



To: General Purposes Committee **Date:** June 10, 2015
From: Jane Fernyhough **File:** 11-7000-09-20-201/Vol
 Director, Arts, Culture and Heritage Services 01
Re: **Minoru Complex Aquatic Centre Public Art Concept Proposal**

Staff Recommendation

That the concept proposal and installation for the Minoru Complex Aquatic Centre public artwork by artists Germaine Koh and Gordon Hicks, as presented in the report titled "Minoru Complex Aquatic Centre Public Art Concept Proposal" from the Director, Arts, Culture and Heritage Services dated June 10, 2015, be endorsed.

Jane Fernyhough
 Director, Arts, Culture and Heritage Services
 (604-276-4288)

Att. 2

REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Capital Buildings Project Development Recreation & Sport Services	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: 	APPROVED BY CAO

Staff Report

Origin

At the October 14, 2014 Council meeting, Council formally endorsed the Minoru Civic Precinct Public Art Plan as the guiding plan for public art opportunities in the Minoru Civic Precinct, including the proposed Minoru Complex.

This report presents the artwork concept proposal for the Aquatic Centre commission, a significant artwork to be integrated into the natatorium of the Minoru Complex.

This report supports Council's 2014-2018 Term Goal #2 A Vibrant, Active and Connected City:

Continue the development and implementation of an excellent and accessible system of programs, services, and public spaces that reflect Richmond's demographics, rich heritage, diverse needs, and unique opportunities, and that facilitate active, caring, and connected communities.

Analysis

Minoru Civic Precinct Public Art Plan Vision for Aquatic Centre Artwork

The vision for the Minoru Complex is to be an exceptional, sustainable, accessible, synergistic and connected centre of excellence for active living and wellness. The public artwork for Aquatics supports the broader project goals and guiding principles by

- contributing to a sense of place;
- creating artwork of the highest quality;
- reflecting the principles of sustainability; and
- achieving synergies between the design team, the artists and the community.

Terms of Reference – Minoru Complex Aquatic Centre Artwork

The Public Art Terms of Reference for the Minoru Complex Aquatic Centre public artwork (Attachment 1) describes the art opportunity, site description, scope of work, budget, selection process, design schedule and submission requirements. The Terms of Reference were reviewed and endorsed by the Public Art Advisory Committee on September 16, 2014. An artist call for submissions was issued on November 3, 2014, with a deadline of December 1, 2014. Eligibility was for professional artists residing in Canada.

Minoru Complex Aquatic Centre Artwork - Public Art Artist Selection Process

On December 16, 2014, following the administrative procedures for artist selection for civic public art projects, the selection panel reviewed the artist qualifications of the twenty nine artists who responded to the Open Call to Artists and shortlisted two artists.

Members of the selection panel included:

- Bruce Grenville, Senior Curator, Vancouver Art Gallery
- Christine McLaren, Urban Design Journalist
- George Rammell, Artist/Educator
- Shengtian Zheng, Artist/Independent curator
- Thomas Xue, Community Representative, Richmond Rapids Swim Club

Recommended Artist

Following the presentations and interviews of the two shortlisted artists, the Public Art Selection Panel reached a consensus and recommended artists Germaine Koh and Gordon Hicks for the Minoru Complex Aquatic Centre public artwork. The Public Art Advisory Committee supports the Selection Panel's artist recommendation. The artists and City staff engaged a group of nine staff and community stakeholder representatives in a consultation meeting on February 12, 2015, to introduce the artists, discuss the artists' past work, and engage community representatives and staff in identifying aspirations and potential operational issues associated with the natatorium for the artists to consider while developing the artwork.

Recommended Public Art Concept Proposal

The proposed location for the artwork will be in the main natatorium, suspended from the ceiling above the leisure pool area. The artwork will assist in defining a distinct aesthetic between the meditative, soothing environment of the hot tub/sauna area and the fun, exciting environment designed for children. The artwork is entitled "Errant Rain Cloud" and is in the form of a suspended sculptural rain cloud. Every few hours a brief, gentle rain shower will fall from the cloud into the pool. The rain cloud mimics the natural sun-powered water cycle of the atmosphere, at a very local scale and creates a sense of occasion. This might be reinforced with a signalling feature, perhaps using LEDs within the sculpture to create a glowing effect, which builds anticipation by indicating that a shower is imminent.

The artist describes the artwork as follows:

"The rain cloud brings a whimsical element to the pool area, and also illustrates the natural cycle of water in our atmosphere."

Attachment 2 provides further information about the proposed artwork.

A technical review and coordination phase with the architect-led design team will be included with the design development phase of the artwork. A small scaled prototype of the artwork mechanics will be created and located in the existing Minoru Aquatic Centre to monitor performance and durability of materials. The artists, City staff and design consultants will continue to meet to review construction coordination and implementation budgets. Maintenance of the artwork will be the responsibility of the Public Art Program.

On May 19, 2015, the Public Art Advisory Committee reviewed the concept proposal and enthusiastically endorsed the "Errant Rain Cloud" artwork, noting that it will add a whimsical and fun experience for the users of the Aquatic Centre. The Committee also supported the

proposal to build a prototype and test the mechanical components of the work in the existing Minoru Aquatic Centre.

Financial Impact

There is no new financial impact for this project.

The total public art budget for the Minoru Complex Aquatic Centre public artwork is \$100,000 funded out of the approved Major Facilities Phase I Projects. For this initial project, a budget of up to \$20,000 is provided to the artist for design services. The balance of \$80,000 will be used for fabrication and installation of the artwork including all related artist expenses. Any repairs required to the artwork will be the responsibility of the Public Art Program. City funds for maintenance would be allocated out of the Public Art Program's annual operating budget.

Conclusion

The new Minoru Complex facility represents an opportunity to integrate public art to enhance the identity and vibrancy of the Minoru Civic Precinct. This initiative also supports the Richmond Arts Strategy's 2012-2017 recommended action to broaden the diversity of arts experiences and opportunities in the City, through strengthening and fostering the connection with civic recreation facilities.

Staff recommend that Council endorse the proposed concept and installation of the Minoru Complex Aquatic Centre public artwork, entitled "Errant Rain Cloud", by artists Germaine Koh and Gordon Hicks, as presented in this report.



