24 hr Building: A Study into the Cyclical Nature of Architecture

James Thomas Lancaster

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Susan Piedmont-Palladino
Committee Chair

Paul Emmons
Committee Member

Marcia Feuerstein
Committee Member

Jaan Holt
Committee Member

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We live in a society dominated by time. It plays a part in nearly everything we do. Time tells us when to wake up, when to eat, when to be at work, when it’s time to sleep, and so on. Just as people are controlled by time, so are the buildings we use. These buildings often times are very narrowly used. As a result, portions of our cities are full of activity during certain times of the day, while at other times become deserted. What happens to the building when it is not being used? Does the building go to sleep? Do buildings need to sleep? Is it possible to design a mixed-use building in our nations capitol that never sleeps? These are just a few of the questions that began this journey to design 24 hours building and the cyclical nature of the people that inhabit them.
This thesis journey began with a quest for a site within Washington, DC. While searching for a site I was in the process of reading Le Corbusier, “Towards a New Architecture”. At the same time I had just begun working for RTKL Associates Inc. located in the Dupont Circle area of Washington, D.C. My hunt for a site took me to the vicinity of the RTKL offices during a weekend. The first thing I noticed was the lack of activity, reminiscent of a ghost town. As I walked around I remember reading the passage by Le Corbusier:

“The eight hours day! The three “eights” in the factory! The shifts working in relays. This one starting at 10 p.m. and finishing at 6 a.m.; another ending at 2 p.m. Did our legislators think of that when they granted the eight hour day? What is man going to do with his freedom from 6 a.m. till 10 p.m.; from 2 p.m. till night?”

I began thinking about a building that was continuously active 24 hours a day, 365 days a year. Thus the journey into the 24 hour building had begun.

1. Le Corbusier, pg. 275
the site

The site is located within the Shaw neighborhood and is the North entrance to the Howard University Metro station. The southern end of the site is currently vacant with only the presence of the metro entrance. The first step in the analysis was to understand the existing land use in the neighborhood while seeking to discover why in a city with few undeveloped lots, this particular one remains vacant.

The series of maps to the right illustrate the existing land use in the Shaw neighborhood. Once the various land uses are superimposed on a black and white map, it becomes evident that the neighborhood is dominated by low density residential and commercial buildings.
The combination of maps and models to the right represent the evolution of the site from the late 19th century through present day. The first model was constructing as a representative of what was present in 1888. For each of the following dates buildings were either added or subtracted based on the corresponding maps. One can see a clear correlation between the architecture and the history of the Shaw neighborhood.
Many of the laws passed during Reconstruction in Washington, that provided civil rights to African Americans, were being ignored. Washington officially dropped these laws resulting in the movement of African Americans to areas of the city in which they were permitted. The Shaw Neighborhood, within the more notable area of the Greater U Street, was one of the locations that received an influx of African Americans.

Howard Theatre, designed by architect J. Edward Storck, was constructed. This theatre predated any African American entertainment venue in Harlem.

White Cross Bakery was constructed.

The Southern Aid Society Building was a mixed-use building with commercial space, hotel rooms, and a movie theatre (Dunbar Theatre). The Society was one the first African American owned and operated insurance companies in the country.

As African Americans moved in, many whites moved out and the once racially mixed neighborhood became a more homogenous African American one.

The Supreme Court overturned restrictive covenants, desegregating Washington by allowing African Americans to legally move anywhere they desired. The professional class began to move to the suburbs resulting in a shift in the socioeconomic make-up. Single-family dwellings were converted to multi-family rental properties catering to a transient population. The once middle-class area gave way to poverty and overcrowding in the U Street Area.

The Supreme Court ruled that the laws set in place during Reconstruction were valid. Businesses that once only served whites were now prohibited from doing so. As a result, the businesses within the U Street area now had to compete with those in downtown Washington. African Americans, now living throughout the city, found traveling to the U Street area less convenient resulting in a decline of commercial businesses.

The assassination of Martin Luther King sparked riots that devastated the Shaw neighborhood. Century old commercial and residential buildings were looted and burned.

