
291	17	17030	Baseball Field	Golden Horseshoe Park	Sydney River
292	17	17030	Soccer Field	Golden Horseshoe Park	Sydney River
293	17	17030	Baseball Field	Indian Beach	North Sydney
294	17	17030	Baseball Field	Jonathon Skeete Ball Field	Whitney Pier
295	17	17030	Soccer Field	MacCormack	Sydney
296	17	17030	Soccer Field	Malcolm Munroe Soccer Field	Sydney River
297	17	17030	Baseball Field	Mira Road Fields	Sydney
298	17	17030	Soccer Field	Munroe Park	North Sydney
299	17	17030	Baseball Field	Neville Park	Whitney Pier
300	17	17030	Soccer Field	Nevills Park	Whitney Pier
301	17	17030	Baseball Field	No.11 Robbie MacDonald Field	Glace Bay
302	17	17030	Baseball Field	Percy Leyte	North Sydney
303	17	17030	Baseball Field	Pitt Street Complex	Sydney Mines
304	17	17030	Soccer Field	Riverview Soccer Field	Coxheath
305	17	17030	Baseball Field	Riverview Y'S Men Ball Field	Coxheath
306	17	17030	Baseball Field	Rotary Park	Sydney
307	17	17030	Baseball Field	Seaton School	North Sydney
308	17	17030	Baseball Field	South Street Park	Glace Bay
309	17	17030	Baseball Field	St. Anthony Daniel	Sydney
310	17	17030	Baseball Field	Susan Mac Eachern Memorial	Sydney
311	17	17030	Baseball Field	Westmount Family Park	Westmount

