



DEPARTMENT OF FACILITIES MANAGEMENT
REQUEST FOR
PROPOSALS
FOR
CANADA GAMES
FACILITIES
UPGRADE AQ-004-19

Request for Proposal Number: RFP-096-21

Issued: September 9th 2021

Submission Deadline: Thursday, October 7th, 2021 @ 3:00 PM NDT

Request for Proposal			
Title:	REQUEST FOR PROPOSALS FOR CANADA GAMES FACILITIES UPGRADE AQ-004-19		
Open Call #:	RFP-096-21	Issue Date:	September 9, 2021
Questions Deadline:	72 hours prior to close time	Closing Date and Time:	Thursday, October 7th, 2021 3:00 PM NDT
		Proposal Submission Format:	opencalls@mun.ca
		Opening Date & Time:	Thursday, October 7th, 2021 3:30 PM NDT
			Via Conference Line: 1-416-915-6530 (toll free) Access Code: 2630 613 5110 Attendee ID: Please Press Pound (#)
Proposals Irrevocable Period after Submission Deadline:			45 days
Proposal Submission: Responses to this solicitation must be submitted by email to <u>opencalls@mun.ca</u>. Email subject line must read: <u>PROPOSAL SUBMISSION: RFP-096-21 REQUEST FOR PROPOSAL FOR CANADA GAMES FACILITIES UPGRADE AQ-004-19</u>			
<p>Inquiries and communication: Strategic Procurement Office, Financial and Administrative Services, Memorial University of Newfoundland, opencalls@mun.ca. Inquiries accepted only via email. No phone calls will be accepted.</p> <p>Please reference <u>RFP-096-21 REQUEST FOR PROPOSAL FOR CANADA GAMES FACILITIES UPGRADE AQ-004-19</u> in subject line. Emails not containing this requirement information in the subject line will NOT be responded to.</p> <p>Proposals submitted by fax, mail, courier, drop off or by any other means of delivery other than by email stated above shall not be accepted.</p>			

ABOUT MEMORIAL UNIVERSITY

As Newfoundland and Labrador's only university, Memorial has a special obligation to the people of this province. Established as a memorial to the Newfoundlanders who lost their lives on active service during the First and Second World Wars, Memorial University draws inspiration from these shattering sacrifices of the past as we help to build a better future for our province, our country and our world.

We are a multi-campus, multi-disciplinary, public university committed to excellence in teaching and learning, research and scholarship, and to public engagement and service. We strive to have national and global impact, while fulfilling our social mandate to provide access to university education for the people of the province and to contribute to the social, cultural, scientific and economic development of Newfoundland and Labrador and beyond.

The Memorial experience goes beyond academics; it invites a discovery of self, community and place. At Memorial, we celebrate our unique identity through the stories of our people – the work of scholars and educators, the ingenuity of students, the achievements of alumni – and the impact we collectively make in the province, the country and the world. Memorial is the natural place where people and ideas become.

Memorial University has more than 18,500 students and 3,600 faculty and staff spread across four campuses and nearly 100,000 alumni active throughout the world. From local endeavors to research projects of national importance, Memorial's impact is felt far and wide.

Mission, Vision and Values

Vision

Memorial University will be one of the most distinguished public universities in Canada and beyond, and will fulfill its special obligation to the people of Newfoundland and Labrador.

Mission

Memorial University is an inclusive community dedicated to innovation and excellence in teaching and learning, research, scholarship, creative activity, service and public engagement. Memorial welcomes and supports students and scholars from all over the world and contributes knowledge and expertise locally, nationally and internationally.

Values

Excellence: Encouraging and promoting excellence through innovation and creativity, rigor and pragmatism.

Integrity: Being honest and ethical in all interactions, maintaining the highest ethical standards in teaching, research, public engagement and service.

Collegiality: Engaging others with respect, openness and trust in pursuit of a common purpose, having regard for individuals, ideals and the institution as a whole.

Inclusiveness and diversity: Embracing and acting on responsibility to guarantee diversity and equity.

Responsiveness: Being receptive to individuals and communities.

Accountability: Accepting responsibility for achievement of common goals and objectives.

Freedom and Discovery: Supporting the freedom to pursue knowledge that is based on individual and collective intelligence, curiosity, ingenuity and creativity.

Recognition: Acknowledging, tangibly, all aspects of university enterprise including teaching and learning, research, scholarship, creative activity and public engagement.

Responsibility to place: Valuing and fulfilling the special obligation to the people of Newfoundland and Labrador by supporting and building capacity for excellence that:

- addresses needs and opportunities for Newfoundland and Labrador;
- engages the university community on matters of national and international significance;
- produces and delivers academic programs of national and international calibre; and,
- Recognizes the dynamic opportunities presented by a multi-campus institution.

Responsibility to learners: Recognizing students as a first priority and providing the environment and support to ensure their academic and personal success.

Interdisciplinary collaboration: Supporting overarching themes in all pursuits that cut across academic units and address significant opportunities and challenges for which Memorial is particularly well positioned to build nationally and internationally recognized capacity.

Sustainability: Acting in a manner that is environmentally, economically and socially sustainable in administration, academic and research programs.

Memorial's exceptional staff and students contribute to the vitality and positive environment of the university through active community engagement. Memorial University has always been a publicly engaged institution. Since the founding of the University in 1949, the work of many of Memorial's students, faculty and staff has emphasized the importance of strong, sustained partnerships with members of the public of Newfoundland and Labrador and beyond.

Faculty and Staff

Memorial is one of the largest employers in the province, with approximately 3,600 faculty and staff. Memorial has been recognized as an Employer of Distinction by the Newfoundland and Labrador Employers' Council, which is reflective of its investment in comprehensive benefits, services such as childcare and recreation facilities, emphasis on work-life balance, and its vibrant work environment.

Governance and Administration

The management, administration and control of the property, revenue, business and affairs of the University are vested in a Board of Regents. The Board is appointed under the *Memorial University Act* and is responsible for the management, administration, and control of the property, revenue, business and affairs of the university. Matters of an academic character are in general charge of the Senate of the University.

For more information on Memorial University of Newfoundland, please

visit: Memorial home page: <http://www.mun.ca/>

Land Acknowledgement

We respectfully acknowledge the territory on which we gather as the ancestral homelands of the Beothuk, and the island of Newfoundland/ Ktaqmkuk as the ancestral homelands of the Mi'kmaq and Beothuk. We would also like to recognize the Inuit of Nunatsiavut and NunatuKavut and the Innu of Nitassinan, and their ancestors, as the original people of Labrador. We strive for respectful relationships with all the peoples of this province.

PART 1 – SUBMISSION INSTRUCTIONS

1.1 Proposals to be Submitted on Time

Proposals must be submitted as set out above on or before the Submission Deadline. Proposals submitted after the Submission Deadline will be rejected. Onus and responsibility rests solely with the proponent to submit its Proposal to the email indicated in the Request for Proposal on or before the Submission Deadline. The Owner does not accept any responsibility for any proposals submitted by means other than the email listed above. Proponents making submissions near the deadline do so at their own risk due to server availability. The time for the closing will be determined according to the inbox time stamp on opencalls@mun.ca . Proposals received after the closing time based on this time stamp, will NOT be considered.

1.2 Proposals to be Submitted in Prescribed Format

Proponents should submit **One (1)** email submission as a single file in PDF format. Please note: File size cannot exceed 15 MB. Otherwise server may reject proposal submission due to size. Proposals submitted by fax, mail, courier, drop off or by any other means of delivery other than by email stated above shall not be accepted.

1.3 Amendment of Proposals

Proponents may amend their Proposals after they have been submitted if, and only if, the amendment is emailed prior to the Submission Deadline marked PROPOSAL SUBMISSION AMENDMENT followed by RFP-096-21 CANADA GAMES FACILITIES UPGRADE AQ-004-19 Proposal revisions, changes and alterations may be made only by completing a new proposal. Previous submissions will be cancelled and the submission with the most recent date and time will be considered the final proposal.

Email inquiries and requests for clarification shall be accepted up to **72 hours** prior to the closing time. Inquiries and requests for clarification received after this date shall not be addressed. The Strategic Procurement Office will be the only official source of information regarding this Open Call for Proposals and information from any other source shall be considered unofficial and may not be correct.

To ensure consistency and quality in the information provided to Proponents the Owner shall provide, by way of amendment to this request for proposals in the form of an addendum, any relevant information with respect to the Request for Proposal inquiries received in writing without revealing the source of those inquiries. Proponents are cautioned that it is their responsibility to ensure that they receive all information relevant to this Request for Proposal. The Owner shall not be responsible for Proponents who fail to inform themselves regarding the scope and nature of the work. The Owner shall publish all amendments on Memorial University's website at https://www.mun.ca/finance/strategic_procurement/ or current service providers: MERX: www.merx.com, Bids: www.bids.ca and PODS: www.pods.net .Proponents should check on a regular basis for Request for Proposal updates. Proponents are solely responsible for ensuring they are aware of and have complied with all amendments by proposal submission closing time. Proponents are welcome to register their email address through opencalls@mun.ca to receive addendum notifications from Open Calls as a matter of courtesy. This does not relieve any Proponent of their responsibility to ensure all addenda has been received.

1.4 Withdrawal of Proposals

Proponents may withdraw their Proposals prior to the Submission Deadline. To withdraw a Proposal, a notice of withdrawal must be sent to the opencalls@mun.ca prior to the Submission Deadline and must be signed by an authorized representative of the Proponents. The Owner is under no obligation to return withdrawn Proposals.

1.5 Proposals Irrevocable after Submission Deadline

Proposals shall be irrevocable for a period of **45** days running from the moment that the Submission Deadline passes.

1.6 Delivery

Delivery of all materials and services must be DAP (delivered at place) or DDP (delivered duty paid (all locations) and local environs).

1.7 Signature

Memorial University, in consideration of section 11 of the Electronic Commerce Act, confirms its acceptance of electronic signatures, or other acceptable form of electronic consent, in satisfaction of the signature requirement for proposal submissions. The electronic form of signature or consent must be directly related to the relevant proposal submission at issue and must be reliable, in a manner as determined by Memorial University, for the purpose of identifying the person submitting the proposal response. By submitting a proposal under this process, the proponent confirms that the signatory has the appropriate and proper authority to bind the proponent to its submission, a confirmation upon which Memorial University relies in the processing of the proposal submission. **Proponents must complete Appendix B – Submission Form. Proposals received without Appendix B completed will be deemed non-compliant.**

1.8 Closure

In the event that the University is closed earlier than normally expected prior to a scheduled Request for Proposal closing for that day, or for the full day, the closing date for those Request for Proposal will be extended to the next business day for the University at the same time as listed originally.

1.9 Corporations Act

The Corporations Act of Newfoundland and Labrador requires that an extra-provincial company be registered before it begins or carries on business in the Province. If your company is not registered, please apply for the appropriate forms and procedures to:

Commercial Registrations Division

Department of Government Services

PO Box 8700

St John's, NL Canada A1B 4J6

Phone: 709-729-3317, Fax: 709-729-0232

Website: http://www.gs.gov.nl.ca/registries/companies/corp_art_inc.html

[End of Part 1]

PART 2 – EVALUATION AND AWARD

2.1 Stages of Evaluation

The Owner will conduct the evaluation of Proposals in the following stages:

2.2 Stage I – Mandatory Submission Requirements

Stage I will consist of a review to determine which Proposals comply with all of the mandatory submission requirements. Proposals that do not comply with all of the mandatory submission requirements as of the Submission Deadline will, subject to the express and implied rights of the Owner, be disqualified and not evaluated further. The submission form (**Appendix B**) must be completed. Submission without **Appendix B completed will be disqualified.**

2.3 No Amendment to Forms

Other than inserting the information requested on the mandatory submission forms set out in the Request for Proposal, a Proponent may not make any changes to any of the forms. Any Proposal containing any such changes, whether on the face of the form or elsewhere in the Proposal shall be disqualified.

Stage II will consist of the following:

2.4 Mandatory Technical Requirements

The Owner will review the proposals to determine whether the mandatory technical requirements as set out in **Appendix A** been met. Proposals that do not comply with all of the mandatory technical requirements will, subject to the express and implied rights of the Owner, be disqualified and not evaluated further.

2.5 Rated Criteria

The Owner will evaluate each qualified proposal on the basis of the rated criteria set out in **Appendix C.**

2.6 Selection of Proponent

After the completion of Stage II proponents will be ranked based on their total scores, all scores from will be added together and proponents will be ranked based on their total scores. Subject to the reserved rights of the Owner, the top-ranked proponent may be selected to enter into the Agreement in accordance with the following section.

Provincial suppliers, suppliers with a place of business in Newfoundland and Labrador, will be given provincial supplier preference provision. This mandates an allowance of ten percent for provincial suppliers for all procurement below trade agreement thresholds.

Please note, the supplier preference does not apply when the estimated value of the commodity is above the trade agreement threshold shown below.

Public Body	Thresholds			
	Goods	Services	Public Works	Lease of Space
Memorial University	\$105,700	\$105,700	\$264,200	\$100,000

2.7 Notification

Notice of selection by the Owner to the preferred supplier(s) shall be in writing.

2.8 Failure to Enter into Agreement

If a preferred supplier fails to satisfy the pre-conditions of award within fifteen (15) days of notice of selection, the Owner may, without incurring any liability, proceed with the selection of another proponent and pursue all remedies available to the Owner

2.9 Payment Terms

The University's standard payment terms are net 30 days after delivery of goods, or net 15 days after successful completion of installation as applicable. In the case of services, payment terms are also net 30 days after successful completion of the service. These terms shall also apply in the case of sub-contracted items. Prepayments will not be considered unless the supplier provides an irrevocable standby letter of credit, or the supplier provides a credit reference from its banker satisfactory to the Director of Financial and Administrative Services.

[End of Part 2]

PART 3 – TERMS AND CONDITIONS OF THE OPEN CALL PROCESS

3.1 Incorporated into Proposal

All of the provisions of this Request for Proposal are deemed to be accepted by each Proponent and incorporated into each Proponents' Proposal. A Proponent who submits conditions, options, variations or contingent statements to the terms as set out in this Request for Proposal, either as part of its Proposal or after receiving notice of selection, unless otherwise indicated, may be disqualified. If a Proponent is not disqualified despite such changes or qualifications, the provisions of this Request for Proposal, including any agreement set out in will prevail over any such changes or qualifications in the Proposal.

3.2 Proponents to Follow Instructions

Proponents should structure their Proposals in accordance with the instructions in this Request for Proposal. Where information is requested in this Request for Proposal, any response made in a Proposal should reference the applicable section numbers of this Request for Proposal.

3.3 Proposals in English

All Proposals are to be in English only.

3.4 No Incorporation by Reference

The entire content of the Proponent's Proposal should be submitted in a fixed form, and the content of websites or other external documents referred to in the proponent's Proposal but not attached will not be considered to form part of its Proposal.

3.5 References and Past Performance

In the evaluation process, the Owner may include information provided by the Proponents references and may also consider the Proponents past performance or conduct on previous contracts with the Owner or other institutions.

3.6 Information in Request for Proposal Only an Estimate

The Owner and its advisers make no representation, warranty or guarantee as to the accuracy of the information contained in this Request for Proposal or issued by way of addenda. Any quantities shown or data contained in this Request for Proposal or provided by way of addenda are estimates only, and are for the sole purpose of indicating to Proponents the general scale and scope of the Deliverables. It is the Proponents' responsibility to obtain all the information necessary to prepare a Proposal in response to this Request for Proposal.

3.7 Proponents to Bear Their Own Costs

The Proponent will bear all costs associated with or incurred in the preparation and presentation of its Proposal, including, if applicable, costs incurred for interviews or demonstrations.

3.8 Proposal to be Retained by the Owner

The Owner will not return the Proposal or any accompanying documentation submitted by a Proponent.

3.9 Trade Agreements

Proponents should note that procurements falling within the scope of the Canadian Free Trade Agreement and/or the Canada-European Union Comprehensive Economic Trade Agreement are subject to those trade agreements but that the rights and obligations of the parties will be governed by the specific terms of this Request for Proposal.

3.10 No Guarantee of Volume of Work or Exclusivity of Contract

The Owner makes no guarantee of the value or volume of work to be assigned to the successful Proponent.

3.11 Proponent to Review Request for Proposal

Proponents shall promptly examine all of the documents comprising this Request for Proposal, and

- (a) shall report any errors, omissions or ambiguities; and
- (b) may direct questions or seek additional information

in writing by email to the Request for Proposal contact on or before the Deadline for Questions. All questions or comments submitted by Proponents by email to the Contact shall be deemed to be received once the email has entered into the contact's email inbox. No such communications are to be directed to anyone other than the Request for Proposal Contact, and the Owner shall not be responsible for any information provided by or obtained from any source other than the Request for Proposal Contact. The Owner is under no obligation to provide additional information. It is the responsibility of the Proponent to seek clarification from the Request for Proposal Contact on any matter it considers to be unclear. The Owner shall not be responsible for any misunderstanding on the part of the Proponents concerning this Request for Proposal or its process.

3.12 All New Information to Proponents by Way of Addenda

This Request for Proposal may be amended only by addendum in accordance with this section. If the Owner, for any reason, determines that it is necessary to provide additional information relating to this Request for Proposal, such information will be communicated to all Proponents by addenda. Each addendum forms an integral part of this Request for Proposal and may contain important information, including significant changes. Proponents are responsible for obtaining all addenda issued by the Owner. In the Submission Form (**Appendix B**), Proponents shall confirm their receipt of all addenda by setting out the number of each addendum in the space provided. Proponents who fail to acknowledge all posted addenda will be deemed non-compliant and disqualified.

3.13 Addenda and Extension of Submission Deadline

Any addendum added within four (4) calendar days of the Request for Proposals closing (Including on closing day) will extend closing by a reasonable period to be determined by Memorial University

3.14 Verify, Clarify and Supplement

When evaluating Proposals, the Owner may request further information from the Proponent or third parties in order to verify, clarify or supplement the information provided in the Proponent's Proposal. The response received by the Owner shall, if accepted by the Owner, form an integral part of the Proponent's Proposal.

3.15 Notification to Other Proponents

In accordance with section 30 of the *Public Procurement Regulations*, once the Agreement is awarded by the Owner, the outcome of the Request for Proposal will be publicly posted at Public Procurement Agency Website.

3.16 Debriefing

Unsuccessful Proponents may request a debriefing within ten (10) business days after the award has been posted. The request must be sent in writing to the Request for Proposal Contact. The intent of the debriefing information session is to aid the Proponent in presenting a better Proposal in subsequent procurement opportunities. The debriefing process is not for the purpose of providing an opportunity to challenge the procurement process or its outcome.

3.17 Supplier Complaint Process

If a Proponent wishes to register a complaint with respect to the Request for Proposal process, it should provide it in writing and within the parameters established by section 25 of the *Public Procurement Regulations*, as amended. The notice must provide a detailed explanation of the Proponent's concerns with the procurement process or its outcome, in addition to such other information as may be required by the *Regulations*. Proponents should note that these complaint procedures are separate and distinct from any dispute resolution processes that may be provided for under applicable trade agreements. If a Proponent wishes to dispute a matter under an applicable trade agreement, the Proponent must follow the process set out in the trade agreement.

3.18 Conflict of Interest

The Owner may disqualify a Proponent for any conduct, situation or circumstances, determined by the Owner, in its sole and absolute discretion, to constitute a conflict of interest.

The Owner reserves the right to disqualify any Proponent that in the Owner's sole opinion has an actual or potential conflict of interest or an unfair advantage, or may permit the Proponent to continue and impose such terms and conditions, as the Owner in its sole discretion may require.

For the purposes of this Request for Proposal, the term "Conflict of Interest" includes, but is not limited to, any situation or circumstance where in relation to the Request for Proposal process, the Proponent has an unfair advantage or engages in conduct, directly or indirectly, that may give it an unfair advantage, including but not limited to: (i) having, or having access to, confidential information of the Owner in the preparation of its Proposal that is not available to other Proponents, (ii) communicating with any person with a view to influencing preferred treatment in the Request for Proposal process (including but not limited to the lobbying of decision makers involved in the Request for Proposal process), or (iii) engaging in conduct that compromises, or could be seen to compromise, the integrity of the open and competitive Request for Proposal

process or render that process non-competitive or unfair.

Proponents are required to disclose, to the Request for Proposal Contact, any potential or perceived conflict of interest issues prior to Request for Proposal closing date and time.

3.19 Disqualification for Prohibited Conduct

The Owner may disqualify a Proponent, rescind a notification of selection or terminate a contract subsequently entered into if the Owner determines that the Proponent has engaged in any conduct prohibited by this Request for Proposal.

3.20 Proponents Not to Communicate with Media

Proponents must not at any time directly or indirectly communicate with the media in relation to this Request for Proposal or any agreement entered into pursuant to this Request for Proposal without first obtaining the written permission of the Request for Proposal Contact.

3.21 No Lobbying

Proponents must not, in relation to this Request for Proposal or the evaluation and selection process, engage directly or indirectly in any form of political or other lobbying whatsoever to influence the selection of the successful Proponent(s).

3.22 Illegal or Unethical Conduct

Proponents must not engage in any illegal business practices, including activities such as Proposal-rigging, price-fixing, bribery, fraud, coercion or collusion must not engage in any unethical conduct, including lobbying, as described above, or other inappropriate communications; offering gifts to any employees, officers, agents, elected or appointed officials or other representatives of the Owner; deceitfulness; submitting Proposals containing misrepresentations or other misleading or inaccurate information; or any other conduct that compromises or may be seen to compromise the competitive process provided for in this Request for Proposal.

3.23 Past Performance or Past Conduct

The Owner may prohibit a supplier from participating in a procurement process based on past performance or based on inappropriate conduct in a prior procurement process, including but not limited to the following:

- (a) illegal or unethical conduct as described above;
- (b) the refusal of the supplier to honour submitted pricing or other commitments; or
- (c) any conduct, situation or circumstance determined by the Owner, in its sole and absolute discretion, to have constituted a Conflict of Interest.

In addition, the Owner may suspend the proposal privileges of a supplier in regard to non-compliant or substandard performance in accordance with section 26 of the *Public Procurement Regulations*.

3.24 Confidential Information of the Owner

All information provided by or obtained from the Owner in any form in connection with this Request for Proposal either before or after the issuance of this Request for Proposal:

- (a) is the sole property of the Owner and must be treated as confidential;
- (b) is not to be used for any purpose other than replying to this Request for Proposal and the performance of the Agreement;
- (c) must not be disclosed without prior written authorization from the Owner; and
- (d) must be returned by the Proponent to the Owner immediately upon the request of the Owner.

3.25 Confidential Information of Proponents

This procurement process is subject to the *Access to Information and Protection of Privacy Act, 2015 (ATIPPA, 2015)*. A Proponent must identify any information in its Proposal or any accompanying documentation supplied in confidence for which confidentiality is requested to be maintained by the Owner. The confidentiality of such information will be maintained by the Owner, except as otherwise required by law or by order of a court or tribunal. Proponents are advised that their Proposal will, as necessary, be disclosed, on a confidential basis, to advisers retained by the Owner to advise or assist with the Request for Proposal process, including the evaluation of Proposals.

The Proponent agrees that any specific information in its submission that may qualify for an exemption from disclosure under subsection 39(1) of the *ATIPPA, 2015* has been identified in its submission. If no specific information has been identified it is assumed that, in the opinion of the Proponent, there is no specific information that qualifies for an exemption under the subsection 39(1) of the *ATIPPA, 2015*.

Contracting with the Owner is a public process. Information provided through this process will be disclosed when requested under the *ATIPPA, 2015*, except where disclosure of that information is harmful to the business' interests, as set out in the three-part test in the *ATIPPA, 2015*.

Information, including the financial value of a contract resulting from this procurement process, will be publicly released as part of the award notification process, in accordance with section 30 of the *Public Procurement Regulations*.

If a Proponent has any questions about the collection and use of personal information pursuant to this Request for Proposal, questions are to be submitted to the Request for Proposal Contact. Further information relating to subsection 39(1) of the *ATIPPA, 2015* is provided in guidance documents available through the Office of the Information and Privacy Commissioner at <https://oipc.nl.ca/guidance/documents>.

3.26 Reserved Rights of the Owner

The Owner reserves the right to:

- (a) make public the names of any or all Proponents as well as Proposal price and value of contract;
- (b) make changes, including substantial changes, to this Request for Proposal provided that those changes are issued by way of addendum in the manner set out in this Request for Proposal;
- (c) request written clarification or the submission of supplementary written information in relation to the clarification request from any Proponent and incorporate a Proponent's response to that request for clarification into the Proponent's Proposal. This shall not be an opportunity for Proposal repair;
- (d) assess a Proponent's Proposal on the basis of: (i) a financial analysis determining the actual cost of the Proposal when considering factors including quality, service, price and transition costs arising from the replacement of existing goods, services, practices, methodologies and infrastructure (howsoever originally established); and (ii) in addition to any other evaluation criteria or considerations set out in this Request for Proposal, consider any other relevant information that arises during this Request for Proposal process;
- (e) waive formalities and accept Proposals that substantially comply with the requirements of this Request for Proposal;
- (f) verify with any Proponent or with a third party any information set out in a Proposal;
- (g) check references other than those provided by any Proponent;
- (h) disqualify a Proponent, rescind a notice of selection or terminate a contract subsequently entered into if the Proponent has engaged in any conduct that breaches the process rules or otherwise compromises or may be seen to compromise the competitive process;
- (i) cancel this Request for Proposal process at any stage;
- (j) cancel this Request for Proposal process at any stage and issue a new Request for Proposal for the same or similar deliverables;
- (k) accept any Proposal in whole or in part; or
- (l) reject any or all Proposals;

and these reserved rights are in addition to any other express rights or any other rights that may be implied in the circumstances.

3.27 Limitation of Liability

By submitting a Proposal, each Proponent agrees that:

- (a) neither the Owner nor any of its employees, officers, agents, elected or appointed officials, advisors or representatives will be liable, under any circumstances, for any claim arising out of this Request for Proposal process including but not limited to costs of preparation of the Proposal, loss of profits, loss of opportunity or for any other claim; and
- (b) the Proponent waives any right to or claim for any compensation of any kind whatsoever, including claims for costs of preparation of the Proposal, loss of profit or loss of opportunity by reason of the Owner's decision not to accept the Proposal submitted by the Proponent, to enter into an agreement with any other Proponent or to cancel this open call process, and the Proponent shall be deemed to have agreed to waive such right or claim.

3.28 Governing Law and Interpretation

These Terms and Conditions of the Request for Proposal Process (Part 3):

- (a) are intended to be interpreted broadly and independently (with no particular provision intended to limit the scope of any other provision);
- (b) are non-exhaustive and shall not be construed as intending to limit the pre-existing rights of the Owner; and
- (c) are to be governed by and construed in accordance with the laws of the Province of Newfoundland & Labrador and the federal laws of Canada applicable therein.

APPENDIX A – SPECIFICATIONS & SCOPE

The form of the agreement may be found at: <https://www.mun.ca/facman/services/forms.php>

The table below summarizes the Scope of Services for the engagement:

Section		Included
3.1	General Principles	Yes
3.2	Additional Services	Yes
3.3	Work Schedule	Yes
3.4	Cost Control	Yes
3.5	Sub-Consultants	Yes
3.6	Functional Programming	Yes
3.7	Concept Design	Yes
3.8	Design Development	Yes

3.9	Construction Contract Documents	Yes
3.10	Bidding and Construction Contract Award	Yes
3.11	Construction Contract Administration	Yes
3.12	Resident Supervision	No
3.13	Insurance	Yes

APPENDIX B – SUBMISSION FORM

1. Proponent's Information

Please fill out the following form, naming one person to be the Proponent's contact for the Open Call process and for any clarifications or communication that might be necessary.	
Full Legal Name of Proponent:	
Any Other Relevant Name under which Proponent Carries on Business:	
Street Address:	
City, Province/State:	
Postal Code:	
Phone Number:	
Fax Number:	
Company Website (if any):	
Proponent's Contact Name and Title:	
Proponent's Contact Phone:	
Proponent's Contact Fax:	
Proponent's Contact Email:	

2. Offer

The Proponent has carefully examined the Open Call documents and has a clear and comprehensive knowledge of the Deliverables required under the Open Call. By submitting a Proposal, the Proponent agrees and consents to the terms, conditions and provisions of the Open Call, including the Form of Agreement, and offers to provide the Deliverables in accordance therewith at the rates set out in the pricing section.

3. Rates

The Proponent has submitted its rates in accordance with the instructions in the Open Call. The Proponent confirms that it has factored all of the provisions of Appendix A, including insurance and indemnity requirements, into its pricing assumptions and calculations.

4. Addenda

The Proponent is deemed to have read and accepted all addenda issued by the Owner. The onus is on Proponents to make any necessary amendments to their Proposals based on the addenda. The Proponent is requested to confirm that it has received all addenda by listing the addenda numbers on the following line: _____ Bidder(s) who fail to complete this section will be deemed to have not received all posted addenda and shall be deemed **non-compliant**.

5. No Prohibited Conduct

The Proponent declares that it has not engaged in any conduct prohibited by this Open Call.

6. Disclosure of Information

The Proponent hereby agrees that any information provided in this Proposal, even if it is identified as being supplied in confidence, may be disclosed where required by law or by order of a court or tribunal. The Proponent hereby consents to the disclosure, on a confidential basis, of this Proposal by the Owner to the advisers retained by the Owner to advise or assist with the Open Call process, including with respect to the evaluation of this Proposal.

7. Proposal Irrevocable

The Proponent agrees that its proposal shall be irrevocable for a period of **45** days following the Submission Deadline.

8. Required Signatures

Failure to submit this signature section will render the Proposal NON-COMPLIANT and the Proposal will be disqualified.

Name of Proponent's Representative

Title of Proponent's Representative

Date

I have the authority to bind the Proponent.

IN SIGNING THIS PAGE AND SUBMITTING YOUR PROPOSAL, THE PROPONENT ACKNOWLEDGES HAVING READ AND UNDERSTOOD AND AGREED TO THE TERMS AND CONDITIONS OF THIS DOCUMENT.

APPENDIX C – EVALUATION CRITERIA AND PRICING FORM

1. EVALUATION CRITERIA

1. Weighting

The following sets out the categories, weightings and descriptions of the rated criteria of the RFP. Proponents who do not meet a minimum technical threshold score will not proceed to the next stage of the evaluation process.

