Placemaking, Craft & Practise

Gardiner Museum Design Build, Toronto
ARCH 684

A pavilion is neither building nor pure experiment. It oscillates between the speculative and the pragmatic.
– Barkow Leibinger

Architecture is not about space but about time.
– Vito Acconel

98% of what gets built today is shit.
– Frank Gehry

School of Architecture
Department of Engineering
University of Waterloo
Winter / Spring 2017

Instructor: Jonathan Friedman, PARTISANS

1. INTRODUCTION

The ambition of the Design-Build Elective is to envision and fabricate an outdoor installation for the Gardiner Museum in Toronto for July 2017 in response to the programme brief outlined below. The temporary site specific installation is intended to animate and activate the semi-public plaza in front of the Museum for a period of 2 weeks, day and night. It will also serve to mark the 50th anniversary of the University of Waterloo, School of Architecture.

The course is designed as a hybrid between design studio, professional practise courses and work term experience. The course aims to lead students from conception of an architectural idea through design development and on to construction. Structured around a real site, budget, programme **the course will bridge urban ideas of placemaking with the intimate act of craft and building.** Students will be involved in the conception and development of the idea, through interfacing with industry professionals (builders, engineers, fabricators) managing a real budget, schedule, life safety and City regulations. The tenants of Vitruvius shall prevail: *firmitas* (solid), *utilitas* (useful), and *venustas* (beautiful).

Throughout the process, students will be expected to become good project managers and successful team members. Evaluation will be based on ambition and design resolution, interpersonal and management skills, and execu-

The Gardiner Museum selected the School of Architecture to participate in their “Community Arts Space 2017” programme, “Art is Change”, with an activation of the forecourt in front of the Museum. This marks the first time that the forecourt has been the site of an art specific installation. The purpose of the installation is to activate the forecourt for 2 weeks in July 2017 using the Museum’s RFP brief (next page) as the starting point. The full brief is included in the Appendix.

Under the overarching theme of “What Makes a Space a Place” and through the conception, design and execution of the installation, students will focus on 3 primary areas of investigation:

1. Urban Placemaking
2. Artifact & Craft
3. Project Delivery

2. DESIGN BRIEF: SITE & PROGRAMME
(Museum RFP Excerpt)

What makes a Space a Place?

ART IS CHANGE
Community Arts Space 2017

"The Gardiner Museum is part of a much larger cultural community in Toronto. Even though its unique history and identity is rooted in the city, its future is increasingly shaped by those beyond the core cultural corridor. As space becomes even more of a premium downtown, the Museum recognizes the urgent need to reach out to communities across Toronto, and demonstrate how the city's strength and growth lies in its multitude of identities.

The Museum's local community of Yorkville was not always a neighbourhood undergoing a condo boom; like many Toronto neighbourhoods it has been transformed over the years by its residents, including a wave of Eastern European immigrants in the 1950s that imported their café culture. Soon after Yorkville became a hotbed of counterculture, once called "a festering sore in the middle of the city." As the Canadian capital of the hippie movement in the 1960s, its bohemian culture nurtured the talents of Joni Mitchell, Neil Young, Gordon Lightfoot, Margaret Atwood, and Dennis Lee. They used their art for social activism, just as so many artists do today.

How can we bring arts activism back to this neighbourhood, and how is art continuing to be used for social justice? What is happening across Toronto with communities and individuals trying to make their voices heard? How do the arts challenge the assumptions we make about each other and our city? Through the act of creating something, how can we bring more inclusivity to Toronto? The Gardiner has a podium and we want you to use it. As a museum devoted to ceramics and clay, we recognize the intrinsic value of making. The personal act of shaping and molding an artwork can go beyond just being for the individual, it can be transformative for society.

Through this project, the Museum is hoping to engage with new audiences, form new partnerships, and showcase the best, most interesting, thought-provoking, and audacious arts programming that Toronto has to offer.

The projects on the plaza must be able to weather the outdoors, entice visitors up the steps of the Museum, not require significant security, and address this year's theme.

The Gardiner encourages applications that also include audience engagement activities—we want the plaza to come to life this summer!"

Excerpt from the RFP brief, Art is Change

PARTISANS & Luminato activation of found space, Hearn Generating Station, Toronto, 2016

SITE & PROGRAMME
1. Urban Placemaking

Architects can't force people to connect, it can only plan the crossing points, remove barriers and make the meeting places useful and attractive. – Denise Scott

Scarcity and Sanctity of Public Space

Many underutilized or hidden spaces exist around the City. For instance, last summer, PARTISANS worked with Luminato to activate the Hearn, and in so doing, helped introduce the City to this relatively unknown incredible space. Through a series of architectural interventions and activations, the space was opened up to the public. What became very important was not only the architectural overlay (to provide the look and feel and safety of the event) but also the activation of the spaces through programming. As architects we chose not to separate the architecture from the activation, but saw the process of bringing people to the spaces as much a part of the success of the project. For instance, we held our book launch for the Rise and Sprawl there, organized a design charrette with other young architects and university students, engaged in a speaker series about the development of the Portlands and future of the Hearn and worked with Luminato to integrate food and drinks into the overall master plan, along with the mandate that the main spaces be free and accessible to the public at all hours.

As a Found space, the plaza at the Gardiner requires careful and deliberate activation, drawing from it's immediate site in front of the Gardiner Museum Ceramics, as well as the surrounding context, including the layered and storied neighbourhood of Yorkville.

a Space becomes a Place when it resonates in the memory & imagination. . . when a coherent & compelling story emerges.

SITE & PROGRAMME
1. Urban Placemaking

Furthermore, over the past 20 years, Toronto's downtown core has been dramatically shaped by condo development. In a recent book entitled "Rise and Sprawl" on this very subject, PARTISANS along with architectural critic Hans Ibelings argue that the public realm has suffered significantly with a lack of meaningful and provocative public spaces emerging in the wake of condominiumization. The condo boom of the last 20 years has wreaked havoc with much of the public realm and in particular the spaces at the ground plane that we engage with every day.

Compared to many cities, such as Barcelona, Rome, Copenhagen, New York, Montreal, Toronto does not have a robust infrastructure of public space, nor the culture to demand better public spaces. Consequently, meaningful shared spaces in Toronto for the public to gather informally and formally, are scarce. The examples of good, thoughtful and well-used public spaces in the city are relatively few - Cloud Gardens, Yorkville Park, Kensington Market are examples of vibrant and wonderful active public spaces. Sadly though, many new urban spaces that have been created over the past 20 years are a direct result of the condominiumization of the downtown core. Toronto's streetscape and public areas have suffered tremendously at the hands of poor urban planning, lax rules for developers and no incentive to create better public spaces. The program to create public art in lieu of increased density has afforded developers relative impunity to shape the skylines and ground planes of our city with impunity. The result in most cases are awkward and unpleasant public experiences that in many cases do little to enhance the public realm.

The installation offers students the chance to examine the importance of civic space in light of the recent and ongoing condominiumization of the area. Student have the opportunity to engage directly in the act of City Building: What is the role of public space in the City? How can architectural interventions enhance and activate found public space? How can we build more engaged and engaging spaces? Can city officials and developers, architects and planners be provoked and challenged to provide us with better public space?

Recent condo development, trading public art for density, is no way to build a vibrant public realm.


