Museum Design As A Tool For A City

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MUSEUM DESIGN AS A TOOL FOR A CITY

A Thesis Presented

by

CUNBEI JIANG

Submitted to the Graduate School of the University of Massachusetts Amherst in partial fulfillment of the requirements for the degree of

MASTER OF ARCHITECTURE

September 2019

Department of Architecture
MUSEUM DESIGN AS A TOOL FOR A CITY

A Thesis Presented

by

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The renovation of declining industrial cities has become a particularly important topic in recent years as many American cities have suffered from shifts in the economy of industry. People from various fields are looking for measures to revitalize these cities. One of the most commonly used strategies is to shift a city from a manufacturing economy to one relying more on service and culture. With the financial growth and international acclaim brought about by Guggenheim Museum for Bilbao, the media started to talk about the so-called “Bilbao Effect”. For the next two decades, the general public has been more and more convinced and accustomed to the positive results landmark architecture might bring for their cities. Thus it is worthwhile to explore the root of the Bilbao Effect and to dig into the effects of Guggenheim Museum so that similar industrial cities may select and apply strategies basing on their own conditions.
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CHAPTER 1

INTRODUCTION AND METHODOLOGY

1.1 Introduction

Museums have been thriving for more than two hundred years. In different history periods they bear different expectations from the society. Museums gradually develop from facilities exclusively for artwork display to a place where social activities might happen. One prominent case is the Guggenheim Museum in Bilbao, which is viewed as a landmark contributing to the re-urbanization of the city. The successful practice of the Guggenheim Museum inspired a lot of cities globally and pushed their process of revitalization.

The success of Bilbao and the Guggenheim museum can contribute more to cities under similar situation if rules behind the phenomenon can be unveiled. Museums, among all other landmark buildings, are selected as a typical architecture type to be studied by this thesis.

The purpose of this thesis is to find out, criticize, and practice rules behind the phenomenon. The Pulitzer Arts Foundation and Contemporary Art Museum in St. Louis are contributing to the re-urbanization process of St. Louis with their own measures. These three museums and their unique strategies will be studied in two directions: from exterior, their connection with the city; and from interior architectural methods to reinforce the connection.
Last but not least, a new museum will be designed in a site close to the Gateway Arch in St. Louis. Effective strategies from these precedents and new measurements will be practiced based on the characteristics of the site and the city.

1.2 Methodology

The two questions the thesis attempts to answer are: how does the expectation for contemporary art museums from the public change in the last 50 years, and what the experience of contemporary art museums is made of in order to meet the expectation.

For the first question, it is important to take numerous historical events into account. The social role contemporary museums play is influenced by art movement, while art movements are always triggered by relative history events. The method will be to consider two different architects, Tadao Ando and Brad Cloepfil, and then list spots when they evolved their architectural ideas and the social realities during these periods. By doing this, the development of their thoughts and the stories behind the development are uncovered. It is useful to research on history events and then the effects those events had on these two architects, but starting with individual architects and then connecting them to history events is a better way as it helps to clarify the relationship between historic events and architects, or between architects.

The development of these architects’ architectural ideas and their solutions reflect the changes of the expectation from the public for a contemporary art museum in different periods. After revealing the social role contemporary art museums play, it comes to the second question: what is the experience of museums made of in order to meet the expectation.
Two museums will be studied: The Pulitzer Foundation for the Arts and Contemporary museum in St. Louis, and two kinds of information will be gathered: background information, and experience information. Background information includes site conditions, the social environment when it was built, and architects’ motives. The approach is to go through books about architects and their museums, and summary their thoughts and solutions. Experience information focuses more on conditions of the museums themselves, including:

1. Light conditions (artificial and natural light)
2. Materiality
3. Pathways (circulation)
4. Display/ Exhibition
5. Transition/ Threshold
6. Space/ Volume
7. Entry

Each museum will be analyzed individually according to the list above, and the differences and similarities will be compared. Diagraming is a tool to present it in a clear way. A series of hand drawing diagrams will be used.
CHAPTER 2
WAYFINDING AS A TOOL FOR DESIGN

An important factor for a museum is the circulation through which spectators go, and enjoy art works. Kevin Lynch provided his idea about the relationship between movement and experience in his book *The Image of the City*. Even though the book is mainly for urban planning, which is in a larger scale, theories from this book can still be used in a museum design as long as proper methods are applied. This thesis is trying to find the similarity of urban design and museum design.