Eric Fiss
Public Art Planner
(604-247-4612)

- Att. 1: The Public Art Terms of Reference for the Minoru Complex Aquatic Centre
- 2: "Errant Rain Cloud" Concept Proposal

REQUEST FOR QUALIFICATIONS

MINORU MAJOR FACILITY PUBLIC ART COMMISSIONS

- ENTRIES & ARRIVAL ZONE
- AQUATIC CENTRE

TWO SIGNIFICANT SITE-RESPONSIVE COMMISSIONS. ARTISTS OR ARTIST TEAMS MAY APPLY FOR ONE OR BOTH; HOWEVER, GEOGRAPHIC ELIGIBILITY IS DIFFERENT FOR EACH OPPORTUNITY.

BUDGET | ENTRIES & ARRIVAL: \$250,000, PLUS APPLICABLE CONSTRUCTION CREDITS

BUDGET | AQUATIC CENTRE: \$100,000, PLUS APPLICABLE CONSTRUCTION CREDITS

[BUDGETS ARE INCLUSIVE OF DESIGN, FABRICATION, INSTALLATION, TRAVEL AND RELEVANT TAXES; A 15% TAX WILL BE WITHHELD FOR US-BASED ARTISTS FOR WORK PERFORMED WITHIN CANADA.]

ELIGIBILITY | ENTRIES & ARRIVAL: OPEN COMPETITION FOR PROFESSIONAL ARTISTS RESIDING IN BRITISH COLUMBIA AND ALBERTA, CANADA AND OREGON, WASHINGTON AND ALASKA, UNITED STATES.

ELIGIBILITY | AQUATIC CENTRE: OPEN COMPETITION FOR PROFESSIONAL ARTISTS RESIDING IN CANADA.

APPLICATION: SUBMISSION OF AN ONLINE APPLICATION IS REQUIRED FOR THIS OPPORTUNITY

DEADLINE: 5:00 PM PST ON MONDAY, DECEMBER 1, 2014

OPPORTUNITIES

The City of Richmond Public Art Program, in partnership with the Minoru Civic Precinct development team and design consultants, is seeking artists/artist teams to create site-responsive artwork for two significant areas within the new Minoru Major Facility (MMF) multi-purpose complex: the Entry & Arrival Zone and the Aquatic Centre.

ENTRY & ARRIVAL ZONE: There are several opportunities related to the entry and arrival zones where public art can welcome and contribute to the sense of place. Because the MMF is a multi-purpose facility, it is important to develop a strong aesthetic that signals entry and provides clarity of the building's internal functions at the entrances. Public art, working in concert with architectural and landscape design, can invite building users towards the services and activity areas they are seeking.

Sequential siting of artwork can create a sense of journey and linked narratives that define each entry as its own unique place and express a visual connection for the visitors and staff who will use the variety of services

in the new building. Positioning artworks within the entry plazas, the selected artist will need to be mindful of the full range of activities and events that need to be accommodated at various times.

One artist/artist team will be awarded the commission with the expectation that artwork elements will be integrated throughout the entry and arrival zones, both exterior and interior. The selected artist/team will determine the concepts for the artwork and how and where to best locate and integrate the art elements, including determining how best to allocate the commission budget.

AQUATIC CENTRE: Many of Richmond's residents learned to swim at the existing Minoru Aquatic Centre and many more generations to come will develop this life skill at the new Minoru Complex Aquatic Centre. The Minoru Complex is a city-wide amenity serving all of Richmond and the Learn-to-Swim program attracts residents, both locally and city-wide.

The aquatic programs involve residents across the life spectrum, from infants and toddlers learning to swim to older adults relaxing in the spa areas that include hot pools, sauna and whirlpool baths. The pool natatorium will be an important architectural space. This environment is all about water, from rainwater collected from the large roofscape, to interactive play features and sparkling reflections from still, deep pools. The public art in this location can help to define a distinct aesthetic between the meditative, soothing environment of the spa and the fun, exciting environment designed for the little learners.

One artist/team will be awarded the commission. The selected artist/team will work with City staff and the design team consultants to determine the best location(s) for artwork elements within the Aquatic service area.

BACKGROUND

The City of Richmond, British Columbia has launched an exciting and ambitious capital building program in the Minoru Civic Precinct to address current and future needs for recreation, sport and other community activities. The Minoru Civic Precinct, in Richmond's City Centre neighborhood, incorporates green space in the form of Minoru Park, as well as a variety of cultural attractions including the Richmond Public Library, Art Gallery and Cultural Centre. The Civic Precinct is also home to sports fields and existing facilities for aquatics and older adult activities.

Embracing the city's vision to build a Centre of Excellence for Active Living and Wellness, the Minoru Civic Precinct capital program will add:

- Construction of a new integrated, multi-purpose complex to house an aquatic centre, older adult centre and space for other recreation and community needs. This 110,000 square foot complex will replace and expand services currently available at existing facilities.
- Construction of a Brighthouse Fire Hall No. 1 that, in addition to being Richmond's central fire hall and headquarters, will also house Richmond Fire-Rescue's administrative offices.
- An upgrade and relocation of playing fields and tennis courts in Minoru Park.

The Guiding Principles adopted by the City Council for the Minoru Civic Precinct reflect the high expectations and will inform forward-thinking design, public art and community-building possibilities: Be

Exceptional, Be Sustainable, Be Accessible, Be a “Centre of Excellence for Active Living and Wellness”, Be Synergistic and Be Connected.

The design team consultants include Hughes Condon Marler Architects (HCMA) and PWL Partnership.

RESEARCH THE CLIENT

RESEARCH THE MINORU CIVIC PRECINCT DEVELOPMENT

RESEARCH THE CITY OF RICHMOND

READ THE MINORU CIVIC PRECINCT ART PLAN

ARTIST SELECTION SCHEDULE*

Deadline for Entry	Monday, December 1, 2014
Selection Panel	Tuesday, December 16, 2014
Finalist Notification	Wednesday, December 17, 2014
Finalist Orientation	Thursday, January 8, 2015
Finalist Interviews	Friday, January 9, 2015

PROJECT DESIGN SCHEDULE*

Design Contracts Issued	January 2015
Research/Conceptual Design	February 2015
Conceptual Design Presentation	March 2015
Final Design/Documentation	March –April 2015 * elements of art integrated into phased tender packages and documentation
Building Construction and Artwork Implementation	Fall 2017

In January 2015, the selected artists or artist teams will receive an initial design contracts equal to 20% of the total commission budget: \$50,000 design for the MMF Entries & Arrival and \$20,000 design for the Aquatic Centre. Following design approvals, the artists or teams will receive an implementation contract. Implementation contract amounts may be augmented by applicable construction credits that will be determined during design development.