“Cultures and climates differ all over the world, but people are the same. They will gather in public if you give them a good place to do it.”
Jan Gehl, Architect

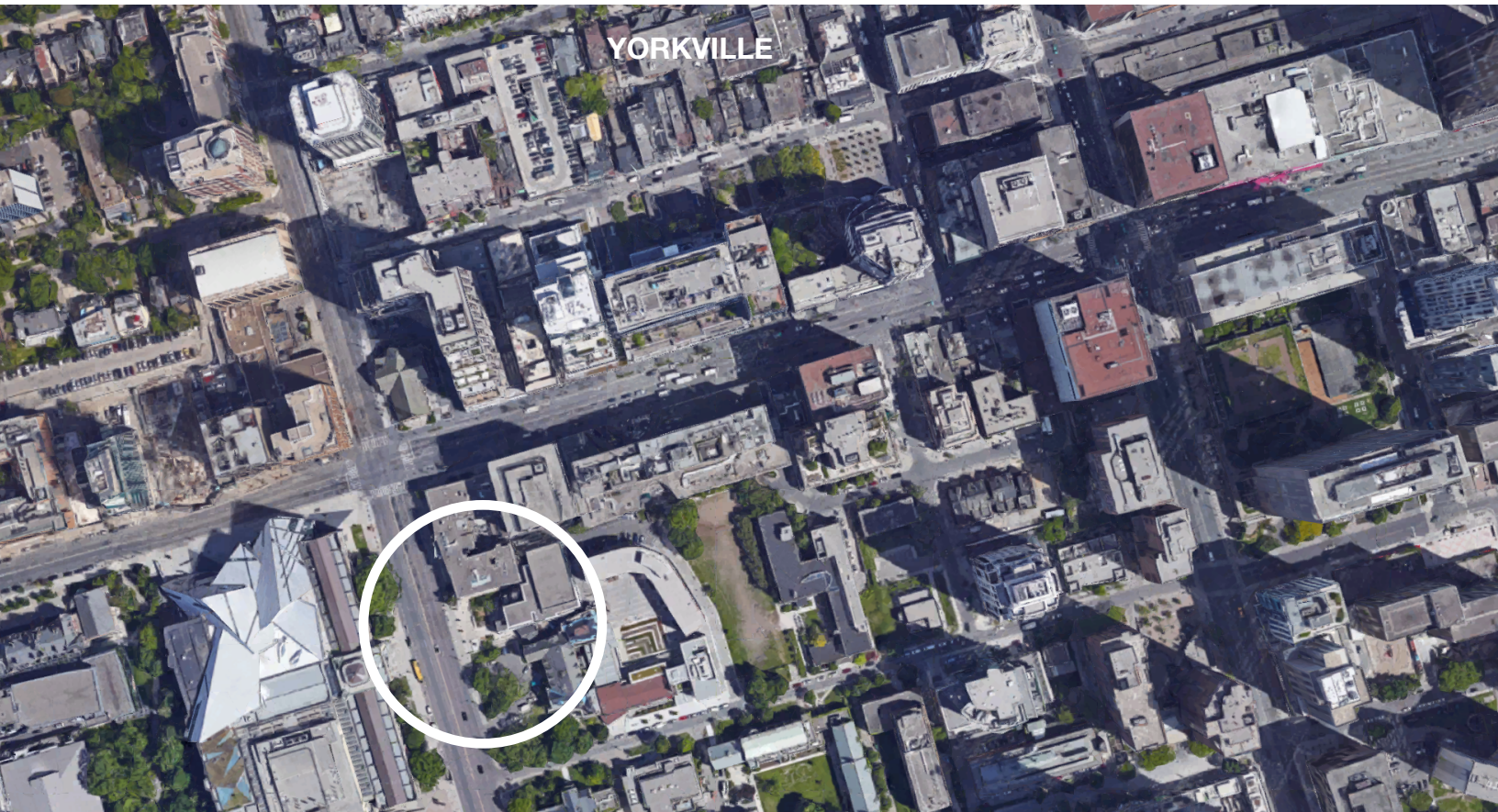

VICTORY
DOWN COLD.

Cloud Garden

Kensington Market

Yorkville Park

What makes a Space a Place?

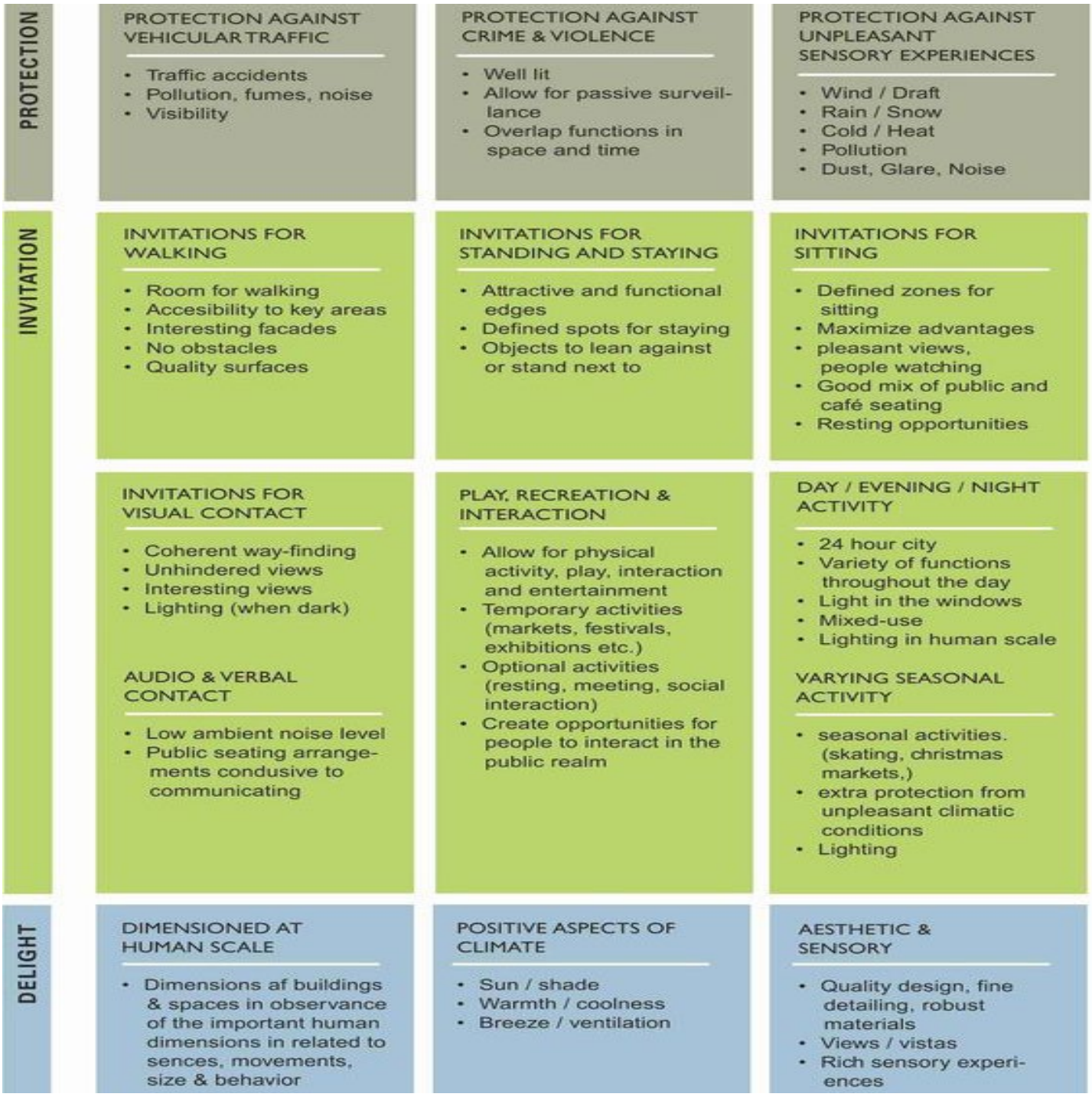


SITE & PROGRAMME

1. Urban Placemaking - Success Matrix

The question of what makes successful public space and how to evaulate it, is complex and nuanced. Architect Jan Gehl has identified a detailed matrix of criteria necessary to consider for the successful design of the public realm. These categories provide a relevant set of considerations to design towards. However, for the purposes of this course and to avoid being too prescriptive, the ideas have been reconstituted into a more open-ended series of provocations: Armature, Activation, Phenomenology, and Context. These are the criteria that the installation must successfully negotiate.