Lynch proposed five elements comprising a city: paths, districts, nodes, edges, and landmarks.¹ These five city elements are not independent. Instead, they are integrated with specific purposes, and every one of these elements has significant impact on the rest. In his theory, a path is able to form its identity not only because of its characteristics, or its nodal junction with surrounding paths; in fact, regions they move through, edges they go along, and landmarks distributed all contribute to distinct characters of the path.² Likewise, the design of museum paths is influenced by exhibition zones, art works, and nodes with other paths. The basic function of museum paths is to arrange the sequence of

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² Ibid, 84
a visiting tour so that spectators do not become lost. A higher requirement for a path is to impress visitors, and in the meanwhile improve the experience.

For urban planning scale, Lynch came up with some ideas about it, and one of them is to create a melodic path. Lynch explained that elements might be organized along the path to create a melodic line, which can be perceived and imaged by visitors who experience during specific time intervals.

Same theory can be applied in museum path design. The arrangement of museum elements, such as art works, and light, can be used to form a classic journey which typically consists of introduction, development, climax, and conclusion in sequence. The encounter of specific art work at the moment of decision making helps spectators to remember the circulation and thus perceive the layout of the museum. The introduction of natural daylight during the tour can be viewed as a refreshing break for spectators, and the experience is improved by maintaining a connection between inside and outside and giving visitors a sense of the time of day without necessarily giving them views outward that may distract from the art.

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2 Ibid, 99
CHAPTER 3

THE BILBAO EFFECT

Bilbao is a city located in north-center of Spain. Throughout the whole 19th century and early 20th century, it experienced flourish industry development due to its location and the natural resources and Atlantic port, which is the largest in Spain. The port provides Bilbao with the opportunity to become a large trading center connecting Spain with all countries along the Atlantic rim. The natural resources, which are mainly iron and steel, is another advantage. Due to the profit from exporting iron, Bilbao became the richest city in Spain in early 19th century.1 However, the world economy gradually transformed during the 1970s, and major industries, including iron and textile, were severely influenced.2 As iron industry had been the driving force of Bilbao’s economy development for more than a century, this city was facing with an unprecedented challenge.

In the meanwhile, the world of architecture was simultaneously experiencing another movement: Postmodernism. Postmodern architecture was a tool used by architects to respond to the failure of modernism architecture. Being controlled by commercial interests, modernism architecture failed to reach the social goals, which was to present architect’s concepts by using universal architecture language understood by the

1 Power A. Bilbao city story. 2016. https://www.openaire.eu/search/publication?articleId=od206::829d7ececc1a8bcbc3c42e569373e5ad
2Ibon Areso Architect, First Deputy Mayor of the Bilbao Town Hall Pza. Ernesto Erkoreka, 1 48007 BILBAO Spain Email Address: iareso@ayto.bilbao.net. Bilbao’s strategic evolution. from the industrial to the post-industrial city. 6
local culture. The blooming of postmodernism brought about a popular idea, among the general public and professional architects, that the fame of architects could bring success to their projects.

Given the two phenomena above, the relation of the Bilbao city and the Guggenheim Museum becomes clear: the former was looking for a method to revive its economy, and the latter attempted to practice its architecture ideas.