Rated Criteria Category	Weighting (Points)
3. Project Manager	10
4. Mechanical Project Lead	10
5. Architectural Project Lead	10
6. Project Team	10
7. Understanding of Integrated Design Approach	10
8. Past, Relevant Technical Experience at Memorial	5
9. Understanding of Scope	20
10. Understanding of Scheduling Approach	10
11. Duration and Schedule	5
Total Technical Score	90
Pricing (See Appendix C for details)	30
Total Points	120

2. Experience and Qualifications

Each proponent should provide the following in its proposal:

- a brief description of the proponent;
- a description of its knowledge, skills and experience relevant to the Deliverables;
- and the roles and responsibilities of the proponent and any of its agents, employees and sub-contractors who will be involved in providing the Deliverables, together with the identity of those who will be performing those roles and their relevant respective expertise.
- The submission should not exceed 2 pages per firm.

3. Project Manager

A description of the proposed Project Manager shall be provided which clearly identifies their experience and their *formal* project management credentials and other qualifications which, in their opinion, enable them to oversee and direct the full delivery of the scope of the services while emphasizing design quality and schedule development and management. The full project is anticipated to require several years and the ability to provide continuity of project management should be highlighted as part of the submission. The Project Manager must be located in St. John's and be reasonably able to commit themselves to a project of this duration.

4. Mechanical Project Lead/Team

A description of the proposed Mechanical Project Lead shall be provided which clearly identifies their experience in successful recreational facility mechanical design and highlight redevelopment projects for aquatic facilities. This is an operational site and skills surrounding constructability of designs on operational facilities should be presented. The full project is anticipated to require several years and the ability to provide continuity of design intent should be highlighted as part of the submission.

5. Architectural Project Lead/Team

A description of the proposed Architectural Project Lead shall be provided which clearly identifies their experience in successful recreational facility architectural design and highlight redevelopment projects for aquatic and multi-sport facilities. This is an operational site and skills surrounding constructability of designs on operational facilities should be presented. Specific examples of code compliance challenges and solutions should be highlighted. The full project is anticipated to require several years and the ability to provide continuity of design intent should be highlighted as part of the submission.

6. Project Team

The balance of the Project Team should be made up of those individuals and/or firms which have been identified by the Prime Consultant as providing value and technical skills required to deliver per the understanding of the scope of work. Each of the sub-consultants within the design team must provide a brief description of each company, its history, size, organizational structure, range of expertise, past projects and past working relationships with the design team as well as those individuals to be utilized for this project. Provide an organizational chart explaining the overall prime/sub-consultants' relationships, the project manager(s), the quality assurance system, the discipline leaders and other key design personnel within each discipline.

It is recognized that certain key personnel and skill sets may be required from firms or individuals located outside of the province and all staff identified with roles on this project must define their primary physical location in their submission.

7. Understanding of Integrated Design Approach

Memorial University owns and operates nearly all of its primary and secondary utility infrastructure as well as all of its buildings and M and E assets across multiple campus'. Continuity of standards are an enduring problem when delivering major capital projects. The Prime Consultant shall explain how they intend to extract from the various stakeholders, many of whom may not consider this project a priority, the required documented and undocumented standards necessary to ensure the design meets the long term operational needs of the University.

In addition, the Aquarena Facility was not constructed by Memorial and former ownership and operating entities may not have designed or renovated to standards currently acceptable to Memorial University. The consultant should explain the potential challenges they envision as this major infrastructure work is undertaken and how they would plan to mitigate uncontrolled costs not covered under the Canada Games upgrades funding.

8. Past, Relevant Technical Experience at Memorial

The proponent should highlight their technical skill and experience designing and delivering projects for Memorial University of Newfoundland over the past 7 years. Where possible, these

projects should be of similar a type, scale, complexity and duration. In cases where the firm did not act as the prime consultant, the proponent should specifically identify their role and proportionate involvement. (i.e. Electrical was 25% of \$5M project construction value.) Where project values are not disclosed provide a range or estimate of value. Where no specific experience with Memorial exists, the proponent may use projects with other institutions or entities with reference contact information.

9. Understanding of Scope

The proponent should attempt to interpret the scope of work as it has been provided and, *in their own words*, provide an overview of the goals and methodologies of the project. The proponents must have a clear and concise understanding of the objectives of the project which will be demonstrated by providing a review of the conceptual methodology and highlight or expand upon the solution or provide an alternate approach. The solution should emphasis the ability to be constructed in a phased manner that introduces as low a risk as possible to the Facilities operations (and in particular the operating schedule of the Aquarena and The Works) and utilities while providing the highest value.

The response should indicate any positive or negative risks, potential mitigation measures, or alternative approaches that reflect their value added to the undertaking.

10. Understanding of Scheduling Approach

The University, in consultation with The Works, developed a conceptual construction schedule in 2020 (See appendix E-1) which includes a large number of upgrade options and preferred periods for completion of the work, which impacts the operations. Note that not all the options in the schedule are in this scope of work or necessarily budgeted to be completed and there may be items omitted which must be incorporated as the design development advances.

Of significant note with respect to schedule is that, while the Canada Summer Games are scheduled for 2025, the provincial teams will often travel to venues in prior years to train, requiring that the pool facilities will need to be operational for simulated Games standards training by spring 2024.

The Prime Consultant should explain how they envision designing and executing the work using this plan, delivering the work by the required deadlines as well as any insights they may have as to how to improve upon it or mitigate the impacts on operation.

They should also address how they might integrate project controls that mitigate market forces and influence the execution of the work by the yet-to-be-determined contractor(s) to ensure delivery of a functional design on time and on budget.

11. Duration and Schedule

The schedule for completing the concept and detailed engineering design, up to the point of delivery of Issued for Tender documents to the University Procurement group, will be evaluated based on the level of detail that went in to the generation of tasks and their respective timelines. The evaluation will not include any elements of delivery outside of their direct control, such as the construction period or approval periods by regulators or the University. However, construction period durations should reflect the proponents understanding of the market conditions and construction sector in Newfoundland and Labrador.

The University will not prescribe durations however for the purpose of comparative analysis of the submissions, it is reasonable to require a level of effort assessment and corresponding schedule (durations) for those tasks which are within the consultant's controls and responsibility. Where

multiple tender packages are proposed and staggered design may occur, the total design period shall be considered and the proposal should summarize the anticipated duration(s) from award date to IFT delivery for each phase, in weeks. It is noted that the expectation for construction to occur during occupied periods and that total shut down of the facility is limited, shall be incorporated into the design approach.

The Prime Consultant should summarize the total number of weeks for the task durations to be evaluated.

12. Submission Compliance

The requirements for submission compliance are outlined in the respective sections.

2. PRICING FORM

1. Instructions on How to Complete Pricing Form

Rates must be provided in Canadian funds, inclusive of all applicable duties and taxes except for HST, which should be itemized separately.

Rates quoted by the proponent must be all-inclusive and must include all labour and material costs, all travel and carriage costs, all insurance costs, all costs of delivery, and all other overhead, including any fees or other charges required by law.

2. Evaluation of Pricing

Pricing is worth **30 points** of the total score.

Pricing will be scored based on a relative pricing formula using the rates set out in the Pricing Form. Each proponent will receive a percentage of the total possible points allocated to price for the particular category it has bid on, which will be calculated in accordance with the following formula:

$$\text{lowest price} \div \text{proponent's price} \times \text{weighting} = \text{proponent's evaluation points}$$

3. Pricing Form

The fee proposal shall be completed and submitted as a separate PDF file, as per Part A Section 1.2.

Submissions of fees should be broken down into:

1. Lump sum (maximum upset) fee for all services, including that of any sub-consultants, for the scope of work associated with *Scope of Services* as outlined in Appendix A – Form of the Agreement.
2. Expenses will be paid as a disbursement at cost with per diems for meals. Backup for travels costs is required to be submitted with expense claims and paid in accordance with the University's travel and expense policy. Respondents should provide an estimate of anticipated travel expenses as a separate line item of the fee proposal which will be included in the evaluation of total cost to the University.

3. Submit a schedule of per diem rates for additional design and/or contract administration services.
4. Include in the fee proposal the completed Summary Fee Table in Section 4.0. A lump sum value shall be provide for each provision of service, including that of any sub-consultants.
5. The price evaluated shall be based upon line E of the Pricing Form.

4. Pricing Form

Item	Service	Fee
A	Lump sum (maximum upset) Fee	
B	Travel Expenses (estimated)	
C	Other Reimbursable Expenses (estimated)	
D	SUBTOTAL OF ESTIMATED EXPENSES (B+C)	
E	EXPECTED TOTAL FEE (A+D) (Excludes HST)	
F	HST (15%)	

APPENDIX D – REQUEST FOR PROPOSAL PARTICULARS

1.0 The Deliverables

1.1 Background

The Cities of St. John's, Mount Pearl and Conception Bay South have jointly applied for, and been awarded, the privilege of hosting the 2025 Canada Summer Games. This award is contingent upon a partnership between the Municipalities, the Government of Newfoundland and Labrador and Memorial University of Newfoundland. The St John's Campus of Memorial University is uniquely situated and equipped to provide significant facilities for hosting the Games through its extensive housing and conference services as well as the Field House for indoor, court based sports. In addition, the proximity of the Aquarena – the only pool facility in Newfoundland of competition size for aquatic sports – is a requirement for the successful hosting of the Games.

The two primary facilities under consideration are the Field House (FH) and the Aquarena (AQ). FH was constructed in 2001 as a multi-sport facility with focus on indoor track, basketball, volleyball and other associated court sports. The facility can seat 1408 spectators. Subsequent improvements have included addition of fitness and training areas on Level 1, adjacent the track and necessitating the removal of the long jump and Level 2 cantilevered over the track below. FH is co-located with the Physical Education Building (PE), which houses Memorial's Human Kinetics program, and includes a pool and large gymnasium as well as other teach and office spaces .

The Aquarena was constructed in 1976 (for the 1977 Canada Summer Games) and included a 65m pool, and dive towers. The facility was owned and operated by the City of St. John's for a number of years and Memorial acquired it in the late 1990's. The wind conditions at the site were unfavorable and exterior track and field facilities were decommissioned and partially converted to parking in subsequent years. Interior renovation work has been extensive and relate largely to commercialization of the facility. These upgrades include installation of water slides, saunas, fitness rooms and coffee franchise. These expansions have eroded some or all of the original sporting complex features which must be reinstated, to current Canada Games standards.

While both facilities are owned by Memorial University they are largely occupied and operated by The Works, a separately incorporated entity with its own management board and staff. Memorial has undertaken and extensive pre-bid evaluation of the requirements to host the 2025 Summer Games which was central to the decision for the Municipalities to submit a bid. This evaluation outlined a number of critical gaps in the physical infrastructure at both the Field House and the Aquarena. The gap assessment performed (included in Appendix E-2) looked at the Canada Games standards requirements for both facilities and a separate assessment looked at the mechanical, and electrical requirements (Appendix E-2).

2.0 Scope of Work

This RFP is for the design and contract administration of the of this project. Scope of work for this phase of work includes, but is not limited to, the following:

- Confirmation of the gap assessment work to ensure compliance with the Canada Games Standards.
- Renewal or upgrade of architectural items including but not limited to:
 - o Field House Exit Door Replacement

- Aquarena Epoxy Covering on Pool Deck
 - Aquarena Diving Platforms/Springboards
 - Aquarena Diving Warm Up
 - Aquarena Seating (on pool deck)
 - Aquarena Seating (above pool deck)
 - Aquarena Pool Bulkhead System integration
- Renewal or upgrade of electrical including but not limited to:
 - Aquarena Service and Distribution
 - Renewal or upgrade of mechanical systems including but not limited to:
 - Aquarena Air Cushion & Zone Valves/Controls
 - Natatorium Ventilation and Dehumidification
 - Aquarena Fitness Area Heat Recovery & Heat
 - Aquarena Fitness Area Cooling
 - Aquarena Redundant Pool Circulation Pump & Motor
 - Energy systems design must incorporate life cycle operational cost considerations and balance lowest cost of operation with the available budget(s)
 - Pre-and Post upgrade energy modelling of the facility will be required to define the (as intended) baseline energy use and post-renovations expected energy use. The purpose of this data will be to define ROI and energy budget change which may be used to offset other new operating costs.

The successful team will be expected to consult in depth with Department of Facilities Management and The Works and the Municipalities Canada Games Committee with respect to refining the requirements and developing the specifications and tender documentation to deliver the games sporting events themselves as well as supporting activities of the games events. Of specific note are accessibility upgrades within the facilities as they relate to games delivery.

The University anticipates that the construction work will be tendered as a single construction package however the execution of the work will be carried out over multiple years – tentatively 2022 and 2023, in anticipation for readiness in 2024.

A procurement package will be prepared by the University for the bulkhead system. The integration of the requirements for the bulkhead to be installed will be part of the construction package, as will the installation of the bulkhead. This shall include all preparation for the bulkhead(s) to be transported into and assembled within the Aquarena. The existing bulkhead shall be removed as part of this scope.

The Prime Consultant should consider the advantages of expedited designing of other long lead items such as electrical equipment and air handling equipment for the purpose of tendering (procurement only) and installation by others; either through install of owner supplied equipment or assignment of the procurement purchase order(s).

3.0 Constraints

The Department of Facilities Management will require specific approvals (internal and external) to advance from the various stages and phases to the next; therefore, the successful proponent shall be prepared for an interrupted design process.

The Owner reserves the right to stop the project at any point and the fee paid will reflect work completed to that point; therefore, the Consultant shall indicate in their submission the fee associated with each

stage and phase.

4.0 Mandatory Submission Requirements

This proposal is a two-part submission (service proposal and fee proposal) which will evaluate and rank the various strengths of each proponent. The owner may, at its discretion, short list proponents to participate in an interview and/or presentation.

4.1 Submission Form (Appendix B)

Each proposal must include a Submission Form (Appendix B) completed and signed by an authorized representative of the proponent.

4.2 Pricing Form (Appendix C)

Each proposal must include a Pricing Form (Appendix C) completed according to the instructions contained in the form.

5.0 Negotiations

Memorial University reserves the right to conduct negotiations with more than one vendor simultaneously.

6.0 Evaluation Committee

Members of the Evaluation Committee are:

- Director, The Works
- Senior Administrative Office, Human Kinetics and Research
- Manager, Major Capital Projects (Facilities Management)
- Project Coordinator, (Facilities Management)

7.0 Pre-Conditions of Award

Requirements for the consultant to maintain workplace compensation insurance, general liability insurance and comprehensive automobile insurance as well as professional liability errors and/or errors/omissions insurance with limits not less than \$1,000,000 or 5 times the fee, whichever is greater. The Owner reserves the right to negotiate insurance limited requirements and achieve an acceptable balance of risk and value for the scope of services being provided;

Proof of all insurances shall be provided upon award of the contract and remain in force during the period of the engagement.

APPENDIX E – Supporting Documentation

Appendix E-1: CONCEPTUAL FACILITIES INTERRUPTION AND CONSTRUCTION SCHEDULE

Aquarena BCA Facility Preparation CSG 2025		2021				2022				2023				2024				2025				
Project Element	Open or Closed?	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Parking Facilities - Line painting, signage (5.1.1)	Open																					
Repairs to concrete slab electrical room (5.1.2)	Open			X																X		
Roof repairs (5.1.3)																						
Not clear what needs to be done/completed	Open																					
Pool - drain, blast, repaint lines (w/ Official Inspection) (5.1.4)																						
Pool Ventilation System (5.1.5)	Pool Closed																					
Accessible change rooms / washrooms (5.1.5)	Closed							Option A	Option B													
Building Electrical Systems (5.1.6)	Pool Closed							Option A	Option B													
Sprinkler System - Building Life Safety (5.1.7)	Building Closed							Option A	Option B													
Bulkheads (5.1.8)	Building Closed																					
Pool Air Cushion / Bubbler (Diving) (5.1.8)	Pool Closed																					
Pool Systems - pumps motors, heaters, filters (5.1.8)	Open	X																				
Main Entrance accessibility (5.1.3)	Pool Closed																					
Relocation Plumbing for Accesible stalls (5.1.5)	Open																					
								Option A	Option B													

<p>Option A - Building Closure Spring/Summer</p> <p>-Depending on electrical work, may require a full building shutdown for 6-8 weeks.</p> <p>-Save time/reduce building shutdown, do mechanical work for HVAC system before electrical work starts.</p>	<p>Option B - Building Closure Fall/Winter</p> <p>- No electrical work to be completed</p> <p>-Mechanical HVAC System exterior work completed Sept-Nov</p> <p>-Mechanical HVAC interior work completed Dec - Jan</p>	<p>Building Shutdowns/Closures:</p> <p>Dec 2020 - 4-5 Weeks</p> <p>2022 - Option A or B - 8 Weeks</p> <p>Dec 2023 - 4-5 Weeks</p> <p>Summer 2025 - Canada Games - Business Closure Unknown</p> <p>Para Games 2025 - Business Closure Unknown</p>
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AQ Gap Analysis Facility Preparation CSG 2025		2021				2022				2023				2024				2025				
Project Element	Open or Closed?	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Pool Deck (6.1.1) Space around pool deck.																						
Office removal**	Pool Closed																			X		X
Walls on pool deck																				Remove		Re-install
Starting Blocks - Install new (5.2.4b)	Open																					
Backstroke - Ledges (5.3.2b)	Open																					
Other - Lighting (5.5.1a) (Do not feel necessary)																						
Lux Rechecked																						
Other - Seating (6.1.5) Seating, Twister Slide Removal & Replacement*	Pool Closed																			X		X
Diving Tower Renovation																				Remove		Re-install
Tube Slide Removal/Replacement*								Option A	Option B											X		X
Warm Up Space - Equipment																				Remove		Re-install
Other - Seating Options Accessibility																						
Need to consider accessibility for any seating options																						
Other - Additional Rooms Needs/Allowance																						

**Note: Removal of offices, may look extension to facility for office space. Updated: April 17, 2020

Project		2021				2022				2023				2024				2025				
Project	Open or Closed?	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Parking Facilities - Line painting & signage (5.2.1)	Open																					
Roof - (5.2.2)	Open																					
Exterior Door Repair (5.2.2)	Open																					
Hardwood Floor Refinish (5.2.3)	Closed (short)																					
Building Air Conditioning																						
Back up Generator tie to building																						

FH Gap Analysis Facility Preparation CSG 2025		2021				2022				2023				2024				2025				
Project	Open or Closed?	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Basketball - Adjustment to shot clock location (B.2.3a)	Open							X														
Field House Lighting - LUX Levels (B4.1a)	Open / Closed		X																			
Volleyball - Reorganize courts, refinish track area if required (V1.3b) (Potential of portable sport court?)	Closed (Short)															X					X	
Volleyball - Warm Up Space (Temp Tents) (V4.1b) (Not required)	Open																				X	
Volleyball - Seating? Other (6.4.3)	Open																				X	
End wall matting - PE building (See 6.3.2)	Open							X														

Appendix E-2: Canada Games Standards GAP Assessment



Final Report

Condition Assessment & Gap Analysis of the Aquarena and Field House

Memorial University of Newfoundland and Labrador

**January 2020
Contract Number AQ-004-19
Project Number 1901100**

Prepared for: Jason Daniels
Manager, Capital Projects
Department of Facilities Management
Memorial University of Newfoundland and Labrador
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St. John's Newfoundland and Labrador

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(902) 429-4412

Executive Summary

Project Description

Capital Management Engineering Limited (CMEL) was retained by Mr. Jason Daniels, Manager, Capital Projects, Department of Facilities Management, Memorial University of Newfoundland and Labrador (MUN) to complete a condition assessment and a gap analysis of the Aquarena and Field House.

The potential of completing a bid to host the 2025 Canada Games in Newfoundland and Labrador with swimming and diving supported through the Aquarena, and Basketball and Volleyball utilizing the Field House facilities at the University of Memorial's St. John's Campus is being evaluated. The minimum criteria to support the event were written by the Canada Games Council and are found in the document "Canada Games Hosting Standards - 2025". A Gap analysis of the facilities to these standards as well as condition assessments were completed. These were needed to determine an estimate of cost to support the renovations anticipated to be required to make the two facilities compliant with the minimum standards.

Cost Summary Recommendations

The following costs have been estimated to support the games divided by building:

Section	Item	Cost Estimate
5.1.9	Aquarena BCA	\$ 2,562,500
6.1.7	Aquarena Swimming	\$ 407,442
6.2.7	Aquarena Diving	\$ 159,964
	Aquarena Soft Costs 33%	\$ 1,032,869
	Contingency 10%	\$ 416,278
	Aquarena Sub-Total	\$ 4,579,053
5.2.7	Field House BCA	\$ 1,315,000
6.3.6	Field House Basketball	\$ 70,048
6.4.5	Field House Volleyball	\$ 401,336
	Field House Soft Costs 33%	\$ 589,507
	Contingency 10%	\$ 237,589
	Field House Sub-Total	\$ 2,613,480
	Total Estimated Cost	\$ 7,192,533

The greatest costs to support the event are associated to the Aquarena building with the significant burden of deferred maintenance related to major mechanical and electrical systems which have either been decommissioned, removed, or at end of life.

Soft costs, as identified by the University, have been integrated at a rate of 33% of the anticipated hard costs. A contingency on the hard and soft costs at a rate of 10% has been included.

The operational costs and downtime of facilities caused by the proposed renovations to support the 2025 sporting event and the use of the facilities for the event were not factored into the cost analysis. Potential operations costs including loss of operating income, staff costs or reduction in staff costs, reduction or increase in costs associated to utilities during renovations and the event have also not been included in the cost analysis. CMEL recommends that these more complex cost benefit issues will need to be addressed between the stakeholders and will need to be factored in.

Overall Condition and Limitations

CMEL has not developed a preliminary design. Design is beyond the scope of this report. The requirements are based on the communicated requirements as defined by the University.

Estimates are anticipated to be developed to a class D at best and are anticipated to be suitable for comparative use and for budgetary discussions and decision making.

The statements made in the Executive Summary are subject to the same limitations included in the Closure section, and are to be read in conjunction with the remainder of this report.

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1 Introduction

Capital Management Engineering Limited (CMEL) was retained by Mr. Jason Daniels, Manager, Capital Projects, Department of Facilities Management, Memorial University of Newfoundland and Labrador to complete a condition assessment and a gap analysis of the Aquarena and Field House. The objective of the assessment is to determine the current condition of the facilities and determine if they meet the minimum functional criteria as defined by the Canada Games Hosting Standard 2025. In the event that specific aspects of the functional criteria were not met or current condition may not support the event, CMEL estimated a cost to provide for the functionality.

2 Purpose

The potential of completing a bid to host the 2025 Canada Games in Newfoundland and Labrador with swimming and diving supported through the Aquarena, and Basketball and Volleyball utilizing the Field House facilities at the University of Memorial's St. John's Campus is being evaluated. The minimum criteria to support the events have been supplied by the University and written by the Canada Games Council and are found in the document "Canada Games Hosting Standards - 2025" (Hosting Standards).

This assessment considers current condition of the facilities and determines if they meet the minimum standards for operation as defined by MUN. In the event that specific aspects of the functional criteria are not met, the objective of the assessment is to estimate the cost of adding the functionality to the respective facility.

3 Methodology

3.1 Project Approach

A Gap analysis of the facilities to the standards as provided in the Hosting Standards, as well as current condition assessments were completed to determine an estimate of costs anticipated to be required to make the two facilities compliant to the minimum standards. Once these parameters were understood, the cost estimates could be developed. The project was broken down into the following phases:

- 1) Assemble and review the background information
- 2) Complete a site assessment
- 3) Develop and deliver the report.

A detailed explanation of each phase is below:

➤ ***Phase I – Assemble and review the background information***

Working with information supplied by the University, CMEL identified the minimum functional criteria for each facility in the form of a checklist. Combining this information with the most recent asset management information from MUN's asset management database, we developed a list of items which were verified during a site assessment. The list included the functional criteria based on the intended use as well as items which are considered critical for operation.

Background information was collected on the current Aquarena and Field house in the form of both building information and the standards required to be met. The functional requirements identified to be used were the Canada Games Hosting Standards – 2025 provided by the University to quantify and qualify the size and type of space required to support a major sporting event. The University also provided drawings and supplemental building background information on the condition of the facilities.

➤ ***Phase II – Complete a site assessment***

Site assessments were scheduled and completed in November of 2019. Using the major critical component list and the minimum functional criteria list, CMEL completed a detailed assessment of the facilities. The assessment was based on a visual assessment of the building and its components and did not include material testing or destructive testing. Information to support identification of the difference between the existing functionality and the required functionality of a facility was gathered. This delta is referred to as the “gap” and therefore a “gap analysis”.

CMEL used the minimum functional criteria checklist developed in Phase I to identify whether or not the facilities meet all of the minimum criteria and evaluate if the facility can support the required changes or additions to meet any of the missing functions. The systems and their respective components were visually assessed. This information was gathered to support the determination of the respective component remaining useful life and potential to negatively impact the sporting event.

During the site assessment, additional information was gathered from the site contacts and site personnel, where possible, to further support the determination of systems and component conditions. Subject matter experts provided additional background information with respect to the facility requirements of swimming and diving.

➤ ***Phase III – Develop and deliver the report***

After completing the first two phases, CMEL developed this report that identifies the current condition, the functional criteria that are currently being met and identify which criteria will require modifications or additions to the building. An estimate was developed

to identify the ongoing capital investment required to maintain the building suitable for its intended use including changes and or additions to meet the functional criteria.

In determining the required capital investment necessary to maintain the current components, CMEL categorized the expenditures based on operations and functionality. This categorization will produce a list of critical items s to identify prioritized capital investment.

4 Background Data

4.1 Background

The Aquarena (AQ) was constructed in 1976 for the 1977 Canada Games and has had multiple interior and major exterior repairs since the initial construction. The Fieldhouse was constructed in 2001 and contains interior courts, track and fitness facilities. Both buildings are currently managed and maintained by The Works.

The Canada Games Hosting Standards – 2025 have been provided by Memorial University. It was assumed that this data contained sufficient detail to support high level planning decisions. The document notes that more detail will be provided to the successful bidder. It is therefore assumed that there may be additional requirements not outlined in the standard; meeting these may have the potential to incur additional costs.

4.2 Supporting Documents

The following supporting documentation was provided by Memorial University (MUN) to inform the assessment:

Building	Supporting Document	Type	Date Issued	Issuing Party
Aquarena	Building Assessment	Report	4/15/2013	Stantec
NA	Canada Games Standards (2021)	Other		
Aquarena	Consultant Engagement	Other	10/11/2019	MUN
Aquarena	Architectural	Drawing	12/15/1975	Prack Partners
Aquarena	Electrical	Drawing	1975	G. R. Wetmore
Aquarena	Structural	Drawing	9/17/1975	Prack Partners
Field House	Architectural	Drawing		
Field House	Electrical	Drawing		

Building	Supporting Document	Type	Date Issued	Issuing Party
Field House	Structural	Drawing		
Field House	Civil	Drawing		
Field House	Mechanical	Drawing		
NA	Canada Games Standards (2025)	Other		
Aquarena	Architectural Floor plan (2013)	Drawing	2013	
Aquarena	Architectural Floor plan (2013)	Drawing	2013	
Aquarena	Architectural Floor plan (2013)	Drawing	2013	-
Aquarena	Architectural roof plan (2013)	Drawing	2013	-
Field House	Architectural Floor plan (2013)	Drawing	2013	-
Field House	Architectural Floor plan (2013)	Drawing	2013	-
Aquarena	Architectural Floor plan (Current)	Drawing	-	-
Aquarena	Architectural Floor plan (Current)	Drawing	-	-
Aquarena	Architectural Floor plan (Current)	Drawing	-	-
Aquarena	Architectural roof plan (Current)	Drawing	-	-
Field House	Architectural Floor plan (Current)	Drawing	-	-
Field House	Architectural Floor plan (Current)	Drawing	-	-
Aquarena	Inspection of bulkheads	Report	12/20/2013	Stantec
Aquarena	Slide, bulkhead & tower annual report	Report	12/15/2014	Sound Engineering Inc.
Aquarena	DPC General Diving Canada Rules	Other	-	Diving plongeon Canada
NA	Building Accessibility Regulations	Other	-	Newfoundland & Labrador
Aquarena	FINA swimming rules	Other	9/22/2017	FINA
Aquarena	Starting block users manual (swimming)	Other	/09/2016	Swiss Timing
NA	Cost Report for DD Stage Wedgewood Park CC	Other	7/4/2013	Turner & Townsend CM2R

5 Building Condition Assessment

Building Condition Assessments (BCA's) were completed to determine the facilities' current condition and to identify condition issues which may have the possibility of negatively affecting the ability of providing for the major event in 2025. Systems identified to be beyond their useful life or in poor condition were evaluated to determine their potential to cause disruption to the games. Systems which had the potential to negatively impact the sporting event were evaluated and a cost estimate to meet the games standard was generated.

BCA's were carried out by Capital Management Engineering Limited on both the Aquarena and the Field House at which time the systems and their respective components were visually assessed in keeping with the ASTM E2018-15 standard for assessment with respect to their rate of wear and observed condition.

The site assessments were limited to a visual review of the systems to determine the type of systems present, age, and condition. No physical tests were conducted on the mechanical and electrical operating systems. A detailed evaluation of the property development's compliance with national and Provincial Building Codes and/or Fire Codes was not part of the scope of this assessment.

CMEL completed BCA's of the Aquarena and the Fieldhouse and updated the University's asset management data base. Combining this information with the most recent asset management information from MUN's asset management database, information supplied by the University and the buildings operator, CMEL developed a list of items based on the intended events requirements that are considered critical for operation. Items considered critical for operation were evaluated to determine their condition and if they are anticipated to require or may require replacement to support the required activities in the year 2025.

5.1 Aquarena

Detailed building condition information was gathered to support the determination of the respective component remaining useful life. The condition information was used to update the university's asset management database system, VFA. The detailed complete reports are found in Appendix B of this report. A summary of the risk items and major costs associated to the Aquarena are found below.

5.1.1 Site

The parking and pedestrian areas around the Aquarena associated to the building include two parking areas, one to the north and a second to the east, and concrete flat work as well as a parking attendant's structure. The area is generally in fair to good condition. The parking area to the north has accessible stalls noted however these lead to the lower fitness area which has no accessible access to the upper floors. The eastern parking area has accessible stalls marked however they do not align to the recommended size and layout. Small scale changes to line painting, and vertical as well as horizontal signage are required. The number of spots should exceed the required minimum due to the usage of the building. Direct access from the spots to the sidewalk without entering the parking area is recommended. Due to the possible confusion with the lower level, orientation signage to direct people to the accessible spots and to the venue's main entrance is recommended.

Based on the observed and reported condition of the Site Components a cost of \$8,000 has been budgeted during the evaluation period of five years.

5.1.2 Building Structure

The building structure was observed to be in fair condition. Major repairs have been completed to the steel supports of the diving area and replacement of the end walls in the last ten years. The building's main electrical room is below a shower area. Evidence of deterioration to the concrete slab in the form of spalling concrete and rust staining were observed. It was reported that the area above has been repaired and the building operator has directions for the repair from a structural engineer. At the time of the site visit the repair has not been completed and an allowance has been included in the cost estimate for repair.