Jan Gehl's Criteria for Successful Public Space



Gehl's Notion of Successful Public Space:

Invitation, Delight & Protection

Applies, but criteria gets Reformulated as:

Armature

Built physical armature & apparatus for the activation; Functionality, scale, safety, environmental protection, comfort, adaptability, accessibility . .

Activation

Programming opportunities to use & populate the space; to gather, sit, meander, socialize, eat, drink, be entertained . . .

Phenomenology

Experiential manifestation of light, sound, smell, pattern, texture, form, colour, enclosure, marker . . .

Context

Broader social & geographic relationships, infrastructure, genus locus

SITE & PROGRAMME
2. Artifact & Craft

I call architecture frozen music
- Johann Wolfgang von Goethe

PAVILION TYPOLOGY

"One of the advantages of the pavilion typology is in fact that these structures are temporary, as they create opportunities for testing out ideas very quickly. In a sense perhaps the pavilion is akin to performing a piece of music, as music can only be experienced while you listen or play it at any given moment. The pavilion could in fact be said to behave in a similar way; perhaps because of their temporary nature pavilions provide an experience, and this is in fact the strength of the form. . . .
Moreover, pavilions afford the opportunity not only to test new materials, or material combinations, but also to try out theoretical and conceptual ideas in combination with these more pragmatic elements, sometimes even after the fact.

Excerpt from the Interview with Ben van Berkel
Complete Interview in Appendix A

In addition to important urban questions that the installation raises, the unique setting opens up the dialogue between the making of a place (placemaking) and the making of an object or artifact. Understanding the neighbourhood's unique social and political framework will allow the installation to look outwards to the neighbourhood as a nexus in Toronto, but also looking inwards to the details and craftsmanship of making. The deliberate act of making and craft is especially prevalent given the site of the Museum, an institution devoted to the art and craft of making. And the pavilion as a typology situates students in a canon of speculative and theoretical architecture offering a liberated opportunity to investigate fundamental architectural questions of form & functionality, as well phenomenological ideas about light, shadow, material and time.

The material choice for the pavilion is not restricted at the outset and is meant to open students up to the possibilities at hand and not limit creative ideas. However, the integration of ceramics is an interesting opportunity that we will collectively review. In addition, investigation may involve digital fabrication or investigation of advanced materials, such as 3D printing ceramics. The suitability of this investigation will be filtered through critical factors of buildability, timeframe, budget and student expertise with ultimate direction provided by the instructor on the most appropriate course of action. Again, at the onset, ideas are not to be limited but rather will be filtered through the above criteria at the appropriate stage.

Ceramics are one of the oldest forms human fabrication, with their use dating back to 24,000 BC. There relevance continues today particularly in the realm of technology and building materials, with the development of cutting edge ceramic materials. The broad definition of ceramics involving combining earthen material, forming into a shape and applying heat, allows for a wide range of materials to fall under the ceramics heading, including pottery, glass, brick, terra cotta and cement.


