Revealing Burlington: Vermont Architecture on the Edge

by

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ABSTRACT

This project explores building in the most urban environment of a state that identifies with its ruralness. The site, located at the top of a steep bluff in Burlington at the edge between the city’s downtown core and its waterfront, calls for a response to the urban forces that are present. Creating a connection between the city and the waterfront, and responding to the city grid, the shape of the land, and the adjacent park were central goals of the project. With these objectives in place, I looked to rural sources to establish a set of criteria for judging the architectural design moves. I began by looking at the rural typology of the barn for its simple and continuous membrane, use of materials that record the building’s age, structure that is completely revealed and inhabited, the purely functional plan, and the way it addresses the landscape. The project later drew upon other aspects of ‘Vermontness’ such as the steeple as a marker in the landscape and the quarry’s geometric cuts in the earth. The design uses these criteria together with the site specific urban objectives to create a project that both embodies the identity of the state of Vermont and reveals important aspects of the city and the site.

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Figure 1
Burlington, Vermont from the lake.
I. Introduction to Burlington and its Waterfront

The state of Vermont’s cultural identity is one that is far from urban. The rolling green mountains and valleys sprinkled with small farms and villages are what create the state’s image. The commercial, residential, and cultural center of the state, however, is clearly the city of Burlington. Chittenden County, with Burlington at its center, accounts for approximately 25% of Vermont’s population. The city, while small, is a dense and alive urban environment.

Downtown Burlington is the center of activity not only for the area, but for the entire state. Bustling Church Street, a pedestrian street which spans the downtown core, is packed with restaurants, bars, cafes, retail shops, and cart vendors, with City Hall at one end of the street and a Unitarian Church at the other (see figure 3). The surrounding blocks, in addition to more small businesses spilling out from Church Street, house various branches of both the local and state government, as well as private office buildings and several churches. A few blocks up the hill to the east sits the historic campus of the University of Vermont, with a student population of over 10,000.

Perhaps Burlington’s greatest asset is its location. The city sits on a bluff along the eastern shore of Lake Champlain, with a tremendous view across the lake to New York’s Adirondack Mountains beyond. Though Burlington’s downtown core has flourished for decades, the city has only recently begun to take advantage of its expansive waterfront.

Burlington’s waterfront has a rich history. During the war of 1812, it was the site of a military base and major
military hospital. The base spanned an area of several blocks around a Battery, where Battery Park is located today. From this site in August of 1813, British forces were successfully kept at bay in a short exchange of cannon fire. During the war, Burlington was also the home of the United States Fleet on Lake Champlain. In 1814 Burlington was the staging ground for several unsuccessful attacks against Canada, but later that year, troops once stationed in Burlington achieved an important victory against the British in Plattsburgh, New York. By 1817, the very poorly constructed base was completely abandoned.

In 1823, the Lake Champlain Canal was opened, providing a continuous water route from New York City to Montreal. This sparked rapid growth of the city, and the by 1850’s Burlington had become the third largest lumber port in the world. The arrival of the Central Vermont Railroad in 1862 caused the start of the dairy industry, which continued the city’s growth. By the 1890’s, the railroad had increased the importance of Burlington’s waterfront, as a major transportation hub for both boat and rail between Montreal and New York. By the mid 1920’s, the automobile had become widespread and the interstate highway was completed, causing the city to turn its back on the no longer important waterfront. The automobile was so loved that the city celebrated the abandonment of its streetcar service in 1929 by burning a trolley car in the center of downtown. The waterfront was transformed into an area for fuel storage. By the 1970’s, with the fuel storage necessity passed, the waterfront had been almost completely abandoned, left with a sprinkling of unused industrial remnants.
1853
Burlington is the third largest lumber port in the world.

1890
The waterfront is the transportation center of the state, an important hub between New York and Montreal.

1926
With the advent of the automobile and highway, the city turns its back on the highway and uses it for fuel storage.

1978
The waterfront is almost completely abandoned.
Over the last century, numerous development proposals for the Burlington waterfront have failed. The main reason for this is that architects and developers have presented development ideas that Vermont residents could not relate to. In 1990, Burlington voters passed a “Waterfront Revitalization Plan,” created by the city with the hope of finally reclaiming this valuable asset. Major components of this plan have since been completed, including an 11 acre urban park, an $11.5 million Lake Champlain Basin Science Center, and improved pedestrian, automobile and bicycle access.