312	17	17030	Baseball Field	Woodvine		Sydney Mines

APPENDIX B

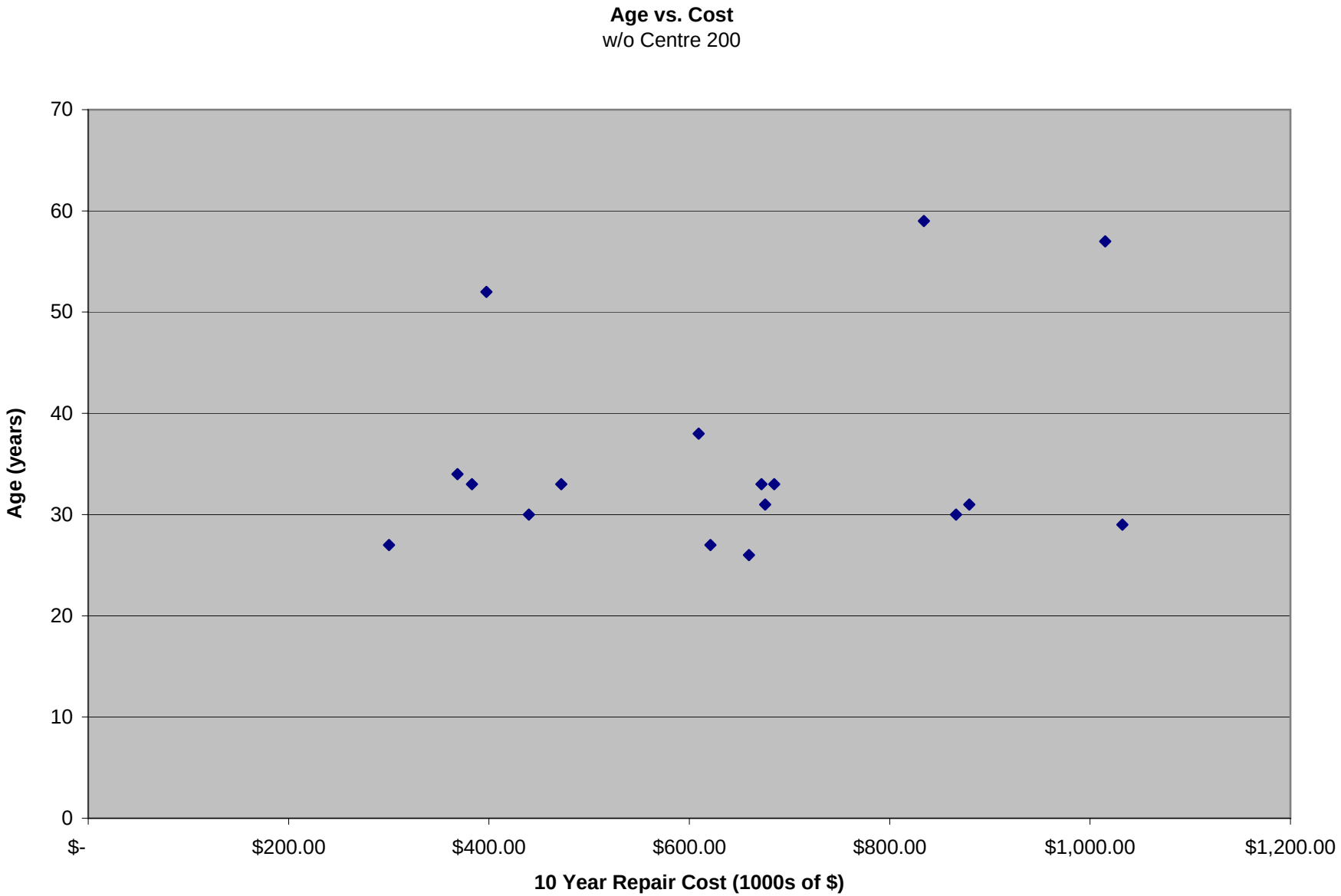
LIFE CYCLE
SPREADSHEETS

Arenas	All $ Values in thousands	Antigonish Year= 2001			Baddeck Year= 2003			Berwick Year= 1997			Bridgewater Year= 2002			Canning Year= 1997			K= 0.02 Report Year= 2004 Canso			Chester Year= 2000			Cheticamp Year= 1997			Dominion Year= 2003			Inverness Year= 1998			Kingston
Group	Item	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Priority 1,2	Priority 3	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost
Barrier Free	Audible Signals																															
Barrier Free	Parking																						$ 6.50	$ 7.62				$ 6.50	$ 7.47		
Barrier Free	Ramp/Stair																						$ 2.00	$ 2.34		$ 3.00	$ 3.12	$ 1.50	$ 1.72		
Barrier Free	Viewing Areas																															
Barrier Free	Washrooms																											$ 8.00	$ 9.19			
SUM			$ -																					$ 9.96			$ 3.12		$ 18.38			
Building Exterior	Doors and Hardware	$ 9.00	$ 3.25	$ 6.49	$ 16.00	$ 10.40	$ 6.24	$ 30.50	$ 27.53	$ 8.79	$ 12.80	$ 3.40	$ 10.19	$ 13.25	$ 15.52		$ 32.40	$ 33.05		$ 8.00		$ 8.83	$ 22.00	$ 25.78		$ 15.50	$ 9.88	$ 6.24	$ 15.00	$ 17.23		$ 11.50
Building Exterior	Foundation Wall																															
Building Exterior	Painting	$ 12.00	$ 6.49	$ 6.49				$ 0.25	$ 0.29					$ 5.25	$ 3.22	$ 2.93							$ 2.00	$ 2.34		$ 20.00	$ 20.81					
Building Exterior	Roofing/ Roofing Lounge				$ 236.00	$ 27.05	$ 218.48	$ 1.50	$ 1.76					$ 90.00	$ 105.45		$ 80.00	$ 81.60		$ 96.90	$ 95.50	$ 11.59	$ 40.00		$ 46.87				$ 4.00	$ 4.59		$ 90.00
Building Exterior	Stairs/Sidewalks																						$ 1.00	$ 1.17				$ 2.00	$ 2.30		
Building Exterior	Wall System				$ 36.00		$ 37.45	$ 21.00	$ 22.85	$ 1.76	$ 25.00	$ 26.53		$ 3.00	$ 3.51					$ 14.50		$ 16.01	$ 0.30	$ 0.35		$ 62.00	$ 2.08	$ 62.42	$ 2.50	$ 2.87		$ 5.00
Building Exterior	Windows				$ 6.00	$ 6.24					$ 10.20	$ 10.82					$ 1.20	$ 1.22								$ 3.00		$ 3.12				$ 0.50
SUM			$ 9.74	$ 12.99		$ 43.70	$ 262.18		$ 52.43	$ 10.54		$ 40.75	$ 10.19		$ 127.71	$ 2.93		$ 115.87			$ 95.50	$ 36.43		$ 29.64	$ 46.87		$ 32.77	$ 71.79		$ 26.99		
Building Interior	Boards and Glass	$ 14.00	$ 7.58	$ 7.58	$ 80.00		$ 83.23	$ 0.75		$ 0.88	$ 120.00	$ 127.34		$ 1.25	$ 1.46		$ 140.00		$ 142.80				$ 90.00		$ 105.45	$ 3.00	$ 3.12		$ 90.00	$ 103.38		$ 1.00
Building Interior	Canteen				$ 15.00		$ 15.61																			$ 15.00	$ 15.61					
Building Interior	Carpet/Rubber Flooring																			$ 28.00	$ 30.91		$ 9.00	$ 10.54				$ 12.00	$ 13.78			
Building Interior	Ceilings				$ 55.00		$ 57.22																$ 40.00	$ 46.87					$ 40.00		$ 45.95	
Building Interior	Change Rooms										$ 175.00	$ 185.71					$ 20.00		$ 20.40				$ 3.00	$ 3.51					$ 25.00	$ 28.72		
Building Interior	Counter Shutters																						$ 2.80	$ 3.28								
Building Interior	Doors and Hardware				$ 16.00	$ 16.65					$ 1.50		$ 1.59							$ 21.00		$ 23.19	$ 7.00	$ 8.20		$ 4.50		$ 4.68				
Building Interior	Floors				$ 26.00	$ 27.05																	$ 2.50	$ 2.93		$ 21.80	$ 6.03	$ 16.65	$ 8.00	$ 2.30	$ 6.89	
Building Interior	Kitchen Cabinets																															
Building Interior	Painting	$ 147.00	$ 98.50	$ 60.62				$ 11.00	$ 7.62	$ 7.62				$ 18.50	$ 17.57	$ 2.93										$ 0.50	$ 0.52					$ 19.50
Building Interior	Ramps/Barrier Free Access										$ 4.00	$ 4.24								$ 5.50	$ 6.07											
Building Interior	Renovations Main Level										$ 100.00	$ 106.12					$ 80.00		$ 81.60													
Building Interior	Renovations Mezzanine Level										$ 120.00	$ 127.34					$ 10.00		$ 10.20				$ 4.00	$ 4.69		$ 9.00	$ 9.36		$ 25.00	$ 5.74	$ 22.97	
Building Interior	Score Boards																															
Building Interior	Seats/Grandstands	$ 26.00	$ 14.07	$ 14.07	$ 9.00	$ 9.36					$ 5.00	$ 5.31											$ 20.00	$ 23.43								
Building Interior	Tiles																			$ 10.20		$ 11.26										
Building Interior	Walls							$ 1.00	$ 1.17					$ 1.00	$ 1.17								$ 9.00	$ 10.54				$ 14.00		$ 16.08	$ 1.00	
Building Interior	Washrooms	$ 9.00	$ 4.87	$ 4.87	$ 35.00	$ 36.41														$ 10.70	$ 3.31	$ 8.50	$ 40.00	$ 46.87		$ 20.00		$ 20.81	$ 7.00	$ 8.04		
SUM			$ 125.02	$ 87.14		$ 89.47	$ 156.06		$ 8.79	$ 8.49		$ 556.07	$ 1.59		$ 20.21	$ 2.93		$ 255.00			$ 40.30	$ 42.95		$ 160.87	$ 105.45		$ 34.65	$ 42.14		$ 161.96	$ 91.89	
General	*Ice Edger*							$ 2.00						$ 2.00																		$ 4.00
General	*Ice Resurfacing Machine*				$ 65.00						$ 75.00			$ 15.00			$ 75.00						$ 4.00									
General Electrical	Electrical Room																						$ 0.05	$ 0.06		$ 0.08	$ 0.08		$ 0.05	$ 0.06		
General Electrical	Infrared Survey	$ 5.80	$ 3.14	$ 3.14																												
General Electrical	Kitchen Equipment																															
General Electrical	Lighting	$ 14.80	$ 14.94	$ 2.16	$ 2.70	$ 2.81		$ 62.00	$ 20.50	$ 52.14	$ 45.58	$ 17.80	$ 30.56	$ 25.00		$ 29.29	$ 36.14	$ 22.44	$ 14.42	$ 1.25	$ 1.38		$ 19.10	$ 22.38		$ 1.20	$ 1.25		$ 21.70	$ 24.12	$ 8.04	$ 48.00
General Electrical	Panel Changeouts				$ 4.00	$ 4.16								$ 10.50		$ 12.30				$ 10.00	$ 11.04											
General Electrical	Power Distribution	$ 38.00		$ 41.13	$ 0.25	$ 0.26					$ 0.80	$ 0.85											$ 0.25	$ 0.29		$ 0.25	$ 0.26		$ 2.70	$ 3.10		$ 3.50
General Electrical	Public Address System										$ 20.00		$ 21.22				$ 5.00		$ 5.10													
General Electrical	Receptacles				$ 2.00	$ 2.08					$ 20.00		$ 21.22				$ 10.00		$ 10.20										$ 1.80	$ 2.07		
General Electrical	Score Clock and Controller										$ 7.00		$ 7.43				$ 7.00		$ 7.14													
General Electrical	Service Entrance																															$ 7.50
General Electrical	Splitters													$ 2.00		$ 2.34				$ 4.10	$ 4.53											
General Electrical	Switch Maintenance/Fuse Change																			$ 3.50	$ 3.86											
General Electrical	Switches										$ 3.60	$ 3.82		$ 6.00		$ 7.03	$ 3.60		$ 3.67	$ 1.50	$ 1.66											
General Electrical	Transformer Perimeter Protection																												$ 0.75	$ 0.86		
General Electrical	Transformer Replacement				$ 5.00	$ 5.20																										
General Electrical	Utility Boxes																															
General Electrical	Wiring													$ 1.00		$ 1.17				$ 2.00	$ 2.21		$ 0.05	$ 0.06		$ 2.00	$ 2.08		$ 0.30	$ 0.34		$ 1.00
SUM			$ 18.08	$ 46.44		$ 14.51	$ -		$ 20.50	$ 52.14		$ 22.47	$ 80.44		$ -	$ 52.14		$ 22.44	$ 40.53		$ 24.68			$ 22.79	$ -		$ 3.67	$ -		$ 30.55	$ 8.04	