Based on the observed and reported condition of the Building Structural Components a cost of \$10,000 has been budgeted during the evaluation period of five years.

5.1.3 Building Exterior

The building's exterior and roof were in fair to good condition. Although there are current repairs required to masonry within the term of five years, they are not considered a risk to the games. The main entrance doors were in fair condition. Prior to the event the doors will need to be tested to ensure that they are accessible. Adjustments to hardware could be sufficient. Operators could be considered if the adjustments to the tare force to open the doors cannot be brought into the required range. An allowance for renovations has been included. The building roof will be nearing the end of its useful life and an allowance for repairs has been included.

Based on the observed and reported condition of the Building Exterior Components a cost of \$18,000 has been budgeted during the evaluation period of five years.

5.1.4 Building Interior

The building's interior finishes were observed to be in generally good condition and have been renovated or replaced in the last ten years. This included major renovation of the fitness change rooms, the public change rooms, the entrance areas and to some of the ancillary rentable spaces off the pool deck. This work has created good quality space with little or no need for improvements to support the games. These are also some of the most used spaces and the renovations made significant improvements to the buildings aesthetics and day to day maintenance.

Although a component of the pool, the pool surface coating is an interior finish. The pool interior finish and line painting is in fair condition however it was reported it is stripped down and completed reinstalled during a maintenance cycle. It is recommended that this is completed included line installation under an official inspection prior to the games. A cost for this work has been included in the Cost Estimate.

Based on the observed and reported condition of the Building Interior Components a cost of \$200,000 has been budgeted during the evaluation period of five years.

5.1.5 Building Mechanical

The building's plumbing fixtures as well as localized areas of piping have been replaced during building renovations undertaken in the last ten years. As noted above, this included major renovation of the fitness change rooms, the public change rooms (which would be the primary facilities used by the games), the entrance areas and to some of the ancillary spaces off the pool deck. The layout of the change room's accessible toilet stall does not appear to meet the current standards. In addition one toilet stall is not anticipated to be sufficient to support the requirements of a potential Para games. An allowance for renovations has been included.

The building's domestic hot water is provided by a series of tanks which are being replaced as needed and major replacement or risk to the games is not anticipated.

Issues of frequent repairs associated to the distribution and sanitary lines were not reported although they are reported to be original to the buildings construction. Major replacement of these systems is not typically undertaken in older buildings without major failure or major renovation. Typical ongoing maintenance allowances are anticipated to be sufficient to address any repairs throughout the five year term.

The pool ventilation system is in poor condition and remains generally as described in the 2013 report. The system is generally original with the exception that the pool dehumidification system and the electronic controls have been decommissioned with no systems reinstalled. A large piece of plywood and the angle from the louver controls that air intake and the humidity by quantity of air circulated. Replacement of the system including providing a Natatorium dehumidification unit is required as system does not provide the current standard of a mechanical system for a competition venue. An estimate of cost has been included in the cost estimate.

The air handling unit which supports the change rooms has had major upgrades to add a heating coil at the time the building was connected to the steam heating loop. It was reported to be in fair condition and meets the needs of the area it services.

The fitness areas on the second level are supported by local cooling units and an air handling unit is located in the attic area. Unless used for seating, this area is not considered critical to the functioning of the games based on the minimum requirements.

The building's elevator is not antedated to require major repair or replacement in the five year term.

Based on the observed and reported condition of the Building Mechanical Components a cost of \$989,500 has been budgeted during the evaluation period of five years.

5.1.6 Building Electrical

The building electrical systems varied in condition from poor to good. The primary shutoff and switch gear were observed to be original to the building's construction and beyond their anticipated useful life of forty years. It was reported that the parts are becoming difficult to source. The equipment has corrosion and is in a room below a shower area with evidence of deterioration to the slab and long term moisture ingress.

It is recommended that the equipment be thermally scanned to determine the performance of the equipment. Following scanning it can be confirmed if replacement of the equipment is required, or if regular scanning until the games event can postpone the requirement for complete replacement

The power distribution system's branch wiring in areas which have not been renovated was reported to be original. The detailed assessment recommended replacement of the systems. In areas of high humidity and anticipated to be used for the games, it is recommended that the wiring panels and devices are replaced. If assessed by an electrician this may be able to be reduced.

The 2013 report referenced a power limiting system which was estimated to be twenty years in age or more. This device was not observed at the time of the site visit. Building controls have an estimated useful life of twenty years. It is recommended that the

system be replaced. Working conservatively and prior to further testing the cost for replacement of all of the systems which are currently beyond their useful life has been included in the cost estimate.

It was reported that the majority of the building lighting was replaced with LED lighting in 2016. Some T12 linear florescent fixtures were observed in building service areas. The building lighting condition is not anticipated to be a risk to the games.

With the exception of new lighting and a battery backup system, the condition remains the same as it was in the 2013 detailed assessment. Based on CMEL's assessment the current condition has the potential to interrupt a major games event. Based on the observed and reported condition of the Building Electrical Components a cost of \$284,000 has been budgeted during the evaluation period of five years.

5.1.7 Building Life Safety

The sprinkler system was reported to have had local repairs due to corrosion. It is anticipated that this will continue to be required and an allowance for repair has been included in the cost estimate. It was reported that replacement of the connections will be completed in the next year. The fire alarm panel and devices as well as the exit and emergency lighting systems and emergency power systems were reported to be functioning and inspected annually. Major replacement for condition reasons is not anticipated to be required during the five year term.

Based on the observed and reported condition of the Building Life Safety Components a cost of \$50,000 has been budgeted during the evaluation period of five years.

5.1.8 Building Pool Specialty Systems

The pool systems are in fair condition and with the exception of local replacements are generally in the same condition as noted in the 2013 report. However the report notes improvements to the system which do not appear to align to the criteria of this report. The ongoing replacement of pumps, motors, pool electric heaters and filter components is anticipated during the five year term. This would be anticipated to be completed though the normal operations cost of the facility. However, acting conservatively, should the work not be completed it could be considered a risk to the games and a cost has been included in the Cost Estimate.

The pool air cushion (the bubbler for diving) is original and beyond its useful life. A cost to replace the unit has been included.

The existing bulkhead was reported in the last annual inspection included in Appendix B to be in fair condition. The building operator indicated that operation of the unit manually is not desirable. CMEL could not confirm the requirement to install a new pool bulkhead system based on the information supplied the inspection on site or the minimum requirements. However, acting conservatively, as the cost of a new system is significant, until a new inspection and confirmation from the CGC is provided, a cost for a new bulkhead with similar functionality has been included in the Cost Estimate.

The diving platforms and boards were observed and reported to be in fair condition. Cyclic replacement of the boards and local repairs of the platforms are anticipated, through operations and maintenance budgets.

Based on the observed and reported condition of the Building Specialty Components a cost of \$1,003,000 has been budgeted during the evaluation period of five years.

5.1.9 Aquarena Cost Summary

A summary of the cost estimate associated to the identified risk items are found below. See section 5.3 for a summary of the Building Condition Assessment Cost Estimate associated to the two buildings.

Aquarena BCA Cost Estimate

Section	System	Cost Estimate
5.1.2	B1010 - Floor Construction	\$ 10,000
5.1.3	B3010 - Roof Coverings	\$ 18,000
5.1.4	C3020 - Floor Finishes	\$ 200,000
5.1.5	D2010 - Plumbing Fixtures	\$ 30,000
5.1.8	D2094 - Pool Piping and Equipment	\$ 168,000
5.1.5	D3050 - Terminal and Package Units	\$ 799,500
5.1.5	D3050 - Terminal and Package Units	\$ 160,000
5.1.7	D4010 - Sprinklers	\$ 50,000
5.1.6	D5010 - Electrical Service and Distribution	\$ 184,000
5.1.6	D5020 - Lighting and Branch Wiring	\$ 100,000
5.1.8	E1090 - Other Equipment	\$ 35,000
5.1.8	E1090 - Other Equipment	\$ 800,000
5.1.1	G2020 - Parking Lots	\$ 8,000
Total		\$ 2,562,500

5.2 Field House

Detailed building condition information was gathered to support the determination of the respective components' remaining useful life. The condition information was used to update the university's asset management database system, VFA. The detailed complete reports are found in Appendix B of this report. A summary of the risk items and major costs associated to the Field House are found below.

5.2.1 Site

The parking and pedestrian areas around the Field House associated to the building include a parking area and concrete flat work. The area is generally in good condition.

The parking area has accessible stalls marked however they do not align to the recommended size and layout. Small-scale changes to line painting and vertical as well as horizontal signage are required. The number of spots should exceed the required minimum due to the usage of the building for a Para games event. Direct access from the spots to the sidewalk without entering the vehicular is recommended with a clear pedestrian pathway to the building entrance. An allowance for line painting and signage has been included in the Cost Estimate.

Based on the observed and reported condition of the Site Components, a cost of \$8,000 has been budgeted during the evaluation period of five years.

5.2.2 Building Exterior

The building's exterior was in fair condition. Although there are current repairs required to masonry in the term of five years, they are not considered a risk to the games. The main entrance doors were in fair condition and have automatic door operators. Corrosion was observed on many of the building exit doors. Partial replacement is required in the term. The building roof will reach the end of its useful life in the five year term. A roof in poor condition is not considered an acceptable risk. The roof should be replaced by scheduled maintenance however as the roof was not accessible at the time of the site visit, and working conservatively, the cost to repair 10 % of the roof every year for the next five years has been included in the Cost Estimate.

Based on the observed and reported condition of the Building Exterior Components a cost of \$1,259,000 has been budgeted during the evaluation period of five years.

5.2.3 Building Interior

The building's interior finishes were observed to be in generally good condition resulting in space with little need for improvements to support the games. The exception to this is that the wood strip floor may require refinishing. An allowance for refinishing has been included in the Cost Estimate.

Based on the observed and reported condition of the Building Interior Components a cost of \$48,000 has been budgeted during the evaluation period of five years.

5.2.4 Building Mechanical

The building's domestic water distribution system, sanitary system and plumbing fixtures are original to the building construction and were observed and reported to be in good condition. Major replacement of these systems is not anticipated to be required during the five year term.

No issues were reported with the building's heating or ventilation systems. Major repairs or renovations are not anticipated to be required in the five year term.

The building is not supplied with air-conditioning to the main court area. Should this be a requirement of the games, additional cooling capacity would need to be added. This is not identified as a requirement on the supplied information and therefore has not been included as a cost.

The buildings elevator is not anticipated to require major repair or replacement in the five year term.

Based on the observed and reported condition of the Building Mechanical Components a cost of \$0 has been budgeted during the evaluation period of five years.

5.2.5 Building Electrical

No issues were reported with the condition of the main incoming power switch, the switch gear distribution or lighting systems. Major replacement for condition reasons is not anticipated to be required during the five year term.

Based on the observed and reported condition of the Building Electrical Components a cost of \$0 has been budgeted during the evaluation period of five years.

5.2.6 Building Life Safety

No issues were reported with the condition of the sprinkler system. There is a current project underway to replace connections under warranty, to the fire alarm panel and devices as well as the exit and emergency lighting systems. Major replacement for condition reasons is not anticipated to be required during the five year term.

Based on the observed and reported condition of the Building Life Safety Components a cost of \$0 has been budgeted during the evaluation period of five years.

5.2.7 Field House Summary Cost

A summary of the cost estimate associated to the identified risk items are found below excluding Soft Costs and Contingency. See section 5.3 for a summary of the Building Condition Assessment Cost Estimate associated to the two buildings.

Field House BCA Cost Estimate

Section	System	Cost Estimate	
5.2.2	B2030 - Exterior Doors	\$	9,000
5.2.2	B3010 - Roof Coverings	\$	1,250,000
5.2.3	C3020 - Floor Finishes	\$	48,000
5.2.1	G2020 - Parking Lots	\$	8,000
		Total \$	1,315,000

5.3 Cost Summary

The detailed evaluation of the building's Mechanical and Electrical systems was completed by Stantec for The Works (the building operator) in 2013. The objectives of that report were to provide recommend projects to improve its Facilities Condition Index (FCI) and Indoor Air Quality (IAQ). The report also was focused on the cost of operating (energy, facilities management and environmental) equipment that could be upgraded to more efficient modern technology. This objective is not completely aligned with the requested scope of this assessment, which was to determine the anticipated cost to support a major sporting event in the year 2025.

The costing within VFA assumes that renewal and replacement of building components are "as like as kind" where practically possible. No upgrading or modernization is included in the estimate. The VFA-estimated costs are within Appendix B and summary costs are found within Appendix F. Accrued deferred maintenance costs; the cost associated with addressing deferred capital projects associated to systems which had the potential to negatively impact the sporting event were evaluated and a cost estimate to meet the games standard was generated. The following items were identified in the Aquarena which present risk to the ability of the facility to support the games event.

There may be opportunities to extend the life of systems which would have a lower cost however this would require careful planning and ongoing monitoring which come with a significant cost and may still result in major replacement prior to the games. To confirm this, detailed specialist investigation would be required. Work completed by the building operator can be removed from the calculation however as the work was not completed at the time of the site visit it represents a risk to the games event if not undertaken and has there for been added in to the initial cost estimate.

CMEL has valued Soft Costs at 33% of the hard cost construction estimate as reported by the University A contingency allowance of 10% on the total of the above items was applied.

Building Condition Assessment Costs Only

Section	Item	Cost Estimate
5.1.9	Aquarena BCA	\$ 2,562,500
	Aquarena Soft Costs 33%	\$ 845,625
	Contingency 10%	\$ 340,813
	Aquarena Sub-Total	\$ 3,748,938
5.2.7	Field House BCA	\$ 1,315,000
	Field House Soft Costs 33%	\$ 433,950
	Contingency 10%	\$ 174,895
	Field House Sub-Total	\$ 1,923,845
	BCA Total Estimated Cost	\$ 5,672,783

6 Gap Analysis

The buildings were reviewed to determine if they met the minimum requirements identified in the Canada Games hosting standard. A gap analysis of the facilities to the standards was completed.

The below list of criteria have been transposed from the 2025 CSG Sport Venue Standards Summary Version 1.0. CMEL has added a serial number system for ease of use and referencing the items to the costing. Visual material was produced to support and illustrate the findings where noted in appendix D. The yellow-highlighted sections on the below table are enhanced requirements which were indicated as not mandatory. Where these were met they were noted.

Following identifying the gap, CMEL produced a range of possible options or solutions. Options are listed in the order of easiest to most difficult with the highest cost and include discussion on the issue by type and viable solution(s) to reach compliance. Costing associated to the potential solutions to solve the issues has been developed. Costs were estimated as follows:

- Renovation to the existing facilities to meet the functional criteria including the hard costs associated with demolition, renovation and returning the building to the pre-event condition.
- Provide temporary facilities for space that is not available on site.
- The costs presented in the project total summaries are the worst case scenario and represent the most stringent to complete the requirement. Should lower level expectations be negotiated with the Canada Games Council it is anticipated that the cost to complete the lower level of change could be used, potentially lowering the required capital investment.
- The Cost Estimate does not include costs to meet the additional enhanced requirements.
- Soft costs and contingencies have been included in the final summary sheet.

6.1 Aquarena Swimming

6.1.1 Pool

Pool					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 1.1	Dimensions	50m x 17m	Y	60m x 18m	
		L: 50m W: 21m D: 2.5m	N	N/A	
S 1.2	Swimming Lanes	8 lanes @ a width of 2m each	Y	8 lanes @ 2.13m each (7ft)	

*Cells containing yellow indicate an Enhanced Requirement

Pool					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 1.3	Deck Space	5m on East end (End with the diving platform)	Y	Deck space of 5.56m from the pools edge to the end wall was measured from the pool deck	Drawing attached
		5m on West end (End opposite of the diving platform)	N	Deck space of 2.44m from the pools edge to the end wall was measured from the pool deck	Drawing attached
		3m on North side (Side of pool with offices)	N	Deck space ranged from 0.66m to 4.62m from the pools edge to the side walls/obstructions. Tubing for waterslide and steel uprights to be removed, concrete slide supports may require removal as well	Drawing attached
		3m on South side (Side opposite of office structures)	Y	Deck space of 6.80m from the pools edge to the side wall was measured from the pool deck	Drawing attached
S 1.4	Depth	1.35m deep for 6m from starting blocks, everywhere else at least 1m	Y	The pool depths from the starting blocks to the turning end are 4.88m and 1.09m, respectively	

*Cells containing yellow indicate an Enhanced Requirement

The pool category minimum requirements are generally met with the exception of item S1.3 Deck Space. Refer to the attached drawings in Appendix D showing the conflicts and required distance. Since the original construction as a competition facility to support the 1977 Canada Games, the facility has been functioning as a recreational aquatic and fitness facility. Renovations to add slides and to enclose or expand rooms around the pool have all encroached on the pool deck clear space required for competition purposes. The following potential solutions have been developed.

Insufficient deck space at the northwest of the pool between the pool and the change rooms/ spectator area:

- **Option S.1.3a** to obtain sufficient space at the north west end of the pool; minor encroachment may be determined to be acceptable to the Canada Games Committee (CGC) and no action would be required.
- **Option S1.3b** to obtain sufficient space at the north west end of the pool, construct a temporary deck area at the shallow end of the pool to obtain the desired deck space. This would prevent the use of the end section of the pool for warm up space, and would need to be evaluated to ensure that it would not negatively affect the pool's mechanical systems or chemical balancing of the pool.

- **Option S1.3c** to obtain sufficient space at the north west end of the pool, remove the rooms which have been built in the deck area, make the deck and rooms usable for competition purposes and then reinstate to the as-found condition at the completion of the sporting event.

Insufficient deck space due to encroachment of slides on the north east and south west pool decks:

- **Option S.1.3d** to remove encroachments on the north east and south west, remove sections of the slide only and store on site for reinstallation. This will require the approval of CGC related to the concrete and steel structure which would remain in the pool deck area.
- **Option S.1.3e** to remove encroachments on the north east and southwest, remove the concrete and steel structures and store on site for reinstallation where possible. Allowance to repair the concrete pool desk where concrete structure of the slide may have damaged the surface.

6.1.2 Starting Blocks

Starting Blocks					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 2.1	Height	0.5m-0.75m above water surface	Y	Starting blocks are 0.42m above the base of the bulkhead; Water level of the pool can be raised or lowered to meet required starting block height	
S 2.2	Surface Area	0.5m ²	Y	Platforms are 0.52m wide & 0.74m long with an adjustable foot rest. The adjustable footrest can be adjusted a total of 200mm in 5 increments of 40mm, reducing the length of the platform	
S 2.3	Slope (Platform)	10 degrees	N	Platform slope is 9.0 degrees	
S 2.4	Conditional Requirements	If platform thickness exceeds 0.04m, grips @ least 0.1m (width) on the sides & 0.4m (width) in front to be cut out to 0.03m from surface platform	N	The Starting blocks are not owned by the facility a subject matter expert needs to confirm compliance. Allowance for replacement included	

*Cells containing yellow indicate an Enhanced Requirement

The Swimming Starting Block category minimum requirements are generally met; however the starting blocks themselves were reported to have been purchased by the local competitive swim team. The angle of the installed starting blocks appears to be 1 degree away from the requirement. The Conditional Requirements S2.4 relationships were not able to be fully confirmed on site or with the supplied product cut sheet.

Incorrect angle of the starting blocks:

- **Option S.2.3a** to obtain correct starting block angle, minor angle irregularity may be determined to be acceptable to the Canada Games Committee (CGC) and no action would be required.
- **Option S.2.3b** to obtain correct starting block angle, remove and reinstall at correct angle.

Conditional relationship of the components of the starting blocks and access to starting blocks not owned by the facility:

- **Option S.2.4a** starting blocks; the blocks could be lent to the games for use by the swim team and it may be determined that the conditional relationships of the components are acceptable to the Canada Games Committee (CGC) and no action would be required.
- **Option S.2.4b** starting blocks; buy and install 8 new starting blocks.

6.1.3 Backstroke

Backstroke					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 3.1	Handgrips	0.3m-0.6m above water (vertical & horizontal)	N	The Starting Blocks Are not owned by the facility. Water level can be adjusted.	
S 3.2	Ledge Dimensions	0.08m height, 0.02m width, 0.65m length (Min)	N	Ledges are not owned by the facility .Buy new ledges for the facility	
S 3.3	Ledge Slope	10 degrees	N	Ledges are not owned by the facility .Buy new ledges for the facility	
S 3.4	Ledge Adjustment	Adjustable 0.04m above/below waterlevel	N	Ledges are not owned by the facility .Buy new ledges for the facility	

*Cells containing yellow indicate an Enhanced Requirement

The hand grips are on the starting blocks. As noted above the starting blocks are not owned by the facility. In addition the backstroke ledges are not owned by the facility.

The back stroke category overlaps with the starting block category, and the costs associated to replacing the starting blocks have been added only to section S3. Note that the item numbers S3.2, S3.3 and S3.4 would all be addressed by the one item below.

To replace the back stroke ledges:

- **Option S.3.2a** backstroke ledges; the equipment could be lent to the games for use by the swim team and it may be determined that the ledges are acceptable to the Canada Games and no action would be required.
- **Option S.3.2b** backstroke ledges; buy eight new ledges

6.1.4 Additional Rooms

Additional Rooms					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 4.1	(2) Accessible Change Rooms	Area of 74m ²	Y	Two accessible change rooms (room 2007 & 2006) located on level 2 of the Aquarena with areas of 95.42m ² & 81.75m ² . Both change rooms are equipped with lavatory and shower facilities.	Drawing attached
S 4.2	Officials Change Room	-	Y	Suitable change rooms may include AQ-2007A, AQ-2006A and AQ-2010 located on level 2 of the aquarena, ranging in size from 16.62m ² to 17.95m ²	
S 4.3	Management Office	-	Y	Suitable rooms may include AQ-2012, AQ-2012A, AQ-2013, AQ-2013A and AQ-2014 located on level 2 of the aquarena. Rooms range in size from 8.63m ² to 19.53m ²	
S 4.4	Timing Booth	Must be in line with the finish line	Y	Suitable timing booth rooms may include AQ-3022 located on level 3 of the Aquarena, or a temporary structure. Room AQ-3022 is 39.38m ²	
S 4.5	Quiet Space/Office	For scorer/recorder	Y	Suitable rooms may include AQ-2012, AQ-2012A, AQ-2013, AQ-2013A, AQ-2021, AQ-2022 and AQ-2023 located on level 2 of the aquarena. Rooms range in size from 10.46m ² to 19.53m ²	

*Cells containing yellow indicate an Enhanced Requirement

The facility has numerous areas which would be able to be used to meet the needs of the Swimming Additional Rooms category. See the attached drawing in Appendix D for the locations of the noted rooms.

6.1.5 Other

Other					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 5.1	Lighting	600 Lux over starting & turning ends of pool	N	Lux measurements were taken around the perimeter of the 50m competition pool, an avg. Lux of 577.83 was measured from the South side of the pool opposite to the pool deck offices. An avg. Lux of 271.72 was measured from the North side of the pool deck containing offices. At the end of the pool by the diving platforms an avg. of 226.27 lux was measured.	Drawing attached
S 5.2	Seating	Pool deck seating for 400 ppl	N	Potential to bring in a portable bleacher system on the side wall across from the offices, or to use/alter office structure for seating	
		500 ppl (not on pool deck)	N	Room AQ-3007 on level 3 of the Aquarena may be suitable to accommodate spectator seating (not located on the pool deck)	

*Cells containing yellow indicate an Enhanced Requirement

Based on the assessment of CMEL all of the items in the Swimming Other category require expenditure to meet the minimum standards. It was reported that the Works completed the 2016 lighting replacement to achieve a competition lighting level. CMEL collected light level readings while the lights were on the highest lighting setting during the site visit and they were found to be lower than the required minimum. It is recommended that an independent electrical engineer or lighting supplier be asked to verify the lighting levels. Working with the worst case approach, CMEL has included costs associated to augmenting the pool lighting to meet the minimum standard.

There is currently very minimal seating availability at the facility. Several solutions were developed to meet the minimum requirements, all of which have anticipated cost. All options include renting bleacher style seating. The plan for seating will also require areas which are accessible and review of the current CSA standard for assembly areas is recommended.

To augment the lighting at the pool area:

- **S.5.1a** augment lighting; increase the number of fixtures and connect them to the existing lighting system which was installed in 2016 using similar fixtures.

Provide seating for 400 at pool deck all options include the cost to rent bleacher style seating:

- **Option S.5.2a** provide seating; install seating on the long south west side of the pool. This would create a conflict in paths for the athletes from the change rooms and the spectators who it would be assumed would come from the main entrance.
- **Option S.5.2b** provide seating; install seating on the upper level at the north west side currently used for fitness and squash court (this would include demolition and reinstatement of the wall, windows and the squash court. It also may result in the administrative offices being relocated temporarily.) and install seating in these and in areas on the north east side of the pool for a total of 400. The estimated costs of this option were not significantly less than option C below.
- **Option S.5.2c** provide seating; install seating on the long north east side of the pool by demolishing the areas currently used as pool offices and reinstate at the end of the event. This would affect the additional rooms available where noted.

6.1.6 Warm Up

Warm Up					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
S 6.1	Adjacent Pool	L: 20-25m W: 15-17m D: 1-1.2m	Y	Phys. Ed. Pool has already been determined that it is sufficient enough for warm up purposes	
		L: 25m W: 18m D: 1.2m	N	N/A	

*Cells containing yellow indicate an Enhanced Requirement

It was reported that the CGC has approved use of the pool located in the connected Physical Education Building. A secondary option to use the pool space in the main pool beyond the bulkheads was proposed. This will need to be determined by the games organizers. For the purposes of the study, based on the material supplied, the requirements for the Swimming Warm Up have been met and no additional costs are anticipated.

6.1.7 Swimming Summary

The largest costs associated to meeting the minimum requirements of the swimming event are associated to the Other category and relate to providing lighting and seating. These costs are also required to support the needs of the diving category.

The summary of the estimated costs by category, excluding soft costs and contingency of supporting the identified requirements of swimming to meet the Canada Games Standard are listed below. See section 6.5 Cost Summary for a summary of the estimated costs to meet the Canada Games Standards for the two buildings and four sports.

Aquarena Canada Games Requirements Costs Only				
Sport	Venue Requirement Specifications	Minimum Requirements Met (Y/N)	Enhanced Requirements Met (Y/N)	Cost Estimate
Swimming	Pool			\$ 129,250
	Starting Blocks		N/A	\$ 32,000
	Additional Rooms		N/A	\$ -
	Backstroke		N/A	\$ 2,400
	Warm Up			\$ -
	Other			\$ 243,792
Swimming Hard Cost Sub-Total				\$ 407,442

6.2 Aquarena Diving

6.2.1 Pool

Pool					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
D 1.1	Length	Min. of 13.5m in front of 10m platform	Y	The length in front of the 10m platform can range the entire length of the pool (60m) depending on the location of the movable bulkhead	
		20-25m in front of 10m platform	Y	The length in front of the 10m platform can range the entire length of the pool (60m) depending on the location of the movable bulkhead	
D 1.2	Width	Venues built prior to Sept. 2011 are "Dependent on diving board configuration" (venues that are new as of Sept. 2011 must have width of 25m)	-	Since the pool was built prior to 2011 more details on the width of the pool based on "diving board configuration" is required, Pool is 18m wide	
D 1.3	Depth (Platform height & corresponding depth)	1m --> 3.4m depth	Y	Depth is 4.88m	
		3m --> 3.7m depth	Y	Depth is 4.88m	
		5m --> 3.7m depth	Y	Depth is 4.88m	
		10m --> 4.5m depth	Y	Depth is 4.88m	

*Cells containing yellow indicate an Enhanced Requirement

Based on the supplied information the pool meets the minimum requirements outlined in the Diving Pool Category.

6.2.2 Platform & Springboard

Platforms & Diving Boards					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
D 2.1	(2) 1m Springboards	Durafirm short stands; 4.8m x 0.5m (non-slip surface)	Y	All spring boards have short stands. (2) 1m springboards are located on the South side of the pool and do not require relocation to the end of the pool where the other springboards are located. Based on expected useful life of the springboards, it is assumed that springboards will be replaced and surveyed prior to competition	
D 2.2	(2) 3m Springboards	Durafirm short stands; 4.8m x 0.5m (non-slip surface)	N	Anticipated change required: Removal of waterslide All spring boards have short stands, both 3m springboards are located on the 3m high mezzanine. Based on expected useful life of the springboards, it is assumed that springboards will be replaced and surveyed prior to competition.	
		(3) 3m Springboards with same specs	N	Only (2) 3m springboards are present	
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
D 2.3	4 Level Platform Complex	3m high (6m x 1.5m platform)	N	Anticipated change required: There is no 3m platform. Potential to install a 3m platform under the 10m platform (beside the 3m springboards) is a suitable option, platforms can be stacked	
		5m high (6m x 1.5m platform)	Y	7.54m x 1.85m platform	
		7.5m high (6m x 1.5m platform)	Y	7.37m x 1.80m platform	
		10m high (6m x 3m platform)	N	7.52m x 2.11m platform	
Synchronized Diving:					
D 2.4	(2) 3m Springboards	Side by side with no obstructions; 2.2m - 2.6m centre to centre	Y	Currently the waterslide is obstructing the space directly behind the 3m springboards. Centre to centre distance of the boards is 2.49m	

*Cells containing yellow indicate an Enhanced Requirement

There is currently a water slide that obstructs the area of the diving platforms. In addition the size of the some of the platforms to complete the synchronized diving events does not meet the standard. CMEL retained Campbell Comeau to provide an initial assessment of the viability of making changes to the existing diving platform structure or to recommend it the entire structure required replacement. Based on review

of the original building tower structural drawings it was found to be structurally feasible. Therefore costs to make revisions to the tower only have been included. In addition the placement and quantity of springboards do not meet the current minimum standards.

- **D2.2a** to remove the obstruction of the slide, remove the slide and support structure, store the slide on site. Reinstall the slide following the games event.
- **D2.3a** to revise the current layout of the diving area .