The current owners of nearly all of the developable land on the Burlington waterfront have realized the mistakes of the past. After an extensive analysis of both the history of the area and of the architecture of Vermont villages, they have just recently set in motion a new, quite promising, twenty-five year development masterplan that has been met with great approval. This plan intends to introduce a “neighborhood” of small-scale, mixed use, office, retail, entertainment and residential development that will ensure year-round, day and night activity on the waterfront. The plan also includes the introduction of a Multi-Modal Transportation Center on the site of the historic train station, making the waterfront the major transportation hub for the area once again. Some of the initial pieces of this project have been completed, and another major component is under construction.
II. Introduction to the Project Site

The specific site for my proposal is located at the edge between the waterfront and the city, in a key location to act as a catalyst for connection between the two. The shape of the waterfront is defined by a steep bluff, with an elevation change of approximately 100' at its highest. This landform, while creating breathtaking views from Battery Park at its top, it also creates a barrier between the city and the waterfront.

Four major streets run from downtown to the waterfront, and define the downtown core. The project site sits between the two northern streets. Pearl Street, the northernmost of these major connections, and the northern edge of the downtown core, is not only an important connection to downtown, but extends to connect to the University of Vermont, and acts as one of two major connections from the neighboring cities. Church Street, the pedestrian mall that is the current center of activity, runs north/south between these streets (see figure 7). From the waterfront, there is no indication of the streets above.

The site is also located at the meeting point of two clashing grids within the city. Running parallel to the shape of the bluff the city rests on, the neighborhood north of the downtown core shifts to a geometry different from the one defined by downtown (see figure 8). This geometry is clearly expressed in the major path that runs diagonally through Battery Park.
The site is sandwiched between the two major public park spaces of Burlington. Battery Park, the historic park located at the top of the bluff overlooking the waterfront is located to the north of the site, but also extends to create a tree-lined pedestrian path running down the hill from the park to College Street. The second is the newer park below the bluff at the water’s edge, one of the first elements of the city’s plan for redevelopment (see figure 9).

With all of these urban forces coming together at one key point, the site seemed magnetic. It is an important yet unresolved place within the city of Burlington that was perfect for the exploration of this thesis.
Figure 12
Site context
Figure 13
Examples of surrounding buildings:
III. Urban Objectives

After careful analysis of the city and the selected site, I was able to arrive at a set of objectives that would not only help to determine the scope of the project, but would act as the central guidelines for shaping the project at the urban scale.

1. Create an additional physical connection between the city and the waterfront

The most obvious reason for the disconnect between the city and the waterfront is the physical barrier created by the steep bluff. Currently there is only one access point to the waterfront (at the base of College Street), which is often packed with both pedestrian and vehicular traffic. One goal of the project was to create an alternative path closer to the northern edge of downtown and Battery Park, which allows pedestrians to negotiate the elevation change created by the bluff and to move between the waterfront and the city.

2. Create visual connections between the city and the waterfront

In addition to the physical barrier, there is also a clear visual disconnect between the waterfront and the city. My goal was for the project to mark the city grid, creating a stronger visual connection between the city and the waterfront, and creating a greater sense of place within the city while at the water’s edge.

3. Expose the bluff and make it an extension of the park

Though the overgrown bluff acts as a physical and visual barrier, it is nearly impossible to have a sense of the dramatic elevation change or the shape of the land from either the top or the bottom. Another goal was to cut into the bluff and expose it, which would not only allow for a clearer sense of the elevation change and shape of the landform, but would also make the slope of the bluff habitable land, an extension of the park that takes advantage of the views out over the waterfront, Lake Champlain, and the Adirondack mountains beyond.

4. Address the converging geometries

As was shown earlier, the site is at a point of converging city geometries. A fourth urban objective is to receive these geometries into the project, and address this important point where they come together.
Figure 14
View over the waterfront from Battery Park

Figure 15
Panorama of Battery Park

Figure 16
Looking toward the bluff
In addition to the objectives that inform the design at the urban scale, a main goal from the beginning of the project was to establish a set of architectural design criteria that were drawn from the cultural identity of Vermont. These would help to judge the design decisions that were made throughout the process. Since Vermont’s identity is very much based on its ruralness, I looked to rural Vermont to search for principles which could be applied to a building in an urban setting. I was first drawn to the rural typology of the barn, and after some study, I was able to define a set of five design criteria that I could use to inform my architectural design process.

1. **Membrane enclosure**

Though the material may shift from the roof to the walls, the barn can be identified by an uninterrupted membrane which covers the entire structure, and remains constant despite any of the changes that may be happening within.

2. **Materials**

In early times, for the sake of economy and practicality, barns were constructed using materials that were local to the site, usually consisting of wood and stone. The use of these materials creates an inherent connection to the site. These materials by nature also record the building’s age, and only improve aesthetically as time passes.
3. **Structure**

In contrast with the membrane enclosure, a barn’s structure is almost always completely exposed, visible, and inhabitable. The structural order is clearly expressed, with varied layers of space created within the larger structure.
4. **Plan and Functionality**

The beauty of barn plans is that they are almost always purely functional and coincide quite closely with the structural order. This allows for a simple and clear layout of the spaces and circulation. A common feature of many barn plans is the wide aisle that runs through the center, for ease of movement through the building.