		Antigonish Year= 2001			**Baddeck** Year= 2003			**Berwick** Year= 1997			**Bridgewater** Year= 2002			**Canning** Year= 1997			Report Year= 2004		**Canso**	**Chester** Year= 2000			**Cheticamp** Year= 1997			**Dominion** Year= 2003			**Inverness** Year= 1998			**Kingston**
Group	Item	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Priority 1,2	Priority 3	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost
Heating/Ventilation	Controls + EMS				$ 2.50	$ 2.60		$ 1.65	$ 1.93					$ 3.60	$ 4.22								$ 6.00	$ 7.03		$ 3.30	$ 3.43					$ 5.40
Heating/Ventilation	Dehumidifiers																$ 20.00	$ 20.40		$ 26.00		$ 28.71				$ 35.00	$ 36.41					$ 15.00
Heating/Ventilation	Heating General	$ -			$ 4.80	$ 4.99	$ -	$ 1.00	$ -	$ 1.17	$ 24.35	$ 23.77	$ 2.07	$ 30.05	$ 11.31	$ 23.90	$ -	$ -		$ -			$ 5.00	$ -	$ 5.86	$ 0.10	$ 0.10	$ -	$ 13.53	$ 15.54	$ -	$ 24.25
Heating/Ventilation	Ventilation General	$ 4.00	$ 2.16	$ 2.16	$ 11.40	$ 11.86	$ -	$ 2.50	$ 2.93	$ -	$ 4.35	$ 4.62	$ -	$ 7.70	$ 9.02	$ -	$ 1.90	$ 0.36	$ 1.58	$ 93.50	$ 98.82	$ 4.42	$ 5.25	$ 6.15	$ -	$ 11.00	$ 11.44	$ -	$ 7.00	$ 8.04	$ -	$ 9.50
SUM			$ 2.16	$ 2.16		$ 19.46	$ -		$ 4.86	$ 1.17		$ 28.39	$ 2.07		$ 24.55	$ 23.90		$ 20.76	$ 1.58		$ 98.82	$ 33.12		$ 13.18	$ 5.86		$ 51.40	$ -		$ 30.47	$ -	
Life Safety	Alarm Valve																			$ 7.00		$ 7.73										
Life Safety	Detectors																$ 1.50		$ 1.53										$ 0.25	$ 0.29		
Life Safety	Emergency Breathing Aparatus																						$ 3.30	$ 3.87								
Life Safety	Emergency Lighting	$ 7.00	$ 3.36	$ 4.22	$ 0.18	$ 0.19								$ 9.00	$ 10.54		$ 5.70	$ 5.05	$ 0.77				$ 3.05	$ 3.57		$ 1.50	$ 1.56		$ 4.00	$ 4.59		$ 9.00
Life Safety	Fire Alarm				$ 0.03	$ 0.03		$ 8.50		$ 9.96				$ 8.50	$ 9.96		$ 1.00		$ 1.02				$ 0.38	$ 0.44								$ 8.50
Life Safety	Fire Alarm Testing/Inspection	$ 5.00	$ 2.71	$ 2.71							$ 1.00	$ 1.06					$ 1.00	$ 1.02								$ 0.43	$ 0.44					
Life Safety	Fire Extinguishers				$ 0.40	$ 0.42		$ 2.00		$ 2.34				$ 3.13	$ 3.66											$ 0.30	$ 0.31					$ 8.00
Life Safety	Fire Proofing																												$ 66.00	$ 75.81		
Life Safety	Fire Separation																						$ 45.00	$ 52.72					$ 45.00	$ 51.69		
Life Safety	Fire Suppression																						$ 4.30	$ 5.04					$ 0.10	$ 0.11		
Life Safety	Kitchen Hood																$ 3.50	$ 3.57					$ 0.25	$ 0.29								
Life Safety	Sprinklers				$ 125.00		$ 130.05																									
Life Safety	Sprinklers (EACH)																			$ 0.10		$ 0.11										
SUM			$ 6.06	$ 6.93		$ 0.63	$ 130.05			$ 12.30		$ 1.06			$ 24.17			$ 9.64	$ 3.32			$ 7.84		$ 136.23			$ 2.31			$ 132.50		
Misc	Motor Protection																															
Misc	Provide Cordless Phone																												$ 0.30	$ 0.34		
Misc	Sound System																												$ 7.50	$ 8.62		
Misc	Storage Cabinets				$ 5.00	$ 5.20																										
SUM						$ 5.20																										
Plumbing	Circulating Pumps										$ 0.45		$ 0.48	$ 1.20	$ 1.41																	$ 1.65
Plumbing	Storage tanks				$ 0.50	$ 0.52		$ 5.20	$ 2.11	$ 3.98	$ 1.00	$ 1.06		$ 17.80	$ 20.86		$ 1.36	$ 0.72	$ 0.66				$ 1.20	$ 1.41		$ 0.30	$ 0.31		$ 0.25	$ 0.29		$ 4.00
Plumbing	Fixtures				$ 4.60	$ 0.10	$ 4.68	$ 64.03	$ 14.12	$ 60.90	$ 17.65	$ 17.03	$ 1.70	$ 30.18	$ 28.59	$ 6.77				$ 29.40	$ 32.46		$ 15.80	$ 4.63	$ 13.88	$ 2.50	$ 2.60		$ 7.00	$ 4.02	$ 4.02	$ 7.30
Plumbing	Fuel Storage																$ 0.60	$ 0.61											$ 0.75	$ 0.86		
Plumbing	General/Piping	$ 10.90	$ 5.90	$ 5.90																						$ 2.50	$ 2.60					
Plumbing	Insulation				$ 1.50	$ 1.56																	$ 4.30	$ 5.04		$ 1.50	$ 1.56					
Plumbing	Well Pumps and Pressure Tanks							$ 2.69	$ 2.23	$ 0.93				$ 0.38	$ 0.44					$ 0.70	$ 0.77		$ 2.50		$ 2.93							$ 2.69
SUM			$ 5.90	$ 5.90		$ 2.18	$ 4.68		$ 18.45	$ 65.81		$ 18.09	$ 2.18		$ 51.29	$ 6.77		$ 1.33	$ 0.66		$ 33.23	$ -		$ 11.07	$ 16.81		$ 7.07	$ -		$ 5.17	$ 4.02	
Refrigeration	Brine Systems	$ 5.00		$ 5.41	$ 0.80	$ 0.83		$ 6.83	$ 6.97	$ 1.03	$ 33.00	$ 24.83	$ 8.12				$ 5.45	$ 4.13	$ 1.43	$ -			$ 12.00	$ 14.06		$ 1.70	$ 1.77		$ 9.05	$ 10.40		$ 22.98
Refrigeration	Control Systems	$ 6.00	$ 3.25	$ 3.25	$ 18.00	$ 18.73		$ 0.75	$ 0.53	$ 0.35				$ 0.45	$ 0.53					$ 18.00	$ 19.87								$ 22.50	$ 25.85		$ 1.85
Refrigeration	Heat Recovery Systems																						$ 12.50		$ 14.65							
Refrigeration	Ice Plant	$ 20.00	$ 10.82	$ 10.82	$ 70.40	$ 5.62	$ 67.63	$ 65.70	$ 42.41	$ 34.56	$ 91.75	$ 28.92	$ 68.45	$ 232.00	$ 110.14	$ 161.69	$ 167.25	$ 165.24	$ 6.78	$ 159.00	$ 175.55		$ 22.50	$ 26.36		$ 30.00	$ 31.21		$ 96.90	$ 19.99	$ 91.32	$ 32.50
SUM			$ 14.07	$ 19.48		$ 25.18	$ 67.63		$ 49.91	$ 35.94		$ 53.75	$ 76.57		$ 110.66	$ 161.69		$ 169.37	$ 8.21		$ 195.42	$ -		$ 40.42	$ 14.65		$ 32.98	$ -		$ 56.23	$ 91.32	
Site	Drainage							$ 12.50		$ 14.65				$ 20.00	$ 23.43								$ 5.00		$ 5.86				$ 2.00	$ 2.30		$ 10.00
Site	Fencing																															
Site	Ground Maintenance							$ 1.50	$ 1.76					$ 1.50	$ 1.76																	$ 16.00
Site	Parking Lot/Asphalt	$ 3.00	$ 1.62	$ 1.62				$ 33.00	$ 9.37	$ 29.29	$ 71.50	$ 75.88		$ 30.00	$ 5.86	$ 27.60	$ 10.50	$ 10.71						$ -		$ 11.00	$ 11.44		$ 1.00	$ 1.15		$ 7.00
Site	Sidewalk/Concrete													$ 6.00	$ 7.03																	
Site	Storage Shed				$ 0.10	$ 0.10																										
Site	Vehicle Barrier																															
SUM			$ 1.62	$ 1.62		$ 0.10			$ 11.13	$ 43.94		$ 75.88			$ 38.08	$ 27.60		$ 10.71							$ 5.86		$ 11.44			$ 3.45		
Structural	Frame/Roof				$ 21.50	$ 22.37					$ 43.00	$ 45.63											$ 0.30	$ 0.35		$ 4.80	$ 4.99					
Structural	Drainage				$ 22.00	$ 22.89																										
Structural	Floors/Slabs							$ 0.50		$ 0.59				$ 0.50	$ 0.59								$ 0.90	$ 1.05					$ 0.80	$ 0.92		$ 0.50
Structural	Foundation	$ 3.00		$ 3.25																$ 1.00	$ 1.10		$ 0.30	$ 0.35		$ 1.80	$ 1.87					$ 0.25
Structural	Ice Surface							$ 0.50		$ 0.59				$ 0.50		$ 0.59													$ 1.00	$ 1.15		$ 0.50
SUM			$ -	$ 3.25		$ 45.26				$ 1.17		$ 45.63	$ -		$ 0.59	$ 0.59					$ 1.10			$ 1.41			$ 6.87			$ 2.07	$ -	
TOTAL			$ 182.66	$ 185.91	$ -	$ 245.70	$ 620.60	$ -	$ 166.08	$ 231.51	$ -	$ 842.10	$ 173.03	$ -	$ 397.25	$ 278.54		$ 350.12	$ 309.30	$ -	$ 489.05	$ 120.34	$ -	$ 425.58	$ 195.49	$ -	$ 183.16	$ 117.05	$ -	$ 476.73	$ 195.28	$ -	