our de ville
Sightseeing
sky


totem


ground

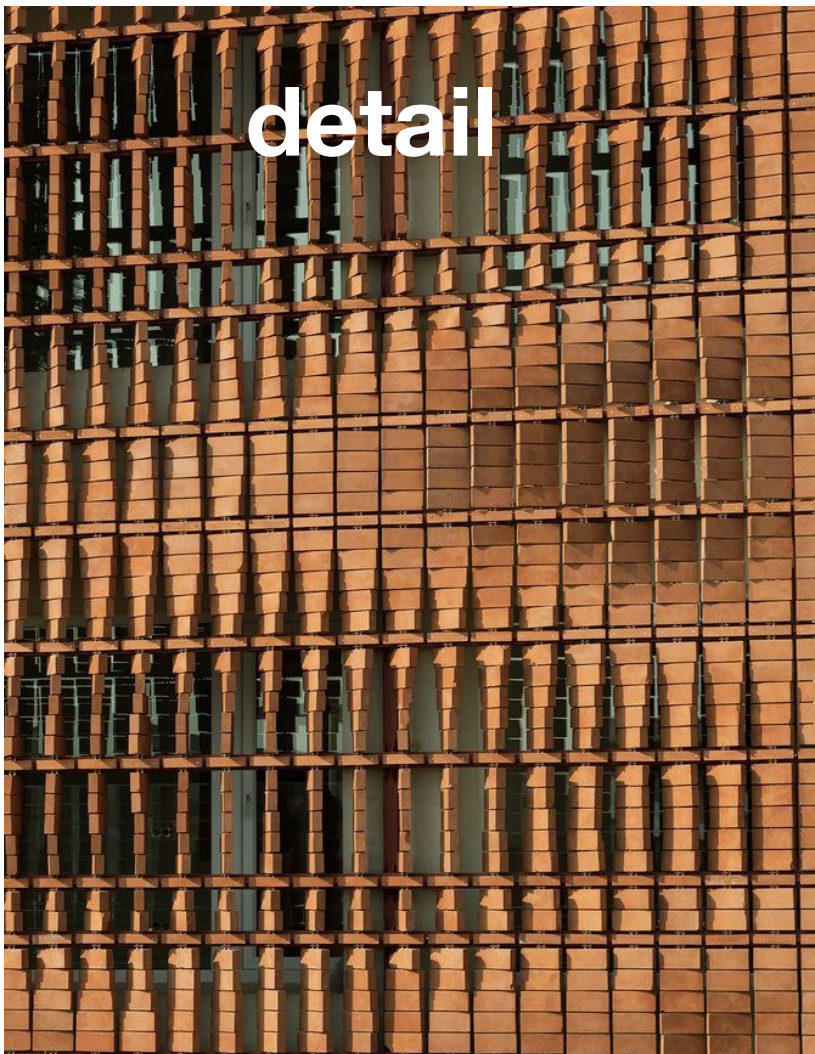

enclosure

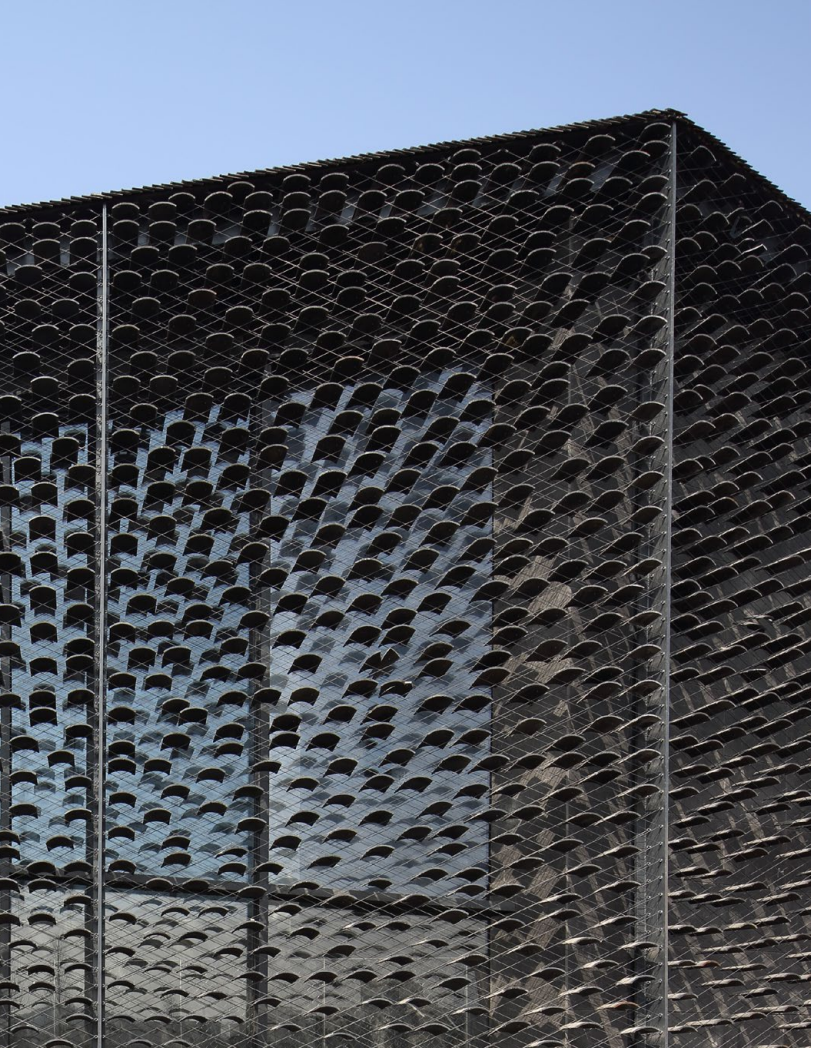
form

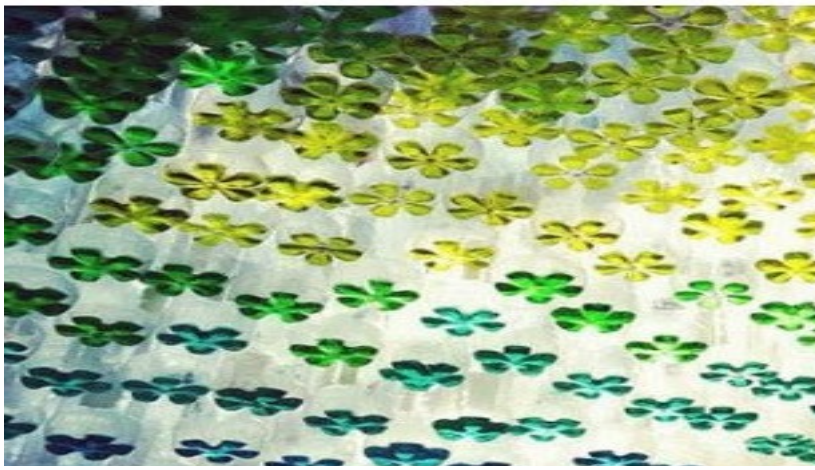

play


pause

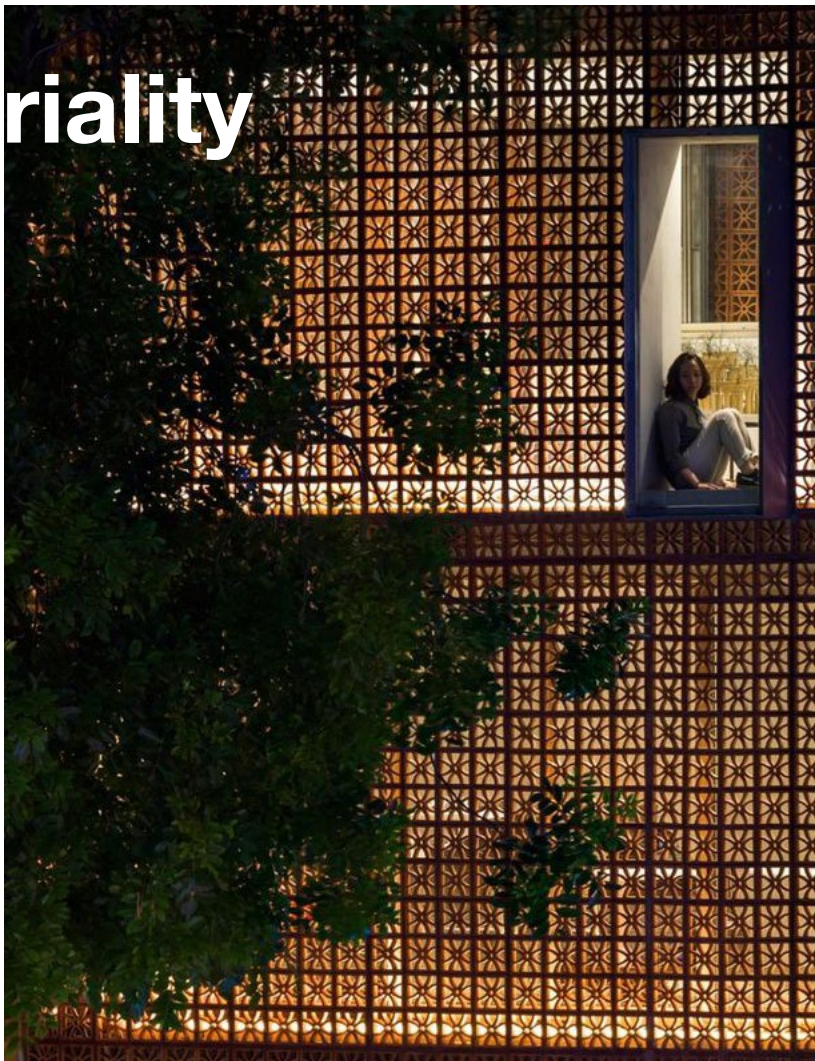

activation


detail





materiality



SITE & PROGRAMME
3. Project Delivery & Execution

Architecture starts when you carefully put two bricks together. There it begins.
- Ludwig Mies van der Rohe

The third area of focus in the course is on project delivery and execution. The course is structured along the lines of a typical real-world design and construction project, to provide students with a hands-on approach to

Conceiving the idea (Schematic Design)
Developing the design (Design Development)
Fabrication and building (Construction)

Students will develop critical skills in design, meeting specific site and programme requirements, timeframe, budget and constructibility. Along the way, students are expected to liaison and coordinate with industry professionals, including fabricators, contractors, engineers & city officials.

Through this process, design, craft and process are united. The business of architecture cannot be undervalued. Project management skills will play a significant role in the successful project. It is not simply enough to conceive of something beautiful and impactful, it must be built! All students have experience in the workplace and know the importance of good project management. Emphasis on teamwork and collaboration are the underpinnings of a successful project. With limited resources, smart and careful planning is required. Budgets and timelines will be developed and monitored.