DC Office of Planning issued a draft development framework in an attempt to make the Greater Shaw/U Street area a culture destination.
There are several notable buildings located in the immediate vicinity of the site which have played a vital role in the history of the Shaw neighborhood, as well as, our country. The Howard Theater was the first theater building in the nation erected specifically for African Americans. The Dunbar Theater housed one of the first African American owned and operated insurance companies in the country. The White Cross Bakery, eventually becoming The Wonder Bread Bakery, provided fresh bread to the neighborhood. More recently added, is the northern entrance to the Howard University metro station which is located along the yellow and green line.
Howard Theater

Wonder Bread Bakery

site location

8th Street

T Street

S Street

Florida Ave
It was important to understand the relationship between the site and the Metro rail line early on in the design process. The following two sections represent the connection between the city street and the Howard University metro station. From these sections, grew the desire to bridge the gap between the metro level and that of the city streets.
site photomontage (8)
The process of selecting a building program was initiated by looking at the 24 hour cycle of the building. A building program needed to be select that would result in a building that contained some level of activity throughout the course of a 24 hour period. The building program is as follows:

- LIVE – Residential
- WORK - Office
- SHOP - Retail
- PLAY – Night Club
- BE – Plazas

Once the building program was established it was important to associate a verb with each element to better describe the activities that would be taking place in these areas. The next step in the design process was to begin organizing these elements on the site. Through early program modeling it became evident that “all program elements are not created equal.” Therefore, the decision was made to put a greater infuses on the connection between the residential portion and the 24 hour cycle.
The 24 hour building program was established through investigating various building activities over the course of a 24 hour period. The light activity diagram to the left is the result of this study. The red column indicates the level of activity each program element experiences in one full 24 hour cycle. The darker shades denote a higher level of activity. Once the level of activity was established, the need for both natural and artificial light were determined for each element. The light blue column represents the need for natural light, and the dark blue column represents the need for artificial light.
The following three study models investigate various ways to organize the program elements on the site. The colors represent the various program elements. They are as follows:

**LIVE** - red  
**WORK** - blue  
**SHOP** - yellow  
**PLAY** - purple  
**PLAZA** - green

Once the first three models were completed the third in the series (take III) was selected to develop further.
The design of the residential portion of this thesis very quickly became a microcosm of the 24 hour building. Just as the retail, office, and nightclub have their own 24 hour cycle, so does the various unit types within the residential blocks. The 24 hour cycle of someone living in a studio unit will be very different from that of someone living in a three bedroom unit. Through the structure, circulation, and the juxtaposition of the various units, the residential blocks aim to celebrate the diversity of 24 hour cycles.
The residential unit types are indicated by the various colored shapes. In the beginning there were upwards of eleven different unit types, but as the design developed the number decreased to nine. The residential block type I and type II diagrams on the following page is representative of the residential block configurations. In the end, each of the four blocks became unique due to the required vertical and horizontal circulation, which will be further explained in the circulation portion of this chapter.
Residential Block - type II
Residential Block - type I
unit concepts
Each of the nine unit types contain a core that aligns with the structure below. Just as the residential blocks rely on the concrete columns for support, each unit relies on the core for all the necessities for living. The cores consist of the kitchen, restrooms, stairs, closets, etc. To further stress the importance of the building core, a majority of the units require the dweller to enter the through the core. By doing this the rest of the unit can be configured in a way that best suits the people that will ultimately be inhabiting the space.
unit concepts

view of 1st floor of residential unit

view from 1st floor of residential unit

view from 2nd floor balcony of residential unit
The unit layouts of the northernmost and southernmost units require horizontal circulation on each of the four residential levels. In contrast, the layouts of the center two blocks only require circulation on the first and third levels. Each of the blocks are then connected by bridges that act as the second means of egress. As result, space is given back to the residences, as well as, eliminates the need for two means of vertical circulation.
The vertical core has been placed on the northern portion of each block. This allows additional units to be located on South facing portion of the blocks. The vertical cores contain the elevators, stairs, and the trash chutes for each block. The location of these cores vary based on the condition at the street level.
The various sketches to the right are views from the residential corridors, as well as, the bridges that connect them. The glass roof on the corridors allow light that penetrates deep inside the space and serves as a way to reorient the dwellers to the 24 hour cycle.
view from 1st floor residential bridge

view from 1st floor residential corridor

view from 2nd floor residential corridor
The structure for the residential blocks consists of tapered hollow concrete columns. These columns do much more than merely support the residential building. They have become the vessels for all the plumbing and electrical services needed to service the units. The tops of the concrete columns align with the unit cores above, which determines the amount the columns expand at the top.
“Reconnecting our lives to the rhythms of nature, encourages the ritual use of space as a way to conserve energy and to enhance the quality of life.”

The residential blocks are oriented in the East-West axis to take full advantage of the solar day. The corridor between the North and South portion of the residential blocks act like an atrium by providing natural light to the northern units. The first floor of the residential blocks contain glass portals that becomes a source of light for the life below.

