

ONTARIO SCIENCE CENTRE CLOSURE: AN ANALYSIS

Science Centre Doesn't Require Full Closure: Engineers' Report

On Friday, June 21 at 4 pm, the Ontario government announced that the Ontario Science Centre's landmark 1969 building, by Japanese-Canadian architect Raymond Moriyama, would be closed immediately and permanently. The closure follows on a provincial announcement last year that the Ontario Science Centre would relocate to a new building at Ontario Place, and its present site redeveloped with housing. However, the Science Centre was expected to continue operating at its current site until the new facility was complete, around 2028.

The Province cited an engineering report by Rimkus to justify the sudden closure years ahead of schedule, saying that the report found "serious structural issues with the Ontario Science Centre building." While these issues would not be expected to materialize until the winter, according to Infrastructure Ontario, the intervening months were needed "for staff to safely vacate the building."

But a deep dive into the engineering report reveals a different story. It suggests that the building's key exhibition areas could continue to operate safely for years to come—even if the Ontario government chooses not to invest in any structural roof repairs this year.

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NO.	ISSUED FOR:	DATE (Y-M-D):
1.	OBSERVATION REPORT #1 PROGRESS UPDATE	24-01-12
2.	OBSERVATION REPORT #2 PROGRESS UPDATE	24-01-19
3.	REVISED AS PER CLIENT COMMENTS	24-01-30
4.	OBSERVATION REPORT #3 PROGRESS UPDATE	24-02-05
5.	DRAFT ASSESSMENT REPORT SUBMISSION	24-03-01
6.	OBSERVATION REPORT #4 PROGRESS UPDATE	24-03-20
7.	DRAFT ASSESSMENT REPORT RE-SUBMISSION	24-03-27
8.	REVISED AS PER CLIENT COMMENTS	24-05-13

PROJECT:

**ONTARIO SCIENCE CENTRE
770 DON MILLS ROAD,
NORTH YORK, ON
BLDG. C RAAC PANEL ASSESSMENTS**

CLIENT:

INFRASTRUCTURE ONTARIO

ABOVE The engineers' drawings indicate that Infrastructure Ontario had a draft assessment report in hand on March 1, 2024—contradicting the agency's claim that they had received the report in June and acted quickly to impose an emergency closure.

The issue at stake is the presence of Reinforced Autoclaved Aerated Concrete (RAAC) roof panels, sold under the brand name Siporex, which make up 57% of the Science Centre's roofs. A popular material in Ontario from the mid-1950s to mid-1970s, the lightweight panels were made from an aerated blend of sand, Portland cement, and aluminum.

However, concerns have been raised that the panels have an overall reduced robustness compared to steel decks or traditional concrete, especially if there are leaks in the area. It's a known issue—over the past decades, the roofs of the Ontario Science Centre have been monitored and sections of the RAAC roof panels have been replaced with steel decking.