Furthermore, with a real opening date in July, and the intention for the installation to help celebrate the School of Architecture's 50th anniversary celebration, the stakes to deliver cannot be underestimated.

One of the tenets of PARTISANS, is that activation is seen as part of the architectural proposition. It is one of ways of the ways that we bring value to a project - by thinking not just the spaces and places of human interaction, but also about what those activations might be. Thus, the students have the opportunity to create the armature as well as the programming that may take place.

Efforts will be made to reach out to UW alumni in Toronto for partnerships in the project, such as engineers and fabricators. Furthermore, given the large number of UW grads or students on work term, there may be assistance from the broader UW community closer to the time of the build.

Site

Architectural drawings have been provided by the Gardiner Museum. CAD files and possibly 3D files may be available. The site is primarily located in the top area of the plaza/ forecourt of the Gardiner Museum. The entrance and egress paths must remain free and clear at all times that the installation is in place.

Site safety

Safe methods of construction shall be used. As with any studio course, students are expected to be comfortable working with tools and around a construction site. Closer to construction time, our construction partner will advise on work place safety if required. Steel toe boots, hard hats, safety vests, and protective eyewear will be required during on-site construction.

Site Visits

Students should be prepared to visit the site several times prior to fabrication and then to spend time on site during construction. Students are responsible for making their own way to the site. Carpooling is encouraged.

Permits & City Regulations

Necessary local building codes and city regulations shall be abides by. The Gardiner Museum is investigating if any permits are required and will advise once further information is available. A structural engineer will review the design and inspect the installation prior to occupancy. A liquor license is in place for the front patio. Additional information can be provided. As with any activation, issues of noise, health and safety (safe food handling)

Budget

The University of Waterloo School of Engineering is providing $7000 + HST. The Gardiner Museum is providing $5000 + HST towards the proposal. Additional funding may be available through fundraising efforts by UW School of Architecture, the students and the Gardiner Museum. Students may be called on to assist with fundraising efforts.

Client & Support

The instructor will take on the role as the client, bringing to the table relevant voices, such as the team at the Gardiner Museum, other design critics, builders and engineers as required.

Programme

The programme is outlined above. Additional information including some specific programme requirements will become available from the Gardiner.
In addition to specific programme and site considerations, other important elements of the installation to address:

- Daytime / nightime Activation
    - Opportunities to sit, stand, lie
    - Opportunities to eat & drink
    - Opportunities for performance
    - Opportunities to gather & mingle
- Functionality
- Accessibility
- Accommodation for different age groups
- Lighting
- Shade & Weather protection
- Sound
- Robustness and security
- Economy & buildability
- Off-site fabrication vs. on-site assembly
- Existing landscaping
- Museum layout & Programming
- Budget & timeframe constraints
- Non-permanent attachment to the site
- Synergies
- Fundraising and exhibition opportunities
- Efficient set-up and take down
- The life after the project

Terms

The terms pavilion and temporary structure and installation, the design, the proposal, will be used interchangeably and refer to the project at hand. Students refers to students enrolled in the course.

Course

Some students have expressed interest in the course by offering assistance only. The course has also been opened to non-masters students. Some students may participate more fully in the Winter term, as they have work terms in the Spring and may hve reduced availability. Conversely, some students have more time available during the summer build. Determining tasks and responsibilities will be handled as part of the project management component of the course and will require ongoing adjustment.

Just as in any real world design and construction, not all the information is fully known at the onset of the project - budgets can shift, programme can change, or more information becomes available. Therefore, things can and will change .over the course of the project, so be prepared to be adaptable and flexible.

SCHEDULE
(Subject to Change)

SITE VISIT (Location: Gardiner Museum, Toronto)

Friday Jan 27 Overview / Site Visit & Ceramics Workshop / Lunch with discussion / Site investigation, Documentation

PHASE 1: SCHEMATIC DESIGN (Ideation and coming to a Design Scheme)
(3 Weeks)

Week 1 Jan 31	Course introduction / Housekeeping Preliminary Ideas & Site Analysis Review Deliverable 1 introduced PM duties / Setting up the workback schedule, budget review
Week 2 Feb 7	Deliverable 1 - Part A due Crit /Charrette - Initial Ideas (groups of 2 or individual presentations) Assembly of Coalescences; Working in teams develop further for Part B
Week 3 Feb 14	Deliverable 1 - Part B due Crit Format: Review of Coalescences Determination of a single idea to bring forward Assembly of tasks & teams Deliverable 2 Introduced

END OF SD

Feb 21 -- READING WEEK

PHASE 2: DESIGN DEVELOPMENT (Buildability)
(4 weeks)

Week 4 Feb 28	Deliverable 2 Due: Refined scheme with concepts of constructibility, budget
Mar 7 --	
Week 5 Mar 14	Charrette / Crit Review package with invited builders / engineers
Mar 21 --	
Week 6 Mar 28	Group Seminar DD
Week 7 April 4	Crit Format; DD settled

END OF DD

Student Exhibition at the Gardiner Museum / Opening of Gardiner Renovation - to be confirmed;

END OF TERM

Optional: Prototyping and testing

PHASE 3: CONSTRUCTION DOCUMENTATION, FABRICATION & CONSTRUCTION (Making it all happen!)
(9 weeks)

Week 8	May 2	Group Seminar: Structural / building review / Scheduling / Prototyping
Week 9	May 9	Group Seminar: Construction drawings complete / material ordering
	May 16 --	
Week 10	May 23	Group Seminar: Check in / Review Prototyping & Fabrication / Visiting Fabricators / Consultants / Coordination
	May 30 --	
Week 11	June 6	Group Seminar: Check in / Review Fabrication / Consultants / Coordination
	June 13 --	
Week 12	June 20	Group Seminar: Check in / Review Fabrication / Consultants / Coordination
Week 13	June 27	Group Seminar: Check in / Review Fabrication / Consultants / Coordination
Week 14	July 4 - 7th	ON SITE INSTALLATION
	July 8	OPENING PARTY (to be confirmed)
Week 15	July 9 - 23	Installation remains with events / activation DEBRIEFING - Group Feedback & Reflections - date to be confirmed
Week 16	July 24 - 26	TAKE DOWN

ASSIGNMENTS / DELIVERABLES

Deliverable 1 (A) **"Design Impulses"**	10%
Deliverable 1 (B) **"Coalescences"**	10%
Deliverable 2 **"Design Development"**	20%
Deliverable 3 **"The Installation"**	60%
Total:	100%

Each Deliverable will be assessed on the following basis:

1. Idea
   Insight, originality, ambition & relevance
2. Process
   Depth, breadth of investigation, relevance & originality, Project Management, leadership & interpersonal skills
3. Expression
   Craft, level of detail & refinement, resolution, persuasively presented, coherent

DELIVERABLE 1 - PART A
"Design Impulses"

Due: Tuesday February 7, 6pm
Format: Crit: Brief presentation followed by discussion of ideas.

The objective is to identify themes, insights and responses into the site and programme as a departure point for PART B.

Working individually or in pairs, students are to react to the site, offering their ideas for activating the forecourt of the Museum in keeping with the design brief above.

Deliverable: Sketches, Collages, Renders or Drawings required to effectively communicate your ideas.
Minimum: Site Plan and at least 1 collage
Size / scale is open but must be legible and appropriate for the project.

Note: students are to share resources and documentation from the initial site visit.

DELIVERABLE 1 - PART B
"Coalescences"

Due: Tuesday February 14, 6pm
Format: Crit: Brief presentation followed by discussion of ideas.