3.1 Guggenheim Museum

Unlike traditional architecture, which focuses on stability and harmony, deconstructivist architecture radically challenges these values. It was frequently understood as taking apart a building and assembling them together, as deconstructivism architecture consist of a group of components without a strong connection. Despite the fact that deconstructivism architecture might seem like the opposite of construction, it was actually chasing the same goal with traditional architecture, but in an absolutely opposite way. It viewed the building as an organic entity. Every piece of the building, no matter it is aesthetically welcoming or not, is an essential part of the entity, and it could not be removed without destroying the entity. The same logic can be found in the Guggenheim Museum Bilbao. The building is made of a group of geometric shapes which are easier to be found in 3D modeling software than in real world. The unity of the

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building is granted by the material and free curves. Another deconstructivist feature one can find in the museum is the employment of material: deconstructivist has a strong preference to use industrial materials in both residential and commercial building. The mostly used material in the Guggenheim Museum is titanium, which was regraded more for industrial facilities instead of residential or commercial ones before the construction of the museum.

Being the primary iconic building along the industrial zone, Guggenheim museum successfully achieves its goal to bring traffic and tourist income to this city. After Guggenheim museum opened in 1997, it brings nearly nearly a million tourists worldwide to the Abandoibar area, where the museum is located.¹ Guggenheim Museum in Bilbao is a significant precedent for this thesis not because its innovative form, nor the use of industrial material, but instead the contribution it makes to its city.

There are many sharp debates about this building. Some people admire the form and material use: its form is totally different from surrounding buildings. For them, the Guggenheim museum started a new architecture movement in the next decade. However, others criticize Guggenheim museum in a negative manner due to the same reason: its radical form and shape. For them, the beautiful architecture logic and the aesthetics from classic architecture disappear in this museum, and what takes the place is the showing off of modern technologies.

It is hard to determine which side is right, but what is sure is that the Guggenheim museum in Bilbao contributes to the city in its own way, and it provides a new building

¹ Power A. Bilbao city story. . 2016. https://www.openaire.eu/search/publication?articleId=od206::829d7ecec1a8bcbb3c42e569373e5ad24
type that can be used for the renovation of industrial cities. For the following decades, industrial cities undergoing similar situations, such as St. Louis, Cincinnati, and Detroit, started their own urban revitalization projects, and museum design is a tool widely seen among these projects.
CHAPTER 4

THE RISE AND FALL OF ST. LOUIS

Located on the west bank of Mississippi River, St. Louis had the potential to be a major port city for the Missouri state and for the whole country. Just like many midwest cities, St. Louis experienced booming industrial and commercial growth during the 19th century and the early 20th century, and also, it had suffered greatly from the national economy crisis and a loss of population due mainly to the de-industrialization process since early 20th century.

The population of St. Louis had kept growing since the time it became a city of the United States in 1803. In 1821, its population was 5,000, consisting of mostly fur traders, and the next four decades witnessed the growth of population from 5,000 to 160,000.1 The rapid growth of population resulted from a lot of factors: the port allowed and encouraged thriving transportation and trading; large numbers of immigrants from Europe brought with them manufacturing industries and European culture.2 A variety of industries, including breweries, wood working, shoemaking, souring milling, lead mining, and tobacco, contributed to the economic growth: one quarter of the tobacco products was from St. Louis by the early 1890s3; shoe making industries brought a production value of 5 million dollars, which made up of almost 50% of the total

1 Miller EP. St. louis’s german brewing industry: Its rise and fall. ProQuest Dissertations Publishing; 2008. 13
2 Ibid. 15
3 Miller EP. St. louis’s german brewing industry: Its rise and fall. ProQuest Dissertations Publishing; 2008. 83
estimated valued from manufacturing\(^1\); flouring industry, with its 3.8 million dollar investment and more than 600 employees, made St. Louis “the first city of the nation in the production of flour”\(^2\). The economic success in the middle 1840s allowed inhabitants to call their city the “New York of the West”\(^3\).

Another positive influence from these industries, besides the economic growth created by themselves, was the booming the raw material and the construction of infrastructure. For example, breweries required huge amount of barleys, hops, coal, water, and barrels every year, which were mostly provided by local farmers\(^4\); and transportation of products in and out Missouri encouraged the development of the railroad system. These leading industries, with other business and infrastructure construction, leaded to the booming economy of St. Louis until the breakout of World War I, and the subsequent Prohibition.