*Schedules are subject to change

ARTIST SELECTION PROCESS

One panel will select the artists/teams for both commissions through an open call process coupled with finalist interviews. A selection panel comprised of three art or design professionals, one representative from the Aquatic Centre staff, and one representative from the Older Adult Centre staff will review the applicant’s materials. Representatives from the design team will serve as advisors to the panel. Based on the selection criteria listed below, the panel will select three finalists to interview for each of the opportunities.

The finalists will be invited to an orientation session and interview to discuss past approaches and working methods with the panel and answer questions relating to this type of project. On the basis of the interviews, the selection panel will then choose one artist or artist team for each of the commissions.

The panel reserves the right to make no selection from the submitted applications or finalist interviews.

Out-of-town finalists will be reimbursed for travel and lodging expenses to attend the interview and orientation in Richmond, British Columbia, Canada. If applying as a team, the allowance for travel may not fully reimburse all team members.

SELECTION CRITERIA

The artists/teams will be selected based on the following qualifications/criteria:

- Quality and strength of past work as demonstrated in submitted application materials;
- Strong conceptual skills and an ability to reflect or reveal site context, history and story of place in compelling ways;
- A command of dynamic spatial relationships and an ability to activate high use public spaces;
- Interest in and experience with an integrated approach to developing artworks within architecture or landscape, including coordination and collaboration with project representatives and a mission-driven client;
- Availability to begin work in January 2015.

Additional consideration will be given to submissions from artists who have not received commissions from the City of Richmond in the past three years.

ELIGIBILITY

Each of the two opportunities have different geographic eligibility areas. Applicants may submit for both opportunities, but must meet the geographic eligibility.

- MMF Entries & Arrivals is open to artists or artist teams residing in British Columbia and Alberta, Canada and Oregon, Washington and Alaska, United States.
- MMF Aquatic Centre is open to artists or artist teams residing Canada.

Qualified artists will have proven experience developing integrated artworks, specifically for civic projects. City of Richmond staff and its Public Art Advisory Committee members, selection panel members, project personnel and immediate family members of all of the above are not eligible.

APPLICATION MATERIALS **See application checklist and detailed list below for specific requirements.*

- Statement of interest
- Current professional resume
- Digital work samples



TEL 206.296.7580
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 FAX 206.296.8629
 101 PREFONTAINE PL S
 SEATTLE WA 98104
 WWW.4CULTURE.ORG

ARTISTS APPLYING FOR THIS OPPORTUNITY MUST SUBMIT THE FOLLOWING MATERIALS ONLINE VIA 4CULTURE'S APPLICATION SYSTEM.

VISIT WWW.4CULTURE.ORG/APPLY AND FOLLOW THE APPLICATION-SPECIFIC LINK.

PROFILE — Applicant contact information.

RESUMÉ — Two-page (maximum) current professional resume. Teams should include two-page resumes for all members as one document. PDF format is preferred; Text (.txt) files will also be accepted.

STATEMENT OF INTEREST — 300 words (or less) that explain why the artist/team is interested in one or both of these opportunities and how their practice relates to this project and the posted selection criteria. If applying as a team please address how team members work together in the statement of interest. Please include clearly on a separate line at the beginning of your Statement of Interest: "ENTRIES", "AQUATIC" or "BOTH"

DIGITAL IMAGE WORK SAMPLES — Applicants must submit 12 samples of past work that best illustrate their qualifications for this project. Upload JPG files only; images must be under 2MB, exactly 1920 pixels on the longest side and at least 72 dpi. If applying as a team, the team submits no more than 12 images.

Applicants will be required to list the title, date of completion, medium, and dimensions of each work sample. Applicants are encouraged to fill out the optional fields that include commissioning entity, budget, and project partners. Please provide a brief description (75 words or less) of each work sample.

DEADLINE: REQUIRED MATERIALS MUST BE RECEIVED NO LATER THAN 5:00 P.M. PST ON MONDAY, DECEMBER 1, 2014.

QUESTIONS?

For questions regarding the project and City of Richmond Public Art Program, please contact:

Eric Fiss
EFiss@richmond.ca
 604.247.4612

Elisa Yon
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 604.204.8671

For questions regarding the application process please contact:

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 206.296.4137

Ryan Feddersen
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 206.205.8024

IF YOU NEED HELP WITH YOUR APPLICATION OR HAVE QUESTIONS, PLEASE CONTACT US. PLEASE DO NOT WAIT UNTIL THE DEADLINE TO CALL OR START THE APPLICATION PROCESS.





Germaine Koh + Gordon Hicks
Concept Proposal for Public Art
Aquatic Centre, Minoru Complex

Richmond BC
21 May 2015

Artists

Germaine Koh + Gordon Hicks

Germaine Koh (Vancouver) and Gordon Hicks (Toronto) have worked together regularly since 2002. Koh has been a finalist for the prestigious Sobey Art Award and Hicks is a Professional Engineer in addition to being an artist. Their shared thematic interests include communications and technological systems, the natural environment, social behaviours, and play. Their working methods complement each other: Koh's practice is known for its conceptual origins, while Hicks tends to work from careful study of materials. Both incorporate humour and absurdity in their works. Specifically related to this concept proposal, both have produced works tracking the movements of water.



Koh, GroundWaterSeaLevel
LED poles showing changing tide + ground water



Koh + Hicks, There|Here | Two mechanical doors interconnected over Internet



Hicks, Terrain Study
Water dripping onto clay surface



Koh, Fair-weather forces (water level)
Velvet ropes moving in relation to tide level

Aquatic Centre Public Art

THE NATATORIUM WILL BE THE HEART of the new Minoru Aquatic Centre: a vast, high-ceilinged space containing multiple pool basins, with natural light flooding in from glazed north and south walls and the clerestory windows located between the striking waves of glulam beams that form the ten metre high ceiling.

While the pool will often be filled with frenetic activity, it is also a place for regular users to unfold their daily routines of exercise and socializing. The pool serves as a gathering place for different generations, and is a place formed by daily rituals and cycles.