Objective: Identifying and assembling shared ideas and responses together will allow for a distillation of the work produced, leading towards a platform for the design intervention.

Working in Groups of 4, students will tackle selected themes, insights and responses developed in PART A.

Deliverable: PDF of work, including individual starting ideas.

Requirements for Deliverables No. 2 and No. 3 will follow.

Appendices

APPENDIX A: Pavilions
Ben van Berkel, UN STUDIO

Time is an inherent characteristic of the pavilion typology; the pavilion most often being a structure of either temporality or semi-permanence. How does this attribute affect the design approach to these constructions?

BVB: One of the advantages of the pavilion typology is in fact that these structures are temporary, as they create opportunities for testing out ideas very quickly. In a sense perhaps the pavilion is akin to performing a piece of music, as music can only be experienced while you listen or play it at any given moment. The pavilion could in fact be said to behave in a similar way; perhaps because of their temporary nature pavilions provide an experience, and this is in fact the strength of the form.

Scale is also an essential quality of the pavilion. What opportunities does this characteristic offer the architect?

BVB: One of the interesting things about the scale of pavilions is that they afford the possibility to experiment with human scale, with proportions directly connected to the human body, but in a structure that is not yet a building, but moreover a space. Here not only can you be directly concerned with routing and movement on a small scale but also with directional aspects, where spatial and physical qualities can be tested and explored. Scale can then become a sort of combining factor or crossing point between the various elements in the whole structure. But what is perhaps of more interest to me is that pavilion design offers the possibility to test the non-existence of a proper scale, or to create a kind of 'scalelessness', where numerous elements are combined in such a way as to experiment with the notion of scale . One example of this could be the pavilion we designed for the Venice Biennale in 2008, 'The Changing Room'. In this structure lines became surfaces, then transformed into a volume. This one fluid gesture carried the qualities of infrastructure and construction, defining how the visitor moved through the structure, whilst the projections on the inside also related to the idea of changing from an external physical space to an internal contemplative space. In this way the pavilion contained the notion that scale could be expanded upon or extruded, and this is for me perhaps the most interesting way to consider and experiment with scale.

In terms of experimentation and innovation, what advantages does pavilion design offer?

BVB: Pavilions provide a kind of prototypical stepping stone or apparatus for ideas and solutions which can later be expanded upon in buildings. The pavilion can perhaps be seen as an aggregation, in the sense that it can form an accumulation of many different architectural ingredients which interact and influence each other, but may not as yet provide a perfect synthesis which could be applied to larger, more complex building project. But these elements can be tested and combined in the temporary structure and can later lead to concepts and practical solutions which would perhaps otherwise not have been possible to test in a building. Moreover, pavilions afford the opportunity not only to test new materials, or material combinations, but also to try out theoretical and conceptual ideas in combination with these more pragmatic elements, sometimes even after the fact. The pavilion we designed for the Venice Biennale in 2008 gave us the opportunity to further develop ideas we were unable to test in the Villa NM project, which had been realized the year before. The Changing Room installation provided the means to expand on the concepts and ideas employed in the villa project and formed a kind of crossing point between that project and further ideas which can now be expanded upon in future buildings.
However the advantages of pavilion design became particularly apparent to us following the 'Holiday Home' installation which we made in 2006 for a show at the ICA in Philadelphia. This installation influenced a number of projects which we have since realized, on both a formal and conceptual level. The vertical foyer and pink ribbon in the Theatre Agora in Lelystad evolved largely from certain physical qualities and effects in the Holiday Home installation, whilst conceptually the idea of taking the 'retreat' concept home to daily life was an essential element in our recent

design for ‘MYchair’; a product for which the conceptual starting point was the notion of providing moments of light escapism in day to day life.

Pavilions, whilst affording a large degree of freedom for invention and conceptual considerations are at the same time functional structures with very specific programmes. How is the ideal balance reached between innovation, experimentation and invention, and the more pragmatic values which need to be addressed?

BVB: The freedom afforded in pavilion design also varies considerably. It is not always the case that the structure needs to have a practical function, as often it will take the form of an installation in a museum or gallery. But at other times indeed, it will involve combining the conceptual and the theoretical with more pragmatic considerations. For instance the pavilion we are now building in Battery Park in New York is on the one hand a sculptural form, but on the other is designed to utilise its petal-like structure to spatially orientate itself to the site in order to provide directional services to the thousands of people who will visit the location on a daily basis. Here the flower-like structure is used to provide a variety of services, such as an information point and a coffee bar. Because we have experience of designing pavilions in the past, it became possible to combine functional requirements with interesting and experimental architecture. But in fact this is not so different to the approach required for buildings, so in a sense one is already experienced in finding this balance.

Pavilion projects need to capture people’s attention in a short period of time. How does one approach this during the design phase?

BVB: I have always believed that interest is not to be found in the first image or the first effect you create, that this is actually not the most interesting way for a building of any kind to communicate. It is more often what we call the ‘after image’, or the double readings you create; a certain layered effect or fascination that needs to be present in the design which functions as an attractor. You can create a form of crossing point, whereby the pavilion becomes an ideogram, where the visual elements of the pavilion are combined with the theoretical aspects of the design. This suggests a linguistic form, but in fact it is more a kind of merging of the formal and the linguistic, a kind of juxtaposition between the two. Perhaps not dissimilar to the idiogramatic qualities inherent in Chinese characters, where the visual representation may show one thing, but where this in fact functions as a signifier for the meaning, or the word represented.

By their very nature, pavilions are usually very site specific, often forming an extension to an existing building or location. How do you approach this specificity in your designs and is this actually any different to a larger scale building project?

BVB: In fact it is very similar to a building and is again related to the idea of non-existence of a proper scale, as the context can be read in many different ways and doesn’t need to be reduced down to simply one scale. Pavilions, like buildings, need a formal contextual approach. Even a pavilion project for a museum needs to consider aspects such as where the light is coming from and how people will approach or enter the structure. Similarly a pavilion in a park also has a classical form of building context, but essentially the regulations of the context need to merge with the forces of the internal aspects of the structure, for instance the movement from the inside to outside or from the outside in.

Given contemporary concerns surrounding sustainability for the design industry as a whole, what solutions can be incorporated into the design of temporary pavilions to offset these concerns?

BVB: Essentially the design for any temporary structure needs to incorporate the re-use of materials from the outset. This is also the case in the pavilion we are building in Chicago. It is a temporary structure to celebrate the centennial of the Burnham plan for Chicago. Our pavilion will be constructed from quite basic materials, but most essentially the contractor for the project - who describes himself as a ‘deconstructivist contractor’ – will extend the project by dismantling the structure and passing the materials on to artists, who in turn will use this material to construct public art works in the city. This is then a solution which ensures not only that there is no material wastage, but also that the material is recycled in a way that expands upon its initial use.

How important is pavilion architecture to young, emerging firms?

BVB: Pavilions are very important as a testing ground for the ideas that as a young architect or firm you haven’t as yet had the opportunity to carry out. They provide a projection for ambitions and an opportunity to build on ideas. What is in fact slightly surprising is the fact that more established firms don’t seem to engage is these projects as much as one might expect. I have seen pavilion projects from Rem Koolhaas and Peter Eisenman, and a number by

Herzog & de Meuron but I do find it a pity that pavilions are not used so much anymore as a theoretical testing ground.

What, if any, are the limitations of this form?