3. Knowles, pg. 3
The design of the lower building aims to play on the scale and context of the neighborhood, as well as respond to the residential building above. Although the lower building is closely connected to the building above, it remains somewhat independent. Each program element contains unique qualities that separate itself from the rest, but at the same time reinforces the idea of the 24 hour building.

**Work**
The offices are primarily located on the 2nd and 3rd floor of the lower building, with two small entrance lobbies located along 7th Street and one main lobby located along 8 Street.

**Shop**
The retail shops are located at the street level and plaza level. The shops has been design to allow entire walls to be opened up to the outside.

**Play**
The Night Club is located off the Howard Theater Plaza at the northern end of the site. The 2nd Floor Stage of the club contains the ability to open up to the plaza which allows for outdoor concerts during special events.
connection with the life above

The development of the lower building occurred secondary to that of the residential portion. Although the design was developed in direct response to what was happening above, the lower building is meant to act independently.

submitting to the columns

view from 2nd Floor Office Lobby
The investigation of the Shaw neighborhood, grew a desire to play on the rich history of a once thriving area in Washington. The scale and structure of the lower building is used to create a rhythm that is reminiscent of the row houses that once dominated the neighborhood. The structure is further used to frame the various uses contained within the building.
Once the structural rhythm of the lower building was determined, the study into appropriate ways to fill in these frames began. These frames were filled with conventional materials that could be found in the vernacular, but are used in a modern way. The North and South facades of the upper floors consist of brick with simple punched openings. The East and West facades are constructed of corten and glass with integral sun shades. The ground floor retail spaces are constructed of brick and glass. The glass walls have the ability to open a portion of the retail space to the outside.
The idea of the city floor was born during a conversation with Jaan Holt early in the design process. He stated that the roofs of buildings were merely an extension of this floor. He then went on to explain, that before the advent of air conditioning, the roofs of buildings were held in high regard and were frequently used by people. Today, however, roofs are most often used simply to house the building’s mechanical systems which in many cases is enclosed on all sides by a penthouse.

The various ways to experience the city floor has been incorporated in the design of the 24 building. The various floors are broken down into three main categories: the metro plaza floor, the city floor, and the residential floor.
The design of the plaza began as a simple desire to mediate the transition between the metro floor and the city floor. The design process began with a look at other metro stations around the city to see the various ways a metro station could be incorporated into the design of the building located above. What was found was a clear disconnect between the metro floor and the city floor. In most cases one merely emerges from the dark, damp underground tunnels of the metro only to be dumped directly onto the city streets. Through these experiences grew a desire to create a more desirable transition between the floor of the metro and that of the city. The result is a plaza that is located midway between the city floor and the metro. As people get off the metro they will no longer be required to use an escalator to reach the city street. They will instead enter a plaza, at which time they will have a choice to either take the stairs to the street or a ramp that leads up to another plaza located at the street level.
the metro plaza floor
The city floor can be further broken down into two main categories: the Transition Plaza and the Howard Theater Plaza. The Transition Plaza is located midway between S Street and T Street. The main entrance to the Residential blocks above is located off this plaza, as well as, the ramp that leads down to the metro plaza. While in this plaza one can experience the full extent of the columns that support the residences above while enjoying a cup of coffee at one of the coffee shops that will undoubtedly be located off this plaza. The Howard Theater Plaza is located at the northern end of the site and is facing T street. This plaza aims to complement Howard Theater by providing a place for people to gather before and after concerts. It also serves as place for people to gather for outdoor concerts.
The residential floor is made possible because of the retail, office, and night club located below. By creating a space between the lower building and the upper building, the residential dwellers are given a place in the sky to relax. The space between the residential blocks is comprised of a green roof and open to the sky.
the residential floor
development

The following collection of drawings and sketches shows a deeper look into the development of the various aspects of this thesis project. Each drawing has played a role in the final design.
Plaza Plan Concept

process drawings

Stairway to the Lower Roof

Metro Plaza Concept Sketch
Early Floor Plan Drawings

Ground Floor Plan

2nd Floor Plan
process drawings

2nd Floor Corridor View

West Elevation Study

Elevation Studies
8 final drawings

Washington, DC map (11)
1. retail space
2. residential lobby
3. office lobby
4. night club
5. metro plaza
6. middle plaza
7. howard theater plaza
8. office space
9. residential communal space
10. loading dock
11. parking garage ramp
West Elevation - Metro Section
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