However, in the 20th century the economic and population growth of St. Louis began to slow down dramatically. The decline is a contentious topic, and various answers have been proved by researchers in different field. Some writers point to the decision to be independent from the county deprived the possibility for the city to gain tax from wider area; the overall business environment could be too conservative for more

\(^1\) Ibid. 83  
\(^2\) Ibid. 49  
\(^3\) bid. 17  
\(^4\) bid. 70
investment; the geographical features to some degree made communication to other major cities less convenient.¹

Prohibition is an obvious reason one could hardly ignore as the economy relied on the brewery industry. Germany immigrants brought beer culture and beer industries with them during 1830s, and soon breweries became one of the most important pillars for local economy. The brewery industry provided more than 7 percent of the the total manufacturing value in the early 1900s.² However, during the Prohibition period, the city suffered greatly from the loss of related industries for more than 26 million dollars every year, and tens of thousands of citizens working for breweries and related industries lost their jobs.³ Large numbers of middle class citizens moved to suburban area, and it accelerated the downfall of this city.

4.1 The Grand Center Revitalization Project

An important part of the renovation of St. Louis focuses on the Grand Center Art District, colloquially referred to as the Grand center. Grand Center is a neighborhood in the western center of St. Louis that consists of museums, galleries, theaters, and concert halls, all of which allow artists of various fields connect and communicate with each other, and different arts may coexist. This is also a district open to the public: galleries and museums such as the Pulitzer Foundation for the Arts and Contemporary Museum in

¹ Miller EP. St. Louis’s German Brewing Industry: Its rise and fall. ProQuest Dissertations Publishing; 2008. 181
² bid. 184
³ bid. 6
St. Louis, provide residents and visitors a place to interact with fine art; St. Louis Symphony provides classic jazz and other music; and there are a series of utilities such as learning centers and plazas provide a place to learn and relax.

Figure 1: The Grand Center
CHAPTER 5

PRECEDENT RESEARCH

Just like many other midwest cities, St. Louis is struggling hard to call back the
glory it used to have. A series of projects has been contributing for this ambition, among
which Eero Saarinen’s Gateway Arch was the first to mark the process in 1968.\textsuperscript{1} In the
Grand Center Arts District, there are two museums, the Pulitzer Art Foundation, and
Contemporary Art Museum in St. Louis. Despite sitting next to each other, and even with
similar material, these two museums represent totally different architectural spirits. Given
the fact that two museums, having the same geographic, climatic, and cultural
backgrounds, carry different architectural meanings, a comparison will be necessary to
find out the theories and approaches architects use obtain their goals.

5.1 Pulitzer Art Foundation

Pulitzer Art Foundation is a private museum and it is located close to the south
dge of the Grand Center, sharing a common courtyard with Contemporary Art Museum
from the east side. It is designed mainly by a Japanese architect, Tadao Ando, with the
cooperation of artists Ellsworth Kelly and Richard Serra, whose art works would be
placed permanently in the museum in the later days.

The main body of the museum consists of three parts: two concrete boxes and a
water area in between them. The long box with lower ceiling on the west side is for office

\textsuperscript{1} Webb M. Pushing the envelope (contemporary art museum, st louis, missouri,
silk.library.umass.edu/login?url=https://search.ebscohost.com/login.aspx?
direct=true&db=edswah&AN=000188168500011&site=eds-live&scope=site.
rooms and administration, and the other one, relatively shorter, but with higher ceiling, is exhibitions open to visitors.