6.2.3 Additional Rooms

Additional Rooms					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
D 3.1	(1) Dressing Space (female)	93m ²	Y	Suitable change rooms may include AQ-1002 and AQ-2006, located on levels 1 and 2 of the Aquarena and ranging in size from 42.87m ² to 81.75m ² . Change rooms are equipped with lavatory and shower facilities	
D 3.2	(1) Dressing Space (male)	93m ²	Y	Suitable change rooms may include AQ-1003 and AQ-2007, located on levels 1 and 2 of the Aquarena and ranging in size from 62.84m ² to 95.42m ² . Change rooms are equipped with lavatory and shower facilities	
D 3.3	(1) Officials/Judges Dressing Room	-	Y	A suitable room may include AQ-2010 located on level 2 of the aquarena. Size of the change room is 17.95m ²	
D 3.4	Judges' Stand (Stage Unit)	Height of 1.5m-2m; Accomodate Min of 4 ppl on each side of pool deck	Y	Use of a temporary structure for judges stand may be suitable (possibly already owned by Canada Games). Room AQ-3022 located on level 3 of aquarena or the mezzanine directly above (Currently used for the waterslide) may also be suitable for judging	
		Level 0.5m greater then main stage unit to accomodate 1 person on each side of deck with appropriate sight lines for synchro swimming	Y	(2) judge stands are required for synchro diving (1 stand on each side of the diving apparatus). Use of temporary structures for judges stands may be suitable (possibly already owned by Canada Games)	

*Cells containing yellow indicate an Enhanced Requirement

The facility has numerous areas which would be able to be used to meet the needs of the Diving Additional Rooms category. See the attached drawing in Appendix D for the locations of the noted rooms.

6.2.4 Other

Other					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
D 4.1	Equipment	Mechanical surface agitation to be installed under the boards and tower with a horizontal sprinkler system	Y	(1) Sprinkler/spray system is already in place, the addition of sprinklers will be require in order to spray the areas under both the platforms and springboards	
		Facility equipped to run simultaneous events/practices	Y	Dependent on the events	
		On deck warm water spray shower or hot tub	Y	(5) warm water shower heads (3 tall & 2 short) are located at the end of the pool opposite of the diving platforms. A smaller heated kids pool is also located on the side of the pool deck	

*Cells containing yellow indicate an Enhanced Requirement

The minimum requirements for Diving Other category appear to be met.

6.2.5 Warm Up

Warm Up					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
D 5.1	Dry-Land Area With Equipment Complying With DPC Technical Specs	Min. (1) trampoline	Y	Equipment on site; verbal agreement has been made regarding the use of the equipment for competition, to be confirmed in the future	
		Min. (1) dry-board	Y	Equipment on site; verbal agreement has been made regarding the use of the equipment for competition, to be confirmed in the future	
		Min. Surface of 800 ft ² covered with floor mats	N	Equipment on site; verbal agreement has been made regarding the use of the equipment for competition, to be confirmed in the future. More floor space is required to reach the minimum 800 ft ² as required	
		Min. (2) stations for platform take-off (synchro divers)	N	No stations for platform take-offs were on site, to be confirmed in the future	

*Cells containing yellow indicate an Enhanced Requirement

The equipment associated to the diving warm up area was on site and was reported to be owned by the Diving school run out to the facility. The organization has agreed to provide the equipment for use at the games. The area of matting and platforms did not appear to meet the minimum standard.

- **D5.1a** purchase additional warm up area equipment.

6.2.6 Diving Summary

The largest cost associated to the diving category is related to the changes required to the diving platforms. There do not appear to be solutions to reduce this cost. In addition, the costs to provide lighting and seating to support the diving event are located in the swimming category.

The summary of the estimated costs, excluding soft costs and contingency of supporting the identified requirements of Diving to meet the Canada Games Standard are listed below. See section 6.5 Cost Summary for a summary of the estimated costs to meet the Canada Games Standards for the two buildings and four sports.

Aquarena Canada Games Requirements Costs Only				
Sport	Venue Requirement Specifications	Minimum Requirements Met (Y/N)	Enhanced Requirements Met (Y/N)	Cost Estimate
Diving	Pool			\$ -
	Platforms/Springboards			\$ 146,416
	Additional Rooms		N/A	\$ -
	Warm Up		N/A	\$ 13,548
	Other			\$ -
Diving Hard Cost Sub-Total				\$ 159,964

6.3 Field House Basketball

6.3.1 Courts

Courts					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
B 1.1	(2) Courts - If Genders Are Same The Week	28m x 15m	Y	(28.75m x 15.34m) Phys. Ed. gymnasium may be suitable for a second competition court (upgrades are required)	
		(3) courts (28m x 15m)	N	N/A	
B 1.2	(1) Court - If Genders Aren't The Same Week	28m x 15m	Y	(28.75m x 15.34m)	
		(2) courts (28m x 15m)	N	Phys. Ed. gymnasium may be suitable for a second competition court (upgrades are required)	
B 1.3	Additional Space	2m all around the court	Y	2.90m of additional space all around the court	
		5m distance from boundary line for spectator seating	Y	± 2.13m of additional space on to the green sport court (on both sides of the basketball court) is required to reach the 5m boundary	
B 1.4	Ceiling Clearance	7m	Y	9.83m clearance	
B 1.5	Surface	Hardwood cushion floor with matte surface	Y	Hardwood cushioned floor with a matte finish	

*Cells containing yellow indicate an Enhanced Requirement

The minimum requirements for the Basketball Courts category appear to be met.

6.3.2 Equipment

Equipment					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
B 2.1	End wall padding (Under Both Baskets)	Min: 4.9m x 2in x 6ft	N	There are no solid end walls located around the basketball court, Only curtain walls or no walls at all. If Phys. Ed. Gymnasium is being used then padding at the end walls will be required for that court	
		Padding runs further then 4.9m (length of the key)	N	N/A unless Phys. Ed. Gymnasium is in use	
B 2.2	Backboard	(1.80m x 1.05m) must be padded; if backboard is floor fixed/mobile it must be 2m including padding from outer edge of baseline	Y	Backboards (1.83m x 1.19m) are mobile and the support structures are located 1.12m, including padding, from the outer edge of the baseline. Backboards are both padded	
		Tempered safety glass backboard (1.80m x 1.05m)	Y	Both mobile backboards are constructed out of tempered glass (1.83m x 1.19m)	
B 2.3	(2) 24-Second Shot Clocks	Mounted on backboard support structure 300mm above and behind	N	Each shot clock (1 per backboard) is mounted on the support structure 304.8mm behind and 76.4mm above the backboard	

*Cells containing yellow indicate an Enhanced Requirement

The Basketball Equipment category requirements are generally met. Adjustments to the location of the shot clocks are required. In addition should the Physical Education Gym be used, end wall matting will be required.

- **B2.3a** re-install shot clocks at compliant locations.

6.3.3 Additional Rooms

Additional Rooms					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
B 3.1	(4) Separate Locker Rooms	Must contain whiteboards, should contain shower facilities	Y	Suitable rooms may include FH-1011A, FH-1010A, FH- 1009A, FH-1008A, FH-2006A and FH-2003 located on levels 1 and 2 of the field house. Rooms range in size from 36.62m ² to 136.49m ² , Drawings will be provided at a later date highlighting the rooms listed	Drawing attached
B 3.2	Officials Dressing Rooms (Separate For Male & Female)	Must contain washroom facilities (Dressing room max of 12 officials at one time)	Y	Suitable space may include rooms located in the attached Phys. Ed building. Rooms may not include shower or lavatory facilities	
B 3.3	Officials Meeting Room	-	Y	Suitable rooms may include FH-2001, FH-2001B located on level 2 of field house or a room in the adjacent Phys. Ed. building. Rooms range in size from 14.85m ² to 18.75m ²	
B 3.4	Training Room	-	Y	Suitable rooms may include FH-1000A, FH-2009 or FH-2010 located on levels 1 and 2 of the field house. These rooms range in size from 150.17m ² to 212.03m ²	
B 3.5	Medical Area	-	Y	Suitable rooms/areas may include FH-1001A or FH-1019 located On level 1 of the field house. These rooms/areas range in size from 14.25m ² to 52.92m ²	
B 3.6	Committee-only Control Room	-	Y	Suitable rooms may include FH-2009 or FH-2010 located on level 2 of the field house or a room in the adjacent Phys. Ed. Building. Size of rooms FH-2009 & FH-2010 are 151.22m ² & 150.17m ² , respectively	

*Cells containing yellow indicate an Enhanced Requirement

The facility has numerous areas which would be able to be used to meet the needs of the Basketball Additional Rooms category. See the attached drawing in Appendix D for the locations of the noted rooms.

6.3.4 Other

Other					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
B 4.1	Lighting	Uniform light; 540-600 lx measured 1m above floor	N	Avg. Lux of 197.71 was measured 1m above the competition court (4 lights were off during the time lux was measured, 3 down the middle of the court and 1 at the end corner of the court)	Drawing attached

*Cells containing yellow indicate an Enhanced Requirement

The facility is currently in the process of changing their lighting through an EPC. At the time of the site visit the work was not complete. Lighting was measured and found to not meet the minimum standard. See the attached drawings for the readings taken. Note that the area would also affect the volleyball court and therefore the costs cannot be avoided even if basketball is relocated to another facility.

- **B4.1a** augment the lighting to meet the standard.

6.3.5 Warm Up

Warm Up					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
B 5.1	(3) Practice Courts	Similar dimensions as seen above; may be in another location (no additional space requirements)	Y	There is not enough space/courts in field house, an additional location with courts may be required	
B 5.2	Warm-up Court	In same building as competition (wood or sport court floor)	Y	The Phys. Ed. Gymnasium would be suitable if not needed as a competition court, portable baskets could also be used on the sport court adjacent to the competition court (FH-1000)	

*Cells containing yellow indicate an Enhanced Requirement

The minimum requirements for the Basketball Warm Up category appear to be met.

6.3.6 Basketball Summary

When the new lighting installation is completed in the Field House, it is possible that the lighting costs may alter either by increasing or decreasing pending testing to confirm the lighting levels achieved with the new fixtures.

The summary of the estimated costs, excluding soft costs and contingency of supporting the identified requirements of Basketball to meet the Canada Games Standard are listed below. See section 6.5 Cost Summary for a summary of the estimated costs to meet the Canada Games Standards for the two buildings and four sports.

Field House Canada Games Requirements Costs Only					
Sport	Venue Requirement Specifications	Minimum Requirements Met (Y/N)	Enhanced Requirements Met (Y/N)	Cost Estimate	
Basketball	Courts			\$ -	
	Equipment			\$ 1,000	
	Additional Rooms			N/A	\$ -
	Warm Up			N/A	\$ -
	Other			N/A	\$ 69,048
Basketball Hard Cost Sub-Total				\$ 70,048	

6.4 Field House Volleyball

6.4.1 Courts

Courts					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
V 1.1	# of Courts	3 Volleyball courts (1 set up as centre court)	Y	3 courts: (1) wood & (2) sport court	
		4 Volleyball courts (1 set up as centre court)	Y	Phys. Ed. gymnasium could be suitable as a 4th court	
V 1.2	Dimensions	18m x 9m	Y	Wood Court: 17.96m x 9.02m Sport Courts: 17.97m x 9.00m	
V 1.3	Additional Space	4.5m on sides & 5m on ends	N	The wood court has 6.0m of additional space on either side and an additional 8.28m of space on the ends. The (2) sport courts have a distance of 5.97m between each other with additional space of 3.89m and 3.56m from their outer sidelines and 8.20m of additional space on the ends of the courts. A diagram will be provided at a later date to help illustrate the measurements.	Drawing attached
		More than 4.5m on sides & 9m on ends	N	N/A	
V 1.4	Ceiling Clearance	Min. 9m	Y	9.83m clearance	
		Min. 10m	N	N/A	
V 1.5	Surface	Hardwood cushion floor	Y	(1) Hardwood cushioned court & (2) sport courts, Phys. Ed. gymnasium is hardwood cushioned floor (If used for competition)	
		Matte surface	Y	Both the wood and sport court surfaces have a matte finish	
		Small surface elasticity	TBD	Could not be determined	
		Non-slip	Y	Both the wood and sport court surfaces are non-slip	
		If portable floors are being laid on concrete, sub flooring must be installed	N	N/A	

*Cells containing yellow indicate an Enhanced Requirement

The majority of the Volleyball Court category requirements have been met with the exception of the additional space around the courts. Refer to the drawing found in Appendix D.

- **Option V1.3a** If the placement and lack of additional space for the courts can be confirmed to be acceptable by CGC, no action would be required
- **Option V1.3b** In order to obtain the required additional space the courts' lines would need to be repainted and the upright locations changed. When repainted, the courts will overlap the running track so additional floor finish changes and reinstatements at the end of the games would be completed.

6.4.2 Additional Rooms

Additional Rooms					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
V 2.1	(6) Dressing Rooms (2 Per Court)	35 m ²	Y	Suitable space to accommodate all (6) dressing rooms may include rooms located in the attached Phys. Ed. Building. Rooms may not include shower or lavatory facilities	
V 2.2	(1) Officials Dressing Room	-	Y	Suitable rooms may include rooms located in the attached Phys. Ed. Building, these rooms may not include shower or lavatory facilities	

*Cells containing yellow indicate an Enhanced Requirement

The facility has numerous adjacent areas which could be able to be used to meet the needs of the Volleyball Additional Rooms category.

6.4.3 Other

Other					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
V 3.1	Lighting	Semi direct; 540 lx	N	Avg. Lux of 144.84 was measured from the surface of the sport court (suspended platforms and replaced lighting caused reduced illumination) Avg. Lux of 224.87 was measured from the surface of the hardwood court (4 lights were off during the time of measurement). A diagram will be provided at a later date to help illustrate the measurements.	Drawing attached
		Lights approx. 10m above court & uniform	Y	9.83m ± 1.22m above court surface, the lighting formation currently isnt uniform	
V 3.2	Spectator Seating	3500-5000 ppl for centre court	N	1360 bleacher seats, additional seating to be determined	

*Cells containing yellow indicate an Enhanced Requirement

The facility is currently in the process of changing their lighting through an EPC. At the time of the site visit the work was not complete. Lighting was measured and found to not meet the minimum standard. See the attached drawings for the readings taken. Note that the area would also affect the basketball court (See B4.1) and therefore the costs from 4.1 will need to be included for volleyball even if basketball is relocated to another facility.

- **V3.1a** augment the lighting to meet the standard.

6.4.4 Warm Up

Warm Up					
Item #	Description	Requirements	Requirements Met (Y/N)	Comments	Material to be Attached
V 4.1	(3) Volleyball Courts	In addition to the competition courts	N	If the Phys. Ed. gymnasium is not used for competition it could be used as 1 of the 3 warm up courts; No more court space is available for the other (2) warm up courts Tent and surface rental	
		4 additional volleyball courts	N	N/A	

*Cells containing yellow indicate an Enhanced Requirement

The facility does not have the required warm up court space. Only one additional court is available in the physical education gym which is attached to the Field House. This issue presents the most significant cost to the support of volleyball at the venue. In order to obtain the additional courts either alternative solutions, major renovations or a temporary tent to accommodate will be required.

- **V4.1a** use a gym(s) located off -campus and provide transportation to and from the venue.
- **V4.1b** provide temporary tents with flooring and lighting for warm up courts.

6.4.5 Volleyball Summary

The largest cost associated to volleyball is to provide the required warm up areas. This cost may be reduced if alternative acceptable facilities or solutions are found. In addition when the lighting installation is completed, it is possible that the lighting costs alter either by increasing or decreasing pending testing to confirm the lighting levels achieved.

The summary of the estimated costs, excluding soft costs and contingency of supporting the identified requirements of volleyball to meet the Canada Games Standard are listed below. See section 6.5 Cost Summary for a summary of the estimated costs to meet the Canada Games Standards for the two buildings and four sports.

Field House Canada Games Requirements Costs Only				
Sport	Venue Requirement Specifications	Minimum Requirements Met (Y/N)	Enhanced Requirements Met (Y/N)	Cost Estimate
Volleyball	Courts			\$ 21,401
	Additional Rooms		N/A	\$ -
	Warm Up			\$ 328,700
	Other			\$ 51,235
Volleyball Hard Cost Sub-Total				\$ 401,336

6.5 Cost Summary

Working with information supplied by the University, CMEL assessed the facilities against the Canada Games Hosting Standard 2025 to find areas where the standard was not met. Potential solutions to close the “gap” were then created and cost estimate complete.

CMEL has identified a range of solutions to resolve the identified deficiencies and in some cases confirmation that the item is not critical may result in removal of the estimated cost. Working conservatively, the solution which would be the worst case or the most exacting approach to meeting the requirements has been included in the

summary estimates. Where alterations are made to the facilities current components, returning the facility to its pre-event condition has been included in the estimate.

CMEL has valued Soft Costs at 33% of the hard cost construction estimate as reported by the University. A contingency allowance of 10% on the total of the above items was applied. The below table summarizes the gap analysis and the estimated cost to meet the minimum standards:

Canada Games Requirements Costs Only

Section	Item	Cost Estimate
6.1.1	Swimming Pool	\$ 129,250
6.1.2	Swimming Starting Blocks	\$ 32,000
6.1.3	Swimming Backstroke	\$ 2,400
6.1.4	Swimming Additional Rooms	\$ -
6.1.5	Swimming Other	\$ 243,792
6.1.6	Swimming Warm Up	\$ -
6.1.7	Swimming Hard Cost Sub-Total	\$ 407,442
6.2.1	Diving Pool	\$ -
6.2.2	Diving Platforms/Springboards	\$ 146,416
6.2.3	Diving Additional Rooms	\$ -
6.2.4	Diving Other	\$ -
6.2.5	Diving Warm Up	\$ 13,548
6.2.6	Diving Hard Cost Sub-Total	\$ 159,964
6.3.1	Basketball Courts	\$ -
6.3.2	Basketball Equipment	\$ 1,000
6.3.3	Basketball Additional Rooms	\$ -
6.3.4	Basketball Other	\$ 69,048
6.3.5	Basketball Warm Up	\$ -
6.3.6	Basketball Hard Cost Sub-Total	\$ 70,048
6.4.1	Volleyball Courts	\$ 21,401
6.4.2	Volleyball Additional Rooms	\$ -
6.4.3	Volleyball Other	\$ 51,235
6.4.4	Volleyball Warm Up	\$ 328,700
6.4.5	Volleyball Hard Cost Sub-Total	\$ 401,336
	Canada Games Hard Cost Sub Total	\$ 1,038,790
	Soft Costs 33%	\$ 342,801
	Contingency 10%	\$ 138,159
	Canada Games Standard Estimated Total Cost	\$ 1,519,750

7 Summary & Recommendations

The potential of completing a bid to host the 2025 Canada Games in Newfoundland and Labrador with swimming and diving at the Aquarena, and Basketball and Volleyball utilizing the Fieldhouse facilities at the University of Memorial's St. John's Campus is being evaluated. The minimum criteria to support the event were written by the Canada Games Council and are found in the document "Canada Games Hosting Standards - 2025" located in Appendix A. CMEL completed a Gap analysis of the facilities to these standards as well as condition assessments to determine an estimate of costs to support the renovations anticipated to be required to make the two facilities compliant.. Visual material was also produced to support and illustrate the findings.

CMEL completed building condition assessments of the Aquarena and the Fieldhouse and updated the University's asset management data base. Combining this information with the most recent asset management information from MUN's asset management database, information supplied by the University, and the buildings operator, CMEL developed a list of items based on the intended event's requirements that are considered critical for operation. Items considered critical for operation were evaluated to determine their condition and if they are anticipated to require or may require replacement to support the required activities in the year 2025. Items that are in the five to ten year window from 2025 to 2030 were also evaluated to determine if these presented a risk related to possible premature failure.

CMEL has identified a range of solutions to resolve the identified deficiencies and in some cases confirmation that the item is not critical may result in removal of the estimated cost. At all times, worst case or the most costly solution has been included in the total costing.

Where alterations are made to the facilities current components, returning the facility to its pre-event condition has been included in the estimate. The costs presented in the project total summaries are the worst case and represent the most stringent to complete the requirement. Should lower-level expectations be negotiated with the Canada Games Council it is anticipated that the cost to complete the lower level of change could be used, potentially lowering the required capital investment

The greatest costs to support the event are associated to the Aquarena building with the significant burden of deferred maintenance associated to major mechanical and electrical systems which have either been decommissioned, removed, or at end of life. Although the event requirements do not clearly state many of the minimum requirements for these systems, the facility providing current standard of services for an aquatic facility

can reasonably be assumed. The estimates included recapitalization anticipated to replace end of life components.

Soft costs, as identified by the University, have been integrated in to the costs of all the work at a rate of 33% of the anticipated hard costs.

The operational costs and downtime of facilities caused by the proposed renovations to support the 2025 sporting event and the use of the facilities for the event were not factored into the cost analysis. Potential operations costs including loss of operating income, staff costs or reduction in staff costs, reduction or increase in costs associated to utilities during renovations and the event have also not been included in the cost analysis. CMEL recommends that these more complex cost benefit issues will need to be addressed between the stakeholders and will need to be factored in.

The following costs have been estimated associated to the sports and to the buildings:

Section	Item	Cost Estimate
5.1.9	Aquarena BCA	\$ 2,562,500
6.1.7	Aquarena Swimming	\$ 407,442
6.2.7	Aquarena Diving	\$ 159,964
	Aquarena Soft Costs 33%	\$ 1,032,869
	Contingency 10%	\$ 416,278
	Aquarena Sub-Total	\$ 4,579,053
5.2.7	Field House BCA	\$ 1,315,000
6.3.6	Field House Basketball	\$ 70,048
6.4.5	Field House Volleyball	\$ 401,336
	Field House Soft Costs 33%	\$ 589,507
	Contingency 10%	\$ 237,589
	Field House Sub-Total	\$ 2,613,480
	Total Estimated Cost	\$ 7,192,533

8 Limitations

This report may not be relied upon by any other person or entity without the expressed written consent of Capital Management Engineering Limited and Memorial University. Any other parties that rely or make decisions based on this report do so solely at their own risk.

Capital Management Engineering makes no warranties, whether written or oral, statutory, expressed or implied, in connection with the services provided, including,

without limitation, any warranty of fitness for any particular purpose or use with respect to the property or building components and systems.

Capital Management Engineering's cumulative liability for all claims relating to this report or the services provided shall not exceed the total amount of all fees actually paid for this report.

The opinions of cost are intended for global budgeting purposes only. Actual costs for recommended work can only be determined after preparation of design and tender documents, detailing the site restrictions, effects and or restrictions on ongoing operations of the building and requirements associated with the construction schedule.

The recommendations made in this report are based on the visual observations made by the assessor during the site assessment and are limited to the areas of the site and building that were observed and accessible during the assessment. Concealed, inaccessible and un-observed areas may be in a different condition than what is reported herein. During the site assessment the assessor will attempt to verify any additional information provided by the site contact. However, in many cases the information will be relied upon and presented without field verification.

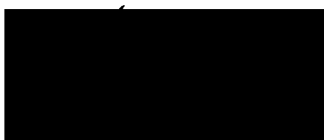
9 Closure

Capital Management Engineering Limited is pleased to present this final report in electronic format for Memorial University. The findings presented suggest a strategic long term view to managing assets and will provide the University with the tools to support development.

The site assessment findings and report were completed by Ms. Kyla Simpson. The Aquarena & Fieldhouse Gap Analysis and Condition Assessment report was reviewed by Mr. Gerard Wttewaall.

s. 40 (1) 

Kyla Simpson, B.A.S.,
Site Assessor
Capital Management Engineering

 s. 40 (1)

Gerard Wttewaall
Senior Review
Capital Management Engineering

Appendix A – Canada Games Hosting Standards- 2025



**2025 CANADA SUMMER GAMES
SPORT VENUE STANDARDS SUMMARY
Version 1.0 (2019.10.23)**

All sport venues must meet the Canada Games Council's (CGC) Sport Venue Standards. These standards include field of play requirements, non-field of play requirements, practice/warm-up requirements and ancillary facility requirements. The full version of the Sport Venue Standards will be made available to the bid community who wins the rights to host the Canada Games. The selected community is required to adhere to all Sport Venue Standards when delivering the Canada Games.

The Sport Venue Standards **Summary** below has been established as a *bid evaluation tool*, to be used by bidding communities and the CGC's Technical Review Committee to evaluate a community's ability to host the sports on the Canada Games program. The summary highlights the critical sport venue standards and main cost drivers in respect of venues, including, but not limited to: number of facilities required, field of play dimensions, surface type, access to venue, lighting, length of competition schedule, etc.

A bidding community is required to demonstrate their ability to provide venues for all selected sports, based on the below venue standards, as part of the bid process.

Sport	<u>Minimum</u> Competition Venue Requirements	<u>Minimum</u> Practice/Warm-up Venue Requirements	<u>Enhanced</u> Competition or Practice/Warm-Up Venue Requirements
Artistic Swimming	FIELD OF PLAY <ul style="list-style-type: none"> • Pool dimensions <ul style="list-style-type: none"> ○ Length: 25m ○ Width: 20m ○ Depth: 3m deep for at least 12m in length and 2m at shallow point • Water temperature: minimum 24 °C • Water must be of sufficient clarity for the bottom of the pool to be visible 	GENERAL <ul style="list-style-type: none"> • Practice pool dimensions: <ul style="list-style-type: none"> ○ Length: 25m ○ Width: 20m ○ Depth: 2m • If available, a diving tank may be used 	FIELD OF PLAY <ul style="list-style-type: none"> • 50m pool, subdivided by a bulkhead used for both competition and practice pools • Pool Depth: 3m deep throughout the competition pool • Seating for 500 people

	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • Space to accommodate two elevated platforms (9.8m wide x 2.5m deep x 0.5m high) on either side of the competition pool • Minimum clearance of 1.8m on 3 sides of the pool deck with fourth side wide enough (4m x 8m) for referees, scorekeepers, announcer and PA system <p>LIGHTING</p> <ul style="list-style-type: none"> • Underwater lighting: 1500 LUX • Lighting: 1000 LUX <p>TECHNOLOGY</p> <ul style="list-style-type: none"> • Wired internet connection with a minimum 15mb upload capacity • Sufficient power for scoring, announcing, music and technical evaluation on pool deck <p>ANCILLARY</p> <ul style="list-style-type: none"> • Hair gelling room (12 sq m), with sufficient power to support 5 kettles • Participant seating: 100 persons • Athlete change rooms to accommodate male and female competitors • Officials' change rooms: 1 		
Athletics	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 1 track & field facility/stadium <ul style="list-style-type: none"> ○ Track with 1 water jump on track's second semi-circle ○ Field events inside the stadium for competition 	<p>GENERAL</p> <ul style="list-style-type: none"> • The track & field facility must also serve as the practice facility outside of competition • 1 warm-up track 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • Water jump outside the track's running lanes • 2 runways for pole vault

	<ul style="list-style-type: none"> o 2 parallel long jump runways with pits at both ends o 2 parallel triple jump runways with pits at both ends o 1 parallel pole vault runway o 1 High Jump Fan o 1 javelin runway and sector o Shot, discus and hammer circles and sectors (cage for discus & hammer circle) <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Track: <ul style="list-style-type: none"> o 400m o 8 lanes o Maximum lateral inclination of track: 1:100 o Minimum width of track: 9.76m o Length of parallel stretches: 84.39m o Length of radius of semi-circle: 36.5m • Water jump: <ul style="list-style-type: none"> o 3.66m W x 3.66m L x 70.0cm D • Shot, discus and hammer circles, sectors and landing areas: <ul style="list-style-type: none"> o As per IAAF Rules 187-192 • Javelin runway, sector and landing area: <ul style="list-style-type: none"> o As per IAAF Rule 187 • Long/Triple Jump runway and pits: <ul style="list-style-type: none"> o As per IAAF Rules 184-186 • High Jump apron: <ul style="list-style-type: none"> o Big enough for 2 pits o As per IAAF Rule 182 • Pole Vault runway: <ul style="list-style-type: none"> o As per IAAF Rule 183 	<ul style="list-style-type: none"> • Warm-up circles for shot, discus and hammer located outside of infield <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Warm-up track: <ul style="list-style-type: none"> o 4 lanes x 85m in length, within 100m of competition track • Wheelchair racing warm-up area: <ul style="list-style-type: none"> o Paved, "smooth" road surface of 200m or more o Closed to traffic and accessible to and from the call room • Warm-up circles: <ul style="list-style-type: none"> o As per IAAF rules • Warm-up/training circle: <ul style="list-style-type: none"> o As per WPA rules <p>SURFACE</p> <ul style="list-style-type: none"> • Track: same material as competition surface • Field: same surface as competition 	<p>TECHNOLOGY</p> <ul style="list-style-type: none"> • Finish line timing on both sides of the track (two potential finish line areas) <p>ANCILLARY</p> <ul style="list-style-type: none"> • Finish line tower (at main finish line) <p>LIGHTING</p> <ul style="list-style-type: none"> • Track lit for option of night-time use
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	<ul style="list-style-type: none"> • Tie down throws for Para events: <ul style="list-style-type: none"> o As per WPA Rule 35 <p>SURFACE</p> <ul style="list-style-type: none"> • All weather track • Throw landing areas are natural grass (exception: shot puts on stone dust) <p>ANCILLARY</p> <ul style="list-style-type: none"> • Minimum 4' fencing separating athlete competition from spectator zones • Secure storage room for all equipment (minimum 40' x 50') • Accessible Change rooms: <ul style="list-style-type: none"> o 185.0m² for males o 185.0m² for females o 1 officials change room • Technical Information Centre/Competition Office <p>TECHNOLOGY</p> <ul style="list-style-type: none"> • Electrical/communications conduits under finish line area of track 		
Baseball	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 2 baseball fields (with 1 designated as main field) <ul style="list-style-type: none"> o Outfield fence with protective caps; o 2 covered dugouts per field (roof with sides) with bench seating; o Backstop (screen with durable wire); o 4 bullpens outside the foul lines (two on each side of the field) 	<p>GENERAL</p> <ul style="list-style-type: none"> • 2 warm up fields within walking distance to competition fields <ul style="list-style-type: none"> o Space for batting practice o Space for infield practice o 2 bullpens, one on each side of practice field • If practice fields are too small to accommodate 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 3 baseball fields (with 1 designated as main field) <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Distance from home plate to centre field fence is 400 feet and 330 down the line; • Distance from home plate to nearest obstacle along foul line is 90 feet; • Outfield fence is 8 feet high

	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • Distance between bases - 90 feet; • Distance between home plate and pitcher's mound is 60 feet 6 inches; • Distance from home plate to centre field fence is 375 feet and 300 feet down the lines; • Allowable outfield slope is 1 inch per 100 feet starting from center field; • Distance from home plate to nearest obstacle along foul line is 60 feet; • Pitcher's mound 10" above home plate; • Outfield fence: <ul style="list-style-type: none"> o Minimum of 6 feet high; • Backstop: <ul style="list-style-type: none"> o Height: 18-30 feet; o Length: 40-60 feet; o 60 feet behind home plate; • Bullpens: <ul style="list-style-type: none"> o Same distance & dimensions as field of play; • Dugouts: <ul style="list-style-type: none"> o 47 feet x 5 feet <p>SURFACE</p> <ul style="list-style-type: none"> • Natural turf infields are mandatory. Clay base paths or all-weather surfaced base paths required. <p>LIGHTING</p> <ul style="list-style-type: none"> • Floodlights casting a minimum of 324 lux in infield, and 216 lux in outfield for main field. 	<p>batting practice, 2 batting tunnels must be placed outside of the competition field.</p> <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Comparable size to competition fields. <p>SURFACE</p> <ul style="list-style-type: none"> • Natural turf infield and clay or all-weather surface base paths are not required for practice fields. <p>LIGHTING</p> <ul style="list-style-type: none"> • Not required 	<p>LIGHTING</p> <ul style="list-style-type: none"> • Floodlights casting a minimum of 324 lux in infield, and 216 lux in outfield for all playing fields <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> • Spectator seating room to accommodate 2,000 people
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	<p>ANCILLARY</p> <ul style="list-style-type: none"> • 4 dressing rooms at each field, 35.0m² in size; • 1 dressing room for officials at each field. 		
Basketball	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • 2 courts (28.0m x 15.0m) - If genders same week • 1 court (28.0m x 15.0m) - If genders separate weeks • Additional space requirements: 2.0m all around court • Ceiling clearance: 7.0m • Padding on the end walls underneath both baskets; at a minimum, must run the length of the key (4.9m), and extend a minimum of 6 feet high measured from the floor, with a thickness of 2" • Backboard (1.8m x 1.05m) must be padded • For mobile or floor-fixed backboard support structures, the structure must be at least 2.0m including padding, from the outer edge of the endline • Two twenty-four second clocks must be mounted on each backboard support structure a minimum of 300mm above and behind the backboard <p>SURFACE</p> <ul style="list-style-type: none"> • A hardwood cushion floor with a matte surface is ideal for basketball 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • 3 other practice courts (may be in another location) with similar court dimensions. Additional space requirements not mandatory. <p>SURFACE</p> <ul style="list-style-type: none"> • Warm-up court in same building as competition court (wooden or sport court floor) 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • 3 courts (28.0m x 15.0m) - same week • 2 courts (28.0m x 15.0m) - separate weeks • Additional space requirements: 5.0m distance from boundary line for spectator seating • Padding on the end walls underneath the baskets, runs further than the length of the key • Tempered safety glass backboard (1.8m x 1.05m)

	<p>ANCILLARY</p> <ul style="list-style-type: none"> • 4 separate team locker rooms, must lock and contain whiteboards; should contain shower facilities • Officials dressing rooms with washroom facilities for a maximum of 12 officials at one time <ul style="list-style-type: none"> o Separate dressing rooms for male and female officials • Officials meeting room • Training room • Medical area • Committee-only control room <p>LIGHTING</p> <ul style="list-style-type: none"> • An intensity of 540 lx - 600 lx measured 1.0m above the floor is necessary for basketball, light should be uniform throughout venue 		
Canoe Kayak	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • 1200m length (1000m course, 75m run-off, and 50m start area) • 95m width (9 lanes at 9.0m wide each, plus wider return lane) • 2m depth (under all lanes) • Race course buoy system as per CKC Sprint National Standard <p>COURSE</p> <ul style="list-style-type: none"> • Sites with reputations for unfair and/or high winds, waves, and motor boat traffic are not recommended and may be declared unacceptable. • Sites with water conditions that aren't fair and equitable across all lanes may be considered as unacceptable. 	<ul style="list-style-type: none"> • Same as competition venue. 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • At least one straight bank along the lanes at a maximum of 50 metres from at least one outside lane is recommended. • 1200m length (1000m course, 100 run-off, and 100m start area).