Our consultation with user groups reiterated that the cyclical and cross-generational use of the Centre is key. As residents grow up and age, the pool will remain a fixture in their lives.

The pool is a gathering place for different generations, a place formed by daily rituals and cycles

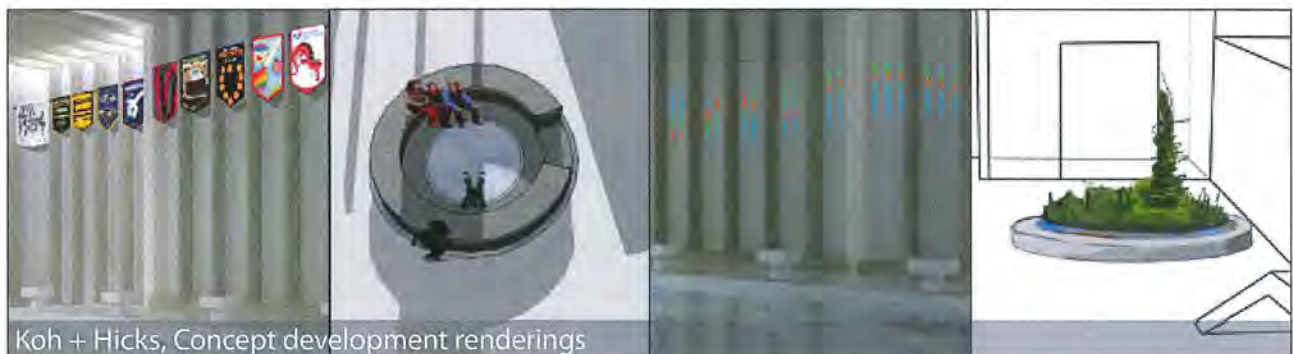
PUBLIC ART PROCESS

Following consultation with user groups, Richmond Archives, and other city staff, we completed two rounds of concept development, presenting a number of ideas to key City staff and building consultants. Arising from that process, we have agreement to bring the following concept forward for approval.

ARTISTS' CONCEPTUAL APPROACH

Our approach has been to address the different types of users of the space, while acknowledging some of the fascinating forces and technologies — machinery, environmental control — at play in the machine that is an aquatic centre. We have approached the project with a long-term view, attempting to conceive a work that will acknowledge the cyclical character of the building's use, its long-term evolution, and the larger human and natural context. Although they are quite distinct, each concept we developed addressed in its own way these slower dimensions of the Centre's life.

Each concept, in its own way, addressed the slower dimensions of the Centre's life



Koh + Hicks, Concept development renderings

Errant Rain Cloud

HOVERING HIGH IN THE NATATORIUM above the leisure pool is a sculptural object in the iconic form of a rain cloud. Every few hours, or perhaps once a day, a brief and gentle rain shower falls from the cloud and into the pool.

The rain cloud brings a whimsical element to the pool area, and also illustrates the natural cycle of water in our atmosphere.

The rain cloud reproduces the natural sun-powered water cycle of the atmosphere, at a very local scale, using the climate of the natatorium. The episodic nature of the rain cycle creates a local sense of occasion. This might be reinforced with a signalling feature, perhaps using LEDs, that builds

anticipation by indicating that a shower is imminent.

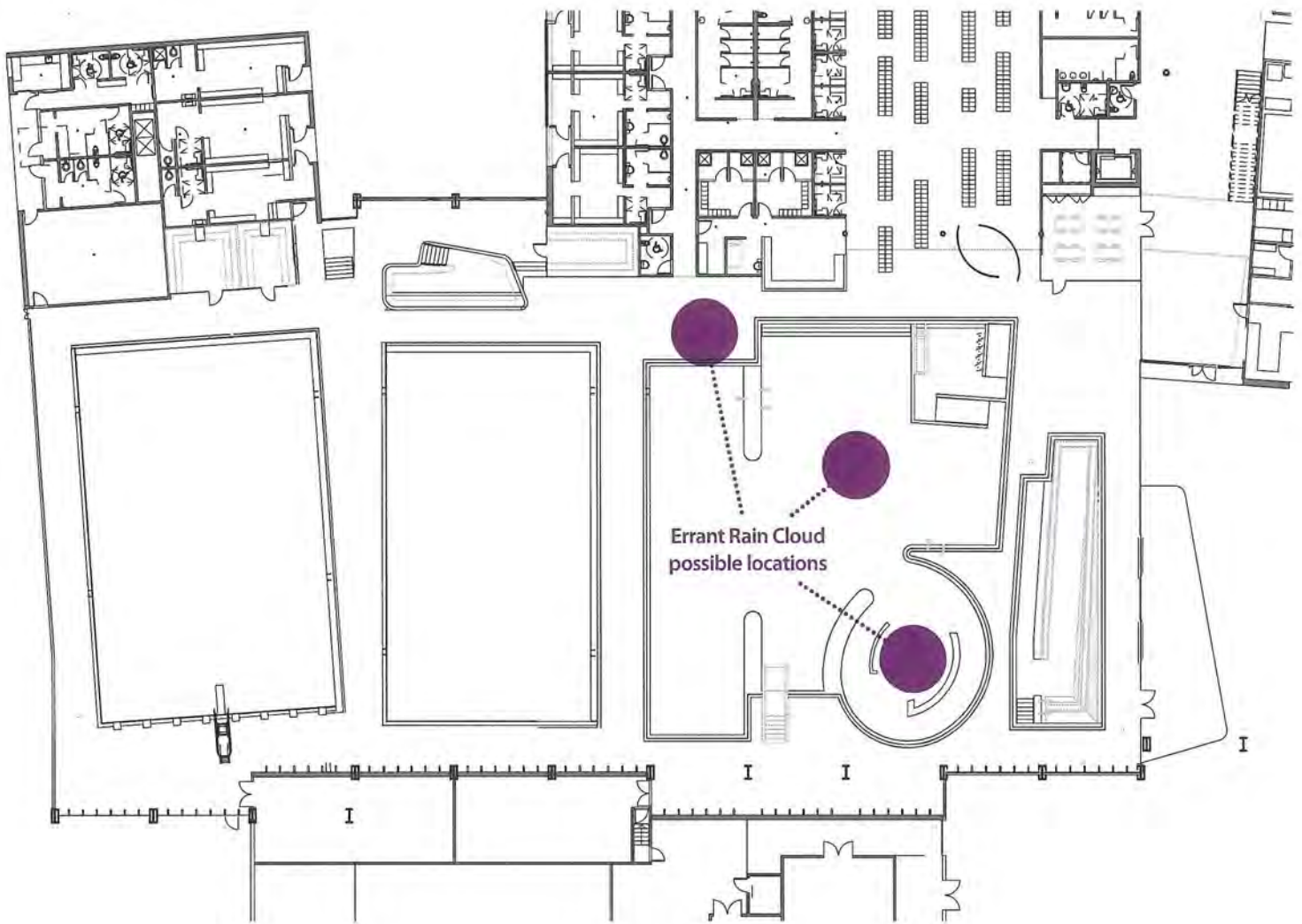
The frequency and duration of the rain shower depends primarily on the amount of sunlight received by a solar panel, to which the cloud is wired. Because the probability of a rain depends on the time since the last shower and on the strength of sunlight at the moment, showers will be more likely to occur in the middle of a sunny day.