Ando’s architectural concept is never an open, delighted space. It is another practice of urban intervention as what the architect does in Japan. The museum is inward-looking, or even secretive. What one can see from outside is a horizontal rectangular masses, concrete walls, and small openings. This feeling of being isolated from the outside starts when one tries to enter the museum. The entrance does not face the street directly. Instead, a fine concrete wall, which is horizontal to the street, directs visitors to the entry lobby. After passing the narrow entrance, visitors experience dramatically upwards and outwards. On the south side is a peaceful water area extending to the skyline of the city in the distance; on the east side is the exhibition zone with the highest ceiling. The lobby is a concrete box connecting two long building parts, and its large windows face southwest to the water surface. Water is always an important architectural element for Ando.

In Ando’s architectural philosophy, there are three significant elements in terms of crystallizing architecture: authentic material, pure geometry, and nature. For the third element, nature, Ando has his personal understanding. Instead of the nature in raw, Ando prefers a man-made nature. Architecture itself is artificial, and to achieve a better balance between architecture and nature, architects have to give order to the nature they applied.


2 Ibid. 15
to their architecture, or they must order abstraction from the nature. Numerous methods could be used for this abstraction, and for Ando, these methods are usually light, sky, and water.¹

Just like Ando’s other works, the Pulitzer Foundation for the Arts has its own nature. Between two concrete boxes, there is a narrow rectangle artificial pond, opening to the southwest. After taking a U turn form the entrance gate, there is a curtain wall, through which one may have the whole view of the pond. As the pond is enclosed by three concrete boxes, in most of times the pond is peaceful. The peaceful pond is how Ando achieves the abstract from the nature: light comes to the interior space through the curtain wall; water is still on the pond; and sky is reflected by the water.

The fenestration along edges of the pond is different according to the use of interior space. To highlight the existence of the pond, a large glass window is applied on the lobby so that visitors have immediate visual access to the exterior. For the other two longer edges, there are only two continuous ribbon windows on each side, and the ribbon window on the display box is higher than that of the administration box. The fenestration shows the architectural hierarchy: the lobby space has the largest opening towards the water, and this is also the first time for a visitor to have visual connection with exterior pond. The large opening helps to provide the whole view of the pond, which could hardly be acquired from the other two openings. The display box, with its ribbon windows, is higher than administration box, which helps to achieve an unstable balance.

Figure 2: The Abstract Nature

The pond and of the layout the concrete boxes helps to create a pure view of artificial nature even though the site is located in a dense urban of St. Louis. The two
boxes are close to each other, which reduces the possibility for a visual connection with the surrounding urban textures. The narrow pond is strongly linear and it extends towards distant urban area, which is most occupied with a city park. The pond, the orientation, and two concrete boxes all contribute to creating a pure nature separate from the crowded city.

Figure 3: The Pulitzer Art Foundation
5.2 Contemporary Art Museum in St. Louis

The Contemporary Art Museum in St. Louis is located just next to the Pulitzer Foundation for the Arts. Unlike the Pulitzer Foundation, which has two permanent art works from two artists, the Contemporary Art Museum in St. Louis is a non-collecting museum, and it does not have a permanent collection.

Figure 4: Plans of the CAM
The relationship between the Pulitzer Foundation for the Arts and the Contemporary Art Museum in St. Louis, or usually referred to as the CAM, is not only about geographic location. It is clear that the relation of these two museums share so many common points in material use, the form of the street entrance, and the open space between them.

Visually, the exterior material use for the CAM is also grey, just like the Pulitzer Foundation for the Arts. This is partly because of the location and construction year. The CAM is constructed after the Pulitzer Foundation for the Arts. As the CAM is just next to the Pulitzer Foundation for the Arts, it helps to keep an architectural continuity for the street with the same appearance. However, it may look alike, but the material use for these two neighbors is tectonically totally different. The concrete the Pulitzer Foundation for the Arts uses is casted on site, and what people can see from the outside is an honest presentation of what is inside. But things are different in the CAM’s case: it uses steel meshes instead of cast-on-site concrete for its walls. A series of facts result in this architectural decision, and a major reason is that the CAM is a public institute, while the Pulitzer Foundation for the Arts is a private owned one, and the owner choose to open the collection to the public. As it is a private project, and the client is generous enough, Ando acquired so much convenience and freedom in terms of achieving his architecture philosophy. However, this is not Brad Cloepfil’s situation. The CAM is a public project, and the government pays for it. It to some degree limits the budget of the whole project, and the architect team has to find a balance between architectural philosophy and the construction cost. As a result, instead of using cast-on-site concrete, the architects team
chose to use different structure, and made use of the steel mesh to achieve the visual continuity.