Arenas	All $ Values in thousands			Mabou	Year= 1998		New Glasgow	Year= 1996		Pictou	Year= 2000		Richmond	Year= 1997		Sydney	Year= 1997		Sydney Mines	Year= 1999		Thorburn	Year= 2001	
Group	Item	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10
Barrier Free	Audible Signals															$ 3.15	$ 3.69							
Barrier Free	Parking			$ 6.50	$ 7.47																			
Barrier Free	Ramp/Stair			$ 1.50	$ 1.72					$ 3.00		$ 3.31												
Barrier Free	Viewing Areas																		$ 2.00	$ 2.25				
Barrier Free	Washrooms			$ 8.00	$ 9.19																			
SUM					$ 18.38							$ 3.31					$ 3.69			$ 2.25			
Building Exterior	Doors and Hardware	$ 4.10	$ 9.37	$ 11.50	$ 13.21		$ 124.80	$ 101.34	$ 47.80	$ 16.00	$ 17.67		$ 14.00	$ 9.37	$ 7.03	$ 86.03	$ 100.79		$ 2.00	$ 2.25		$ 60.63	$ 65.63	
Building Exterior	Foundation Wall										$ -									$ -				
Building Exterior	Painting			$ 12.00	$ 13.78		$ 0.25	$ 0.30		$ 9.00		$ 9.94	$ 49.70	$ 35.03	$ 23.20	$ 1.52	$ 1.78							
Building Exterior	Roofing/ Roofing Lounge	$ 105.45		$ 93.50	$ 107.40		$ 1.00	$ 1.20		$ 20.00	$ 22.08		$ 160.00	$ 187.47					$ 6.00	$ 6.76		$ 85.20	$ 92.22	
Building Exterior	Stairs/Sidewalks				$ -								$ 12.00	$ 14.06			$ -							
Building Exterior	Wall System	$ 2.93	$ 2.93	$ 5.00	$ 5.74		$ 31.50	$ 37.65		$ 6.00			$ 125.00	$ 81.20	$ 64.44	$ 1.58	$ 1.85		$ 10.00	$ 11.26		$ 25.00	$ 27.06	
Building Exterior	Windows	$ 0.59		$ 0.50	$ 0.57		$ 3.50	$ 4.18		$ 3.00		$ 3.31				$ 3.15	$ 3.69		$ 8.00	$ 9.01				
SUM		$ 113.07	$ 12.30		$ 140.71			$ 144.67	$ 47.80		$ 39.75	$ 13.25		$ 327.13	$ 94.67		$ 108.11			$ 29.28			$ 184.91	
Building Interior	Boards and Glass	$ 1.17		$ 3.00	$ 3.45		$ 1.25	$ 1.49		$ 20.00	$ 22.08		$ 18.00		$ 21.09							$ 1.00	$ 1.08	
Building Interior	Canteen			$ 100.50	$ 115.44					$ 15.00		$ 16.56							$ 2.50		$ 2.82	$ 1.00	$ 1.08	
Building Interior	Carpet/Rubber Flooring			$ 8.00	$ 9.19					$ 8.00		$ 8.83				$ 22.58	$ 26.45					$ 12.60	$ 13.64	
Building Interior	Ceilings			$ 39.00	$ 6.89	$ 37.91				$ 55.00		$ 60.72	$ 13.60	$ 5.98	$ 9.96	$ 31.50	$ 36.91		$ 1.50	$ 1.69				
Building Interior	Change Rooms			$ 106.00	$ 121.76								$ 3.20		$ 3.75				$ 20.00	$ 22.52		$ 1.00	$ 1.08	
Building Interior	Counter Shutters																							
Building Interior	Doors and Hardware			$ 11.50	$ 4.02	$ 9.19				$ 1.50	$ 1.66		$ 14.00	$ 8.90	$ 13.12				$ 2.00		$ 2.25			
Building Interior	Floors									$ 27.00	$ 29.81		$ 29.60	$ 13.01	$ 21.68	$ 4.20	$ 4.92		$ 30.00	$ 33.78				
Building Interior	Kitchen Cabinets												$ 2.50	$ 2.93										
Building Interior	Painting	$ 7.03	$ 15.82				$ 10.00	$ 11.95		$ 5.00		$ 5.52	$ 78.00	$ 45.69	$ 45.69	$ 1.58	$ 1.85							
Building Interior	Ramps/Barrier Free Access																							
Building Interior	Renovations Main Level			$ 0.30	$ 0.34												$ -		$ 24.00	$ 27.03				
Building Interior	Renovations Mezzanine Level			$ 8.00	$ 9.19					$ 22.00	$ 24.29									$ -				
Building Interior	Score Boards															$ 9.00	$ 5.27	$ 5.27				$ 7.00	$ 7.58	
Building Interior	Seats/Grandstands			$ 15.00	$ 17.23								$ 22.00	$ 9.37	$ 16.40									
Building Interior	Tiles																							
Building Interior	Walls	$ 1.17		$ 4.50	$ 5.17					$ 30.00		$ 33.12				$ 47.25	$ 55.36		$ 10.00	$ 11.26				
Building Interior	Washrooms			$ 5.00	$ 5.74					$ 5.00		$ 5.52	$ 15.50	$ 7.62	$ 10.54	$ 26.78	$ 31.37		$ 6.00		$ 6.76			
SUM		$ 9.37	$ 15.82		$ 298.43	$ 47.10		$ 13.44			$ 77.84	$ 130.28		$ 93.50	$ 142.24		$ 162.13	$ 5.27		$ 96.29	$ 11.82		$ 24.46	
General	*Ice Edger*												$ 2.50									$ 4.00		
General	*Ice Resurfacing Machine*			$ 4.00									$ 65.00									$ 68.00		
General Electrical	Electrical Room			$ 0.05	$ 0.06														$ 0.08	$ 0.08		$ 3.50	$ 3.79	
General Electrical	Infrared Survey																							
General Electrical	Kitchen Equipment																					$ 2.90		$ 3.14
General Electrical	Lighting	$ 23.43	$ 32.81	$ 20.98	$ 5.51	$ 22.60	$ 39.55	$ 9.62	$ 37.65	$ 0.72	$ 0.79		$ 75.45	$ 85.18	$ 3.22	$ 25.67	$ 30.08		$ 3.70	$ 4.17		$ 5.60	$ 6.06	
General Electrical	Panel Changeouts			$ 0.50	$ 0.57																			
General Electrical	Power Distribution		$ 4.10	$ 1.18	$ 1.35		$ 4.30	$ 5.14					$ 3.00	$ 1.76	$ 1.76	$ 15.44	$ 18.09		$ 0.80	$ 0.90				
General Electrical	Public Address System																							
General Electrical	Receptacles			$ 1.80	$ 2.07					$ 0.10	$ 0.11													
General Electrical	Score Clock and Controller																							
General Electrical	Service Entrance		$ 8.79										$ 6.00	$ 3.51	$ 3.51									
General Electrical	Splitters						$ 3.00	$ 3.59		$ 0.03	$ 0.03											$ 1.50	$ 1.62	
General Electrical	Switch Maintenance/Fuse Change																							
General Electrical	Switches						$ 17.25	$ 11.65	$ 8.96	$ 0.28	$ 0.30													
General Electrical	Transformer Perimeter Protection						$ 15.00		$ 17.93										$ 1.50	$ 1.69				
General Electrical	Transformer Replacement																							
General Electrical	Utility Boxes						$ 8.00	$ 9.56																
General Electrical	Wiring		$ 1.17	$ 0.80	$ 0.92		$ 30.50	$ 9.56	$ 26.89	$ 0.10	$ 0.11								$ 0.10	$ 0.11				
SUM		$ 23.43	$ 46.87		$ 10.48	$ 22.60		$ 49.12	$ 91.42		$ 1.35	$ -		$ 90.45	$ 8.49		$ 48.17	$ -		$ 6.95	$ -		$ 11.47	$ 3.14