	<ul style="list-style-type: none"> • Sites with shorelines that reflect waves back onto the race course will not be accepted, unless booms or other devices can be installed. <p>START / FINISH AREA</p> <ul style="list-style-type: none"> • 80.0 linear m of docking space • 3 starting platforms (min. space for 3 persons) with floor at 2m above water surface and roof <p>JUDGING / SCORING AREA</p> <ul style="list-style-type: none"> • A finish tower with a height of three floors and a minimum dimension of 5m² for each floor <p>ACCESS TO FIELD OF PLAY</p> <ul style="list-style-type: none"> • Boat Trailer parking (area of 350m² with solid surface) <p>TECHNOLOGY</p> <ul style="list-style-type: none"> • Finish Lynx photo finish results system (can be leased) • Polaritas starting gate system (may be rented) <p>ANCILLARY</p> <ul style="list-style-type: none"> • Change room and washroom facilities must be available for participants. Must be separated for men/women. <p>BOATS</p> <ul style="list-style-type: none"> • A minimum of eight 15 hp motor boats. <ul style="list-style-type: none"> ◦ Including - 3 Soft sided rescue Zodiacs 		
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	<p>OTHER</p> <ul style="list-style-type: none"> • Shelter from the elements in the format of tents with a minimum dimension of 6m x 6m for each P/T team. • Potable water for drinking, rinsing boats and showers must be provided. 		
<p>Cycling - Mountain Bike</p>	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • Olympic Cross Country Course <ul style="list-style-type: none"> ◦ Clover leaf shaped consisting of a mix of hills, descents, corners and flat stretches. • Relay Course <ul style="list-style-type: none"> ◦ Can use same or slightly modified version of Olympic Cross Country Course. • Short track course <ul style="list-style-type: none"> ◦ Mix of open double track and slightly technical double track. Shortened version of the XCO course. <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Olympic Course <ul style="list-style-type: none"> ◦ 4.0km-6.0km loop • Relay Course <ul style="list-style-type: none"> ◦ Same as Olympic Course • Short Track <ul style="list-style-type: none"> ◦ Loop of 1km-2km • Start/Finish Area (for all courses) <ul style="list-style-type: none"> ◦ 6.0m wide for 250m on each side <p>SURFACE (FOR ALL COURSES)</p> <ul style="list-style-type: none"> • Mix of pavement, gravel, grass and dirt. 	<p>GENERAL</p> <ul style="list-style-type: none"> • Competition courses must be available for practice/warm-up; • No additional practice/warm-up requirements 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • Shared start/finish area for all courses. <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Optimal Olympic Cross Country course is 5.0km loop. <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> • Designated space along courses for spectator seating.

	<p>ANCILLARY</p> <ul style="list-style-type: none"> • Commissaire unit capable of holding 6 people. Located at the start/finish line, 3 feet off the ground and fully covered. • Timing tent 10 feet x 15 feet at the finish line. Can be part of commissaire unit. • Commentator booth with power and sound system • Up to 13 team tents (1 for each participating team) • Building or large tent for race headquarters • Bike wash • Portable washrooms <p>SECURITY</p> <ul style="list-style-type: none"> • Team tents must be in secure compound • All course junctions must be closed and marshal controlled • Start/Finish area must be fenced in accordance with Cycling Canada/Union Cycliste Internationale rules <p>COURSE APPROVAL</p> <ul style="list-style-type: none"> • Courses must be built to meet Cycling Canada/Union Cycliste Internationale 12 months prior to start of competition. 		
Road Cycling	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • Road Race Course <ul style="list-style-type: none"> o Varying climbs, downhills and flat sections; o Loop (not out and back); o Start/Finish structure (arch). 	<p>GENERAL</p> <ul style="list-style-type: none"> • Competition courses must be available for practice/warm-up; • No additional practice/warm-up 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • Road Race Course <ul style="list-style-type: none"> o 10km loop • Criterium Course <ul style="list-style-type: none"> o 1.5km loop

	<ul style="list-style-type: none"> • criterium Course <ul style="list-style-type: none"> ○ Set up to favour a sprint finish; ○ Loop (not out and back); ○ Start/Finish structure (arch). • Individual Time Trial Course <ul style="list-style-type: none"> ○ Flat with minimum uphill or downhill; ○ Out and back (not loop); ○ Start/Finish Structure (arch). <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Road Race Course <ul style="list-style-type: none"> ○ 6.0km - 12.0km loop; ○ Max gradient of hills is 10%. • Criterium Course <ul style="list-style-type: none"> ○ 1.0km - 3.0km loop; ○ 1 pit lane 100m long x 4m deep in close proximity to start/finish line. • Individual Time Trial <ul style="list-style-type: none"> ○ 7.5km - 20km course (3.75km - 10.0km each way); ○ Max gradient of hills is 5% over 500m; ○ Roads must be no less than 6.0m wide; ○ Start/Finish area <ul style="list-style-type: none"> ■ Must be 8.0m wide; ■ Start ramp as per Cycling Canada/Union Cycliste Internationale regulations; ■ Must be straight and flat, or gently rising for no more than 400m. 	<p>requirements.</p>	<p>SECURITY</p> <ul style="list-style-type: none"> • Complete road closures for all events. <p>ANCILLARY</p> <ul style="list-style-type: none"> • Up to 13 team tents (1 for each team) at each course.
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	<p>SURFACE (FOR ALL COURSES)</p> <ul style="list-style-type: none"> • Smooth pavement <p>ANCILLARY</p> <ul style="list-style-type: none"> • Commissaire unit capable of holding 6 people. Located at the start/finish line, 3 feet off the ground and fully covered; • Timing tent 10 feet x 15 feet at the finish line; • Portable bathroom. <p>SECURITY</p> <ul style="list-style-type: none"> • Police/Municipality authorization to close roads; • All on-coming traffic must be police controlled; • All junctions must be police controlled and overtaking traffic must be restricted. 		
Diving	<p>FIELD OF PLAY / DIMENSIONS (new constructions as of September 2011)</p> <ul style="list-style-type: none"> • Three 1m springboards: <ul style="list-style-type: none"> o "Maxiflex" Type B; o Durafirm short stands. • Two 3m springboards: <ul style="list-style-type: none"> o "Maxiflex" Type B springboards; o Durafirm short stands. • A full platform complex, including four levels: <ul style="list-style-type: none"> o 3.0m (1.5m W x 6.0m L); o 5.0m (3.1m W x 6.0m L); o 7.5m (1.5m W x 6.0m L); o 10.0m (3.1m W x 6.0m L). • A minimum deck width of 4 metres on each side of the diving tank. 	<p>Access to a dry-land area with dry-land equipment complying with the DPC Technical Specifications for dry-land equipment:</p> <ul style="list-style-type: none"> • A minimum of one trampoline; • A minimum of one Dry-board; • A minimum of two stations for platform take-off to accommodate the needs of Synchro divers; • A minimum surface of 800 square feet, covered with 	<p>FIELD OF PLAY / DIMENSIONS (new constructions as of September 2011)</p> <ul style="list-style-type: none"> • Three 3m springboards: <ul style="list-style-type: none"> o "Maxiflex" Type B springboards; o Durafirm short stands. • Pool Dimensions: <ul style="list-style-type: none"> o Length: Ideal length is 20m-25m in front of 10m platform. <p>JUDGING / SCORING AREA</p> <ul style="list-style-type: none"> • Judges' stand at a height of 1.5m to 2.0m with appropriate

	<ul style="list-style-type: none"> • Pool Dimensions <ul style="list-style-type: none"> ○ Depth: <ul style="list-style-type: none"> ■ For 1m: 3.4m; ■ For 3m: 3.7m; ■ For 5m: 3.7m; ■ For 10m: 4.5m. ○ Length: <ul style="list-style-type: none"> ■ Minimum requirement is 13.5m in front of 10m platform ■ 15m will give many options for legacy programs ○ Width: <ul style="list-style-type: none"> ■ 25 m • For synchronized diving <ul style="list-style-type: none"> ○ Two 3m springboards as described above <ul style="list-style-type: none"> ■ Side by side with no visible obstructions; ■ 2.2m–2.6m centre to centre. <p>FIELD OF PLAY / DIMENSIONS (venues built prior to September 2011)</p> <ul style="list-style-type: none"> • Two 1.0m springboards with <ul style="list-style-type: none"> ○ Durafirm short stands; ○ 0.5m wide x 4.8m long; ○ Non-slip surface. • Two 3.0m springboards with <ul style="list-style-type: none"> ○ Durafirm short stands ○ 0.5m wide x 4.8m long, ○ Non-slip surface. • A full platform complex, including four levels: <ul style="list-style-type: none"> ○ 3.0m (1.5m W x 6.0m L); 	<p>mats for floor exercises.</p>	<p>sight lines to be placed on each side of the pool.</p> <p>OTHER</p> <ul style="list-style-type: none"> • Facility equipped to run simultaneous events/practices. • On deck warm water spray shower or hot tub
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	<ul style="list-style-type: none"> o 5.0m (1.5m W x 6.0m L); o 7.5m (1.5m W x 6.0m L); o 10.0m (3.0m W x 6.0m L). • Pool Dimensions <ul style="list-style-type: none"> o Depth: <ul style="list-style-type: none"> ■ For 1m: 3.4m; ■ For 3m: 3.7m; ■ For 5m: 3.7m; ■ For 10m: 4.5m. o Length: <ul style="list-style-type: none"> ■ Minimum requirement is 13.5m in front of 10m platform o Width: <ul style="list-style-type: none"> ■ Dependent on diving board configuration • For synchronized diving <ul style="list-style-type: none"> o Two 3m springboards as described above <ul style="list-style-type: none"> ■ Side by side with no visible obstructions; ■ 2.2m–2.6m centre to centre. <p>EQUIPMENT</p> <ul style="list-style-type: none"> • Mechanical surface agitation to be installed under the boards and tower with a horizontal sprinkler system. <p>JUDGING / SCORING AREA</p> <ul style="list-style-type: none"> • Judges' stand (stage unit) built with a maximum height of 2.0m and a minimum height of 1.5m to accommodate a minimum of four persons on each side of the pool deck. 		
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	<ul style="list-style-type: none"> Judges' stand (stage unit) with a level 0.5m greater than main stage unit to accommodate 1 person on each side of the pool deck with appropriate sight lines to accommodate synchronized diving judges. <p>ANCILLARY</p> <ul style="list-style-type: none"> 93.0 m2 dressing space for males; 93.0 m2 dressing space for females; 1 dressing room for officials and judges. 		
Sailing	<p>DIMENSIONS</p> <ul style="list-style-type: none"> Two race-course areas: for the single-handed classes, and for the double-handed classes. Courses will be defined within a circular course area approximately 1.1 km - 1.5 km in radius, approximately 2.6 km total course distance <p>ORIENTATION</p> <ul style="list-style-type: none"> The course areas should be located away from regular commercial shipping lanes and such that arrangements can be made to close the area to pleasure boating and other recreational water activities The sailing time for the furthest point of the course areas to the land facilities should not exceed one hour Courses will be trapezoidal or windward/leeward. <p>BOATS</p> <ul style="list-style-type: none"> Various support boats must be provided and must meet Ministry of Transport and any local regulations. 	<ul style="list-style-type: none"> Same as competition venue 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> Adjacent sheltered waters in which to conduct races in the event of heavy weather conditions are desirable. This alternative area may be smaller, and the dimensions of the courses may be shorter than outlined above

	<ul style="list-style-type: none"> Teams provide their own boats, cost offset by the federal government. <p>ANCILLARY</p> <ul style="list-style-type: none"> Washrooms, Changing and Shower rooms - 1.85m² per person <p>OTHER</p> <ul style="list-style-type: none"> 40 ft x 40 ft area for land storage per team (4 boats & all team gear) Berths/dock space for water stored boats requires 3 x 6m per boat (2.4m & coach boats) Launching facility - ramps & crane Accessible dock facilities: dock mounted Hoyer- style lift All land & dock facilities to be fully accessible to athletes and observers with physical disabilities Secure area in venue for equipment to be left overnight Overnight security or locked/ gated venue 		
<p>Soccer</p>	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> 2 soccer fields of the same size (+/- 5.0m); Fields to be marked and have the appropriate appurtenances in accordance with the FIFA Laws of the Game in issue at the time of the competition. This is to include corner flags and goal nets. No other sport markings on the fields. <p>DIMENSIONS</p> <ul style="list-style-type: none"> Field Width: 	<p>GENERAL</p> <ul style="list-style-type: none"> 2 fields with same surface and marked to the same size as competition fields <ul style="list-style-type: none"> Where the competition field is turf this may be used for practice pre competition. Where the competition field 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> 3 soccer fields <p>DIMENSIONS</p> <ul style="list-style-type: none"> 105.0m long x 68.0m wide <p>LIGHTING</p> <ul style="list-style-type: none"> 540 lux (800 lux for TV, 1200 lux for HD TV) across entire field (to facilitate hosting evening games)

	<ul style="list-style-type: none"> o 64.0m - 75.0m • Field Length: <ul style="list-style-type: none"> o 100.0m - 110.0m • Additional space around field: <ul style="list-style-type: none"> o 3.0m around from the touch lines and 5.0m behind the goal <p>SURFACE</p> <ul style="list-style-type: none"> • Natural or artificial turf <p>ANCILLARY</p> <ul style="list-style-type: none"> • 4 team dressing rooms with washroom facilities and showers (35.0 m² per team); • 2 officials dressing rooms with washroom facilities and showers (1 for each gender); • Laptop and Internet connection for completion of result service 	<p>is turf, a grass field option may be provided as the second training field during competition.</p>	
Softball	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 2 softball diamonds with: <ul style="list-style-type: none"> o Backstop per field; o Outfield fence per field; o 2 covered dugouts (roof and 3 sides) per field; o Level outfields; o Bullpens for each team. <p>DIMENSIONS</p> <ul style="list-style-type: none"> • All fields must comply with Softball Canada rule book dimensions: <ul style="list-style-type: none"> o Base paths must be 60 feet; o Men's pitching plate must be 46 feet from home plate; o Women's pitching plate must be 	<p>GENERAL</p> <ul style="list-style-type: none"> • 2 softball diamonds or warm-up spaces (i.e. soccer field) within walking distance to competition diamonds for pre game warm up; <ul style="list-style-type: none"> o Should have bases, home plate and pitching plate; o Dimensions do not need to be same as competition diamonds. 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 3 softball diamonds <p>LIGHTING</p> <ul style="list-style-type: none"> • Lighting for all diamonds <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> • 1500 - 2000

- 43 feet from home plate;
- o Backstop must have a centre panel with two side panels at an angle of 30 degrees, made of galvanized wire mesh. Backstop must be a minimum of:
 - 30 feet wide;
 - 15 feet high (if not 15 feet high, protective netting can be added above backstop);
 - 25 feet behind home plate;
 - o A capped outfield fence must be a minimum of 4 feet high;
 - o Men's distance from home plate to the outfield fence:
 - 225 - 265 feet;
 - If a temporary outfield fence is used, the distance shall be set to 250 feet all around;
 - o Women's distance from home plate to the outfield fence:
 - 200 - 225 feet;
 - If a temporary outfield fence is used, the distance shall be set to 220 feet all around;
 - o Dugouts:
 - Must be large enough to accommodate 20 individuals.

	<p>SURFACE</p> <ul style="list-style-type: none"> Natural turf field with skinned infield. <p>LIGHTING</p> <ul style="list-style-type: none"> 1 field must have: <ul style="list-style-type: none"> 325 - 540 lux across infield; 215 - 325 lux across outfield; Televised games will require more lux. <p>ANCILLARY</p> <ul style="list-style-type: none"> 1 change room with washroom and shower for male officials; 1 change room with washroom and shower for female officials. 		
Swimming	<p><u>POOL</u></p> <p>FIELD OF PLAY</p> <ul style="list-style-type: none"> 8 lane swimming pool; Starting blocks for each lane. <p>DIMENSIONS</p> <ul style="list-style-type: none"> Length: 50.0m Width: 17.0m Depth: <ul style="list-style-type: none"> 1.35m deep extending from 1.0m to at least 6.0m from the end of the wall with starting blocks. Depth elsewhere recommended at 1.2m (minimum 1.0m) Lane width: 2.0m Starting Blocks: <ul style="list-style-type: none"> See Swimming Canada FINA rule FR 2.7. Minimum 0.5m x 0.5m with 	<p><u>POOL</u></p> <p>GENERAL</p> <ul style="list-style-type: none"> Adjacent warm up pool with minimum dimensions of: <ul style="list-style-type: none"> Length = 20-25m Width = 15-17m Depth = 1-1.2m <p><u>OPEN WATER</u></p> <ul style="list-style-type: none"> No additional requirements. Competition venue used for practice/warm up 	<p><u>POOL</u></p> <p>DIMENSIONS</p> <ul style="list-style-type: none"> Length = 50.0m Width = 21.0m Depth = 2.50m <p>PRACTICE /WARM UP</p> <ul style="list-style-type: none"> Warm up pool dimensions: <ul style="list-style-type: none"> Length = 25.0m Width = 18.0m Depth = 1.2m <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> 500 (not on pool deck)

	<ul style="list-style-type: none"> starting grips; <ul style="list-style-type: none"> o 0.5m - 0.75m above the water; o Adjustable setting back plate; o Backstroke starting ledges for each lane FINA rule FR 2.10. • Deck Space: <ul style="list-style-type: none"> o 5.0m on ends; o 3.0m on sides. <p>LIGHTING</p> <ul style="list-style-type: none"> • At least 600 lux over starting platforms and turning ends. <p>ANCILLARY</p> <ul style="list-style-type: none"> • 1 accessible male change room with accessibility to pool deck (74.0m²); <ul style="list-style-type: none"> o A family or universal change room may meet accessibility needs • 1 accessible female change room with accessibility to pool deck (74.0m²); <ul style="list-style-type: none"> o A family or universal change room may meet accessibility needs. • 1 change room for officials; • 1 timing booth in line with finish line; • 1 meet management office (separate from sport operations office); • 1 office, or dedicated quiet space for scorer/recorder. <p>OTHER</p> <ul style="list-style-type: none"> • Conduit for wires of timing equipment; • Seating on pool deck for 400 		
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	<p>participants;</p> <ul style="list-style-type: none"> • Overall venue and field of play must be barrier free as sport includes events for athletes with a disability. <p><u>OPEN WATER</u></p> <p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • Body of water with beach. Options include: <ul style="list-style-type: none"> ○ River, lake, rowing basin, waterski venue, canoeing venue. • Must have hazard free bottom; • Course: <ul style="list-style-type: none"> ○ Starting area <ul style="list-style-type: none"> ■ Dock with fixed platform ○ Finish area <ul style="list-style-type: none"> ■ Vertical wall above water ■ At least 5m wide ■ Securely fastened in place to withstand any wind ■ 2 lane ropes 25m to create funnel entry to finish line ■ Marker buoys for finish line ○ Buoys <ul style="list-style-type: none"> ■ Large Doritos markers on corners ■ Markers throughout course (# dependant on course configuration) 		
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	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • Body of water: <ul style="list-style-type: none"> ◦ Minimum 1km x 750m ◦ Minimum depth of 1.4m • Course distance of 3km • Parallel to the riverbank/beach • Can be out and back or triangle orientation • Enough space to avoid head on traffic patterns <p>SAFETY</p> <ul style="list-style-type: none"> • Water temperature must be between 16 degrees Celsius and 31 degrees Celsius <p>BOATS</p> <ul style="list-style-type: none"> • A minimum of 5 boats <ul style="list-style-type: none"> ◦ Safety boat ◦ Referee boat ◦ Lifeguard boat ◦ Extraction boat ◦ Media boat • Storage for boats <p>ANCILLARY</p> <ul style="list-style-type: none"> • Men's and Women's change rooms with showers • Washroom facilities • Athlete equipment storage area • Timing booth • Electronics booth • Officials office 		
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Tennis	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 8 Tennis courts <ul style="list-style-type: none"> ○ With a centre court for finals ○ North/South orientation if outdoors <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Single Courts - 23.77m x 8.23m. • Double Courts - 23.77m x 10.97m. • Additional space requirements: Minimum 3.05 m at sides, 5.48 m at ends / Maximum 3.66 m at sides, 6.40 m at ends. • If there are more than two courts side by side, there needs to be at least 3.66 m between the courts. <p>SURFACE</p> <ul style="list-style-type: none"> • The tennis court surface may be of concrete, bituminous material, sand, clay, or synthetic materials. • The court must not drain to the centre. <p>SECURITY</p> <ul style="list-style-type: none"> • The courts are to be enclosed with 11 gauge, 5.0 cm mesh chain link fence at least 3.05 m high. <p>ANCILLARY</p> <ul style="list-style-type: none"> • 11.0 m² dressing space for each court; • 1 dressing room for officials. <p>CONTINGENCY</p> <ul style="list-style-type: none"> • 4 Indoor courts meeting dimensions listed above 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • 2 practice courts available at all times within walking distance from competition venue. 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 12 Tennis courts <p>SURFACE</p> <ul style="list-style-type: none"> • Hard court surface (asphalt). <p>LIGHTING</p> <ul style="list-style-type: none"> • Designated finals court lit to a minimum level of 540 lx measured 1.07 m above the surface of the court. <p>CONTINGENCY</p> <ul style="list-style-type: none"> • 8 Indoor courts meeting dimensions listed above <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • 8 outdoor courts lit to a minimum of 540 LUX measured 1.07m above the surface of the court.
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	<p>OR</p> <ul style="list-style-type: none"> 4 outdoor courts lit to a minimum of 540 LUX measured 1.07m above the surface of the court. 		
Beach Volleyball	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> 2 beach volleyball courts (1 designated as centre court for finals); Courts must be orientated with ends facing North and South. <p>DIMENSIONS</p> <ul style="list-style-type: none"> Courts: <ul style="list-style-type: none"> 8.0m x 16.0m; Minimum of 5.0m and maximum of 6.0m buffer at sides and ends of each court; A minimum 6 foot mesh fence must divide the competition courts. Sand: <ul style="list-style-type: none"> Must be a minimum of 40cm deep. <p>SURFACE</p> <ul style="list-style-type: none"> Sand: <ul style="list-style-type: none"> Must be composed of fine loosely compacted grains and sifted to an acceptable size; Approval on sand selection must come from Volleyball Canada https://drive.google.com/a/canadagames2.ca/file/d/0B10UATw1XDafNIAwcGlvR0VfX3M/view?u 	<p>GENERAL</p> <ul style="list-style-type: none"> 2 practice/warm-up courts with same dimensions as competition courts. 	<p>PRACTICE/WARM UP</p> <ul style="list-style-type: none"> 4 courts for practice/warm up. <p>LIGHTING</p> <ul style="list-style-type: none"> 1500 lux, measured 1 metre above the sand. <p>ANCILLARY</p> <ul style="list-style-type: none"> 1 team tent per competing Province/Territory (max of 13). <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> Spectator seating for 1,500 – 2,000 for finals encouraged.

	<p><u>sp=sharing</u>).</p> <p>ANCILLARY</p> <ul style="list-style-type: none"> • 2 male change rooms with showers (1 for training team and 1 for competing team) and 2 female changing rooms with showers (1 for training team and 1 for competing team); • 4 team meeting areas for coaches and players (before/after a match). 		
Indoor Volleyball	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 3 volleyball courts • 1 set up as centre court <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Courts: <ul style="list-style-type: none"> o 18.0m x 9.0m • Space around courts: <ul style="list-style-type: none"> o 4.5m on sides o 5.0m on ends • Ceiling clearance: <ul style="list-style-type: none"> o Minimum 9.0m <p>SURFACE</p> <ul style="list-style-type: none"> • Hardwood cushion floor • Matte surface • Small surface elasticity • Non-slip • If portable floors are being laid on concrete, sub-flooring must be installed <p>LIGHTING</p> <ul style="list-style-type: none"> • Semi direct • Average intensity of 540 lux • Luminaries mounted approximately 	<p>GENERAL</p> <ul style="list-style-type: none"> • 3 volleyball courts (in addition to the competition courts) 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 4 volleyball courts • 1 set up as centre court <p>DIMENSIONS</p> <ul style="list-style-type: none"> • Space around courts: <ul style="list-style-type: none"> o More than 4.5m on sides o 9.0m on ends • Ceiling Clearance: <ul style="list-style-type: none"> o Minimum 10.0m <p>PRACTICE/WARM-UP</p> <ul style="list-style-type: none"> • 4 volleyball courts (in addition to the competition courts) <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> • 3,500 - 5,000 for centre court

	<p>10.0m above court and laid out uniformly</p> <p>ANCILLARY</p> <ul style="list-style-type: none"> • 6 dressing rooms (2 per court), 35.0 m2 each • 1 dressing room for officials 		
Wrestling	<p>COMPETITION VENUE</p> <ul style="list-style-type: none"> • Gymnasium, arena or field house with an ambient temperature of 18 to 22C • Venue must have IT capabilities (eg. hard-wired network) to support the operation of the tournament software <p>COMPETITION AREA</p> <ul style="list-style-type: none"> • 6 wrestling mats <ul style="list-style-type: none"> ○ 3 mats for women's competition ○ 3 mats for men's competition ○ Each mat is composed of 6-8 rolls or a mat with a removable vinyl cover <p>COMPETITION SURFACE DIMENSIONS</p> <ul style="list-style-type: none"> • Each mat is 12.0m x 12.0m (40' x 40'), which includes a protection area of 1.5m - 2m • Thickness = 1.625 - 2.0 inches <p>COMPETITION SURFACE</p> <ul style="list-style-type: none"> • Mats: <ul style="list-style-type: none"> ○ Foam or foam-like material • Floor underneath mats: <ul style="list-style-type: none"> ○ Mats cannot be laid directly on concrete. If using a concrete floor a temporary sub-floor (½ to ¾ inch 	<p>DIMENSIONS</p> <ul style="list-style-type: none"> • Corral area • 2 practice mats in another area or in a corner of the competition area within 50 m of the field of play <ul style="list-style-type: none"> ○ 1 mat for women's competition ○ 1 mat for men's competition 	<p>FIELD OF PLAY</p> <ul style="list-style-type: none"> • 8 wrestling mats <ul style="list-style-type: none"> ○ 4 mats for women's competition; ○ 4 mats for men's competition • Platforms of 0.8 to 1.0m high for mats to set on composed of flexible deck or elastic platform. <p>SPECTATOR SEATING</p> <ul style="list-style-type: none"> • Recommended seating for over 700 spectators

	<p>plywood) must be laid under the competition and protection area</p> <p>FIELD OF PLAY (must include the following areas):</p> <ul style="list-style-type: none"> • Competition area • Officials tables for officiating and scoring • Head table • Pairing area • Announcer's table • Mat side medical area • The perimeter of the field of play must be secured by a barrier <p>LIGHTING</p> <ul style="list-style-type: none"> • Lighting should be direct from above with a concentrating distribution from a 6.1 m mounting height. There should be a light intensity of 540 lux over the total area. <p>ANCILLARY</p> <ul style="list-style-type: none"> • Adequate change rooms and shower facilities for athletes • Adequate change rooms for officials • Training Room • First Aid Room • Officials Meeting Room • Weigh-in room / area 		
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Appendix B - Background Material

Stantec

stantec Consulting Ltd
430-434 Water Street Suite 230, St. John's NL A1C 1E2

December 20, 2013

The Works
17 Westerland Road
St. John's, NL
A1B 3R7

Attention: Mr. Craig Nell

Dear Sir:

**Reference: Aquarena Aluminum
Bulkhead Inspection
SCL Ref. No. 133411117**

On December 18, 2013, the undersigned met with a technician with Acuren Group Inc. to initiate an inspection of the aluminum bulkheads that act as dividers within the twenty meter wide swimming pool. Existing drawings were not available of the structure and therefore original member sizes were not available. The two bulkheads are three dimensional, aluminum, box trusses, which span across the width of the pool. The truss must support its own dead weight and a live load dictated by its usage. Although, in service the bridge supports the weight of divers in competition, a live load of 2.4 kpa was selected for structural assessment.