BVB: Sometimes perhaps you could think that the use of certain materials could create a limitation, in the sense that they would not be suitable, like concrete for instance. But in fact that's not essentially true. One of the first pavilion projects I did was an installation called 'Dream Transport', where I used a mix of many different materials, including concrete. I was fascinated at the time with cast materials and perhaps also influenced by Le Corbusier's La Tourette project and the early surrealists like De Chirico. But 'Dream Transport' was in fact made of cast concrete forms, in a gallery space and it was quite a challenge to get it built and installed. So I suppose it depends on how you limit yourself, or that the only limitations are in fact the ones you create for yourself.

In your opinion, what qualities/considerations are essential to good pavilion design?

BVB: I think a good pavilion contains a kind attraction which draws you in and needs to work on many levels, in the same way as a building needs to work, or even a painting needs to work. They need to communicate on several levels. A good design will also be ground breaking on some level. I once saw a beautiful pavilion done by David Adjaye, where he worked with both the transparency and intensity of light and created a wonderful and intense visual experience which went beyond the notion of the space itself.
On the whole I believe that pavilions can be seen not just as models for experimenting with materials or construction techniques, but also as models for thinking; as intellectual constructs. Through the experience of working with the diagram or even design models, as apart from working in a linear process of moving from sketch to design, the pavilion can be seen as a kind of extension of an instrument for design; the pavilion can function as a possible apparatus for the process of design.

APPENDIX B
The Gardiner Museum

(source: https://www.gardinermuseum.on.ca/)

The Gardiner Museum is an inviting destination that inspires and connects people, art and ideas through clay, one of the world's oldest art forms.

The Gardiner Museum of Ceramic Art was opened in 1984 by George and Helen Gardiner to house their collection of ancient American artifacts and European pottery and porcelain. Between 1987 and 1996 it was managed by the Royal Ontario Museum, but a generous endowment from George Gardiner allowed it to regain its independence. Attendance, membership, and program participation more than doubled over the next seven years, and the Museum became an important centre for ceramics in North America. The Museum was closed from 2004 to 2006 for a major expansion. Today the Museum boasts an expanding permanent collection, a full schedule of exhibitions and programs, and a growing audience.

The Expansion: The Gardiner Museum temporarily closed its doors in 2003 to undergo expansion, with major funding from the Government of Canada, the Province of Ontario, an anonymous lead donor, and Museum co-founder Helen Gardiner. Building on the architectural strength of the original 1984 structure, the award-winning firm of Kuwabara Payne McKenna Blumberg led this compelling renewal. The Museum reopened in 2006 to universal critical acclaim.

The expansion allowed for the strategic addition of 14,000 square feet, primarily for new galleries, larger educational, administrative, and studio spaces, a new retail shop, a café and special events space, and an engaging extension to the street.

The expansion has produced a dramatically broader focus at the Gardiner: a capacity for a larger collection, more special exhibitions, and greater public participation in the Gardiner experience.

The Gardiner Museum is Canada's national ceramics museum, and one of the world's great specialty museums.

We are committed to making a contribution to the medium we celebrate, as well as the community we serve. We strive to be an inviting destination that inspires and connects people, art, and ideas through clay."

Regular admission: $9
Free Admission to students with valid ID every Tuesday
Half-price admission every Friday 4pm to 9pm
Hours: Mon through Thurs 10am to 6pm
Friday 10am to 9pm
Saturday / Sunday 10am to 5pm

APPENDIX C
Ceramics

(Source: Science Learning Hub)

A ceramic is an inorganic non-metallic solid made up of either metal or non-metal compounds that have been shaped and then hardened by heating to high temperatures. In general, they are hard, corrosion-resistant and brittle.

Dr Ian Brown, a senior research scientist with Industrial Research Limited, explains how the term 'ceramics' now has a more expansive meaning. Traditional ceramics are clay-based, but high-performance or advanced ceramics are being developed from a far wider range of inorganic non-metal materials. Advanced ceramics have the properties of high strength, high hardness, high durability and high toughness.

Ceramic comes from the Greek word meaning 'pottery'. The clay-based domestic wares, art objects and building products are familiar to us all, but pottery is just one part of the ceramic world.

Nowadays the term 'ceramic' has a more expansive meaning and includes materials like glass, advanced ceramics and some cement systems as well.

Traditional ceramics – pottery
Pottery is one of the oldest human technologies. Fragments of clay pottery found recently in Hunan Province in China have been carbon dated to 17,500–18,300 years old.

Traditional ceramics are clay–based. The categories of pottery shown here are earthenware, stoneware and porcelain. The composition of the clays used, type of additives and firing temperatures determine the nature of the end product.

The major types of pottery are described as earthenware, stoneware and porcelain.

Earthenware is used extensively for pottery tableware and decorative objects. It is one of the oldest materials used in pottery.

The clay is fired at relatively low temperatures (1,000–1,150°C), producing a slightly porous, coarse product. To overcome its porosity, the fired object is covered with finely ground glass powder suspended in water (glaze) and is then fired a second time. Faience, Delft and majolica are examples of earthenware.

Stoneware clay is fired at a high temperature (about 1,200°C) until made glass-like (vitrified). Because stoneware is non-porous, glaze is applied only for decoration. It is a sturdy, chip-resistant and durable material suitable for use in the kitchen for cooking, baking, storing liquids and as serving dishes.

Porcelain is a very hard, translucent white ceramic. The earliest forms of porcelain originated in China around 1600BC, and by 600AD, Chinese porcelain was a prized commodity with Arabian traders. Because porcelain was associated with China and often used to make plates, cups, vases and other works of fine art, it often goes by the name of 'fine china

To make porcelain, small amounts of glass, granite and feldspar minerals are ground up with fine white kaolin clay. Water is then added to the resulting fine white powder so that it can be kneaded and worked into shape. This is fired in a kiln to between 1,200–1,450°C. Decorative glazes are then applied followed by further firing.

Bone china – which is easier to make, harder to chip and stronger than porcelain – is made by adding ash from cattle bones to clay, feldspar minerals and fine silica sand.

Advanced ceramics – new materials
Advanced ceramics are not generally clay-based. Instead, they are either based on oxides or non-oxides or combinations of the two:
Typical oxides used are alumina (Al2O3) and zirconia (ZrO2
Non-oxides are often carbides, borides, nitrides and silicides, for example, boron carbide (B4C), silicon carbide (SiC) and molybdenum disilicide (MoSi2
The space shuttle Discovery
Part of the space shuttle's outer skin is made up of over 27,000 ceramic tiles. The tiles are designed to withstand the tremendous heat generated on re-entry into the Earth's atmosphere.

Production processes firstly involve thoroughly blending the very fine constituent material powders. After shaping them

into a green body, this is high-temperature fired (1,600–1,800°C). This step is often carried out in an oxygen-free atmosphere.
The high temperature allows the tiny grains of the individual ceramic components to fuse together, forming a hard, tough, durable and corrosion-resistant product. This process is called sintering.

Applications of advanced ceramics
Advanced ceramic materials are now well established in many areas of everyday use, from fridge magnets to an increasing range or industries, including metals production and processing, aerospace, electronics, automotive and personnel protection.

https://www.sciencelearn.org.nz/resources/1769-what-are-ceramics

CERAMICS (source: explainthatstuff.com)

Archaeologists have found evidence of primitive ceramic manufacture dating back to around 24,000 B.C.., but those most modern of materials, the silicon chip and the catalytic converter, are also examples of ceramics. The modern era is as much a ceramics age as any other.