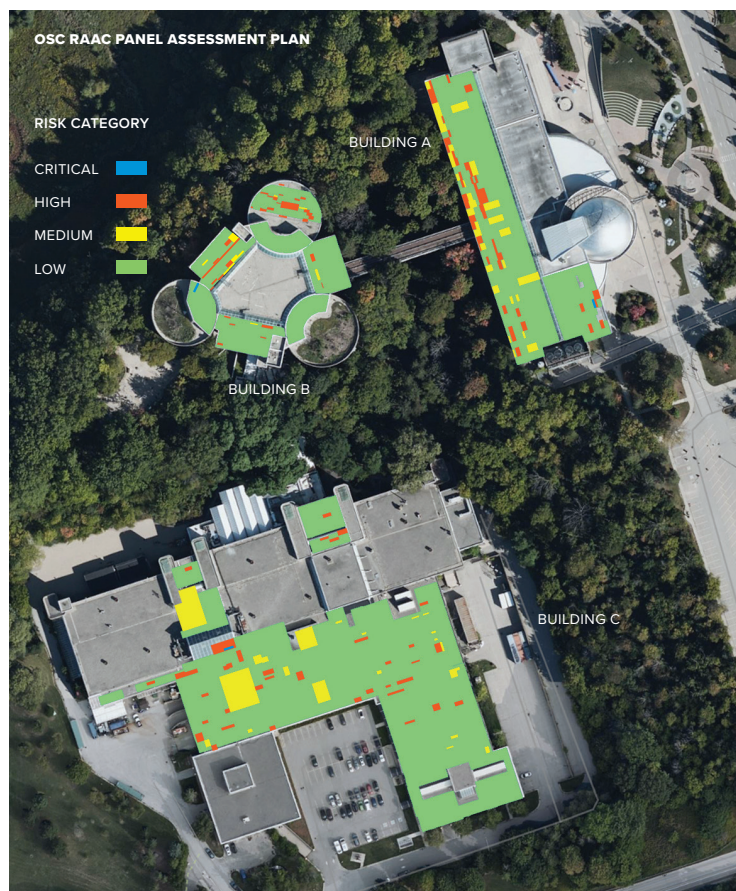
Rimkus's report is a comprehensive, panel-by-panel visual assessment of all accessible RAAC roof panels in the facility. It recommends a staged approach to addressing the RAAC issue once and for all: by removing and replacing all remaining RAAC panels with steel deck roofs, mostly when they come up for regular scheduled renewal over the next 10 years.

In assessing the panels, Rimkus found that a total of six of the 18-inch-wide, 5- or 10-foot-long RAAC panels in the facility were in what it deemed "critical" condition. These were reported as soon as they were identified, and all of these panels have been shored or are in the process of being reinforced.

Rimkus assessed a number of additional RAAC panels as being in "high risk" condition, and recommended that these be reinforced or replaced before the next snow season begins at the end of October, when an exceptionally large snow load could compromise the panels. In total, the "high risk" and "critical" condition RAAC panels constitute less than 2.5% of the Science Centre's overall roofs.

The remediation of these "high risk" panels is estimated to take at least three months per building—and floor areas directly beneath the high risk panels would "need to be treated as construction zones within the building," according to the report.

However, this doesn't mean closing the building entirely: it means restricting access or erecting barrier walls to eliminate pedestrian traffic in the areas directly below the 2.3% of the roof panels being repaired or replaced. The hoarding could be similar to what's currently present inside the ROM, where parts of the museum are undergoing renovation.



At the Ontario Science Centre, the construction would arguably affect visitors even less than at the ROM, because the RAAC panels do not exist above most key exhibition areas.

In the lowest and largest building, facing the Don Valley, the main exhibition spaces are in a part of the building with regular concrete panels on the roof—not the RAAC panels. Areas under the regular roof, which is not in need of repair, including the Weston Family Innovation Centre, AstraZeneca Human Edge, Living Earth, Science Arcade, Hot Zone, A Question of Truth, School Area Learning Centres, and the Valley Cafeteria.

In the trillium-shaped Building B, the highly popular KidSpark and the Space Hall—as well as the Rube Goldberg-esque machine outside of these areas—could also remain open, since they are not immediately beneath a roof, but one level down. The IMAX theatre and entrance, as well, have a different roof type and could remain open with no danger.

There are some areas that would be more affected, but these are largely outside of the permanent exhibition areas. The report notes that the Science Centre's in-house workshop would need to pause operations for the repairs to be completed, since that area includes large machinery that couldn't be easily moved out of the way for repairs.

The most notable temporary closure would be of the Great Hall, where special exhibitions are hosted; the special exhibition space at the lowest level may also need to be temporarily, partially closed. From what is shown on the drawings, the Rock Paper Science hall—a space that is currently only sparsely populated with a handful of exhibits—is the only permanent exhibition area that may require partial, temporary closure to accommodate repairs.