			Year= 1997		**Mabou**	Year= 1998		**Glasgow**	Year= 1996		**Pictou**	Year= 2000		**Richmond**	Year= 1997		**Sydney**	Year= 1997		**Mines**	Year= 1999		**Thorburn**	Year= 2001	
Group	Item	Yr 1 to 5		Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10	Rep. Cost	Yr 1 to 5	Yr 6 to 10
Heating/Ventilation	Controls + EMS			$ 6.33	$ 4.00	$ 4.59					$ 3.00	$ 3.31					$ 30.16	$ 35.34		$ 18.30	$ 20.61				
Heating/Ventilation	Dehumidifiers	$ 17.57															$ 5.00	$ 5.86		$ 30.00	$ 33.78		$ 9.00		$ 9.74
Heating/Ventilation	Heating General	$ 7.50	$ 20.91		$ 1.40	$ 1.61	$ -	$ 13.53	$ 10.76	$ 5.41	$ 7.05	$ 7.78	$ -	$ -			$ 131.88	$ 154.52	$ -	$ 2.60	$ 2.93	$ -	$ 4.20	$ 1.30	$ 3.25
Heating/Ventilation	Ventilation General	$ 11.13	$ -		$ 4.00	$ 4.59	$ -	$ 1.73	$ 2.06	$ -	$ 22.00	$ 11.59	$ 12.70	$ 6.75	$ 7.91		$ 122.98	$ 144.10	$ -	$ 13.00	$ 14.64	$ -	$ 6.10	$ 2.70	$ 3.89
SUM		$ 36.20	$ 27.24			$ 10.80	$ -		$ 12.82	$ 5.41		$ 22.69	$ 12.70		$ 7.91	$ -		$ 339.81	$ -		$ 71.96	$ -		$ 4.00	$ 16.88
Life Safety	Alarm Valve																								
Life Safety	Detectors							$ 5.80		$ 6.93										$ 0.60	$ 0.68				
Life Safety	Emergency Breathing Aparatus																								
Life Safety	Emergency Lighting	$ 6.44	$ 4.10		$ 3.50	$ 4.02					$ 0.35	$ 0.39		$ 3.44	$ 0.94	$ 3.09				$ 3.10	$ 3.49				
Life Safety	Fire Alarm		$ 9.96		$ 0.25	$ 0.29					$ 0.05	$ 0.06		$ 4.00	$ 2.34	$ 2.34	$ 2.54	$ 2.98					$ 2.00	$ 2.16	
Life Safety	Fire Alarm Testing/Inspection							$ 1.00	$ 1.20								$ 7.23	$ 8.47		$ 0.03	$ 0.03				
Life Safety	Fire Extinguishers		$ 9.37		$ 1.00	$ 1.15					$ 1.20	$ 1.32								$ 1.20	$ 1.35				
Life Safety	Fire Proofing																								
Life Safety	Fire Separation				$ 10.00	$ 11.49																	$ 1.00	$ 1.08	
Life Safety	Fire Suppression										$ 0.40	$ 0.44					$ 0.15	$ 0.17							
Life Safety	Kitchen Hood																			$ 0.20	$ 0.23				
Life Safety	Sprinklers																			$ 125.00		$ 140.77			
Life Safety	Sprinklers (EACH)																								
SUM		$ 6.44	$ 23.43			$ 16.94			$ 1.20	$ 6.93		$ 2.21			$ 3.28	$ 5.44		$ 11.61			$ 5.77	$ 140.77		$ 3.25	
Misc	Motor Protection																						$ 1.50	$ 1.62	
Misc	Provide Cordless Phone																								
Misc	Sound System																								
Misc	Storage Cabinets										$ 0.50	$ 0.55					$ 0.58	$ 0.67		$ 0.50	$ 0.56				
SUM												$ 0.55						$ 0.67			$ 0.56			$ 1.62	
Plumbing	Circulating Pumps	$ 0.64	$ 1.29					$ 3.60		$ 4.30															
Plumbing	Storage tanks	$ 4.69			$ 1.10		$ 1.26	$ 8.31	$ 9.93					$ 2.20	$ 1.17	$ 1.76				$ 0.05	$ 0.06		$ 1.95	$ 2.11	
Plumbing	Fixtures	$ 0.64	$ 7.91		$ 6.80	$ 0.92	$ 6.89				$ 2.00	$ 2.21		$ 4.90	$ 2.69	$ 3.40								$ 1.00	$ 1.08	
Plumbing	Fuel Storage																								
Plumbing	General/Piping				$ 0.15	$ 0.17								$ 5.00	$ 2.93	$ 2.93				$ 0.05	$ 0.06				
Plumbing	Insulation				$ 0.10	$ 0.11					$ 1.33	$ 1.46								$ 0.60	$ 0.68				
Plumbing	Well Pumps and Pressure Tanks			$ 3.15																					
SUM		$ 5.98	$ 12.35			$ 1.21	$ 8.16		$ 9.93	$ 4.30		$ 3.67	$ -		$ 6.80	$ 8.08					$ 0.79	$ -		$ 3.19	$ -
Refrigeration	Brine Systems	$ 5.83	$ 21.09		$ 7.50	$ 8.62		$ 5.43	$ 4.54	$ 1.94	$ 18.00	$ 15.68	$ 4.20	$ 8.00	$ 9.37		$ -			$ 12.00	$ 6.76	$ 6.76	$ 22.50	$ 24.35	
Refrigeration	Control Systems	$ 0.70	$ 1.46		$ 18.50	$ 21.25								$ 30.00	$ 23.43	$ 11.72									
Refrigeration	Heat Recovery Systems				$ 12.00		$ 13.78																$ 10.00	$ 10.82	
Refrigeration	Ice Plant	$ 35.15	$ 2.93		$ 46.00	$ 52.84		$ 73.75	$ 65.43	$ 22.71	$ 98.00	$ 49.68	$ 58.52	$ 90.00	$ 105.45		$ 280.23	$ 328.33		$ 8.00		$ 9.01	$ 59.45	$ 55.47	$ 8.88
SUM		$ 41.68	$ 25.48			$ 82.71	$ 13.78		$ 69.97	$ 24.65		$ 65.36	$ 62.71		$ 138.26	$ 11.72		$ 328.33	$ -		$ 6.76	$ 15.77		$ 90.65	$ 8.88
Site	Drainage		$ 11.72		$ 5.30	$ 4.37	$ 1.72	$ 5.50		$ 6.57	$ 9.00	$ 9.94		$ 1.50		$ 1.76	$ 10.50	$ 12.30		$ 15.00	$ 16.89				
Site	Fencing																						$ 0.80	$ 0.87	
Site	Ground Maintenance	$ 7.03	$ 11.72					$ 12.00	$ 14.34														$ 1.50	$ 1.62	
Site	Parking Lot/Asphalt	$ 0.59	$ 7.62			$ -		$ 25.50	$ 30.47					$ 30.00	$ 17.57	$ 17.57				$ 6.50	$ 1.69	$ 5.63	$ 23.50	$ 2.16	$ 25.38
Site	Sidewalk/Concrete													$ 12.00	$ 14.06		$ 0.53	$ 0.62							
Site	Storage Shed																						$ 0.50	$ 0.54	
Site	Vehicle Barrier													$ 20.00	$ 23.43										
SUM		$ 7.62	$ 31.05			$ 4.37	$ 1.72		$ 44.82	$ 6.57		$ 9.94			$ 55.07	$ 19.33		$ 12.92			$ 18.58	$ 5.63		$ 5.19	$ 25.38
Structural	Frame/Roof										$ 4.00	$ 4.42					$ 1.58	$ 1.85		$ 34.10	$ 38.40				
Structural	Drainage				$ 3.50	$ 4.02					$ 3.50	$ 3.86								$ 15.00	$ 16.89				
Structural	Floors/Slabs	$ 0.59						$ 1.00	$ 1.20		$ 10.00	$ 11.04					$ 3.15	$ 3.69							
Structural	Foundation	$ 0.29			$ 3.00	$ 3.45					$ 6.50	$ 7.18		$ 2.00	$ 2.34		$ 2.10	$ 2.46							
Structural	Ice Surface			$ 0.59				$ 251.00	$ 1.20	$ 298.77				$ 15.00		$ 17.57				$ 365.00	$ 411.05				
SUM		$ 0.88	$ 0.59			$ 7.47			$ 2.39	$ 298.77		$ 26.50			$ 2.34	$ 17.57		$ 8.00	$ -		$ 466.34				
TOTAL		$ 244.67	$ 195.13		$ -	$ 591.49	$ 93.36	$ -	$ 348.35	$ 485.86	$ -	$ 249.85	$ 222.25	$ -	$ 724.73	$ 307.55	$ -	$ 1,023.44	$ 5.27	$ -	$ 705.54	$ 173.99	$ -	$ 328.75	$ 54.28


Age vs. Cost
w/o Centre 200
70
60
50
40
30
20
10
0
Age (years)
$-
$200.00
$400.00
$600.00
$800.00
$1,000.00
$1,200.00
10 Year Repair Cost (1000s of $)