5. **Address of the Landscape**

Most barns have a close relationship with the surrounding landscape, and often allow the landscape to pass into and through the structure. Due to the nature of my site I especially looked at the bank barn, which uses stone walls to hold back the slope on two or three sides, creating a habitable lower level. A lighter structure defines the other sides, the upper level, and the roof.
As the initial design ideas began to take shape, my process lead me to look beyond the typology of the barn to other aspects of 'Vermontness' that could inform the project. This study added two additional points to my design criteria.

6. **The Quarry**

In finding a way to deal with the steep slope of the site, I looked to the geometric cuts made by the Vermont quarry, creating walls of stone. This inspired the way I handled the incisions that I made in the Burlington bluff.

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7. **The Church Steeple**

My design intention was to not only mark the city grid but to act as a marker in the landscape of the city. This was inspired by looking at the way the church steeple is the recognizable landmark in the typical Vermont village.
V. Program

The site I have chosen has extreme prominence due to its proximity to both downtown and the waterfront, its visibility from the city and especially from the water, and its location adjacent to the major public park spaces in the city. Because of this my aim was to find a program that was civic in nature and extremely accessible to the public, but that would also allow for the exploration of both my urban objectives and my architectural design criteria.

Burlington’s Waterfront Revitalization Plan, updated in 1998, discussed tentative plans for the reuse of the Moran Generating Station, an abandoned power station present on the northern end of Burlington’s Waterfront, as contemporary art facility. While these plans were never carried out, replaced by the most recent plan to relocate the Burlington YMCA to this building, they did express the need for a facility that the city currently lacks. The plans were raised by the Fleming Museum, the art museum of the University of Vermont. The plan states the need for a building with “large open spaces that can accommodate very large scale work and can be reconfigured as needed.”

This program is appropriate for the site for a number of reasons. First, this type of building meets the civic and public requirements that I was searching for. It is the perfect building type for adjacency to public park space. Second an art gallery of this type acts as one of the city’s main attractions, and seems to call for a visibility and prominence that it would not have received at the Moran Plant. Third, my desire to connect with the city is strengthened with this program, adding a connection to the University as well as
the general public. The Fleming Museum is located along Pearl Street, which ends directly at my site. Fourth, the program allows for the incorporation of a large sculpture garden, which provides an expansive landscape element to the project, following with my desires to create habitable outdoor space along the bluff as an extension of the park. Lastly, this building type provides enough flexibility to allow for the exploration of both the urban and architectural objectives stated earlier.

The program consists of:

a. A large gallery space with filtered light and movable partitions which allows for frequently rotating contemporary art exhibitions.

b. An auditorium seating approximately 250 persons for lectures associated with the museum as well as other public and university events.

c. Reception and area and café kiosk to service museum patrons.

d. Museum store selling products related to the museum and its exhibitions.

e. Office space, break room, and conference rooms, separated from the main building for use by administrative staff.

f. Loading dock and small storage area for delivery and removal of exhibitions.

g. Public restrooms and coatroom.

h. A large outdoor sculpture garden consisting of four terraces spanning an entire city block which acts as public outdoor space with views over the water.

i. An outdoor pavilion which acts as a second entrance to the museum and sculpture garden, and provides circulation for the terraces.
Figure 28
View of the project in the surrounding context
Key Project Views

View from Lake Champlain and the waterfront
From this view the buildings have a strong verticality, appearing as towers rising out of the bluff. The project acts as a landmark for the city, much like the church steeple in the small Vermont village. The buildings also mark the city streets beyond, creating a stronger visual connection between the waterfront and the city. The terraces appear as a ‘white gash’ in the slope, much like a quarry, exposing the shape of the bluff and the dramatic elevation change.

View from the city
As one approaches from up the hill on Pearl Street, the museum has an urban presence at the end of the street, while at the same time remaining very much in scale with the surrounding buildings. The building from this side is a glass display case, which draws people to it, but also allows framed views through it to the water beyond.
View from the park

From Battery Park, the administrative building is in the foreground, taking on the angled geometry of the park and looking out over it. The large retaining wall with the museum behind shoots out from the slope toward the water.
1. **Retaining Walls**

The stone walls of the project appear as quarry-like cuts in the slope. The main retaining wall grows in height as it follows the slope of Battery Street and the bluff, reaching its maximum height to define the lower level of the museum. This wall acts very much like the stone walls of the bank barn, holding back the earth on two sides to create a habitable lower level in the earth. The secondary terrace walls define the outdoor space, and also define the fall of the auditorium and set up a rhythm for the main building structure to grow out of.