The solar panel can be situated to provide a visual tie-in with sunlight coming through the clerestory windows or glazed wall, to make clear the relationship of sunlight to the system. Some information illustrating the natural water cycle will be integrated elsewhere in the pool area.

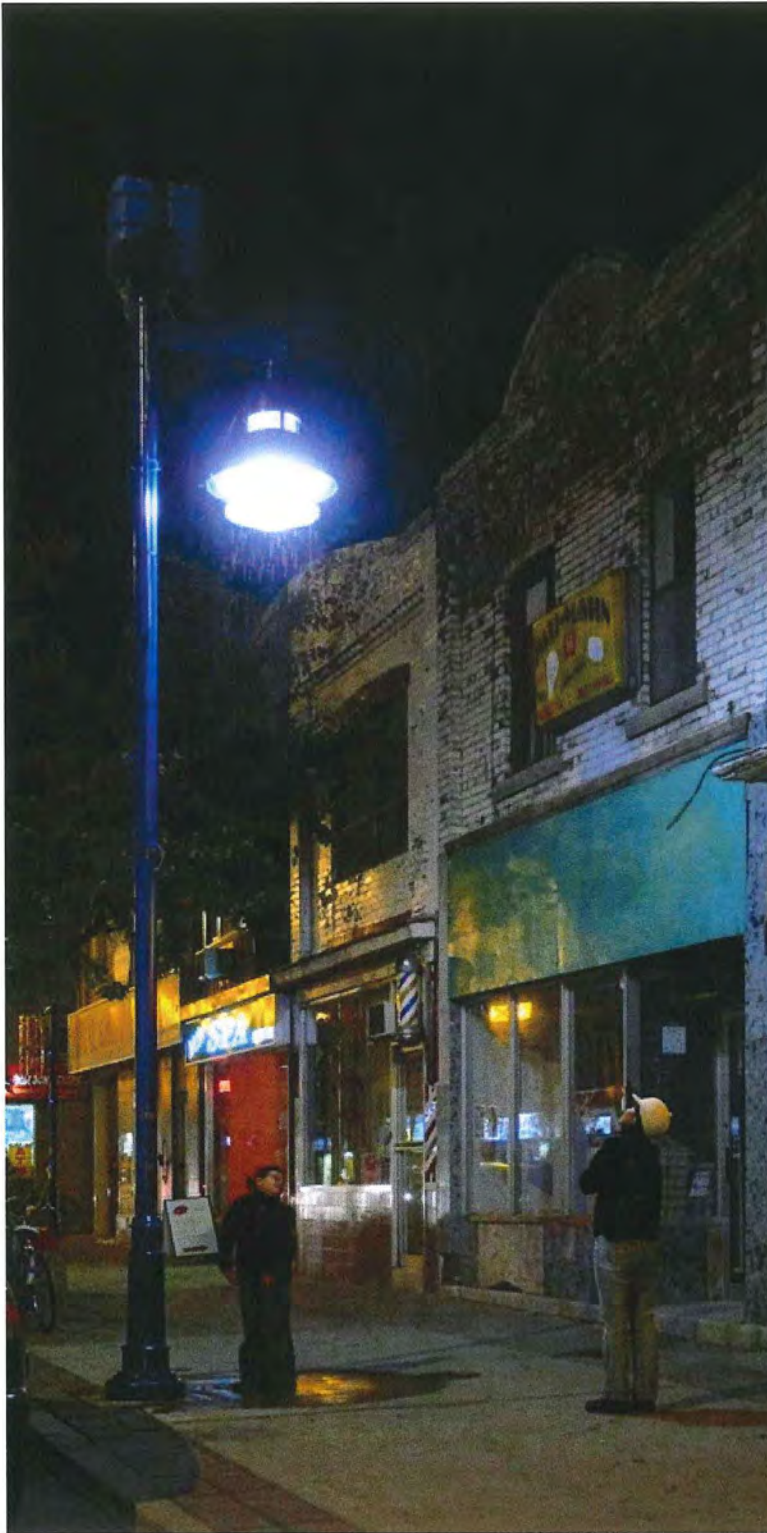


Location

THE RAIN CLOUD is to be installed above the leisure pool basin or deck. Measuring 2-3 metres in diameter, it will be visible from everywhere on the deck, the viewing area, and from outside through the glazing. Exact location will be determined in consultation with the architects during the detailed design phase.



Precedents



The artists have produced rain heads of their own design which have operated continuously for many months in public settings, and the devices have always performed flawlessly.