Curling Clubs	All $ Values in thousands	K= 0.02								
		Lunenburg	Year= 2002		Bridgewater	Year= 1998		Chedabucto	Year= 2002	
Group	Item	Rep. Cost	Yr 03-08	Yr 09-13	Rep. Cost	Yr 99-04	Yr 05-09	Rep. Cost	Yr 02-07	Yr 08-12
Building Exterior	Doors and Hardware	$ 5.40		$ 5.73				$ 2.00	$ 2.12	
Building Exterior	Roofing	$ 60.00	$ 63.67		$ 86.40	$ 99.25				
Building Exterior	Windows	$ 7.80		$ 8.28						
SUM			$ 63.67	$ 14.01		$ 99.25	$ -		$ 2.12	
Building Interior	Carpet/Rubber Flooring				$ 28.00		$ 32.16			
Building Interior	Change Rooms				$ 8.00		$ 9.19			
Building Interior	Doors and Hardware	$ 1.60	$ 1.70							
Building Interior	Handrails	$ 1.00	$ 1.06							
Building Interior	Kitchen							$ 5.00	$ 5.31	
Building Interior	Ramps/Barrier Free Access				$ 5.50	$ 6.32				
Building Interior	Washrooms							$ 30.00	$ 31.84	
SUM			$ 2.76	$ -		$ 6.32	$ 41.35		$ 37.14	$ -
Structural	Flooring System	$ 10.00	$ 10.61							
Structural	Foundation Wall				$ 1.00	$ 1.15				
Structural	Roofing Trusses	$ 30.00	$ 31.84							
SUM			$ 42.45			$ 1.15				
Fire Protection	Air Compressor	$ 2.50		$ 2.65						
Fire Protection	Exit/Emergency Lights	$ 3.38	$ 3.58							
Fire Protection	Fire Alarm Testing/Inspection	$ 0.75	$ 0.80							
SUM			$ 4.38	$ 2.65						
General	Ice Melter	$ 3.00		$ 3.18						
General	Maintenance							$ 7.50	$ 3.98	$ 3.98
SUM				$ 3.18					$ 3.98	$ 3.98
General Electrical	Bingo Hall Upgrade				$ 8.00	$ 9.19				
General Electrical	Lighting	$ 11.85	$ 12.58							
General Electrical	Power Distribution	$ 4.38	$ 3.61	$ 1.03						
General Electrical	Public Address System	$ 5.00	$ 5.31							
General Electrical	Recepticles	$ 20.00	$ 21.22							
General Electrical	Switches	$ 12.00		$ 12.73	$ 1.50	$ 1.72				
General Electrical	Code Upgrade							$ 3.00	$ 3.18	
General Electrical	Controls							$ 4.00	$ 4.24	
SUM			$ 42.71	$ 13.77		$ 10.91	$ -		$ 7.43	$ -
Heating/Ventilation	Boilers	$ 3.50	$ 3.71							
Heating/Ventilation	Chimney/Breeching	$ 0.25		$ 0.27						
Heating/Ventilation	Circulators	$ 0.50	$ 0.53							
Heating/Ventilation	Furnaces				$ 5.00	$ 5.74				
Heating/Ventilation	Dehumidifiers	$ 25.00		$ 26.53				$ 8.00		$ 8.49
Heating/Ventilation	Exhaust Systems & Fans	$ 1.30	$ 0.37	$ 1.01						
Heating/Ventilation	Piping/Valves	$ 5.00	$ 5.31							
Heating/Ventilation	Oil/Fuel Tanks	$ 0.50	$ 0.53		$ 1.00	$ 1.15				
Heating/Ventilation	Ventilation	$ 1.50								
Heating/Ventilation	Space Heaters	$ 3.50		$ 3.71						
SUM			$ 10.45	$ 31.52		$ 6.89				$ 8.49
Plumbing	Sump Pumps				$ 3.00		$ 3.45			
Plumbing	DHW Storage tanks	$ 11.00		$ 11.67						
Plumbing	Expansion Tanks	$ 0.10	$ 0.11							
Plumbing	Fixtures	$ 0.80	$ 0.85		$ 0.80	$ 0.92				
Plumbing	Hot Water Heaters							$ 0.50	$ 0.53	
SUM			$ 0.96	$ 11.67		$ 0.92	$ 3.45		$ 0.53	$ -
Refrigeration	Brine Systems	$ 3.10	$ 3.29							
Refrigeration	Condenser Water Sump	$ 1.20	$ 1.27							
Refrigeration	Condensers	$ 7.00	$ 7.43					$ 3.50	$ 3.71	
Refrigeration	Control Systems	$ 2.50	$ 2.65							
Refrigeration	Sensors/Monitors	$ 1.50	$ 1.59							
Refrigeration	Ice Plant							$ 55.00	$ 58.37	
Refrigeration	Oil Separators	$ 1.00	$ 1.06							
SUM			$ 17.30	$ -		$ -	$ -		$ 62.08	$ -
			$ 184.68	$ 76.80		$ 125.44	$ 44.80		$ 113.28	$ 12.47

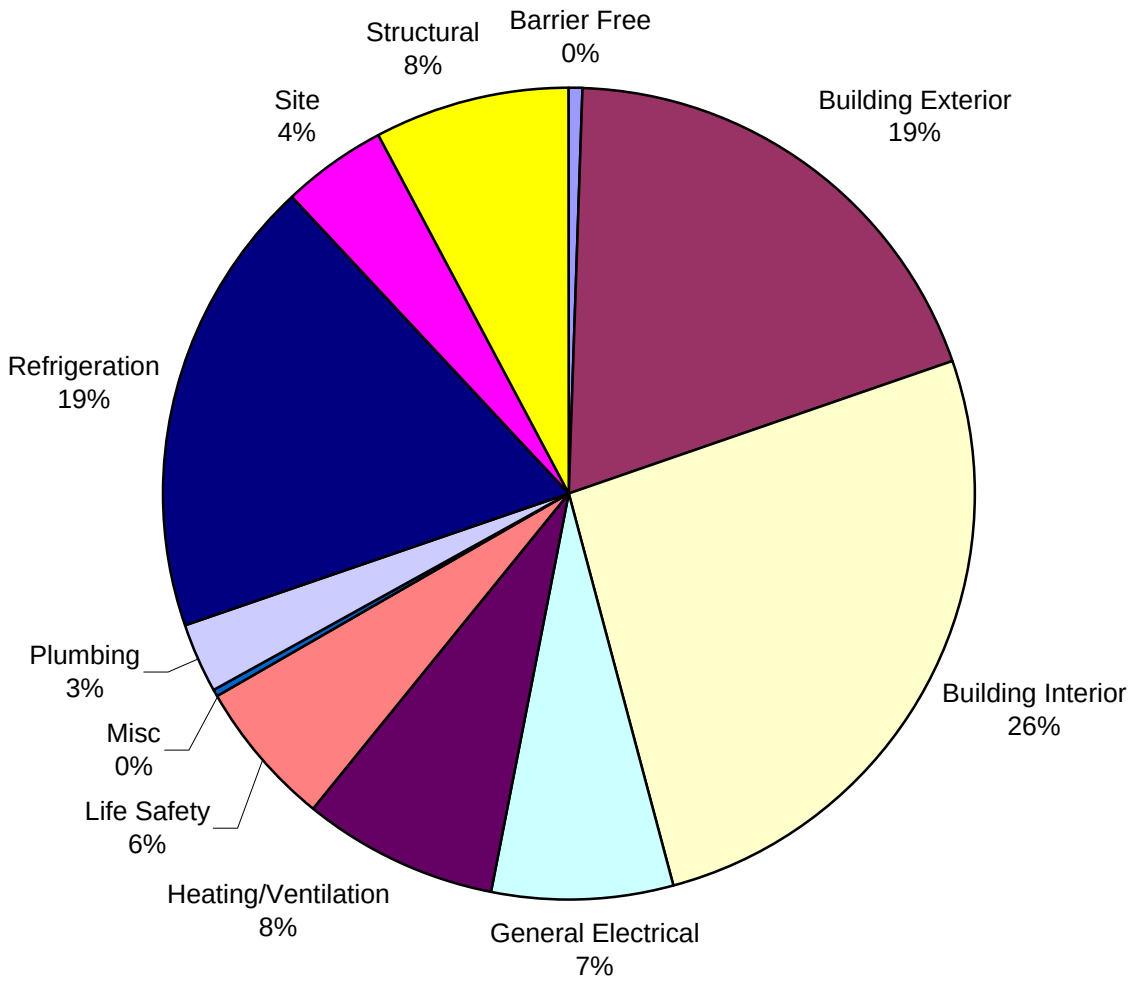
Indoor Pools	**All $ Values in thousands**	K= 0.02							
		Northside	Year= 1999		**Pictou**	Year= 1998			
Group	Item	Rep. Cost	Yr 00-04	Yr 05-09	Rep. Cost	Yr 98-03	Yr 04-08		
Barrier Free	Parking				$ 10.00	$ 11.49			
Barrier Free	Washrooms				$ 26.50	$ 30.44			
SUM						$ 41.93			
Building Exterior	Doors and Hardware	$ 1.00		$ 1.13	$ 3.50	$ 4.02			
Building Exterior	Façade	$ 4.00	$ 4.50						
Building Exterior	Painting				$ 30.00	$ 34.46			
Building Exterior	Roofing	$ 187.00	$ 210.59		$ 130.00	$ 34.46	$ 114.87		
Building Exterior	Walls	$ 2.00	$ 2.25		$ 22.50	$ 11.49	$ 14.36		
Building Exterior	Windows	$ 1.00	$ 1.13						
SUM			$ 218.48	$ 1.13		$ 84.43	$ 129.23		
Building Interior	Ceilings	$ 9.50	$ 10.70		$ 2.55	$ 2.93			
Building Interior	Change Rooms				$ 10.00	$ 11.49			
Building Interior	Circulation Spaces	$ 1.50	$ 1.69		$ 6.50	$ 7.47			
Building Interior	Doors and Hardware				$ 14.70	$ 16.89			
Building Interior	Equipment Replacement				$ 55.00	$ 34.46	$ 28.72		
Building Interior	Floors				$ 43.70	$ 42.16	$ 8.04		
Building Interior	Walls				$ 3.25	$ 2.87	$ 0.86		
SUM			$ 12.39			$ 118.26	$ 37.62		
General Electrical	Breaker				$ 20.00	$ 22.97			
General Electrical	Distribution				$ 10.00	$ 11.49			
General Electrical	General	$ 3.95	$ 4.45						
General Electrical	Insulation				$ 1.00	$ 1.15			
General Electrical	Lighting	$ 9.00	$ 1.13	$ 9.01	$ 7.50	$ 8.62			
SUM			$ 5.57	$ 9.01		$ 44.22			
Heating/Ventilation	Boiler	$ 23.00	$ 25.90						
Heating/Ventilation	Chimney/Breeching	$ 7.71	$ 8.68						
Heating/Ventilation	Controls	$ 3.80	$ 4.28		$ 0.40	$ 0.46			
Heating/Ventilation	Insulation				$ 0.20	$ 0.23			
Heating/Ventilation	Ventilation	$ 9.50	$ 9.57	$ 1.13	$ 67.30	$ 77.31			
SUM			$ 48.44	$ 1.13		$ 78.00			
Life Safety	Detectors	$ 0.50	$ 0.56						
Life Safety	Emergency Lighting	$ 0.90	$ 1.01		$ 1.25	$ 1.44			
Life Safety	Extinguishers	$ 0.25	$ 0.28		$ 0.30	$ 0.34			
Life Safety	Fire Alarm System	$ 2.00	$ 2.25						
Life Safety	Stairs to davit				$ 5.00	$ 5.74			
SUM			$ 4.11			$ 7.52			
Plumbing	Breeching	$ 0.50	$ 0.56						
Plumbing	DHW Tank	$ 3.00	$ 3.38						
Plumbing	Fixtures	$ 3.50	$ 2.25	$ 1.69	$ 0.75	$ 0.86			
SUM			$ 6.19	$ 1.69		$ 0.86			
Pool	Blanket	$ 5.00	$ 5.63						
Pool	Deck				$ 2.00	$ 2.30			
Pool	Piping/Filtration	$ 9.60	$ 10.81						
Pool	Reflective Film	$ 5.00		$ 5.63					
Pool	Tiles	$ 0.30	$ 0.34						
SUM			$ 16.78	$ 5.63		$ 2.30			
Site	Drainage		$ -		$ 0.20	$ 0.23			
Site	Grade	$ 0.50	$ 0.56						
Site	Ground Maintenance				$ 0.50	$ 0.57			
Site	Improvements				$ 2.75	$ 3.16			
Site	Parking Lot/Asphalt	$ 10.00		$ 11.26	$ 0.50	$ 0.57			
SUM			$ 0.56	$ 11.26		$ 4.54			
Structural	Reseal Pool Joints	$ 4.00	$ 2.25	$ 2.25	$ 2.00	$ 1.15	$ 1.15		
Structural	Supports	$ 57.00	$ 64.19		$ 1.50	$ 1.72			
SUM			$ 66.44	$ 2.25		$ 2.87	$ 1.15		
			$ 378.96	$ 32.10	$ -	$ 384.92	$ 168.00		