Ceramics once referred purely to pottery and to articles made by firing materials extracted from Earth. Today, the term has a much broader definition. Ceramics are generally thought of as inorganic and nonmetallic solids with a range of useful properties, including very high hardness and strength, extremely high melting points, and good electrical and thermal insulation.

The best-known ceramics are pottery, glass, brick, porcelain, and cement. But the general definition of a ceramic—a nonmetallic and inorganic solid—is so broad that it covers a much wider range of materials.

Ceramics are best known as brittle solids particularly suited for withstanding high temperatures but, in fact, the different materials used in ceramics can give them a wide range of properties. The classic properties of ceramics include durability, strength and brittleness, high electrical and thermal resistance, and an ability to withstand the damaging effects of acids, oxygen, and other chemicals because of their inertness (chemical unreactivity). But not all ceramics behave in this way. For example, graphite is a very soft ceramic and conducts electricity well, whereas diamond is a very good conductor of heat. Ceramics called ferrites are particularly good conductors of electricity and superconductors have almost no electrical resistance at all. Ceramic matrix composites, made by embedding fibers of a strengthening material in what is known as a ceramic matrix, are not at all brittle.

PROPERTIES
The properties of a particular ceramic depend not just on the materials from which it is made but also on the way they are joined together—in other words, on its crystalline structure. Diamond is strong because all of its carbon atoms are bonded tightly to other carbon atoms. Graphite (such as that used in pencil “leads”) shears because it is made up from different layers. Although the carbon atoms are tightly bonded within a given layer, the different layers are held together only by much weaker bonds. China clay (also called kaolin) behaves in a similar way to graphite, with its constituent aluminum, silicon, oxygen, and hydrogen atoms tightly bonded into flat sheets. But the weak bonds between those sheets are easily broken when water surrounds them and it is this that makes wet clay so easy to mold. When china clay is fired, heat removes the water, and the chemicals inside the clay rearrange themselves into crystals of aluminum silicate tightly bonded by silicate glass, which is overall very much stronger.

Firing is the process by which ceramics have traditionally been made; indeed, the word “ceramic” can be traced back to a Sanskrit word meaning “to burn.” Simple ceramics such as bricks and certain types of glass are still made by processes that would be recognized by people who lived thousands of years ago. Just as in ancient times, today’s pottery is made by digging clay from the ground, mixing it with water to make it flexible, shaping it on a wheel or in a mold, and then firing it in a kiln. Some of today’s processes are more sophisticated than the techniques of past times. Machines have long been used in processes such as extrusion (forcing a material into shape by squeezing it like toothpaste through a shaped tool), jiggering (laying the material automatically into a rotating mold), or hot pressing (forcing a powdered form of the ceramic into a mold then simultaneously heating it and pressing it to fuse the material into shape).

The latest industrial ceramics sometimes demand more advanced production processes. Extremely tough ceramics

made of silicon nitride are made by a method called reaction bonding. This involves forming silicon powder into the desired shape then heating it with nitrogen gas. Because the silicon powder already occupies the same volume as the finished product, grains of silicon nitride can form only by fusing together tightly.

Types of clay and their common ceramic uses
The US Geological Survey lists six types of clay mined in the United States: common clay, kaolin (China clay), bentonite, ball clay, fuller's Earth, and fire clay, and each has a number of different uses:
Common clay is mostly used for bricks, cement, and aggregate.
Kaolin is widely used for making glossy paper.
Bentonite has a variety of industrial uses, including drilling mud and foundry sand, and is also found in household products that absorb pet waste.
Ball clay is a high quality clay prized for its use in ceramics, sanitaryware, and wall and floor tiles.
Fuller's Earth is also used for pet-waste products.
Fire clay is used in refractory (high-temperature) bricks and cement.

It is difficult to think of an area of modern life that has not been touched by ceramics. Our homes are made from brick walls, held together by cement made from calcium silicates, and glass windows, also made from silica. Inside, the walls are plastered with ceramic gypsum, porcelain bathrooms are decorated with tiles made of clay and talc, and kitchens stacked with pottery and glass have decorative ceramic floor tiles. Clay pipes link our homes to the sewage system and ceramic insulators are essential in connecting them to the electricity grid. Back inside the house, that electricity flows through television sets that contain more ceramic insulators, components such as capacitors and resistors made from ceramics, computers based on silicon chips, magnetic ceramics used in the electric motors of appliances such as vacuum cleaners and food blenders, and piezoelectric ceramics used in tiny headphones and loudspeakers. Telephone calls and cable television signals may be piped to the home through glass fibers, while other kinds of glass fibers keep heat inside the walls and the roof. That heat may itself be provided by a heated ceramic filament, just as lighting comes from glass bulbs or fluorescent tubes.

But ceramics have not just proved useful in everyday situations. The properties of advanced ceramics have made them important for some much more extraordinary applications. For example, the toughened silicon carbide used in hip replacements is designed to be porous so that it stimulates natural bone growth and tissue formation around the artificial joint. Ceramic engine components are used in "lean burn" car engines that combust fuel more cleanly. Catalytic converters, which convert air pollution into less harmful gases, are made from light but strong aluminosilicate ceramics that can withstand the high temperatures generated in car exhausts. The latest generation of lightweight, deep-sea submersibles are being built not from steel, like their predecessors, but from ceramics originally made for defense purposes. One of the most innovative uses of ceramics is a new kind of paint made from a piezoelectric ceramic. Like other piezoelectric materials, this produces a tiny electric current when it undergoes stresses and strains and its Japanese inventors believe it could be used to detect metal failures or even earthquakes.

http://www.explainthatstuff.com/ceramics.html

APPENDIX D
University Policy & Code of Conduct

Project deadlines can only be extended in cases of illness or incapacity.
Requests for such extensions must be made BEFORE the project deadline to the studio coordinator, using the Request For Extension form available from the front office, and be accompanied by a medical certificate when appropriate.
Work submitted after the hand in date and time without a confirmed extension will be subject to a penalty of 5% reduction of the assessed grade and 5% per day there after, and after four business days a mark of zero will be recorded. For example if a project is due at Monday at 5PM and it is handed in at 5.45PM on Monday a 5% penalty will result. If it is handed in on Tuesday at 9AM a 10% penalty will be assessed.
If your work depends on computer-generated presentation please make frequent paper back ups of your work and plan your printing accordingly. Last minute printing problems WILL NOT be accepted as an excuse for late submissions. We urge you to manage your time wisely throughout the studio, as this is an expertise as valuable
as any other skill taught at the school.
Plagiarism is a complex issue in the field of architecture, as all architects are in some way influenced by the work of others. In student projects, the assessment of the degree to which another design has been copied may create cause for concern. In all cases, it is the obligation of the student to declare their sources. Failure to do so may be considered as an offence under policy 71.
Expectation of Academic Integrity: To create and promote a culture of academic integrity, the behavior of all members of the University of Waterloo is based on honesty, trust, fairness, mutual respect and responsibility.
Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy #70, Student Petitions and Grievances, Section 4. When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.
Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. For information on categories of offenses and types of penalties, students should refer to Policy #71, Student Discipline, For typical penalties check Guidelines for the Assessment of Penalties.
Appeals: A decision or penalty imposed under Policy #70 (Student Petitions and Grievances) (other than petitions) or Policy #71 (Student Discipline) may appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy #72 (Student Appeals).
Note for students with disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.