Figure 5: The Entrance Space

Both the Pulitzer Foundation for the Arts and the CAM have entrances that is not totally open to the street. For the former, one needs to go through a short walkway that is parallel to the street to reach a small private garden, in which the entrance is located. In this way, Ando separates the museum from the street, and the walkway and the small garden becomes what he uses to transfer from public street to his private space. For the CAM, likewise, the entrance does not open to the street. Instead, it opens to the small
plaza space that is defined by the elevated concrete wall, and the little plaza, these elements are the first things to be noticed by visitors who are interested in this institute, and try to experience the interior space. These two entrances are anything but conspicuous from outside, but relatively the CAM has a stronger relationship with the street. Firstly, its entrance is just next to the street even though it does not direct open to the street side. It may take some time for one to find the main gate, but it never hides from the public. Secondly, the experience before one enters the museum is totally different. The walkway and garden of the Pulitzer Foundation for the Arts are highly private, and the only opening for the public is the small space behind a solid concrete wall. It is challenging for those who visit the museum for the first time to find the entrance. However, the space in front of CAM’s entrance opens totally to the public street. The elevated wall and the wall with slightly different texture and color on the ground level together highlight the existence of the front space. Another strategy to establish the connection between the entrance and the street is the large window just above the main gate. The large window is located in the middle of the second floor. The large window and the front space are suggestive architectural components indicating the existence of the main entrance.

The geographic location of these two museums provides the possibility for a private outdoor space shared only by them. As the Pulitzer Foundation for the Arts was designed for permanent art works from the initial design process, form and location of display spaces exclusively for each permanent art works become significant for the root philosophy of the museum: for Ellsworth Kelly’s Blue Black painting, which is narrow
and tall, is placed on the double height space where the staircase connecting the ground floor and underground floor is located in; Richard Serra’s rusted steel sculpture is located in the shared outdoor garden, which becomes its display. The relation between the Pulitzer Foundation for the Arts and the shared garden is not so strong as there is no direct visual connection for visitors inside the museum during their tours. Things are different in the CAM case. Entering the lobby, one may soon find the visual access to the outdoor space through the curtain wall on the other side. There is nothing between visitors and the shared garden except the curtain wall even though there are no permanent metal sculptures there.

Figure 6: The Display Space
The display circulation of the CAM is different from that of the Pulitzer Foundation for the Arts. For the CAM, different display spaces are continuous and connecting to each other. It is more a big space divided by a serious of concrete walls on different levels. A interesting phenomenon is that walls are located on two levels: the ground level and the the upper level. The division is repeatedly highlighted by the architect through the whole museum. One may feel this division even before he or she enters it, with the existence of the large glass window and the elevated wall above the space in front of the entrance.

Unlike the Pulitzer Foundation for the Arts, the display space of the CAM opens more to the street. Firstly, there is a large curtainwall on the ground level, and it creates the visual connection between the interior and exterior space. To build a visual hierarchy, and also to eliminate the possibility of direct sunlight from the curtain wall, the architect applied a temporary wall between the curtain wall and the deeper display space. Secondly, one exterior wall is in the same shape with the street. The wall is curved to fit the angle of the street as the museum is on the corner of a curved street.
CHAPTER 6

THE MUSEUM PROJECT

The project is a test for the relationship between the city and museum design.