The Rinkus report acknowledges that getting the first wave of needed repairs done by October 31 may be challenging. So, it offers some alternate options for maintaining public safety. You could install temporary



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reinforcement for the panels, it says, or horizontal hoarding below the panels. The absolute safest option, it notes, would be to close the areas immediately below the less than 2.5% of roofs with high-risk panels, to stop people from walking in these areas.

Since the areas with high-risk panels are largely above non-exhibition areas, this means that even if there was a need to delay roof repairs past October 31, the Ontario Science Centre's permanent exhibitions could remain safely open to the public.

In short, whether the roofs will be repaired or not, there is no material in the engineering report that calls for the complete closure of the Science Centre, either now or even by the October 31 deadline. Those repairs should be made, of course, presuming there is the intent to keep the building functional in some way in the future—but the idea that a life safety issue requires complete closure of the centre is false. If the repairs take longer than the fall, the construction hoarding can stay up, and this solution is judged by the engineers to “completely eliminate the risk to public or staff.”

The timing of the sudden closure of the Ontario Science Centre on June 21 also seems to have been calculated, rather than resulting from a newly received report. Officials with Infrastructure Ontario said they had received the report detailing the building's structural roof issues in the week of the announcement, and made the decision to close the building “as quickly as we could move.” However, the drawings included with the engineers' report indicate that Infrastructure Ontario had received progress updates about Rimkus's roof assessment as early as January 12, 2024, and that it had a draft assessment report in hand on March 1, 2024—almost four months before the June 21, 2024 announcement of the immediate closure.



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A Costly Plan for Temporary Relocation

On Monday, June 24, 2024, just three days after the closure of the Ontario Science Centre's sudden closure, the government's search for a temporary location for the facility began. Infrastructure Ontario put out a Request for Proposals (RFP) for a 50,000 to 100,000 square foot commercial/retail space to house a temporary Science Centre until its planned new facility at Ontario Place is complete.

The temporary location, which would not be open until 2026, will put the Science Centre in a location that is significantly smaller—and likely much more remote—than its current site. It will be there for up to eight years until the new facility at Ontario Place is open.

Ironically, relocating to a temporary location will also be at least as expensive—and up to three times more costly—as making the \$22 million in roof repairs which Infrastructure Ontario cited as the reason for the Centre's abrupt closure. The option that best serves Ontarians (and the one that may also prove the most economical) appears to be making repairs to the Science Centre, and reopening it.

The RFP for the relocation initiates a search for a space that the document says will take up to 12 months to fit-out, with a subsequent move-in date as late as January 1, 2026. In theory, the document implies, the renovation of a space could happen more quickly and the move-in date could be sooner, but the reverse is more likely the case: for a project of this size and scope, 18 to 24 months would be a more realistic schedule.

Even if the project moves exceptionally quickly, it means that Toronto would have no Science Centre for at least a year and a half, and more likely over two full years.

The RFP's terms also suggest that a new, smaller Science Centre would not be completed until 2030, or perhaps as late as 2034—not the 2028 date that has been publicized. This is apparent from the RFP's ask for a five-year lease starting as late as January 1, 2026, with the option to terminate the lease anytime after the fourth year, and to renew the lease for up to three years.

What would a temporary Science Centre look like? Overall, the new space will be a fraction of the current Science Centre's 568,000 square feet—possibly less than a tenth of its overall size.

The current Science Centre has been critiqued for having a small ratio of exhibition space to overall space, at around 25%. An environmental scan commissioned by the Province from Lord Cultural Resources says that the median ratio of exhibition-space-to-building-space for science centres in North America is somewhere between 39 to 45%. At the most efficient end, the exhibitions in the temporary location may occupy 22,400 to 44,800 square feet of space. That's a 61 to 85% reduction from the 153,360 square feet of exhibition space in the current location of the Science Centre.