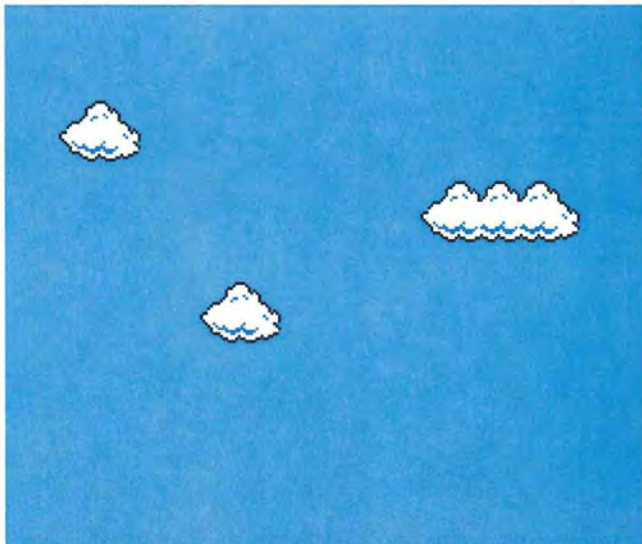
Illustrated: Gordon Hicks, Light Rain Tonight, 2007

References

CLOUDS, represented both realistically and in simplified iconic form, have long served as a symbol of freedom, aspiration, play, and creative thought. A cloud's ever-changing form, subject to larger environmental patterns, is also a reminder of the slow and constantly-changing forces to in the world around us, to which we are connected.



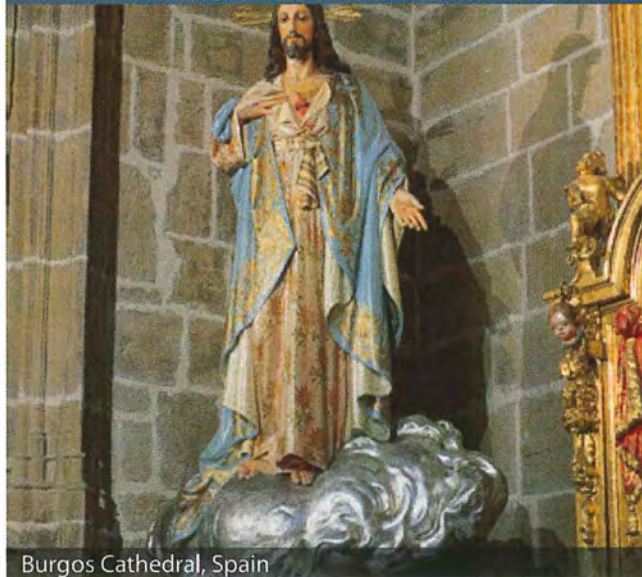
Cloud: Cumulus congestus



Super Mario video game modified by Cory Archangel



Berndnaut Smilde, Nimbus II, 2012



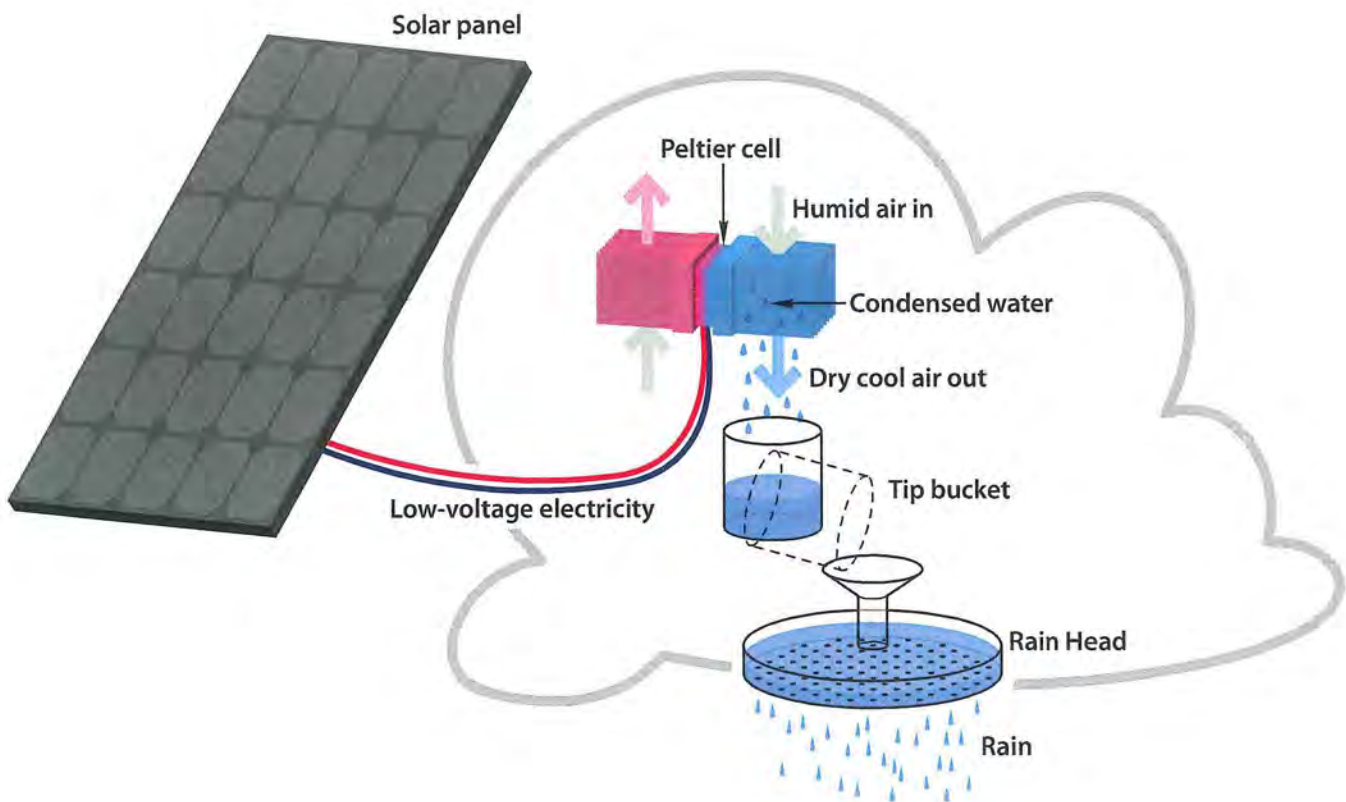
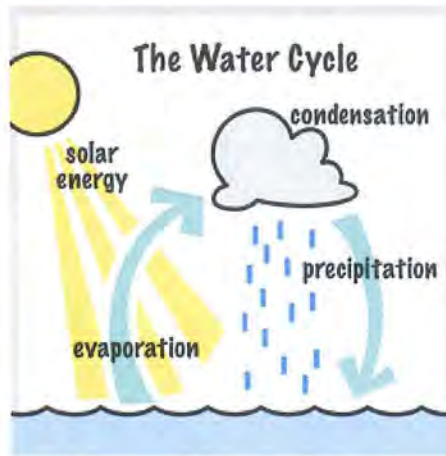
Burgos Cathedral, Spain



John Constable painting, early 19th c.