6.1 The Site

The site is on an existing parking lot close to the Busch Stadium, and on the other side of the route 64 highway. The site, with its surrounding area, is geographically close to the downtown St. Louis. Most public buildings and landmarks, such as the Gateway Arch, its landscape park, the Old Courthouse, the Laclede’s Landing, and the
Busch Stadium, are located in downtown St. Louis. However, because of a series of reasons, the whole area beyond the highway is viewed as suburban area even though it is so close to the downtown area. Among all these reasons, the highway, with its numerous concrete columns, becomes a major one. The highway is approximately 40 feet high. The highway and its columns are seen as the boundary of the urban area form different scale due to their massive volume and impressive height. For those far from the highway, the elevated highway itself becomes the boundary because of its height; And the columns, on the other hand, become the boundary for people close to them, regardless of the fact that people from one side still have visual and physical accesses to the other side.

Figure 8: Public Buildings and Parks in Downtown St. Louis
Compared with the highly developed downtown area, the area on the other side of the highway is a relatively undeveloped, occupied with train tracks, residential blocks, industries and unused lands. It is an interesting phenomenon that the impact from the highway and train tracks on this city texture is so negative: these linear city components simply separate the downtown area from suburban area, and the boundary between these two is very sharp.

Museums are contributing to their surrounding areas and cities in different ways. Guggenheim Museum in Bilbao attracts visitors and increases incomes of relative industries for the whole city, and it is the successful landmark to signal the transition from a post-industrial city to a culture-based city; the Pulitzer Foundation for the Arts
provides visitors and nearby residents a place independent from the surrounding urban life, and abstract nature carefully designed by the architect; and for this thesis project, the topic is to extend urban life to areas close to the downtown area, but on the other side of the highway.

![Site Analysis](image)

Figure 10: Site Analysis

The site is just next to Busch Stadium, and on the other side of the highway. There are two train tracks: the one on the south helps to connect St. Louis and the world on the other side of Mississippi River; the one on the north is part of the subway system and it goes up above ground, and it will go back underground on the station close to a gate of the Busch Stadium. Open the site may look, the traffic of the surrounding area is highly
limited by these two tracks as there is no streets on the ground level to intersect with them. The site is actually in a location where pedestrians and vehicle traffics from north, west, and south are totally blocked by two train tracks, and the only opening is the 8th street on the east, which is marked out as the thick black curve on the figure 4. As a result, the 8th street becomes the only access to the site no matter from the urban area or suburban area, and the relationship between the site and the 8th street should be carefully dealt with.

Busch Stadium is another important building close to the site. It is one of major reasons for citizens to show up in this block and surrounding areas especially when there are athletic events such as baseball matches inside the stadium.

Figure 11: Flows around the Busch Stadium
The Busch Stadium is a massive building with a square footprint, and it has three main entrances on all edges but the one against the highway on the south. The entrance close to the subway station has a relatively stronger relationship with the site compared with the other two because it has direct visual connection with the site.

![Figure 12: The Above Ground Subway Track and the Station](image)

There is a subway station next to the stadium, and this is where the subway train goes to and from underground. The subway system is an important traffic method for people to arrive this location especially when there are events in the stadium and parking for private cars becomes very hard. As a result, this station, and surrounding areas
including the entrance of the stadium, are where flows of pedestrians are from. It becomes important to establish a strong link between the station area and the site.

To summary, the site is on a location viewed as suburban area even though it is so close to the downtown St. Louis, and the only thing to separate the site from the downtown area is the highway. The only access for visitors to the site is the 8th street, which is on the east side of the site, and the other three sides of the site are physically blocked by two train tracks on north and south. The stadium attract visitors and the subway system is an important method for visitors to arrive this area, and there must be some architectural strategies to guide the flow of pedestrians and vehicles from the urban area to the site.
6.2 The Orientation

The museum has four types of components: the solid thick wall; the glass cone; the display box; and the bridge connecting display boxes.