Each bulkhead has a 20 millimeter rigid covering on the floor, two sides, and the majority of the bottom. A small section of the panel at one end was removed to examine the construction of each truss. From a visual examination, the normal high water level was clearly visible. Above that line the structural members were visually in as-installed condition. Below the water line, all members were spotted with what is believed to be a product of corrosion. The actual mechanism was not investigated during this inspection, only the significance of the corrosion on the load carrying capacity of the trusses.

From a surface examination, members had varying levels of surface corrosion, but it would be estimated that on average, twenty five percent of the surface area was affected. The important aspect of the corrosion was how deep the pitting was, and therefore loss of member cross section, and how this loss of cross section affects the safe working capacity of each structure.

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SCLRef.No.133411117

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Accessibility through the box truss was physically possible but it would be extremely difficult in which to work and would bring into play confined access measures. There were also numerous members that could be inspected. From a visual examination, it was determined that there were no variations with regard to condition along the length of each truss that might occur for example if wave making equipment was creating turbulence in localized areas. The variation was strictly related to which members were submerged and which were not. Therefore, it was decided to concentrate nondestructive testing examination within the area easily accessible, and the results of the inspection could easily be extrapolated. A representative of Acuren Group Inc. completed an ultrasonic inspection and the results of that inspection are enclosed in Appendix "A".

While field work was completed a structural code check of the box truss was completed. Measurements were taken of the overall geometry, as well as each member section type. A three dimensional, stiffness analysis program was then used to calculate the forces in each member based on the dead weight of the truss and the superimposed live load. Such an analysis would reveal the theoretical capacity of each member and the actual force in each member. The interaction of each member, which is the ratio of the actual load to the capacity, should be less than 1.0 in a well-designed structural. The amount of conservatism built into the design is at the discretion of the original designer. Based on the thickness measurement information gained from the Acuren field work, a cross section reduction factor could be imposed and a comparison made between the reduced section capacity and the theoretical capacity.

The results of the analytical work, which are contained in Appendix "B", revealed that the maximum utilization factor was 0.23, much less than the 1.0 limit, meaning that the truss as designed had significant capacity reserve.

Based on a combination of visual inspection density of pitting and the maximum pit depth recorded, it was estimated that the individual members of the truss, which are loaded either in tension or compression, had ninety percent of original cross sectional area. Therefore, the adjusted maximum interaction value encountered was 0.30, still far less than 1.0.

It is difficult to assess if the corrosion rate of the truss is linearly proportional with time, or if had a period of escalation, but based strictly on our analysis and the field thickness testing that was completed, the structural components of the truss have significant life expectancy.

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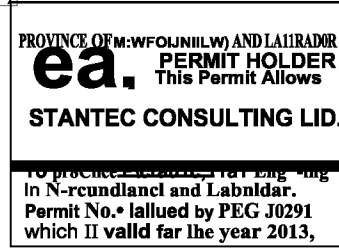
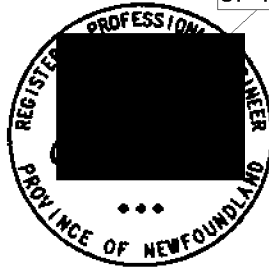
We trust that the information contained in this report have addressed the subject matter. However, if you have any questions with regards to its content, please contact the undersigned at your convenience.

Yours very truly,

STANTEC CONSULTING LTD.

ire

Ken Tobin, P. Eng.



APPENDIX "A"

NONDESTRUCTIVE TESTING REPORT



Acuren Group Inc.
112 Forest Road
St. John's, NL, Canada A1 A1E6
www.acuren.com

Phone: 709.753.2100
Fax: 709.753.7011

NOT, Inspection and Materials Engineering
a Rockwood Company

ULTRASONIC EXAMINATION REPORT

U-181213AR-01

CLIENT: Stantec

DATE: Dec 18 / 2013

PAGE: 1 of 4

ACUREN JOB#: 3150-200

P.O.:

WORK LOCATION: Aquarena, St. John's, NL

ATTENTION: Ken Tobin

PROJECT: Aquarena Aluminum bulkhead

ITEM(S) TESTED: North Bulkhead West Side members

PART#: See Below MATERIAL: CARBON STEEL STAINLESS STEEL 181OTHER THICKNESS: See Below

SCOPE: To perform a 0 degree ultrasonic survey & visual as per clients request

TYPE OF INSPECTION: Ultrasonic

TEST DETAILS: ULTRASONIC

ACCEPTANCE STANDARD: Client Info

REV / DATE: NIA

PROCEDURE#: WI-ACUREN-065 REVISION: 6, June 1 2012 TECHNIQUE#: NA

REVISION: NA

TYPE: 181 THICKNESS FLAW DETECTION METHOD: 181 CONTACT IMMERSION

INSTRUMENT: Olympus MODEL: 38DL Plus SIN: 120467507 CAL DUE: July 24 / 2014

CAL BLOCK: DSC Block SIN: 136113 CABLE-TYPE: BNC-Microdot LENGTH: NA

CAL BLOCK: Step Wedge (CIS) SIN: COUPLANT: Sonotech UTX

CAL BLOCK: IIW SIN: 1084-13 SPECIAL EQUIP. NA

PROBE & TECHNIQUE DETAILS:

Table with 14 columns: TEST ANGLE, PROBE TYPE, CRYSTAL SIZE, FREQ. (MHz), SERIAL NUMBER, DAMPING Q, TEST FROM, REFERENCE REFLECTOR, TRANSFER VALUE, REFERENCE dB, %FSH, SCAN dB, RANGE. Row 1: 0, GE, 318", 5, 025JRT, NA, A, FBW, NIA, 69, 80, NIA, 2"

SURFACE CONDITION: 181 ASGROUND 0 ASWELDED 0 MACHINED 0 SHOTBLASTED 181 CLEANBAREMETAL

SURFACE TEMPERATURE: 0 <- 4°C|20°F 0-4°C|20°F TO 10°C|50°F 18110°C|50°F TO 52°C|125°F >52°C|125°F

RESULTS:

As per Clients request a 0 degree ultrasonic survey along with a visual of the aluminum Members on the Far North Bulkhead, West side. See Page 2 - 4 for Results.

s. 40 (1)

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CLIENT REPRESENTATIVE:

TECHNICIAN:

PRINTNAME: Andrew Rideout (14136)

181 CGSB_ L

SNT

Reviewed by:

Technician



Acuren Group Inc.
112 Forest Road
St. John's, NL, Canada A1A 1E6
www.acuren.com

Phone: 709.753.2100
Fax: 709.753.7011

NDT, Inspection and Materials Engineering
a Rockwood Company

NONDESTRUCTIVE EXAMINATION REPORT

REPORT# V- 18163 Ag-O

CLIENT: STAAITE, c.,
[Blank lines for address]

REPORT# V-1-0113 Allt-O PAGE: 01 of 11

DATE: E.C. 11

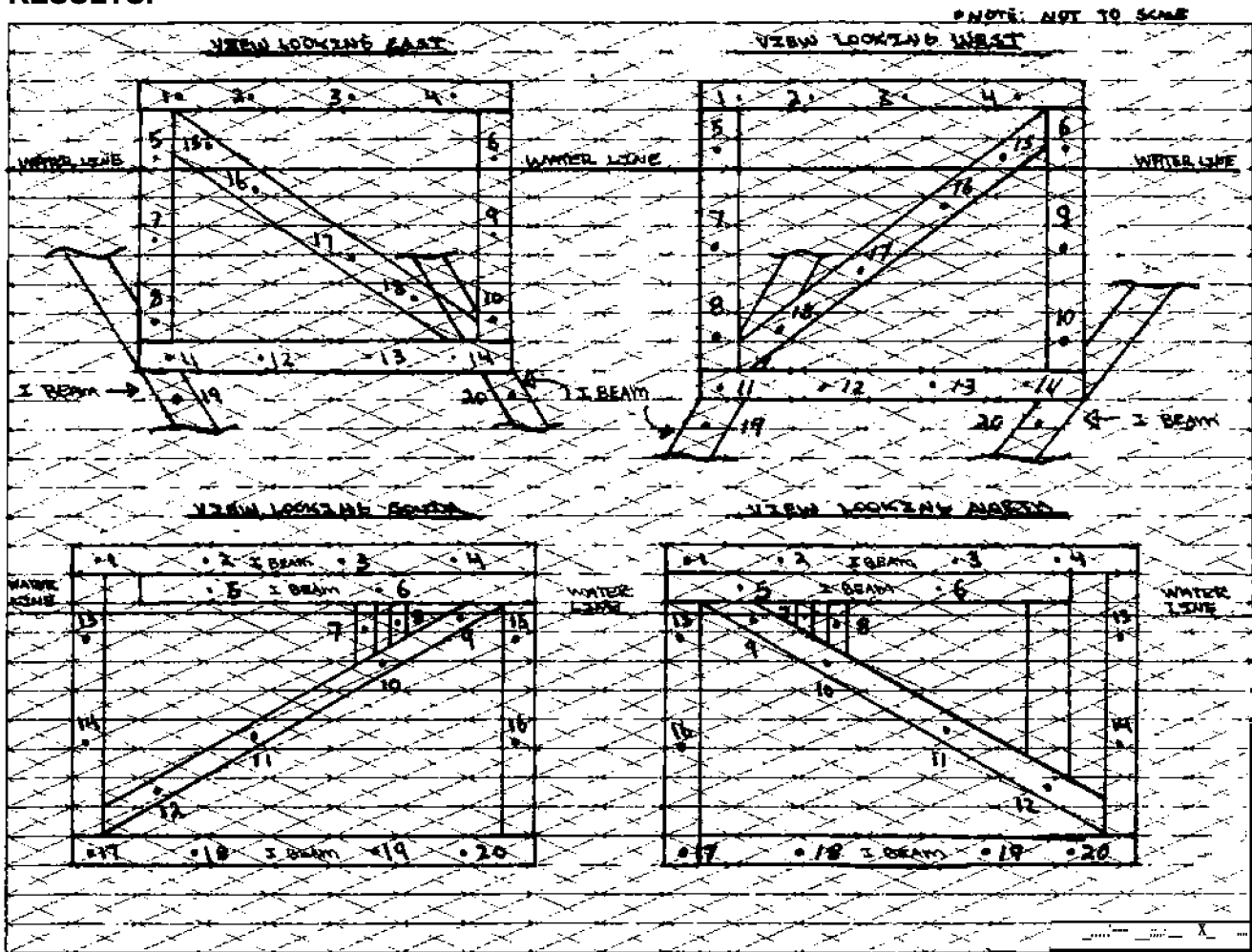
ACUREN JOB#: 110

P.O.:

WORK LOCATION INHW V0 : "3" , HA-

ATTENTION: [Handwritten notes]

RESULTS:



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CLIENT REPRESENTATIVE:

TECHNICIAN:

[Redacted] s. 40 (1)

12/19/13

PRINT NAME:

ANDREW REIDOUT (14136)
Technician

YCSB & SNT

Reviewed by



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 St. John's, NL, Canada A1A 1E6
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Phone: 709.753.2100
 Fax: 709.753.7011

**NOT, Inspection and Materials Engineering
 a Rockwood Company**

NON DESTRUCTIVE EXAMINATION REPORT

REPORT# U-181213AR-01

CLIENT: **Stantec**

REPORT#: **U-181213AR-01** PAGE: **3 of 4**

DATE: **Dec 18 / 2013**

ACUREN JOB#: **3150-200**

P.O.: _____

WORK LOCATION: **St. John's, NL**

ATTENTION: **Ken Tobin**

RESULTS:

Location	NORTH	EAST	SOUTH	WEST
1	0.280 / 0.351	0.230	0.279 / 0.350	0.231
2	0.280 / 0.349	0.233	0.280 / 0.347	0.237
3	0.279 / 0.345	0.230	0.281 / 0.349	0.232
4	0.275 / 0.341	0.231	0.280 / 0.350	0.229
5	0.278 / 0.339	0.230	0.279 / 0.347	0.227
6	0.273 / 0.347	0.212	0.280 / 0.350	0.229
7	0.272	0.221	0.278	0.219
8	0.276	0.229	0.280	0.230
9	0.275	0.161	0.285	0.222
10	0.270	0.222	0.287	0.226
11	0.237	0.230	0.226	0.229
12	0.244	0.211	0.270	0.230
13	0.232	0.221	0.212	0.229
14	0.229	0.199	0.220	0.221
15	0.230	0.228	0.224	0.198
16	0.231	0.230	0.220	0.230
17	0.275 / 0.322	0.227	0.270 / 0.314	0.230
18	0.269 / 0.328	0.218	0.271 / 0.320	0.221
19	0.272 / 0.330	0.271 / 0.342	0.270 / 0.331	0.274 / 0.343
20	0.265 / 0.334	0.275 / 0.343	0.268 / 0.324	0.271 / 0.340

Readings were taken on the web and flange of I-BEAMS

*** NOTE: Pitting was noted on 90% of all members examined, The Pit depth ranged from 0.03125"(1/32") to 0.125"(1/8") OR Thru Wall in some cases.**

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CLIENT REPRESENTATIVE:		
TECHNICIAN:	14 L:: =::; , =-; , =-	1 2/19 13
PRINT NAME:	Andrew Rideout (14136)	C&J CGSB_1 0 SNT _ _
		Reviewed by:



ACUREN

AcurenGroup Inc.
112 Forest Road
St. John's, NL, Canada A1A 1E6
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Phone: 709.753.2100
Fax: 709.753.7011

NDT, Inspection and Materials Engineering
a Rockwood Company

NONDESTRUCTIVE EXAMINATION REPORT

REPORT# U-181213AR-01

CLIENT: **Stantec**

REPORT#: **U-181213AR-01** PAGE: **4 of 4**

DATE: **Dec 18 / 2013**

ACUREN JOB#: **3150-200**

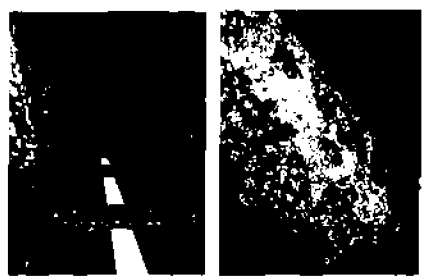
P.O.: _____

WORK LOCATION: **St. John's, NL**

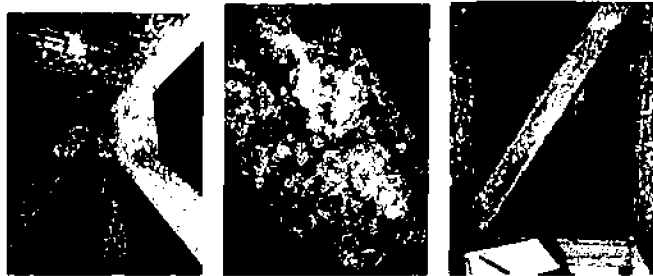
ATTENTION: **Ken Tobin**

RESULTS:

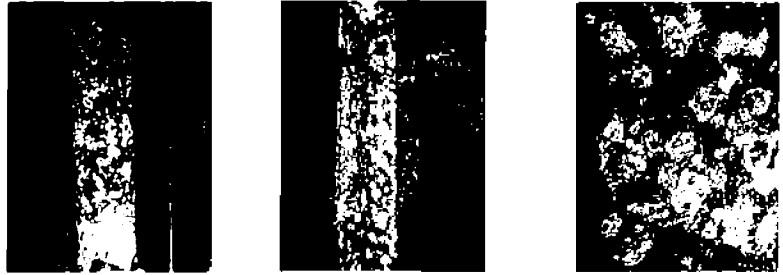
View looking East



View looking West



View looking North



View Looking South



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CLIENT REPRESENTATIVE: _____
TECHNICIAN: _____ s. 40 (1) _____ 12/19/13

PRINT NAME: **Andrew Rideout (14136)** 1:8: CGSB_I 0 SNT _ Reviewed by: _____

APPENDIX "B"

STRUCTURAL ANALYSIS REPORT

DESIGN MEMORANDUM

Client: Memorial University

Sheet 1 Of 1

Project: Aquarena Maintenance

Date: December 19, 2013

Data For: Pool Divider Capacity Check

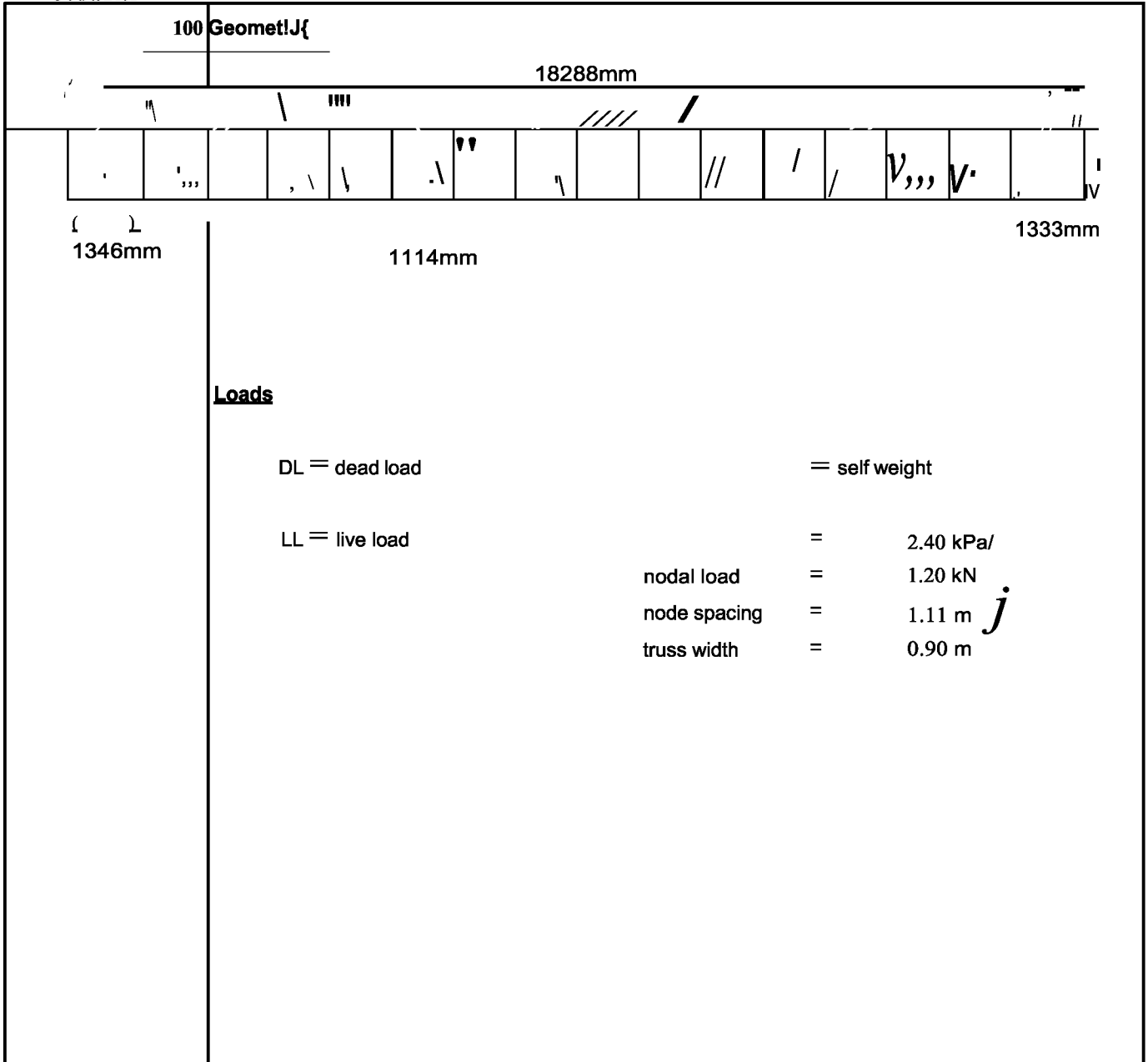
Work Order: 133411xxx

Prepared By: TP Checked By: KT

FileNo: Se



Code/Ref



DESIGN MEMORANDUM

Client: Memorial University

Sheet _____ Of 1

Project: Aquarena Maintenance

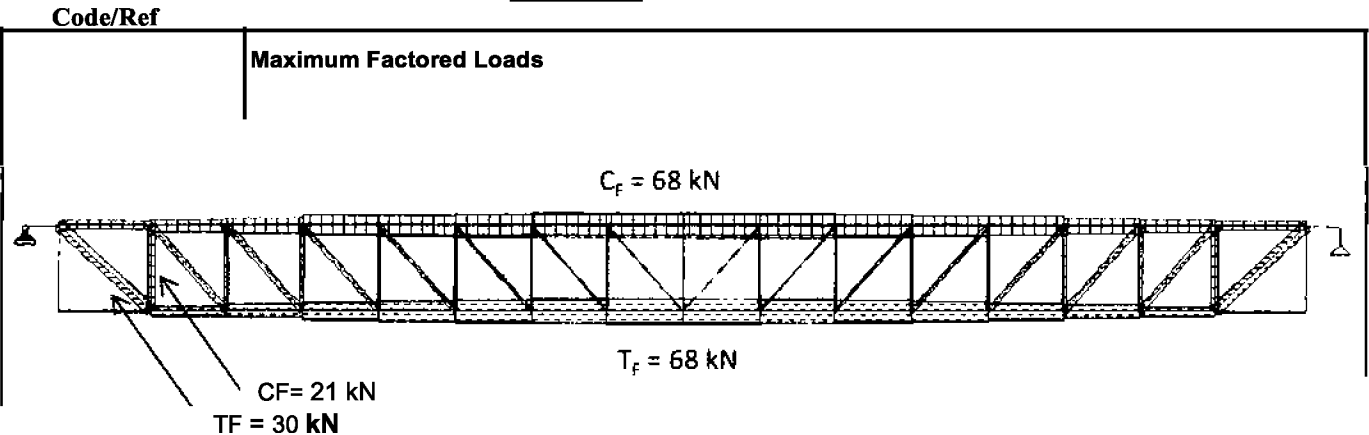
Date: December 19, 2013

Data For: Pool Divider Capacity Check

Work Order: 133411xxx

Prepared By: TP Checked By: KT

FileNo: Se



MAXIMUM FACTORED AXIAL LOADS

Bottom Chord Check (Cl. 16.5.6)

Chord Member: WF4x4.76

Ag = gross cross-sectional area	=	2613 mm ²	
Fy = yield strength of Aluminium (6061-T6)	=	240 MPa	
TF = factored tensile force	=	68 kN	
TR = factored tensile resistance	=	564 kN	OK
UTIL	=	12%	

Top Chord Check (Cl. 16.5.7)

Chord Member: WF4x4.76

Ag = gross cross-sectional area	=	2613 mm ²	
r = radius of gyration	=	24 mm	
K = effective length factor (Cl. 16.5.8.2)	=	1	
Fy = yield strength of Aluminium (6061-T6)	=	240 MPa	
L = unsupported length	=	1114 mm	
KUr = slenderness ratio	=	47	
Cr/A= from S16-09 Table 4.4	=	191 MPa	
CR = factored compressive resistance	=	424 kN	OK
= Cr/A* A* 0.85			
CF = factored compressive force	=	68 kN	
UTIL	=	16%	

Web (Cl. 16.5.8)

i) Web in Tension

Diagonal Member: CS4x2.53

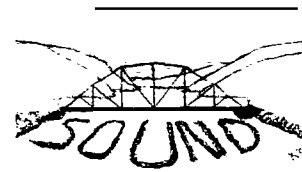
Ag = gross cross-sectional area	=	1387 mm ²
---------------------------------	---	----------------------

Fy = yield strength of Aluminium (6061-16)	=	240 MPa	
T = factored tensile force	=	30 kN	
TR = factored tensile resistance	=	300 kN	OK
	UTIL =	10%	

ii) First web In compression

Vertical Member: CS4x2.53

Ag = gross cross-sectional area	=	1387 mm ²	
r = radius of gyration	=	10 mm	
K = effective length factor (Cl. 16.5.8.2)	=	1	
Fy = yield strength of Aluminium (6061-T6)	=	240 MPa	
L = unsupported length	=	1333 mm	
KL/r = slenderness ratio	=	138	
Cr/A= from S16-09 Table 4.4	=	78 MPa	
CR = factored compressive resistance	=	91 kN	OK
= Cr/A* A* 0.85			
CF = factored compressive force	=	21 kN	
	UTIL =	23%	



December 15, 2014

Project No. 5200-001

Sound Engineering Inc.

47 Carrick Drive

St. John's, NL

A1A 4N3

The Works

17 Westerland Road

St. John's, NL

AIB 3R7

Attention: Mr. Craig Neil

Dear Sir:

Reference: Aquarena Annual Structural Inspection

Sound Engineering Inc. has recently completed a structural inspection at the above referenced facility over a two day period. The first inspection pertained to the aluminum, floating bulkhead in the main pool. Observations were similar to the preceding year when a visual examination and structural analysis had been completed. There was some minor pitting observed, but overall the truss work was deemed to be in good condition. There was residue on the surface of the aluminum in some locations that was in the process of being cleaned. We do not know the constituents of this residue and we would recommend from an environmental perspective that this be analyzed with respect to water quality issues.

The second days inspection focused on the water slide structural steel support system. A partial visual inspection was completed of the bolted connections of the water slide. We did not see any missing bolts, and a sample of these were manually tested and all were found to be

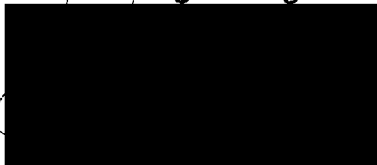
tight. The only structural deficiency that was highlighted was a handrail post on the second level which had to perforations from corrosion. The other highlighted item would be at the underside of the three meter diving board slab. There were two areas of localized concrete cracking that were still physically intact but which should be put on the maintenance list for next year.

Apart from the comments above, the structure was considered to be in good condition, and the repair areas highlighted can be part of next year's shutdown or at any convenient time prior to that.

Yours truly,

Sound Engineering Inc.

s. 40 (1)



Mr. Ken Tobin, P. Eng.



s. 40 (1)

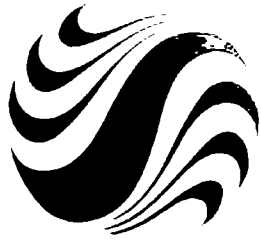
PROVINCE OF NEWFOUNDLAND AND LABRADOR

E PERMIT HOLDER
This Permit Allows

SOUND ENGINEERING INC.

practice Professional Engineering

6 Newfoundland and Labrador
No. s Issued by PE NL J:JE:1j
r.n.'svahd for the year 1



Stantec

Prepared For: The Works

**UFE...with
THEWORKS™**

April 15, 2013

Prepared by: BR & MT

Reviewed by: MO & TD

AQUARENA MECHANICAL & ELECTRICAL BUILDING ASSESSMENT REPORT

Aquarena Mechanical and Electrical Assessments

March 14, 2013

Stantec Consulting Ltd.

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1 Project Framework/Introduction

1.1 Background

The Aquarena Facility has undergone numerous renovations to meet the changing needs of the facility since it opened in 1976. Many of the existing mechanical and electrical systems are original or more than 30 years old. Modifications have typically been performed based on available budgets which may not have always allowed for Building Services best practices or for documentation of the existing facility with a composite set of drawings.

In 2011 Capital Management Engineering Ltd. Submitted a Property Condition Assessment for the building which identified a need to reduce the building's current Facilities Condition Index (FCI) from 21% to a minimum of 15%. Stantec Consulting was then commissioned by The Works Ltd. and MUN Facilities Management to perform a more detailed condition assessment and identify phased projects with the objectives of improving the Indoor Air Quality (IAQ) and FCI.

Ken Coffey and Ed Kenney of The Works accompanied Bernie Ropson and Mike Taylor of Stantec on a detailed walkthrough of the building in November 2012 and a few follow up investigations were conducted in the following weeks. Numerous photographs of the Mechanical and Electrical system were taken and are included in Appendix A of this report.

Stantec commissioned the services of Advanced Thermal Imaging Ltd. to perform a thermal scan and investigation of the building envelope in order to identify potential damage to the building envelope and energy conservation opportunities. ATI's investigation report is included as Appendix B.

1.1 Objective

The objective of this report is to provide information on the current condition of the mechanical and electrical systems at the Aquarena and recommend projects to improve its Facilities Condition Index (FCI) to 15% or lower.

A review of the mechanical and electrical systems with respect to code compliance, energy usage, and maintenance issues is provided. Recommendations for immediate and future improvements are presented.

1.2 Methods

Stantec has carried out on site discussions and had discussions with facilities management staff in support of the recommendations. Stantec has not carried out any investigations relating to the presence of hazardous substances, contaminants, or pollutants.

Costs are presented in year 2013 dollars and should be considered order of magnitude only. Costs do not include professional fees and contingencies. Refer to section 3.8.1 for a detailed pricing explanation.

1.3 Documents Provided

For reference purposes, we have accessed the following documents and or information:

- Newfoundland Power account history, Aquarena, 2011-2012
- Capital Management Engineering Limited FCA report.
- Historical Mechanical, Electrical and Architectural drawings provided by Memorial University (MUN)

1.4 Codes Referenced

- ASHRAE 62.1-2010 Standard for Acceptable Indoor Air Quality
- ASHRAE 90.1-2010 Energy Standard for Buildings
- ANSI/APSP-7 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins
- National Plumbing Code of Canada 2005
- National Building Code of Canada 2005
- Province of Newfoundland and Labrador, Public Pools Regulations
- CSA B52 Mechanical Refrigeration Code, 2005
- NFPA 10 Standard for Portable Fire Extinguishers
- Water Quality and Record Keeping Standards for Public Pools Operating in Newfoundland and Labrador, March 2004
- CSA C22.1 Canadian Electrical Code (CEC), 2012;
- National Building Code of Canada (NBCC), 2010;
- Newfoundland and Labrador Accessibility Act;
- CAN/ULC - S524-Standard for the Installation of Fire Alarm Systems;
- Provincial Fire Commissioner's Regulations;
- Illuminating Engineering Society (IES) Lighting Handbook, 10th Edition.

1.5 Assumptions

- Condition of piping and equipment may be estimated based on age.
- Concealed piping, duct, cabling etc. are assumed to be consistent in materials, condition and age as their visible or accessible counterparts.
- Electrical power and fuel costs are assumed to increase at the rate of inflation.
- All concealed equipment; piping or other relevant items and/or conditions have been disclosed by the operator and are described based on their accounts.
- In general, services within the building do not appear to contain environmental hazards. However, any fluorescent lighting ballasts dating back to pre-1980 could possibly contain PCB contaminants.