Outdoor Pools	**All $ Values in thousands**	K= 0.02												
		Windsor	Year= 2003		**Annapolis**	Year= 1994		**Mulgrave**	Year= 2000		
Group	Item	Rep. Cost	Yr 03-06	Yr 07-08	Rep. Cost	Yr 94-99	Yr 00-04		Yr 01-05	Yr 06-11	
Barrier Free		$ 11.00	$ 11.44								
SUM			$ 11.44								$ 11.44
Building Exterior	Doors and Hardware	$ 5.00	$ 5.20								
Building Exterior	Maintenance				$ 0.50	$ 0.62					
Building Exterior	Painting				$ 0.25	$ 0.31					
Building Exterior	Roofing				$ 0.75		$ 0.93				
Building Exterior	Windows	$ 4.00	$ 4.16								
Building Exterior	Soffits	$ 2.50	$ 2.60								
SUM			$ 11.96			$ 0.93	$ 0.93				$ 13.83
Building Interior	Ceilings	$ 1.50	$ 1.56								
Building Interior	Floors	$ 12.00	$ 12.48								
Building Interior	Walls	$ 4.00	$ 4.16								
Building Interior	Washrooms	$ 10.50	$ 7.80	$ 3.12							
SUM			$ 26.01	$ 3.12							$ 29.13
General Electrical	Deficiencies				$ 0.35	$ 0.44					
General Electrical	Entrance				$ 0.50	$ 0.62					
General Electrical	Lighting	$ 0.40	$ 0.42					$ 0.90	$ 0.99		
General Electrical	Receptacles	$ 0.50	$ 0.52								
General Electrical	Switchboard	$ 3.00	$ 3.12								
General Electrical	Wiring				$ 0.50	$ 0.62					
SUM			$ 4.06			$ 1.68			$ 0.99		$ 6.73
Heating/Ventilation	Exhaust							$ 1.20		$ 1.32	
Heating/Ventilation	Oil/Fuel Tanks							$ 0.30		$ 0.33	
Heating/Ventilation	Ventilation	$ 7.50	$ 7.80					$ 0.80	$ 0.88		
SUM			$ 7.80						$ 0.88	$ 1.66	$ 10.34
Plumbing	Backflow Preventers	$ 2.50	$ 2.60								
Plumbing	Hot Water Tank							$ 1.20		$ 1.32	
Plumbing	Insulation	$ 1.25	$ 1.30								
Plumbing	Fixtures							$ 4.00	$ 2.21	$ 2.21	
Plumbing	Floor Drains	$ 5.00	$ 5.20								
SUM			$ 9.10						$ 2.21	$ 3.53	$ 14.84
Pool	Caulking/Sealing	$ 3.00	$ 3.12		$ 1.25	$ 1.55					
Pool	Chlorinator				$ 0.60	$ 0.75					
Pool	Cover							$ 2.40	$ 0.88	$ 1.77	
Pool	Deck	$ 5.00	$ 5.20		$ 2.75	$ 3.42		$ 2.40	$ 1.32	$ 1.32	
Pool	Equipment				$ 2.15	$ 2.67					
Pool	Filters/Pump				$ 1.71	$ 1.19	$ 0.93	$ 7.05	$ 7.78		
Pool	Floors	$ 15.00	$ 10.40	$ 5.20							
Pool	Maintenance							$ 3.30	$ 1.66	$ 1.99	
Pool	Painting				$ 0.50	$ 0.62					
Pool	Piping/Valves	$ 1.00	$ 1.04		$ 0.78	$ 0.96		$ 4.00	$ 4.42		
Pool	Upgrades							$ 1.80	$ 1.99		
Pool	Slide							$ 5.80	$ 2.76	$ 3.64	
Pool	Walls	$ 15.00	$ 10.40	$ 5.20							
Pool	Waterproofing	$ 17.00	$ 11.44	$ 6.24							
SUM			$ 41.62	$ 16.65		$ 11.17	$ 0.93		$ 20.81	$ 8.72	$ 99.89
Site	Retaining Walls	$ 40.00	$ 41.62								
Site	Maintenance				$ 0.25	$ 0.31		$ 0.75	$ 0.28	$ 0.55	
Site	Fencing							$ 16.00	$ 17.67		
SUM			$ 41.62			$ 0.31			$ 17.94	$ 0.55	$ 60.42
			$ 153.62	$ 19.77	$ -	$ 14.09	$ 1.87	$ -	$ 42.84	$ 14.46	