Principle of Operation

WATER IS EXTRACTED FROM THE HUMID AIR of the natatorium by a solid-state thermoelectric chiller. Low-voltage electricity supplied by a solar panel powers the chiller, and the amount of solar power received is key to the timing of the system. There are no moving parts in the system and the solid-state components are exceptionally reliable. The humid and chemically reactive environment is addressed by careful material selection and protective coatings. Electrical or electronic components are sealed in environment-proof containers. A modular design will allow for replaceable parts.



Technical

SCULPTURAL SHELL

A sculptural shell in the form of a rain cloud is the most visible aspect of the artwork. It is anticipated that the overall mass of the cloud plus internal mechanisms will be less than 100 kg with a greatest dimension of about 3 metres. The shell will be constructed from a polymer-based material selected for resistance to water and corrosion such as fibreglass or moulded plastic. These materials are well understood and are mature technologies used in boat-building and outdoor equipment manufacture. The exact form, material and scale of the shell will be determined during the detailed design phase.



Karim Rashid, "Lava" bench



Vacuum-formed ABS plastic shell

SOLID-STATE DEHUMIDIFIER

At the heart of Errant Rain Cloud is a dehumidifier that extracts water from the humid air of natatorium. It works by cooling the air below the dew point, which in the pool area is a reliably high 15°C, and capturing the liquid water. Cooling is achieved using a Peltier cell, a solid-state semiconductor device with no moving parts and powered by low-voltage DC electricity. Peltier cells are an exceptionally reliable, well-established technology, and are easily available at low cost (less than \$200) from a range of manufacturers. A finned metal heat-sink facilitates the transfer of heat and extraction of water. The heat sink is the only part of the dehumidifier system that is exposed to the air of the natatorium, and will be protected with power-coated enamel or similar surface coating.



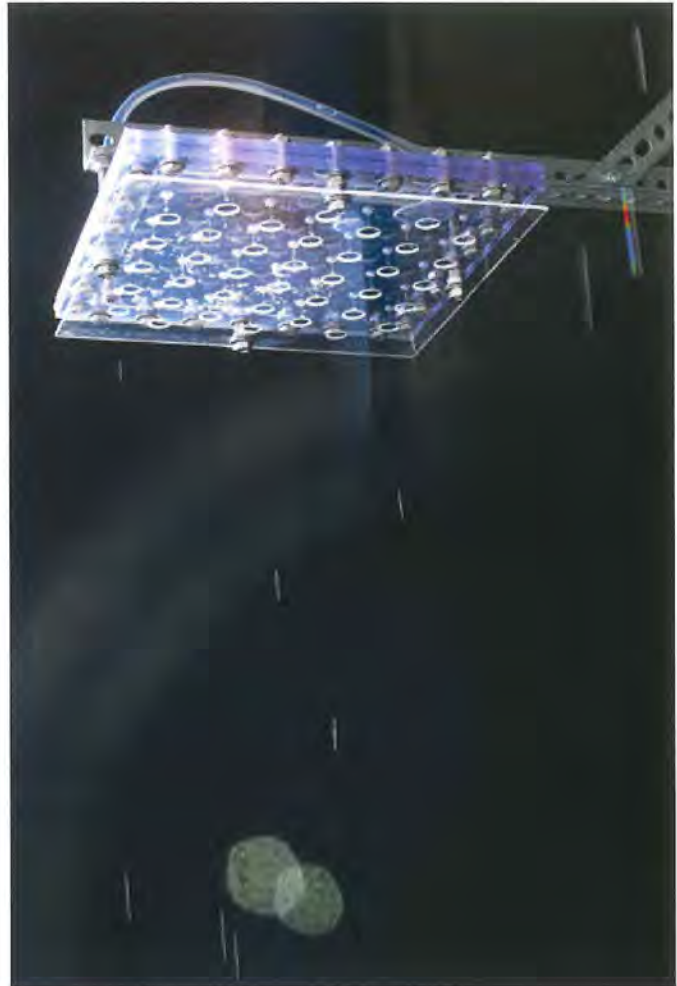
Peltier cell, thermal transfer power 340 watts, 52 x 52 x 3.3 mm

Technical continued

RAIN HEAD

The rain head is designed to emulate real rainfall and differs from a typical spray nozzle in that it generates individual small water droplets of controlled size. It consists of a bank of a few hundred cannulae (small diameter tubes) that are fed water under low pressure. The reliability challenge lies with the small diameter of the tubes and the possibility of clogging from mineralization or water-borne particles. However, in the case of Errant Rain Cloud, the feed water has been distilled from the air and is naturally de-mineralized. A simple water filter captures any particles upstream from the rain head. Because the amount of water that passes the filter is relatively small (less than 200 litres per year) an annual cartridge replacement will keep the filter clear. The individual cannulae are simply replaced with spares should they ever become clogged.

The artists have produced rain heads of their own design which have operated continuously for many months in public settings, and the devices have always performed flawlessly.



Gordon Hicks, rain head prototype



Video of droplets forming in prototype rain head: <http://vimeo.com/album/3392257/video/119480352>

Technical continued

SOLAR PANEL

Solar-voltaic power will be supplied by an off-the-shelf solar panel of the sort that is readily available for home and commercial power generation. Selection will be based on reliability and long life. The placement and exact configuration remain to be determined.



LEDs

The LEDs provide an anticipatory signal that a rain shower is imminent. Low cost, completely weather-proof LEDs are available at low cost, off-the-shelf.



IP68 sealed LED strip

CONTROL ELECTRONICS

The control electronics will be fabricated using highly reliable SMD (surface mount) technology and provided with weather-proof enclosures that completely isolate the electronics from the humid and corrosive environment of the natatorium. Electronics will be engineered very conservatively for reliability. Spare modules will be provided for simple replacement if ever needed.



TIP-BUCKET

Water extracted by the dehumidifier is collected in a tip bucket. When the bucket is full, it over-balances and delivers water to the rain head. The only moving part in the Errant Rain Cloud system, it is simple and reliable.

RIGGING

A cabling system keeps the cloud suspended over the pool. Experts in the discipline of rigging will be engaged to design a reliable, safe and corrosion-resistant system. The rigging will allow the cloud to be lowered and swung over the pool deck for ease of maintenance.