1.6 Facility Assessment Summary Matrix

SYSTEM	ASSESSMENT	IMPACT	ACTION
HVAC	Some Systems beyond useful life	High Maintenance Costs	Undertake a program to replace all HVAC systems in order of priority
	System Design is generally inadequate and not code compliant	Reduced Employee Productivity	
		High Energy Costs	
	Many Systems rely on City Water for cooling	High Environmental Impact	
FIRE SUPPRESSION	Serious Corrosion in some places	Leaks and Water Damage Likely	Undertake a program to replace corroded piping and correct code deficiencies
	Some Code Compliance Issues		
	Sprinkler Missing in some spaces		
PLUMBING	Some Piping is beyond useful life	Leaks and Water Damage Likely	Replace aged piping and water entrance
	Some Plumbing fixtures are beyond or	Poor performance and aesthetics	Continue Facilities Management's Replacement
ELECTRICAL	Most lighting is beyond expected life		
	Service and distribution systems are beyond expected life	High Maintenance Cost	Replace Main Electrical Service
		Failures Likely	
	Service and distribution equipment is obsolete		Replace Electrical Distribution Systems
Some Fire Alarm and Exit Signage does not comply with current codes or MUN standards.		Replace and upgrade as part of Facilities Management Program	
POOL WET MECHANICAL	Piping is in good condition	Long expected life	Continue Facilities Management's maintenance program. Perform a detailed cost benefit analysis to explore possibility of replacement of mechanical plant for 30 year life renewal.
	Water Quality is excellent	Good client comfort	
	Much Equipment beyond useful life		
		Labour Burden	
	System lacks automation	Reliance on specially trained staff	
	System design is prone to failure	High Maintenance Cost	
System lacks redundancy			
LEGEND:			
Impact items shaded GREEN are good - no action required			
Impact items shaded AMBER require could be improved - improvements recommended			

2 Existing Systems Description

2.1 HVAC

2.1.1 Lower Fitness - AQ-1000

A chilled water air handler (AHU-6) is installed to serve this space but it is not adequate. Evidence of condensate damage is evident on the acoustical ceiling tiles. Abandoned diffusers are steel lay-in type. Abandoned system had no return duct or plenum grilles. No cooling is currently available in this space aside from ceiling and floor mounted fans.

Heating is provided by an electric coil in the ventilation system.

2.1.2 Air Hand/er Room - AQ-1001

No heating or cooling systems serve this space. Natural ventilation is by louver with manual damper. Temperature is not controlled. This space is an outside air plenum for AHU-1 which will lead to very low winter time temperatures in the space.

2.1.3 Boi/er Room

Outside Air is provided by a small supply fan which is in good condition. Duct is galvanized sheet metal and in good condition. No heating or cooling systems serve this space. Some abandoned equipment, duct and piping is present.

2.1.4 Members' Changing Rooms - AQ-1002 to AQ1003

Heating and cooling are provided by ceiling cassette type split-system blowers. Ventilation is provided by a rooftop mounted ERV with electric preheat.

2.1.5 Hot Tub Room - AQ-1004

Room is served by an Outside Air Fan SF-2 and an Exhaust Air Fan EF-2. No heating or cooling systems serve this space.

2.1.6 Laundry Room - AQ-1005

Transfer grilles bring in exhaust makeup through the ceiling plenum. Drier exhausts are manifolded together and ducted to the exterior. The main drier exhaust duct has two lint cleanouts which are taped shut to maintain a good seal. This requires time consuming re-taping when routine duct cleaning is performed. One of the cleanouts is in the space and another is located above the acoustical tile ceiling.

2.1.7 Reception and Tim Horton's AQ-2000, AQ-2004, AQ-2S01, AQ2002 & AQ2003

Outside Air is provided by AHU-2 (see section 1.2.2 above). Diffusers are aluminium lay-in type. Bathroom exhaust systems are currently being installed. Control of infiltration at entrances is limited with cold space temperatures reported in the winter.

Heating is provided by ceiling and wall mounted electric resistance blowers which are vintage 2009. Zone control is limited to that provided by the heat blowers and temperature varies greatly across the area.

Tim Horton's is cooled by a chilled water AHU fed by city water. The operator reports that this unit does not provide adequate thermal comfort. There are two restaurant heat exhaust systems serving heat generating equipment.

2.1.8 General/ Changing Rooms AQ-2006 & AQ-2007

Outside Air is provided by the Main Changing Rooms Air Handler (AHU-2) located in AQ-1001. AHU-2 is almost entirely manually controlled with no space thermostats, or automated dampers except for a delivery air temperature sensor and controller. This unit has no return duct and provides 100% outside air preheated as required by electric resistance heating elements. Air diffusers in this space are steel lay-in type with some rusting apparent.

Exhaust is provided by the General Changing Rooms Exhaust Fan (EF-1) located in the Upper Fitness area. Wrap insulation is loose and coming off at points.

No cooling is available in these spaces.

2.1.9 Wall/ed-in Balcony off Male General/ Changing Room

Tim Horton's Freezer Condenser unit is located in this space. An exhaust fan provides fresh air and heat rejection. No make-up air transfer means could be found. Freezer condensate is discharged onto the floor.

2.1.10 Pool Deck & Mezzanine AQ-2009 & AQ-3C03

The Pool Deck is positively pressurized by the Pool Deck Air Handler (AHU-1) located in AQ-1001 which discharges above the Upper Fitness area. This unit is equipped with electric resistance heating, a hot water coil and no cooling. AHU-1 is almost entirely manually controlled with no space thermostats, or automated dampers except for a delivery air temperature sensor and controller. The aluminium return duct to AHU-1 is equipped with a condensate drain that is not piped to any drain. Exhaust air from the Hot Tub Room (AQ-1004) is ducted to the AHU-1 intake.

Exhaust exfiltrates naturally through three louvers on the South wall. One louver is approximately 900mm x 600mm and two louvers are approximately 1200mm x 1200mm. These louvers originally had dampers which are now abandoned or demolished. Due to the positive pressurization of this space, air from the pool deck escapes through the Main Changing Rooms and the Reception Area frustrating efforts at zone temperature control.

The space has large dimensions with diverse heating and cooling loads across the space. AHU-1 has only one discharge point with no forms of zone balancing or control to match capacity to loads.

2.1.11 Family Changing Room - AQ-2010

Heating is provided by two in-wall forced-air electric resistance heaters. There is an exhaust fan and no make-up air system or operable windows.

2.1.12 Pool/ Mechanical/ Areas - AQ-2017 & AQ-1006

There are no heating, cooling or ventilation systems except for one small exhaust fan in the Pool Chemicals Room (AQ-2017). A louver to the outdoors has been boarded up. Heat generation of the mechanical equipment produces high temperatures in the spaces. Some abandoned equipment and conduit is present.

2.1.13 Facilities Management Areas - AQ-2016 & AQ-2V02

Cooling is provided by a portable air conditioning unit with condenser air ducted to the exterior. Heating is provided by electric resistance baseboard heaters and ceiling mounted blowers. There is an outside air fan in room 2016A only and no exhaust systems or transfer louvers are present.

2.1.14 Administration Offices - AQ-3003

Heating and cooling is provided by wall-mounted ductless split-system blowers. Operator reports that these provide good thermal comfort. Outside Air is supplied to the space by AHU-3 and no Exhaust system is present.

Some users have sensitivities to chemicals and have reported a persistent chloramine smell in the spaces. Chloramine odor was evident at the time of survey. This area is adjacent to the Pool Deck which is positively pressurized.

2.1.15 Upper Fitness Area - AQ-3007 to AQ-3013

Unconditioned outside air delivered by the Upper Fitness Outside Air Unit (AHU-3) located in the attic mechanical space. Most of this is delivered to the squash courts. Duct is un-insulated, painted, galvanized, spiral-round, galvanized sheet metal and in good condition. Insulation is in fair condition. Diffusers are linear aluminum mounted on the duct sidewall and are in good condition. Washrooms have exhaust but doors are not louvered and there is no transfer air allowing makeup air to infiltrate from the main space.

Cooling air provided by city water fed AHUs. Most of this is delivered to the general fitness area. Duct is partially-insulated, spiral-round, galvanized sheet metal and in good condition. Double deflection duct sidewall diffusers serving the city water fed AHUs show signs of rusting. Condensate formation is evident on some of these diffusers and there are signs of resulting damage to the carpeting below them. Condensate formation on the canvas connections, piping and other services to the AHUs is evident. One unit installed in AQ-3011 has the supply return and condensate piping running along the floor across the entrance to the office creating a tripping hazard. There are numerous wall, ceiling and floor mounted fans installed for cooling.

Heating, when present, is provided by wall mounted heat blowers. Cold temperatures in AQ-3S01 are an issue. This space is heated but heat tracer has had to be installed on the sprinkler pipe in this area to prevent freezing.

Most of the ceilings in this space are very high (around 20') and thermal stratification of the air is likely.

2.1.16 Pool/ Deck Offices and Party Rooms - AQ-3015 to AQ-3024, AQ-2018 to AQ-2023, AQ-2025 & AQ-2012 to AQ-2015

Cooling is provided by chilled water air handlers fed by potable city water. City water is discharged directly to the sanitary drainage system after it passes through the air handler. Ducting from the air handlers is un-insulated galvanized sheet metal with steel floor registers installed on the duct side walls to serve as diffusers. No heating systems are present. Thermal comfort is reported to be good in these spaces. No ventilation systems or operable windows are present.

2.2 Fire Protection

2.2.1 Sprinkler System

The existing building is protected by an automatic sprinkler system. Original sprinkler piping is black iron and shows signs of considerable exterior corrosion in many places. Some of the original black iron piping has been replaced with galvanized iron in recently renovated spaces. Some of this galvanized iron piping was equipped with black iron fittings. The water entrance and alarm valves appear to be in fair condition and are up to date on their inspections. Some areas are lacking code required sprinkler protection including the main electrical room and the store room off the main men's changing room. Sprinkler heads are in fair condition throughout the building.

2.2.2 Fire Extinguishers

Fire extinguishers appear to be in good condition and are up to date on their inspections.

2.3 Pool & Spa Mechanical

2.3.1 Main and Teach Pools Circulation

Both bodies of water are normally served by a single system. A pump draws water from a tank and grid perlite filtration system. The filtered water is piped separately and chemically sanitized with chemical dosing pumps before being returned to each pool. Water is heated before being returned to the Teach Pool only. The main pool receives heat by mixing with the heated water from the Teach Pool in the filtration tank. When heat is required for the Teach Pool but not the Main Pool, there is a standby pump and sand filter which allows the Teach Pool to be isolated from the Main Pool.

The Main Pool Filtration Pump (P-1) is 2 years old and in good working order but requires frequent changing of impellers. When the pool pump shuts down, the Perlite media detaches from the filtration grids and the system needs to be primed again. It is important to keep this pump in constant operation. There is no pool pump redundancy although a spare pump is kept on hand for parts. This pump is not currently on the generator system although it would be desirable to prevent the need to re-prime the filtration system in the event of a power outage.

There is no permanently piped and wired standby pump; however an extra pump is kept on hand for spare parts.

The Pool Water Heat Share Pump (P-3) moves heated pool water to the Air Handler Room (AQ-1001) where it is used to either fill the Hot Tub or it is run through a heat exchanger to preheat city water feeding the Domestic Water Heaters.

Primary pool heating is provided by five electric resistance heaters which have no aquastats and are entirely manually controlled. Auxiliary pool water heating is provided by heat exchangers running on the MUN heating water system.

2.3.2 Main Pool/ Water Slide

A manual diverter valve channels water from the Main Pool Return branch to the slide when required.

2.3.3 Main and Teach Poo/s Contro/s

The chemistry controller was upgraded in 2010 with a Chemtrol brand system which has been expensive to maintain. Control panel is located in AQ-2016A. There is a timer installed on the Perlite feeder. No centralized control of pumps, heaters, valves or Perlite feeding exists.

2.3.4 Hot Tub Circulation

The Hot Tub Filtration Pump (P-4) pushes Hot Tub water through a sand filter, then an electric resistance heater and returns the heated water to the Hot Tub. The return water is sanitized by a chemical dosing pump and controller.

2.3.5 Hot Tub Action

The Hot Tub Action Pump (P-6) delivers high-flow water to the spa jets when activated.

2.3.6 Hot Tub Contro/s

There is no centralized controller to handle the Hot Tub mechanical system.

2.4 Plumbing

2.4.1 Pool/ Chemical/ Store Room - AQ-2017B

Fixtures:

- Emergency Eyewash Station - In fair condition and in good working order.
- Hose Bib - In fair condition and in good working order.
- Emergency Shower - Corroded and lacking a drain basin.

Condensate from an air conditioning unit is discharging onto the floor.

2.4.2 Lunch Room - AQ-3017

Fixtures:

- Kitchenette Sink - In fair condition and in good working order.

2.4.3 Upper Fitness - AQ-3004 to AQ-3008

Drinking fountains are very old models. Members have requested the older models be retained as they have better performance than newer models used. Washroom fixtures are in fair to good condition.

2.4.4 Main Air Hand/er Room - AQ-1001

Drainage is provided by a sump pump installed in a 5-gallon bucket sunk in the floor.

Fixtures:

- Emergency Eyewash Station - In fair condition and in good working order.

Piping:

- Black iron heating water piping is wrapped with fiberglass insulation with plastic jacketing all in good condition. Condition is good. Vintage - 2002.
- Copper domestic hot and cold water piping is in good condition. 1½" glass insulation with canvass jacketing is in fair condition. Vintage - original.
- Sch. 80 PVC hot tub fill/city water preheat piping is in good condition. Vintage - 1982.
- Cast Iron storm water piping is in good condition. Fittings are no-hub and lead-oakum filled joints.
- Honeywell motor actuators serving heating water 3-way valves are reported as unreliable although newer models are an improvement.
- Drinking fountain sanitary waste was found to be piped to a storm water drainage pipe.

2.4.5 Boi/er Room

Piping:

- Domestic Hot and Cold Water - copper in fair condition - canvass jacketed glass insulation in fair condition - vintage 1976. Isolation valves are in poor condition and unreliable.
- Heating supply and return - painted black iron in good condition - plastic jacketed glass insulation in good condition - vintage 2002. Water meter and drip pan installed to monitor usage is no longer in use.
- Pool to city water preheat/hot tub fill - sch. 80 PVC in excellent condition - vintage 1985
- Municipal Water Supply - black iron in fair condition - vintage 1976. No backflow prevention exists. Water meters are no longer in use.

Domestic Water Heaters:

- Primary heating is by the heating water system which preheats the water. Secondary heating is by water heater electrical resistance elements. No system to control staging and scheduling of primary and secondary heating exists. Water delivery temperature swings above comfortable levels.

2.4.6 Reception and Tim Horton's AQ-2000, AQ-2004, AQ-2S01, AQ2002 & AQ2003

No drinking fountain is present. Tim Horton's plumbing is all vintage 2009. Washroom plumbing fixtures are in fair condition.

2.4.7 First Aid Room AQ-2015

There is a lavatory served by a floor-mounted water heater in the room. Piping is surface mounted.

2.4.8 Pool/ Deck & Mezzanine AQ-2009 & AQ-3C0

Fixtures:

- Accessible Showers - in good condition.
- Hose Bibs x 5 - in fair condition.

2.4.9 Members' Changing Rooms - AQ-1002 to AQ1003

Domestic water piping is copper vintage 2009

2.4.10 Main Changing Rooms AQ-2006 & AQ-2007

Fixtures:

- Urinals - Poor condition. Some grates missing.
- Lavatories - Good condition
- WCs - Fair Condition
- Hose Bibs - Fair Condition
- Showers - Fair Condition
- Floor Drains - Fair Condition. Maintenance has been an issue where grates have been removed to flush floor waste into the drains. Tamper proof screws may be needed. Trap primers are suspected to be absent in the floor drains installed in slabs-on-grade.

2.4.11 Laundry Room - AQ-1005

Domestic hot and cold water piping is vintage 2008 copper with plastic jacketed glass insulation in good condition.

Fixtures:

- Two small commercial/large residential clothes washers

- One janitor's sink

2.4.12 Lunch Room AQ-3017

There is on single compartment kitchen sink in the room which is in good condition.

2.5 Electrical

2.5.1 Main Service

The main building service enters the facility from a 750kVA utility pad mounted transformer located at the west side of the property. The main service is rated 1600A at 347/600V, 3-phase, 4-wire, and extends to a 1600A Westinghouse Type FDP main service entrance switchboard located in the electrical room on the basement level. The service switchboard is complete with a utility metering section and feeds all building electrical loads. All major mechanical loads are fed directly from the service entrance board distribution section at 600V.

Peak demand on the main service over the last two years occurred in January of 2012 at a listed demand of 632 kVA. Based on this information, it appears that the current service is of adequate capacity to support the facility under its current operation. However, the existing utility transformer appears to be well undersized for the service capacity of 1600A. The original 1500 kVA pad mounted transformer was removed in the early eighties when the building's energy consumption was significantly reduced as a result of a mechanical retrofit project.

The service equipment is original to the building construction of 1976 and the equipment has a typical reliable life of 35-40 years, therefore the estimated remaining life of the service equipment is less than 10 years.

2.5.2 Secondary Distribution

Generally, 347/600 volt power is distributed throughout the building for mechanical loads from the 1600A, 347/600V service entrance switchboard located in the main electrical room. Most 120/208 volt power is distributed throughout the building for lighting and general power panels from a 225kVa step-down 600:120/208V, 3-phase transformer that feeds a 600A 208V distribution panel located in the main electrical room.

There is an existing demand control system which was installed during a 1980 energy retrofit which is still in operation. This system provides ten demand limiting zones including the pool space heaters, pool AHU heating coil and the domestic hot water tanks.

The majority of the secondary distribution equipment is original to the building construction from 1976. The existing transformer has an elevated sound level which is characteristic of potential failure of the laminations. There are a couple of newer panel boards and a newer 45kVa transformer installed in the pool hot water tank room as well as a new panel outside the renovated change room area which appear to be in very good condition.

Some of the existing installation is no longer compliant with the current code including the following items:

- Over-counter receptacles in lunch rooms do not meet current requirements for quantity or capacity. Current CEC requires over-counter receptacles within 900mm of a sink to be ground fault protected and rated 20 amps. Other over-counter receptacles should be either split type or 20 amp rated;

The estimated remaining life of the original equipment is 2-5 years with some immediate maintenance required. The estimated life of the newer panel boards is 15-20 years.

2.5.3 Grounding

The building electrical service ground consists of a ground wire from the main service switch to an external ground grid.

Leakage current detectors were not found in the course of the survey.

2.5.4 Interior Lighting

- General lighting is provided mainly by various versions of two lamp 120 V and 347V fluorescent fixtures using T12 lamps and magnetic ballasts.
- The fixtures used in the public areas generally have acrylic lenses. The type of shielded fixtures used in the facility have a documented history of lenses becoming dislodged and falling to the floor due to the poor fastening methods used to contain them.
- Service spaces are generally illuminated using T12 fluorescent strip lights.
- There are specialized fixtures installed in the squash courts with appropriate vandal proof lenses. These fixtures are 6 lamp T12 recessed style. There are a total of 96 tubes (or 3.8kW) of lighting in each court.
- Lighting in the shower areas and some of the lighting over the pool decks consists of vapour proof fluorescent surface mounted fixtures. The basement change rooms use newer T8 fixtures while the main floor change rooms still use some T12 fixtures.
- Lighting in the main entrance area and front desk consists of 2x2 recessed u-tube fluorescent fixtures using a mix of T12 and T8 lamps.
- Some of the original T12 lighting has been retrofitted or replaced over the past several years in favour of newer T8 lamps with electronic ballasts. Some rooms currently have both T12 and T8 fixtures installed.
- Metal halide 1000W high-bay type fixtures are used in the pool area over the deck. These fixtures appear to be in operating condition
- Due to the delayed restart on the metal halide fixtures, backup halogen fixtures have been added in the pool area to provide adequate lighting for egress in the event of a power failure. Maintenance staff expressed concern with the lack of lighting over the pool area during a power outage.

- Lighting levels over the pool mezzanine where the rental spaces are located were noted as insufficient. Levels in the upper fitness area were also noted as being too low. There are a number of dark spots that require additional fixtures.
- The upper fitness area overlooking the pool is equipped with an extensive amount of incandescent track lighting. This lighting appears to be poorly suited for this application and is highly inefficient. Building staff also indicated it presented a significant maintenance problem with constant required re-lamping. There are also incandescent pot light fixtures used in the upper administrative area.

The majority of the building lighting including all lighting in fitness centres, washrooms, pool areas, etc. are currently not switched and run twenty-four hours a day, seven days a week. The building is open about 17 hours every day and active about 3-4 hours every day. The lack of zoned lighting switching means most lights must be left on 24 hours a day to

The T12 lighting technology is obsolete in favour of the more energy efficient T8, T5 or LED technology. Incandescent fixtures are also no longer considered an acceptable solution for commercial facilities due to their inefficiency.

The estimated remaining life of the system is 2-5 years with a large amount of remedial maintenance required immediately to address the damaged fixtures.

The male and female change rooms on the lower level utilize T8 fluorescent recessed fixtures with acrylic lenses and compact fluorescent pot lights. These were installed during the 2008 renovation and are in good condition with 20+ years of remaining life.

2.5.5 Exterior Lighting

Exterior building perimeter lighting consists of soffit recessed halogen (incandescent) pot lights and some wall mounted high intensity discharge fixtures near the exterior exit doors. There are 1000W pole mounted metal halide fixtures lighting the former running track at the north end of the property. Lighting at the front of the facility for the main parking area is provided by Newfoundland Power owned utility street lights. The Newfoundland Power street lights are separately metered from the building and are billed back to the Aquarena on a monthly basis.

The exterior lighting is controlled by two separate lighting contactors; one for the building mounted lighting located in the main electrical room and one for the pole lights located in the basement mechanical room.

The building mounted fixtures should be replaced in the near future as they have very little useful remaining life and are highly inefficient. The Aquarena owned pole lighting appears to be in good operable condition.

Consideration should be given to replacing the utility street lights at the front of the property with poles and fixtures owned by the facility.

2.5.6 Exit Lighting

There is a system of exit lights located throughout the facility. Many of the signs are the original construction incandescent design. The quantity and location of signage appears sufficient by current NBCC requirements.

Incandescent exit signs have become obsolete in favour of more energy efficient and longer life units with LED sources. The exit signs in the renovated change room area and fitness area are LED type with battery back-up and have an extended remaining life of 20+ years. However none of the exit signs in the facility meet the latest edition of the NBCC as exit signs are now required to be green in color with the running man designation.

The exit sign in the pool pump room is currently not operational and needs to be repaired or replaced.

2.5.7 Emergency Lighting

Emergency lighting is provided by un-switched building fixtures connected to the facility emergency generator system. The generator essentially powers all of the lighting in the facility.

Refer to the interior lighting descriptions for condition assessment and remaining reliable service life.

A number of battery units still remain from the original construction (pre generator install in 2007). These units are no longer required by Code however building staff indicated they are still being maintained and are operational.

There was one battery unit noted in the main electrical room which is required because this room houses the building generator emergency transfer switch. The existing unit is however under rated according to current NBCC and Provincial requirements.

2.5.8 Emergency Generator System

The facility is equipped with a 200kW, 347/600V, 3-phase exterior self-enclosed emergency standby generator with in-skid fuel tank. The generator was installed in 2007 to replace the former DC battery based system that was installed during the original building construction. The generator is connected to a 400A Cummins emergency transfer switch located in the main electrical room. This switch feeds a 400A, 120/208V, 3-phase emergency distribution panel located in the same room. The transfer switch and panel were both installed during the generator install project and have 25+ years of remaining useful service life.

The emergency generator feeds the majority of the building lighting; all exit signs, the 225kVa transformer, some pumps, the elevator, one AHU and a portion of the Tim Horton's restaurant.

2.5.9 Communications Systems

Telephone and data service enters the building from an aerial service on the outside of the building and extends to the telephone backboard in the main electrical room. Telephone wiring extends from this telephone backboard to outlets through the building however this system has been mostly abandoned since the building converted to a voice-over-IP (VOIP) telephone system. The only remaining active telephone line is for the fire alarm system monitoring.

Data wiring extends to the main building data rack located in a small screened enclosure in the Tim Horton's storage room off of the pool deck. This data rack location is very poor and violates several areas of the MUNet standard for data rooms.

There is also a small data rack located in the back area of the Tim Horton's restaurant which is strictly owned and operated by the Tim Horton's franchise.

The front desk is equipped with a public address system with speakers located throughout the facility. Paging can be completed from either the front desk or the fitness centre desk in the basement.

2.5.10 Electric Heating Systems

Heating is provided mainly by hot water radiation systems connected to the Central Utilities Annex. There are also localized electric hot water tanks in the basement mechanical room to back up and complement the central system. Refer to the mechanical systems sections of this report for details.

Electric baseboard, cabinet heaters and unit heaters are located in various areas throughout the building. The new male and female change rooms on the basement floor are electrically heated. There are also ceiling mounted heat pumps in these rooms used for cooling however the systems are not interlocked and can both run simultaneously.

- Electric infrared heaters are installed over the overhead pool deck in several areas
- Some of the electric heaters in the building are corroded

The heaters appear to be in good working condition. The corroded heaters should be upgraded immediately however the remaining heaters should provide 10-12 more years of reliable service.

2.5.11 Fire Alarm System

The main Edwards Quick Start addressable fire alarm panel is located at the front entrance near Tim Horton's. The fire alarm panel currently monitors the main building sprinkler valve.

Being fully sprinklered, smoke detectors are installed in stairwells and elevator shafts only. There is a single heat detector installed in the main electrical room as this room is currently not sprinklered. There are pull stations, strobe lights and horns located throughout the facility. The fire alarm system is connected via phone line to the Central Utilities Annex at the University.

The overall system appears to be generally Code compliant with the exception of the following noted deficiencies:

- Pull stations are mounted above the current required height
- No sprinkler in the main electrical room
- No annunciation devices located in the main electrical room, heat exchanger mechanical room or AHU mechanical room in basement.
- Some old horns on the upper levels have been abandoned and replaced with new devices during the change room extension. The old devices should be removed.

- There are no strobe lights on the basement level
- There was one fire alarm bell located at the base of the spiral stairs. This should be replaced with a horn as the NBCC requires consistent signals throughout.
- No smoke detector at the top of the stair from the basement fitness area

2.5.12 Security Systems

There is an existing card access system in the building. Magnetic swipe type card readers are installed at all member entrances. Exterior doors with card access are equipped with magnetic locks.

The member's entrance to the basement fitness centre has a local intrusion alarm horn connected to the door.

There are a number of DSC type intrusion alarm systems located throughout the building, including systems in some offices, front desk computers, safe room and exterior doors. These systems are remotely monitored by MUN Campus Enforcement.

CCTV cameras are located throughout the building, both interior and exterior.

3 Observations & Recommendations

3.1 Remaining Life of Building Components

3.1.1 Remaining Life Table - Mechanical/

Component	Vintage		Life Expectancy (Years)	Approximate Remaining Life (Years)	
	Oldest	Newest		Oldest	Newest
Drinking Fountains	1976	1976	15	-22	-22
Shower Valves	1976	1976	20	-17	-17
Urinals	1976	1976	20	-17	-17
P-3 (Pool Water Heat Share)	1980	1980	20	-13	-13
AHU-2 (Main Changing Rooms)	1976	1976	25	-12	-12
Water Entrance (black iron)	1976	1976	25	-12	-12
Pool Deck Return Duct (aluminum)	1982	1982	20	-11	-11
Main Changing Rooms Galvanized Duct	1976	1976	30	-7	-7
P-5 (Hot Tub Jets)	1986	1986	20	-7	-7
AHU-1 (Pool Deck)	1982	1982	25	-6	-6
Hot Tub Electric Heaters	2000	2008	8	-5	3
Sprinkler Piping (Black Iron)	1976	2012	33	-4	32
EF-1 (Hot Tub)	1986	1986	25	-2	-2
SF-2 (Hot Tub)	1986	1986	25	-2	-2
AHU-3 (Upper Fitness)	1987	1987	25	-1	-1
Flushometers	2002	2013	10	-1	10
Lower Fitness Galvanized Duct	1985	1985	30	2	2
Domestic Hot & Cold Water Piping General (Copper)	1976	1976	40	3	3
Hot Tub Galvanized Exhaust Duct	1986	1986	30	3	3
Hot Tub Galvanized FA duct	1986	1986	30	3	3
Pool Electric Heaters	2009	2013	8	4	8

Aquarena Mechanical and Electrical Assessments

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Stantec Consulting Ltd.

004-17-01-24

Component	Vintage		Life Expectancy (Years)	Approximate Remaining Life (Years)	
Pool Heat Exchangers	2003	2003	15	5	5
Shower Trim	2008	2013	10	5	10
Chilled Water Air Handlers	2005	2012	15	7	14
Members' Changing Rooms Ductless Split-Systems	2008	2008	12	7	7
Drainage Piping (Cast Iron)	1976	1976	45	8	8
Storm Water Drainage Piping (Cast Iron)	1976	2008	45	8	40
Administration Offices Ductless Split-Systems	2010	2010	12	9	9
WCs	2002	2008	20	9	15
Fire Extinguishers	2008	2012	15	10	14
P-6.1 & P-6.2 (Heating Water Main Pumps)	2003	2003	20	10	10
Reception Unit Heaters	2009	2009	15	11	11
Boiler Room Heat Exchangers	2000	2000	25	12	12
Main Domestic Hot Water Heaters	2010	2010	15	12	12
Hot Tub Sand Filter	2006	2006	20	13	13
Reception and Main Changing Lavs.	2011	2011	15	13	13
Heating Supply and Return Piping (Black Iron)	2002	2002	25	14	14
Members' Changing Rooms ERV	2008	2008	20	15	15
Pool Chemical Sanitization System	2008	2012	20	15	19
Hot Tub Sanitization System	2009	2009	20	16	16
Plumbing Fixtures AQ-2000A (Tim Horton's)	2009	2009	20	16	16
Teach Pool Sand Filter	2009	2009	20	16	16
P-1 (Pools circulation)	2011	2010	20	18	17
P-2.1 (Teach Pool Lead)	2011	2011	20	18	18
P-2.2 (Teach Pool Jets)	2011	2010	20	18	17

Aquarena Mechanical and Electrical Assessments

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Stantec Consulting Ltd.