2. **Structure**

Using the spacing defined by the terrace walls, four structural bays create the building frame. This frame provides support for the heavy loads created by the gallery. As in a barn, the structural system is completely clear, and remains visible throughout the building.
3. Gallery Volume

The gallery space consists of a concrete tray that spans between the structural framework and cantilevers out past the frame at its ends. The tray acts not only as the floor, but turns up to become the display walls of the gallery. Above this tray, a translucent glass skin filters both the natural and artificial light and prevents shadows, creating a consistent glow within the gallery.

4. Membrane Structure

This secondary layer of structure provides support for the outer skin of the building, including the roof structure. Since the main structural loads are supported by the larger frame, this layer is made up of lighter members which break up the larger bays.
5. Membrane

Again inspired by the barn, a continuous membrane wraps the outside of the building structure. Though this skin is uninterrupted, it changes in nature as it wraps the building. On the north side of the structure, the membrane is mostly transparent to let in the desirable north light. As it moves to the roof, it becomes completely opaque to allow for insulation in this cold climate. Wrapping around to the south side, the membrane becomes a series of wood louvers that provide shade from the strong southern sun.

6. Slots of space

Space between the structural frame and the gallery volume create space for circulation through the building. From the street, the museum patrons enter through this slot of space, and experience being between the frame and the gallery, looking through the entire building structure and out to the water before entering the gallery. The slot opposite the entry holds a large glass elevator and a stair to move down to the auditorium level and up to the level of the administrative building.
Figure 39
Auditorium level plan
Pavilion circulation plan (below)

Figure 40
Section through gallery and auditorium
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Gallery / Mezzanine level plan
Office level plan (below)

Figure 42
Section through terraces
Figure 43
(left)
Overall view of the project

Figure 44
View of the gallery building from the south side

Figure 45
View of the gallery and service building from the north
Figure 46
(left)
Detail view of the building structure

Figure 47
View of the west side of the building looking through the space
Figure 49
The gallery volume pulled out from the structure

Figure 48
(left)
View from inside the gallery

Figure 50
View from inside the auditorium
SHAPING PARK

MARK CITY STREETS

LARGE TERRACE (HALF WAY DOWN)

STEPPING TERRACES

VIEW TO WATERFRONT

CLASHING GRIDS

FLOATING VOLUME

GRAND RETAINING WALL

PASSAGE DOWN TO WATERFRONT

BANK BARN

MARK THE SLOPE OF STREET

1. membrane
2. materials
3. structure
4. landscape
5. resting lightly

SECONDARY LEVEL
VIII. Conclusion

This thesis project began with a city and a challenging site, and with a multifaceted set of urbanistic and architectural goals. The result is a solution that improves the city’s connection to its waterfront and reveals important aspects of the city and the specific site, giving both the resident and the visitor a better understanding of the place. The program fills a specific need for the city and the university, creates a landmark and destination within the Burlington cityscape, and provides a significant extension of the city’s outdoor public space. Though the solution is quite site specific, the design provides an example of an urban architecture that comes out of the rural identity of the state, drawing inspiration from places that Vermont residents can relate to. It shows that it is possible to draw from these sources without literally transposing them, resulting in a design that is not traditional but still maintains a familiarity that is appropriate in this setting. This design would act as catalyst in the development of an area of Burlington with a very promising future.
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LIST OF ILLUSTRATIONS

*All photos and illustrations were created by the author unless noted below.

Figure 1    Photo by Robert Lyons Photography. Retrieved from <http://www.robertlyonsphotography.com/burlington_waterfront.htm>.

Figure 2    From Hands on the Land: A History of the Vermont Landscape, page 130.


Figure 5    Images from Main Street Landing Company, Burlington, VT. Retrieved from <http://www.mainstreetlanding.com/projects/photos_historical.php>.

Figure 6    Image from Main Street Landing Company, Burlington, VT. Retrieved from <http://www.mainstreetlanding.com/projects/25yearplan.php>.

Figure 17   From Harker’s Barns: Visions of an American Icon, page 45.

Figure 18   From The Barn: A Vanishing Landmark in North America, page 178.

Figure 19   From Harker’s Barns: Visions of an American Icon, page 17.

Figure 20   From Practical Plans for Barns, Carriage Houses, Stables, & Other Country Buildings, page 110.

Figure 21   Image from The Foundation for Historic Building Rescue, Inc. Retrieved from <http://mahoneyfamily.org/fhbr/bernville_barn.html>.


Figure 24   Image from the University of Vermont. Retrieved from <http://www.uvm.edu/~fleming/smarty/templates/press/museumimage.html>.


Figure 26   Photo by Lars Baumer. Retrieved from <http://www.mathematik.uni-bielefeld.de/~baeumer/usa/page.html>.