WIRING

Wires transfer low-voltage electrical power from the solar panel to the dehumidifier mechanism. Standard electrical conduit and junction boxes provide the pathway through the building.

ARCHITECTURAL INTERFACES

Anchor points in the natatorium ceiling will be required for rigging. Electrical conduit and junction boxes will run low-voltage electrical wires from the solar panels to rigging attachment points. Solar panels will need to be located and anchored.

Engineering Safe Water

NOTE: The preliminary plan below was presented to Pacific Coastal Health on 14 May 2015. Detailed design plans will also be submitted to PCH for review.

THE ERRANT RAIN CLOUD uses a solid state dehumidifier to collect water directly from the humid natatorium air. Over 24 hours approximately 500 ml of water is extracted and stored. At least once a day the water released as rain, to fall into the leisure pool.

In this public setting, water must be clean and free from biological or other agents that could cause health risk. Methods for ensuring safe water are outlined here.

AIR FILTER: Intake air is filtered through a high efficiency HEPA filter to remove fine particles from the air. Biological and nutritional agents in air mostly travel attached to much larger particles, so removing particles removes a large fraction.



At the low air volumes required, it is expected that the filter can go one year between replacement. (Example shown: Honeywell Media Air Cleaner with HEPA cartridge)

DISTILLED WATER: Water is extracted from the filtered air by, essentially, a process of distillation. This means the water is relatively pure and naturally de-mineralized. This removes one potential source of nutrients for biological agents.



WATER FILTER: Water is filtered through a micropore ceramic filter of the type used for drinking water purification. The flow rate is very slow (a drop or two

at time) so gravity is enough to push water across the filter. (Example shown: Katadyn Siphon)

WATER PATHWAY IS SEALED: The entire clean water pathway is sealed, so that no foreign material can enter. The rain head, at the extreme lower end of the system, does provide tiny openings to the outside world, but the tubules are so small that they retain a tiny capillary plug of water between daily flushing. On an annual basis, the pathway is cleaned, flushed and re-sterilized using specialized line flushing chemicals. (Example of line flushing chemicals: Katadyn MicroPur Tankline)

CHILLING: The sterile section of the water pathway is cooled to below 10°C by the chiller section of the dehumidifier. Low temperatures retard biologic activity. Legionella, in particular, is understood to require temperatures greater than 20°C to grow.

STERILIZATION: As a final step it is possible to sterilize the water with Ultraviolet (UV) light. Mechanisms for small-scale UV water purification, such as those designed for aquariums and wilderness travel, demonstrate the principle. (Example show: Steripen Ultra)



MAINTENANCE: Annual maintenance will be recommended to change filters, re-sterilize the water path and test/inspect the system.

TIME LIMITED: All water passes through the system in 24 hours or less. Ultimately the water falls as rain into chlorinated pool water where biological activity is already rigorously controlled.

Preliminary Schedule

ITEM	DATES		RESPONSIBLE
• Contract Execution	March 2015	✓	Artist, City staff
Phase 1 (Concept)			
• Stakeholder, staff, designer consultation	February-May 2015	✓	Artist, Community stakeholders, City staff
• Preliminary concepts to City staff + consultants	February, May 2015	✓	Artist, City staff, Consultants
• Health department consultation	May 2015	✓	Artist, Pacific Coastal Health
• Public Art Advisory Committee concept presentation	May 2015	✓	Artist, City staff, Richmond PAAC
• Presentation to City Council + acceptance	June 2015		City staff
Phase 2A (50% Detailed Design)			
• Preliminary engineering + location	June-July 2015		Artist, Architect, City staff, Artist's Engineers
• Working design drawings	June-July 2015		Artist
• 50% Detailed Design submission + acceptance	July 2015		Artist, City staff
Phase 2B (100% Detailed Design)			
• Requirements integrated into architectural plans	June-August 2015		Artist, Architect
• Health department review	August 2015		Artist, Pacific Coastal Health
• Engineer-stamped design drawings	August 2015		Artist, Artist's Engineers
• Identify Fabricators, Installer	August 2015		Artist
• 100% Detailed Design submission + acceptance	August-September 2015		Artist, City staff
Phase 3 (Fabrication)			
• Prototype & testing in current Minoru Aquatic Centre	Fall 2015-mid 2016		Artist, City staff
• Fabrication	mid-end 2016		Artist, Subcontractors
• CSA approval	end 2016		Artist, CSA
Phase 4 (Installation)			
• Installation	February-April 2017		Artist, Installer, Consultants
Phase 5 (Completion)			
• Unveiling	mid 2017		Artist, City staff
• Transfer of title	mid 2017		Artist, City staff
Ongoing			
• Annual maintenance	annual		City staff or contractors

Preliminary Budget

Administration	\$9,580	9.6%
Administration: studio overhead, couriers, legal, local travel	\$1,050	
Artist travel: 4 trips YYZ-YVR	\$3,600	
Project administration	\$1,980	
Documentation: visual & technical	\$500	
Insurance	\$2,450	
Creative work	\$17,299	17.3%
Phase 1: Concept development	\$6,970	
Phase 2: Detailed design	\$3,485	
Phases 3-4: Fabrication, installation	\$3,575	
Phase 5: Completion	\$3,270	
Pre-fabrication	\$10,958	11.0%
Detailed design costs: Prototype, testing, incl. shop rental	\$4,215	
Shop drawings	\$743	
Permits	\$0	
Engineering	\$6,000	
Fabrication	\$41,890	41.9%
Fabrication	\$32,500	
Studio rental & labour	\$1,990	
Spare parts	\$4,000	
CSA certification	\$2,400	
Shipping & transport	\$1,000	
Installation	\$12,000	12.0%
Site prep: excludes any site preparation costs to be included in building construction	\$5,000	
Installation	\$7,000	
Contingency	\$8,270	8.3%
10% contingency on budget except artist fees	\$8,270	
	\$99,997	100.0%

NOTES

1. All amounts inclusive of taxes.
2. Budget: \$100,000. Payment schedule: Phase 1 (concept) \$5,000+\$5,000; Phase 2 (detailed design) \$10,000; Phase 3 (fabrication) \$65,000; Phase 4 (installation) \$10,000; Phase 5 (completion) \$5,000.