Component	Vintage		Life Expectancy (Years)	Approximate Remaining Life (Years)	
P-4 (Hot Tub Filtration)	2011	2011	20	18	18
Pools Vacuum /Drain Pump	2011	2011	20	18	18
SF-1 (Boiler Room)	2007	2007	25	19	19
Pool Circulation Piping	1976	1976	60	23	23
Boiler Room Galvanized FA Duct	2007	2007	30	24	24
Perlite Filtration System	2010	2010	30	27	27
Pool Heat Share Piping (Sch. 80 PVC)	1982	1982	60	29	29
Hose Bibs	2013	2013	30	30	30
Fire Protection Control Valves	2005	2005	40	32	32
Hot-Tub Circulation Piping (Sch. 80 PVC)	1986	1986	60	33	33
Domestic Hot & Cold Water Piping Laundry (Copper)	2008	2008	40	35	35
Domestic Hot & Cold Water Piping Members' Changing (Copper)	2009	2009	40	36	36
Domestic Hot & Cold Water Piping Tim Horton's (Copper)	2009	2009	40	36	36

3.1.2 Remaining Life Table - Electrical

Component	Age (Years)	Life Expectancy (Years)	Approximate Remaining Life (Years)
Main Service Entrance	36	35-40	0-4
Secondary Distribution	36	40	2-5 (original equip.), 15-20 (upgraded equip.)
Grounding	36	50+	15+
Interior Lighting	36 (some upgrades completed)	40	2-5 with maintenance
Exterior Lighting	36	40	2-5 (building), 5+ (poles)
Exit Lighting	36 (some upgrades)	40	2-4

Component	Age (Years)	Life Expectancy (Years)	Approximate Remaining Life (Years)
	completed)		
Emergency Lighting	36	40	4
Emergency Generator System	5	30+	25+
Communication Systems	Varies	40	10+
Heating System	36 (some < 5)	40+	10-12 with some immediate upgrades
Fire Alarm System	10-15	30	10-15
Security Systems	5-10	20	10-15

3.2 HVAC Observations & Recommendations

3.2.1 Pool/ Deck and Hot Tub

Temperature and relative humidity were monitored from 10:00 AM until 5:00 PM near the teach pool on one week day. Temperature varied between 25.7°C and 23.8°C while Relative Humidity (RH) varied between 50%RH and 64%RH. ASHRAE recommends space temperatures between 24°C and 29°C and RH between 50% and 60% for the given water body temperatures and types of activity taking place at the facility. If possible, space temperatures in the higher ranges should be considered to minimize operating costs and increase bather comfort. Recommendations that follow will assume a space temperature of 27°C and 55%RH.

The space is positively pressurized which is causing thermal zone control issues, IAQ in adjacent areas and excessive exfiltration. It is also likely to promote condensation formation inside the building envelope where moist indoor air is forced into the interstitial wall spaces and comes in contact with cold surfaces. A ventilation system capable of maintaining a slightly negative pressure relative to the outdoors is required.

Condensate forms on exterior walls and exposed steel is prone to corrosion. These problems are typically caused by insufficient dehumidification and improper distribution of conditioned air. No dehumidification currently exists and any air circulated in the space is not properly distributed. A pool dehumidification system which washes the walls continuously with dry air is recommended.

Most of a pool's heating requirements are to replace heat lost through the evaporation of water. Specialized Packaged Natatorium HVAC (PNH) units are available which can dehumidify the air and return a significant portion of the lost heat back to the pool. These units are available with integral Energy Recovery Ventilation (ERV) that provides the required amounts of outdoor air,

recovers heat energy from the exhaust air, and maintains the recommended negative pressurization of the space. Economizer options are also available to provide free cooling in the spring and fall. A new PNH system with dehumidification, ERV, pool water heat recovery, supplemental heating and supplemental cooling is recommended. This unit could be located on a new mechanical deck to be built above the upper fitness area. We recommended that the wall between the Upper Fitness area and the pool deck be extended up to the roof to isolate the new mechanical area from the Pool Deck. This will serve to:

- Help reduce noise transmission from the new PNH equipment to the pool deck.
- Reduce the thermal load on the pool deck by isolating it from a significant portion of the building's exterior envelope.
- Reduce the new PNH's required flow by reducing the actual volume of the Pool Deck Area.

The Upper Fitness and Administrative Offices ceilings should be insulated to reduce sound transmission from the new PNH unit to the occupied spaces below.

3.2.2 Aquatics and Facilities Management

These spaces have no supply of fresh air or exhaust to provide adequate Indoor Air Quality (IAQ). Heating requirements are minimal but cooling is important. The existing chilled water air handlers use city water to provide cooling which is wasteful and will become economically impractical when the City of St. John's institutes demand billing for potable water.

We recommend that the chilled water air handlers be replaced with a new Variable Air Volume (VAV) HVAC system. The AHU could be installed in the empty space above these rooms. This unit should be equipped with DX cooling, electric resistance heat and economizer. Economizer and Energy Recovery Ventilator (ERV) Options should be considered at the design stage.

3.2.3 Fitness and Reception Spaces

These spaces are served by several different equipment types employing different HVAC strategies. There is extensive use of chilled water air handlers cooled by city water (see discussion in 3.2.2). Systems are almost entirely manually controlled which limits efficiency and increases facilities management labor costs. Most of these systems have reached the end of their useful life (refer to Table 3.1.1). The Members' Changing Rooms HVAC systems are in good condition and of adequate design and performance. All remaining HVAC systems in this area are recommended to be replaced due to age, inadequate performance or economic reasons.

We recommend replacing all existing HVAC systems in this area with a new ducted VAV HVAC system to be installed in the Air Handler Room in space made vacant in earlier renovation phases. This unit should be equipped with DX cooling, electric resistance heat. Economizer and ERV options should be considered at the design stage. Ductwork can be run to the Members' Changing Rooms and capped for connection at a later phase when the existing systems serving those spaces are closer to the end of their useful life.

3.2.4 Therapeutic Whir/pool/

This space is served by an exhaust system only. Whirlpool heat is lost mainly through evaporation which exits the building through the exhaust air stream without energy recovery. This is typically the most cost effective system type for spaces like this and no changes are recommended.

We recommend supplying Fresh Air to this room with a new Outside Air Fan, ductwork, louver and motorized damper.

3.3 Fire Protection Observations & Recommendations

3.3.1 Sprink/er Systems

Some of the existing sprinkler piping and heads in the Pool Deck, Aquatics and Facilities management areas have been recently replaced with galvanized piping and new sprinkler heads. Some of the recently installed galvanized piping was equipped with black iron fittings. The remainder of the sprinkler systems in these areas are at the end of their useful life, show signs of considerable deterioration in some places and a lack of code compliance in others. It is recommended that approximately 70% of the sprinkler systems in these areas be replaced with a new NFPA 13 compliant sprinkler distribution system. Piping should be galvanized or plastic sprinkler pipe to resist the corrosive environment in these spaces.

Sprinkler systems in the Fitness and Reception areas appears to be newer and/or in better shape. The estimated remaining life of the sprinkler systems in these areas is approximately 25 years. Some heads are corroded or are of the incorrect type for their locations. Rationalization of the sprinkler heads is recommended. We recommend that approximately 25% of the sprinkler heads should be replaced due to condition or code compliance requirements. Some spaces such as the electrical distribution room are either not currently sprinklered or are otherwise in violation of current NFPA 13 requirements. We recommend that approximately 10% of the Fitness and reception areas will require new sprinkler systems to be brought up to current code requirements.

The existing Alarm Valve system was recently installed and within it's useful life. We do not recommend replacing it at this time. However due to its relationship and proximity to the Water Entrance, replacement may be logistically required when the water entrance is upgraded to current standards.

3.4 Plumbing Observations & Recommendations

3.4.1 Domestic P/umbing Systems

Much of the plumbing fixtures and existing hot, cold, drainage and vent piping serving them is original and nearing the end of its useful life. We recommend replacing the fixtures and associated piping which have or will soon exceed their expected useful life as shown in Table 3.1.1.

3.4.2 Water Entrance

The existing water entrance has exceeded its expected useful life and does not meet current CSA or municipal standards. We recommend replacing the existing water entrance with a new water entrance conforming to CSA and city of St. John's standards and regulations.

3.5 Pool and Spa Mechanical Observations Recommendations

3.5.1 Main Pool/ and Teach Pool/ Heating

The existing heating system is shared with the Teach Pool which poses control challenges exacerbated by the manual nature of the existing controls. Most of the primary pool and teach pool heating can be provided by the pool heat recovery system included in the PNH unit recommended in section 3.2.1.

3.5.2 Main Pool/ and Teach Pool/ Pumping

The existing system is shared by both bodies of water with an auxiliary system to supply the Teach Pool only. Presumably this is to allow the Main Pool to receive heat from the Teach Pool.

We recommend permanently separating these systems and providing heat separately with the use of automated valves in the case of water heating provided by the PNH unit (primary heating) and/or the use of dedicated equipment in the case of the secondary and backup water heating systems.

The Teach Pool backup pumps are nearing the end of their useful life and should be replaced. The existing main pump requires frequent replacement of impellers. This is likely due to poor matching of materials to the water chemistry, a mis-match between the design performance of the pump and the actual pumping load or both. Pumping backup is provided by a spare pump kept on hand. Parts are taken from the spare pump as required to maintain the service pump. We recommend replacing the existing pump with a duplex system providing 100% redundancy so that each pump is capable of handling the pumping requirements alone in the case of failure of the other pump. The replacement pumps should be specially designed for pool use, well matched to the pumping load and equipped with Variable Frequency Drives (VFDs) for energy efficiency and increased equipment life. Both the Main and Teach pools should get their own dedicated duplex pumping systems.

3.5.1 Main Pool/ and Teach Pool/ Filtration

The existing Teach Pool filter is now about 10 years beyond its expected useful life and will need to be replaced soon.

The existing Perlite filtration system is installed on the suction side of the pump which can cause cavitation. The short life of pump impellers and anecdotal descriptions of typical wear experienced with this system are indicative of cavitation induced damage. Also, the Perlite system must undergo a time consuming priming process if the main pump stops running for maintenance or power failure. We recommend replacing the Perlite system with a Commercial Sand Filtration system installed on the discharge side of the Main Pool Pump. The filtration area floor slab could be extended over the existing Perlite filtration tank allowing new sand filters to

be installed above it and freeing up space at the basement level Pool Mechanical room to install duplex pumping systems.

3.5.2 Main Pool/ and Teach Pool/ Sanitization

Existing sanitization is by a shared liquid chlorine/bromine chemical dosing system. We recommend replacing this system with dedicated Salt-Chlorine Generation Systems (SCGSs). These systems provide the best water and indoor air quality, reduced chemical costs increased durability of other system components due to the less aggressive water chemistry. Our standard of acceptance would be Autopilot™ brand systems which have been successfully in use on commercial and residential pools for decades with little to no problems and are well supported by the original equipment manufacturer and manufacturers of accessory equipment such as controllers. At this time, we are unaware of substitutes with similar reputations.

3.5.3 Main Pool/ and Teach Pool/ Contro/s

Existing Controls are manual. We recommend that a new commercial Pool and Spa controller be installed to handle scheduling, integration and automation of all proposed mechanical systems serving the Pool deck including the PNH unit, pool pumps, heating systems and motorized valves. This unit should be programmed to provide to allow simple initiation of different operation modes including "Recreation", "Competition", "Water Slide" and "Backwash".

3.6 Electrical Observations & Recommendations

3.6.1 Main Service

The existing main service is in operable condition and appears to be of surplus capacity for the facility under its current operation. However, the equipment has essentially reached the end of its reliable life and replacement parts are no longer available. Facility staff has also indicated that they have experienced a couple of occasions where the main breaker has tripped for no apparent reason. This may be an indication that the breaker has deteriorated and is failing. Any significant renovation should involve replacement of the existing service board with a new 1600A service entrance board. The estimated cost for this upgrade would be in the range of \$75,000.

3.6.2 Secondary Distribution

The majority of the existing 347/600V and 120/208V distribution panels, disconnects and transformers are original to the facility and are near the end of their useful life and should be replaced. The replacement transformer should be high efficiency type to reduce energy losses.

All of the counter receptacles should be replaced with new 20 amp ground fault type receptacles to current Code. In general all receptacles should be replaced throughout the facility as most are original and have surpassed their useful life. Receptacle tension is likely inadequate.

The estimated cost for all of these upgrades is \$275,000. The additional estimated cost to upgrade and expand these systems for the revised mechanical system loads proposed under the planned upgrades is \$120,000, for a total cost of \$395,000.

3.6.3 Grounding

The existing installation is generally Code compliant and adequate for the facility Interior Lighting

The existing lighting system as a whole is in poor condition. Many units have damaged, missing or tarnished lenses and the majority use inefficient T12 or incandescent sources. Most have reached the end of their estimated service life. From an energy efficiency and maintenance perspective, with the exception of the renovated change room areas and some other notable upgrades, the entire lighting system should be replaced with new fixtures using T8 fluorescent lamps and electronic ballasts or LED sources. All existing switches should be replaced.

All of the incandescent fixtures throughout should be replaced with fluorescent or compact fluorescent fixtures as the incandescent design is very energy inefficient.

Occupancy sensor controls should be added to automatically switch off lighting in rooms that experience a lot of transient activity (washrooms, offices, change rooms, etc.)

The estimated cost for these upgrades is \$280,000.

3.6.4 Exterior Lighting

The existing halogen and HID lights over and around the exterior doors are in operating condition but should be replaced with new compact fluorescent or LED fixtures. New fixtures should be added over any exterior doors that currently do not have fixtures installed.

Consideration should be given to increasing the overall amount of building perimeter lighting to improve susceptibility to vandalism and increase the safety of the facility for users accessing the building during hours of darkness.

Consideration should be given to adding new LED pole mounted fixtures should be added to replace the existing Newfoundland Power utility lights. The metal halide fixtures for the former running track area should also be replaced with new LED type to improve lighting quality and efficiency. The existing poles can likely be reused but should be structurally evaluated.

The existing exterior lighting controls should be upgraded to be controlled from a single new time clock and/or photocell controlled lighting contactor. The estimated to upgrade building exterior lighting and controls to IES requirements is \$50,000.

3.6.5 Exit Lighting

The existing exit signage in the building is in reasonable overall condition and in general conformance with the NBCC in terms of quantity and locations. Upgrading the existing incandescent signage to LED "running man" style signs is recommended to improve energy efficiency and meet the NBCC 2010 sign format requirements. The estimated cost of these upgrades is \$20,000.

3.6.6 Emergency Lighting

A 2-hour rated battery unit is required in the main electrical room where the emergency transfer switch is located. Refer to the lighting system recommendations for other lighting recommended upgrades.

3.6.7 Emergency Generator System

The facility staff expressed a desire to add the existing pool equipment panel PP1 to the generator however it is questionable whether there is adequate capacity for this connection. Further review along with a proper load test of the generator system would be required to confirm.

Should the building undergo a major distribution system upgrade, a second emergency transfer switch should be added to properly segregate life safety versus non-life safety loads in accordance with current Canadian Electrical Code requirements. The estimated cost for the above recommended upgrades is \$40,000.

3.6.8 Communication Systems

The voice/data systems appear to be in good working condition and adequate for the facility. Under a significant renovation, consideration should be given to creating a proper data room for the building in accordance with MUNet standards (Estimated Cost \$30,000).

3.6.9 Electric Heating System

Any existing corroded heaters should be replaced with new commercial grade cabinet units. The total estimated cost for these upgrades is \$20,000.

3.6.10 Fire Alarm System

The present system is in good operating condition but has some NBCC violations which should be corrected immediately.

The overall system has an estimated remaining life of 5-10 years however under any major renovation it will likely be more feasible to replace the system with a modern addressable style design. The University is currently in the process of replacing all of these style panels on Campus in favour of the more sophisticated Edwards EST3 panels which are also capable of incorporating voice speaker systems for mass evacuation. Building maintenance staff indicated that the Aquarena was planned to undergo a similar upgrade however to date this work has not been scheduled.

If the facility were to undergo a major renovation, a new addressable fire alarm system consistent with the systems being installed throughout the University should be installed. The majority of the existing detectors, strobe lights, horns and pull stations can likely be reused.

3.6.11 Security Systems

No upgrades recommended.

4 Recommended Projects

4.1 Project Phasing Methodology

It is recognized that the Aquarena is part of an operational fitness complex with active memberships; significant operating revenue and limited means of temporary relocation. Careful coordination of construction work with the Works' needs is required. Construction cost savings could likely be realized if the required work were to be done all at which would need to be weighed against competing costs related to loss of revenue and/or client base.

Phases have been devised according to the following criteria:

- Minimization of downtime
- Work inside the building to be scheduled to coincide with but not be limited to the annual scheduled maintenance period in December and January.
- Prioritization of recommended work as follows:
 1. Indoor Air Quality (IAQ) improvements
 2. Condition of the existing systems and consequences of their failure to the building's operation
 3. Cost of operating (energy, facilities management and environmental) equipment that could be upgraded to more efficient modern technology.

4.2 Priority 1 - Phase 1-3 - Indoor Air Quality (IAQ) and General Works Project

The IAQ and General Works Project is a multi-phase, multi-year project to improve the overall Indoor Air Quality and HVAC equipment efficiency. HVAC systems will be designed to increase automation of systems that are too complex to effectively control manually. All recommended FCI improvement works in the impacted areas, including non-HVAC works, will be undertaken concurrently to minimize overall costs and impacts on the facility's clients (closures).

Phase	CP	Description	Estimated Cost
1	1	Pool HVAC Equipment	\$994,400
	2	Fitness HVAC Equipment	\$186,450
	3	Penthouse Construction	\$778,850
	4	Upper Fitness HVAC Tie-In	\$720,600
	5	Pool HVAC Tie-In	\$899,840
			Phase 1 Total
2	6	Basement and Main Level HVAC Tie-In	\$1.5M
3	7	Aquatics HVAC	\$515k
		Total	\$5.6M

4.3 Priority 2 - Phase 4 - Pool Wet Mechanical Project

Replacing the Pool Wet Services Mechanical Systems to increase energy efficiency and reduce Facilities Management burden. Downtime of the pool is avoided by construction of a new mechanical facility alongside the existing prior to demolition. Greater cost certainty through a more detailed study is required to determine the feasibility of this project.

Phase	CP	Description	Estimated Cost
4	8	Pool Wet Mechanical	\$1.6M

4.4 Preventative Maintenance Works

Some recommended improvements will fit well with the Facilities Management Team's ongoing maintenance and improvement program and are listed below.

Work Item	Estimated Cost
Upper Fitness Plumbing	\$84,000
Exterior Lighting Upgrades	\$50,000
Reception Area Plumbing	\$50,000
Pool Deck Lighting Upgrade	\$46,000
Emergency Generator Switching Upgrade	\$40,000
Data Room Upgrades	\$30,000
New Fire Alarm System	\$30,000
Exit Lighting Upgrade	\$20,000
Hot Tub Wet Mechanical	\$20,000
First Aid Plumbing	\$8,300
Work Shed Plumbing	\$7,000
Domestic Water Heater Controller	\$6,000
Drinking Fountains	\$6,000
Hot Tub Electrical	\$5,000
Laundry Exhaust	\$5,000
Emergency Lighting Upgrades	\$1,000
HST	\$53,000
Total:	\$460,000

4.6 Estimating Qualifications

- Unless otherwise indicated, estimates are class D and are intended to provide order of magnitude costs only.
- Costs for asbestos abatement, mold abatement or other environmental remediation associated with mechanical upgrades are not included.
- Costs related to downtime and lost revenue during construction are not included unless specifically indicated.
- Financing and interest costs are not included.
- Auxiliary equipment rental costs if required to maintain operations during construction are not included (temporary portable generators, office trailers etc.) unless indicated.
- The mechanical and electrical trades labor market in the Avalon region of Newfoundland is in a boom period. No allowance has been included for labor cost inflation due to location and availability of manpower.

5 Appendices

Appendix A: Site Photos

Appendix B: Thermal Scan Report

Appendix A: Site Photos



Work Shed - Outside air fan. Seasonally blocked by user with card.



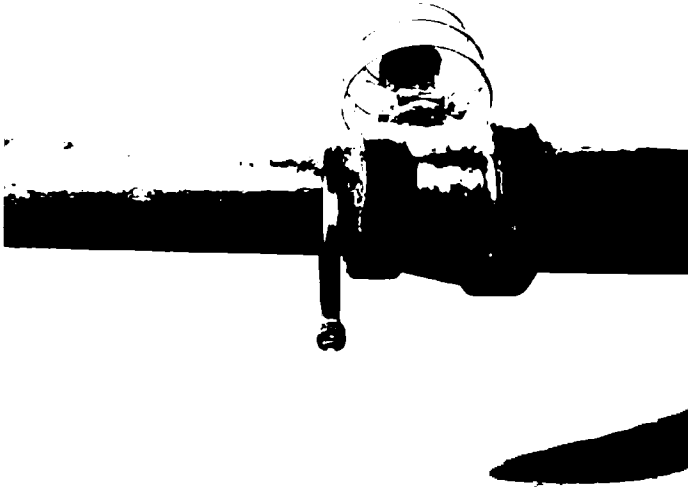
Work Shed - Portable air-conditioning unit.



Work Shed - New pool-chemistry monitor and controller. Never put into service.



Work Shed - Breaker panel.



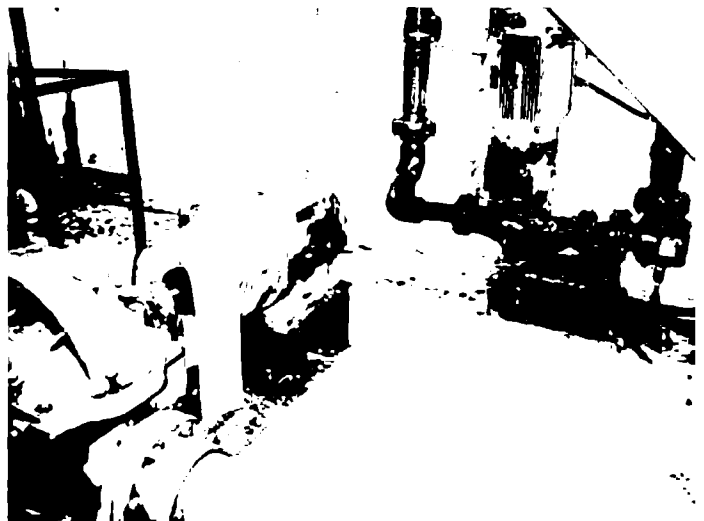
Work Shed - Typical painted black-iron sprinkler head and pipe.



Work Shed - Close-up of corroded black-iron sprinkler pipe.



Work Shed - Blower heater.



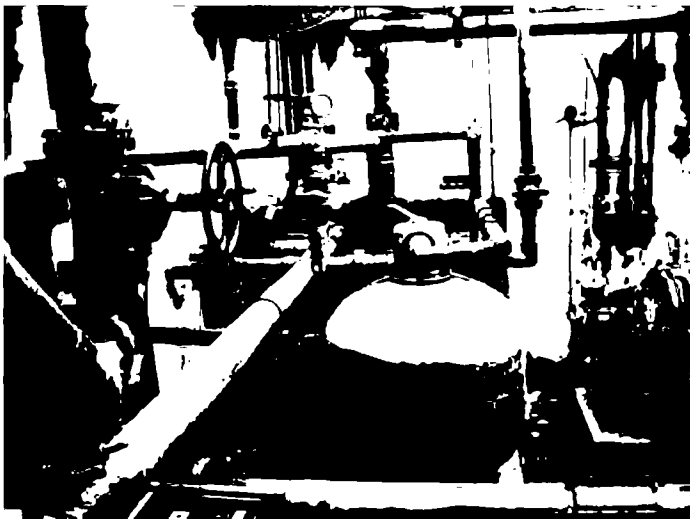
Pool Pump Room - Pool filtration pump (blue motor, grey impeller). Hot-tub fill/pool-city water preheat pump (grey motor, red impeller)



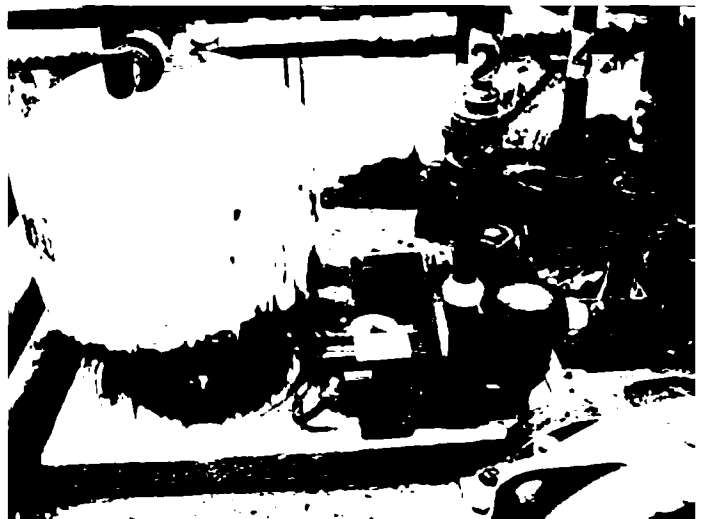
Pool Pump Room - Pool drain-down sump to storm-sewer.



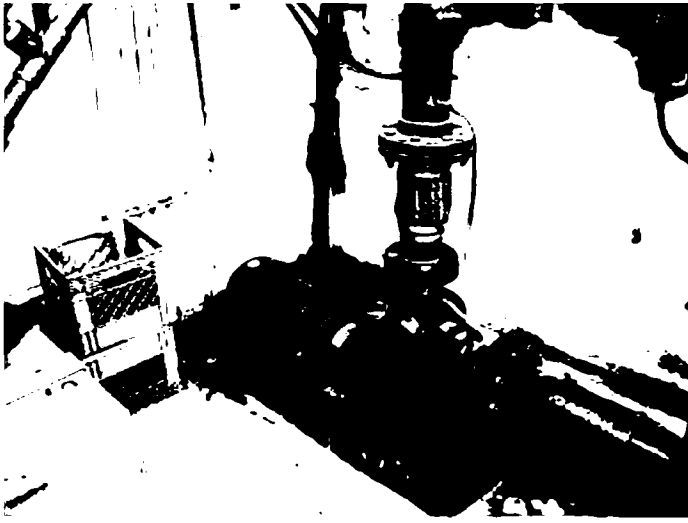
Pool Pump Room - Electric pool heaters.



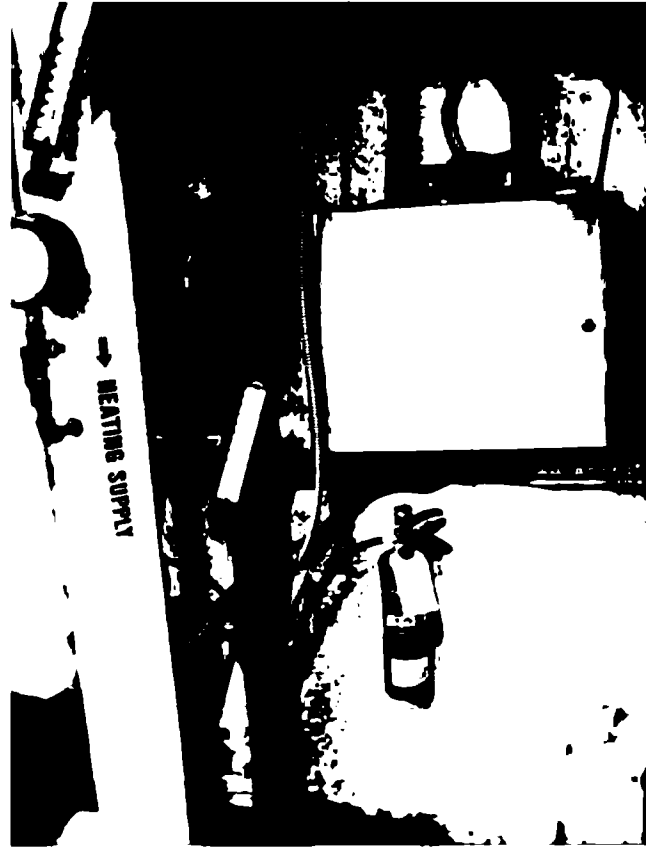
Pool Pump Room.



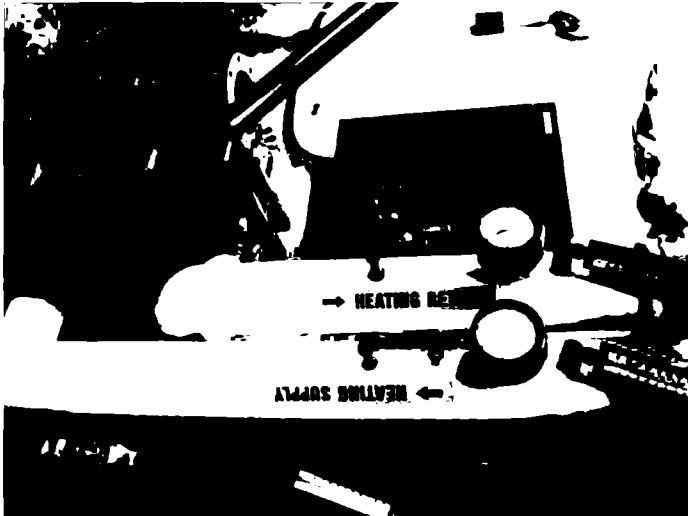
Pool Pump Room - Kid's pool auxiliary filter and filtration pumps.



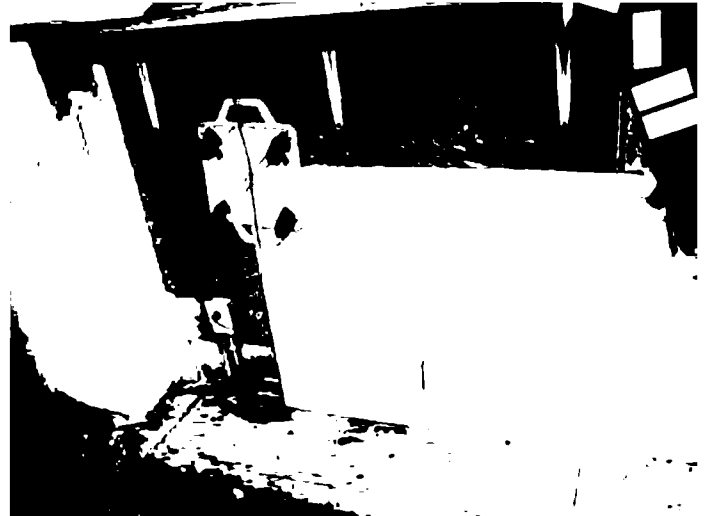
Pool Pump Room - Vacuum Pump



Pool Pump Room - Honeywell Controller - Controls 3-way heating valve for pool HX



Pool Pump Room - Typical heating water supply and return piping with gauges.



Pool Pump Room - Boarded-up outside air louver.