While the RFP states a preference for a downtown, central location, the reality is that its requirements—a very large, high ceilinged building, with up to 500 parking spots, a bus drop-off, a freight elevator and loading dock, and the ability to accommodate up to 5,000+ visitors in peak periods—make a remote location more likely. It's probable that the location will be at the edge of TTC boundaries. An empty big box store might fit the bill, out near Kipling or Vaughan stations, or up by the zoo in Scarborough.

According to The Toronto Regional Real Estate Board, the average commercial/retail lease rate in Toronto is \$29.08/square foot, meaning that annual rent on such a space, depending on its size, would be around \$1.5 million to \$3 million per year—\$6 to \$24 million over the four to eight year term of the lease.

Preparing such a space will be expensive. I spoke with an architect familiar with this project type, who estimated that bringing an empty commercial space up to public museum standards would cost from \$200

to \$300 per square foot, depending on the base building conditions, for a total of \$10 to \$30 million. If the government settled on a large industrial space, it would be especially costly to bring this up to public assembly standard, with modifications needed to meet requirements including fire code, exiting, floor loading, and HVAC. According to the industry expert, the cost could be as much as \$400 per square foot—\$40 million in all—if the location was a large, empty industrial shell building.

Standard practice would be to budget 12% on top of this, to cover the consultant fees of architects, engineers, project managers, and others involved in delivering the project, and to include a 10% cost contingency. This adds \$2.2 to \$8.8 million more.

The move itself is expensive, too—Infrastructure Ontario estimates that a single move to the smaller facility at Ontario Place would cost \$4.9 million; a temporary space will mean paying for that move twice over. Since not all of the exhibitions could be shown in the temporary space, storage would also need to be arranged for a substantial amount of material. TRREB reports that the annual industrial lease rate in Toronto is \$16.90 per square foot. Assuming that the contents of the remaining 500,000 square feet or so of building could be packed into a 20,000 square foot space, this would add up to half a million dollars in annual storage costs.

This back-of-napkin math brings us to a one-time cost of \$17-55 million dollars, plus \$8 to \$28 million in rent, depending on the size of the temporary space and the length of the lease—\$25-\$83 million in all.

Ironically, the space that best meets all the needs of a temporary location, including the RFP's stated preference for a space that enables the Science Centre to "open more quickly," is almost certainly the Ontario Science Centre's current location on Don Mills Road.

It's centrally located, and on the doorstep of the Eglinton LRT.

The complex's lower building, Building C, alone contains 273,465 square feet of space, including almost all of the Science Centre's permanent exhibitions. As I have written in my analysis of Rimkus's engineering report on the roof, these permanent exhibitions are under a section of the building with a standard concrete roof.

RAAC roof does exist over the current temporary entrance to the Science Centre, and a temporary exhibitions hall. This area includes 11 RAAC panels classified as being high-risk, and a 2,500 square foot section of roof that is recommended for replacement in the coming year, as its EPDM membrane is in poor condition.

The cost to fix these areas? About \$450,000, according to the Rimkus report. For an additional \$17,200, the report details, you could also replace the three high-risk panels over an area that connects to the remaining permanent exhibition areas and school spaces on the balcony level of Building C, and to the permanent exhibition areas in Building B—the popular Space Hall and KidSpark. The latter, the engineering report suggests, can safely remain open as they are not directly under the roof, but one level down. Likewise, the Ontario Science Centre's full IMAX theatre, along with its entrance atrium, could remain open.

The RFP says that "IO is evaluating several alternatives and cost is a critical issue. Please specify any concession package to be provided by the Landlord (e.g. free rent, Tenant Improvement Allowance, etc)." The existing Science Centre is already fit-out and owned by the province, and rent on the land will continue to be a bargain at \$1 a year.

As for timing?

A new location for a smaller, temporary Ontario Science Centre in a different location will likely take two years to materialize.

The existing location was closed within a single day. It could be reopened just as quickly. ▲▲

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