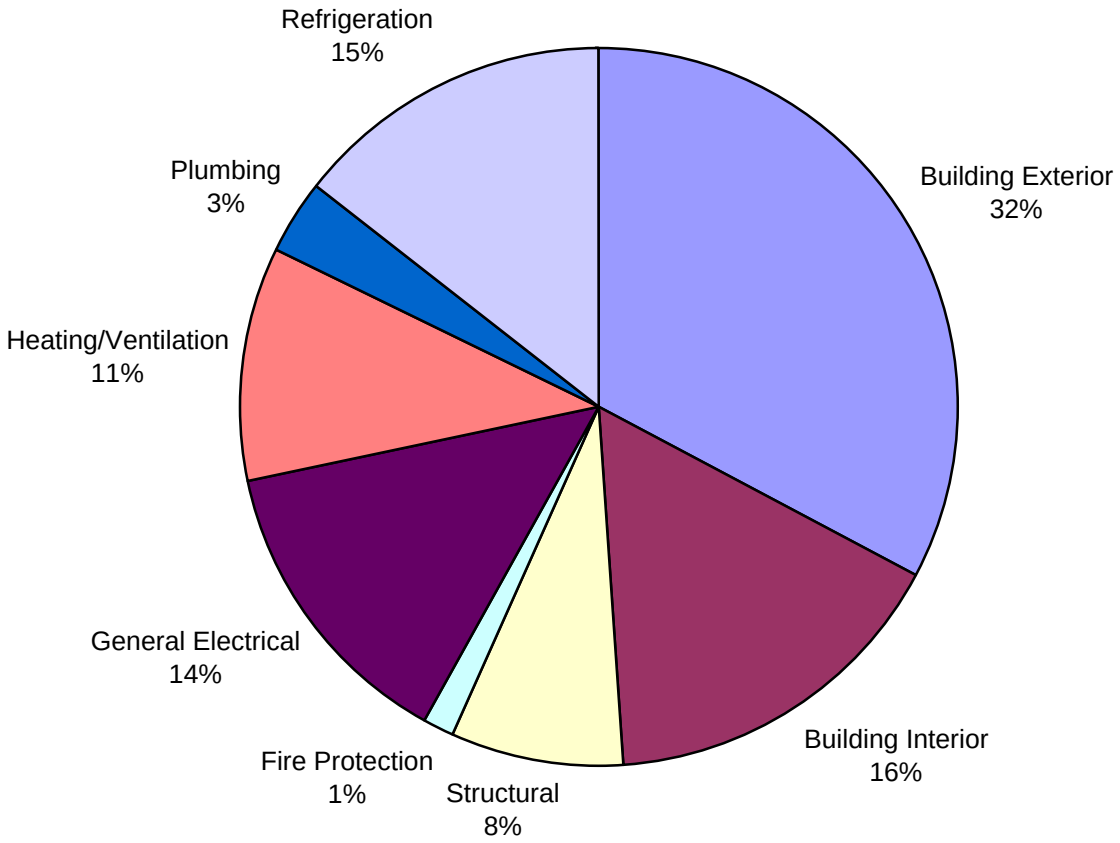
APPENDIX C

COST DISTRIBUTION
CHARTS

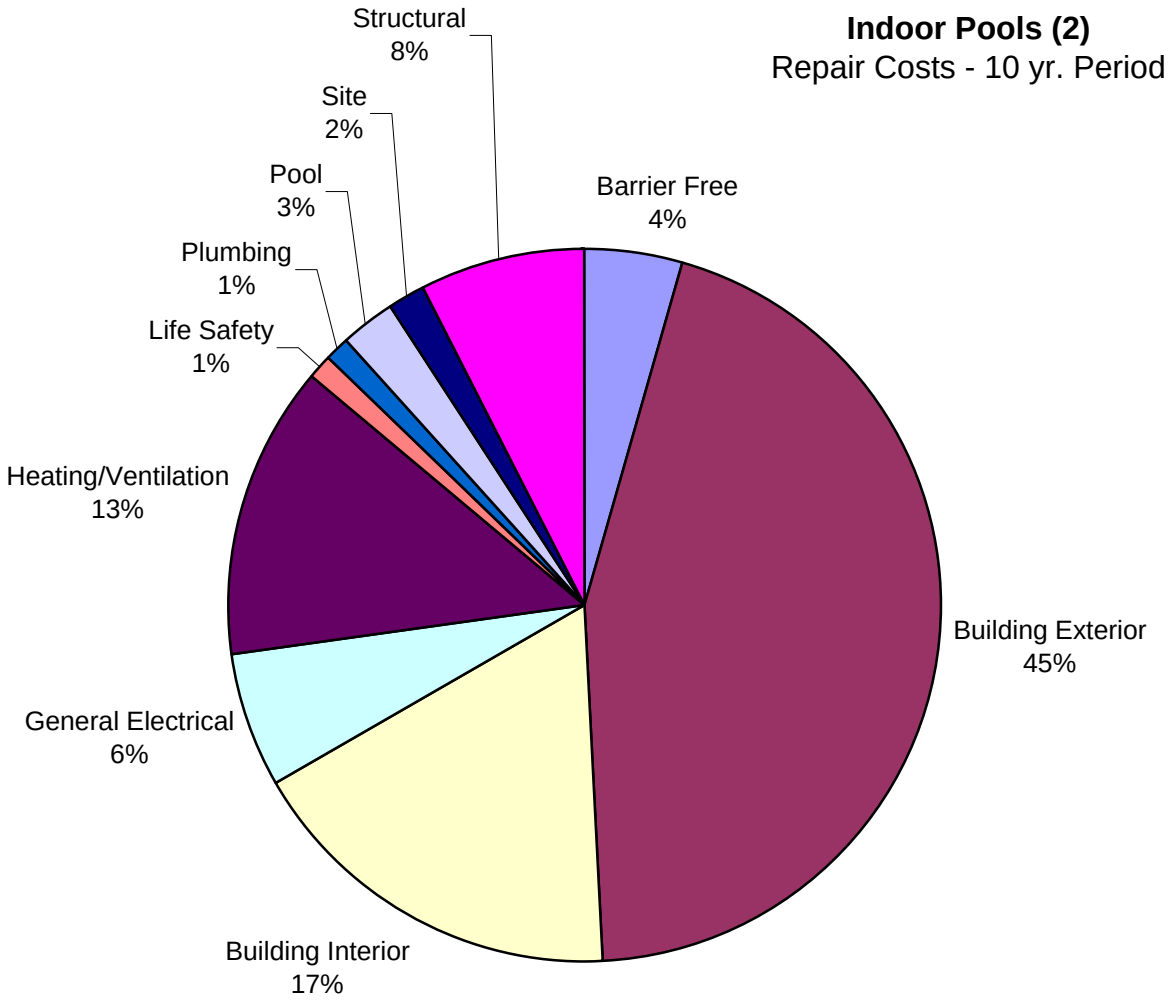
Arenas (18)
Repair Costs - 10 year period



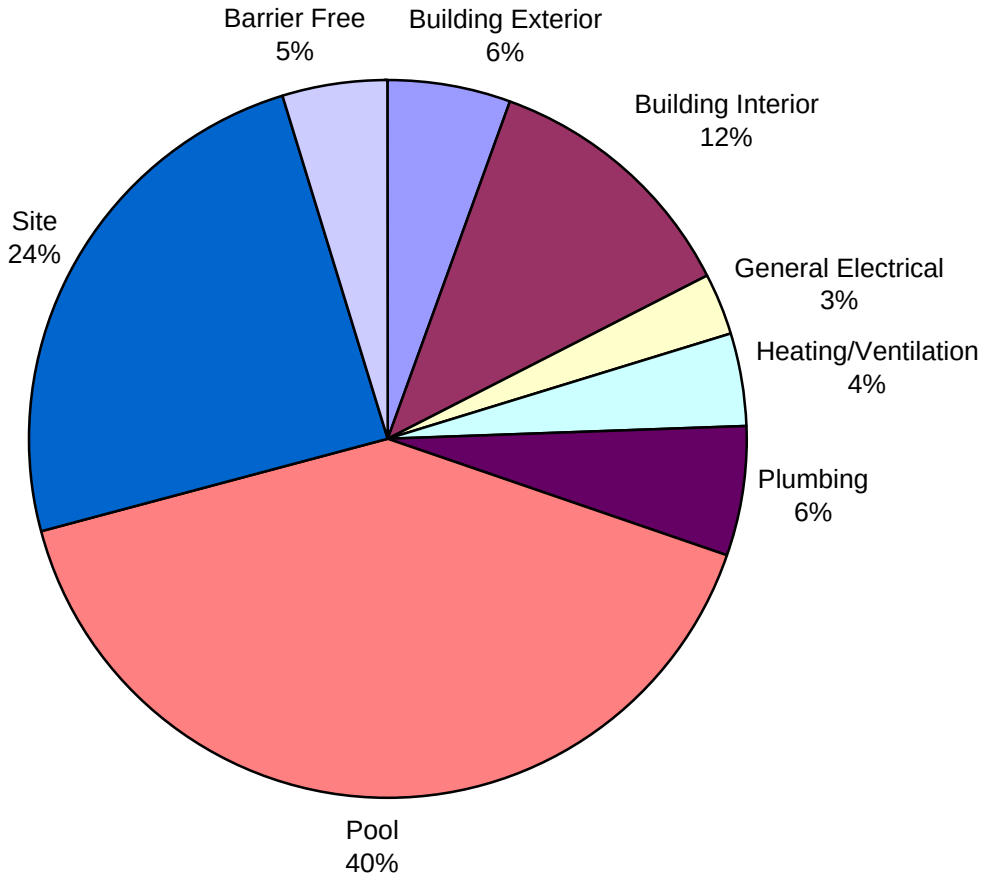
Curling Clubs (3)
Repair Costs 10 yr. Period



Indoor Pools (2)
Repair Costs - 10 yr. Period



Outdoor Pools (3)
Repair Costs - 10 yr. Period



Yarmouth Fields
Repair Costs 10 yr. Period