The orientation of the museum is not parallel to the 8th street or true north. Instead, it is rotated 45 degrees from the street. There are two reasons for doing this: firstly, in this way, the space between the thick wall and the bridge opens towards the urban area where the stadium gate and the subway station are located. The space is for outdoor display of art works and other outdoor social activities. The art works and social activities provide a reason for potential visitors to go here due to the direct visual connection from the urban side.
The other reason for this act is to create square public spaces in front of main entrances. There are two main entrances for the museum opening towards the south and north, and both of them are in the glass cone. The spaces in front help to highlight the existence of main entrances, and provide places for visitors to stay or other activities. It is important to keep these spaces in a square or other similar shape so that they become more usable. If the thick wall component is parallel or perpendicular to the street, spaces in front of entrances become linear, and visitors feel more in a broad walkway but not a plaza when they are within spaces. It decreases the possibility for the space to host social activities, and which in return cut down the desire for potential visitors from the urban side to go through the highway and experience the museum.

As a result, by rotating the whole museum, the outdoor space, with its art work exhibitions and social activities, is more exposed to the urban side, and linear plaza spaces in front of entrances can be avoided.
6.3 Four Components

The Museum of Measures consists of mainly four types of components: the thick wall, the glass cone, elevated display boxes, and the bridge connecting these boxes. Each of these components has their own function: the thick wall is the main body of this museum, and it provides circulation and utilities such as a lobby, a coat room, office rooms, and restrooms; the glass cone is the entrance, and it has two gates open to the north and the south; four of five elevated boxes are display space, and the other is a reception space on the second floor; the bridge is elevated by a series of colored steel columns, and it provides a circular circulation for visitors.

Figure 14: Explosion Analysis
6.3.1 The Thick Wall Space

The thick wall space is a linear and tall space made of cast-on-site concrete. It is the main body of the museum, and the orientation of this component makes the orientation of the whole building. All utility spaces, such as office rooms, coats rooms, storage, and restrooms, are within this component, and it is actually a servant space serves for other space.

The thick wall interweaves with the glass cone, and is divided into parts: the west portion for visitors, and the east portion for staffs.

There are two floors in the west portion, and both two floors work as circulation space. The circular staircase guide the flow of visitors to the second floor. With a width of 16 feet, the second floor connect a series of display boxes. The thick wall interweaves with display boxes as well: the south end of a typical box space serves for social activities, and it is relatively shorter; the north end is longer, and it becomes the display space; and the thick wall space connects circulations of two directions: the thick wall circulation and the box circulation which is perpendicular to the former.

To increase nature daylight for both second floor and ground floor, there is a ribbon skylight along the west end, and part of the floor between two boxes is removed so that the daylight from the skylight can penetrate through both floors. It allows visitors to experience melodic daylight when they are within this space and walking through it.

There are two staircases connecting second floor and ground floor: the circular staircase on the glass cone side and a straight staircase on the other side. The circular
The staircase is viewed as the start point for a typical tour, and visitors return to the ground floor through the straight staircase on the other side. There are restrooms and another staircases under the straight staircase, and a walkway, with emergency exit on the end, provides access to these spaces. Restrooms serve mainly for visitors, and the staircase leads to the underground storage. Going through the whole ground floor from the straight staircase, visitors can return to the glass cone lobby.

Figure 15: Circulation of the Thick Wall

The east portion of the thick wall is more for staffs. There are totally three floors on this portion and each floor has their own restrooms. Two facts allow an extra floor: firstly, the height for each floor can be lower as this is an administration and utility space;
secondly, the roof of the thick wall space is not flat. Instead, there is a slope and the east end is higher. This is originally to increase the visual height of the thick wall, and in this case, the sloped roof provides extra space for the third floor.

The ground floor of the east portion is a coat room. There are staffs behind the counter to help visitors to keep their personal bags and coats, and there is another emergency exit on the end of the coat room space. An individual staircase and an elevator work for staffs only, and bring them to the second and third floor, where office and meeting rooms are. A continuous vertical ribbon window on the east side provides daylight for all three levels, and it connect with the linear skylight on the roof. For ground floor and second floor, there are ribbon windows providing daylight and views from outside for those working inside. For the third floor, there are only vertical windows and a skylight.

6.3.2 The Glass Cone Lobby

The glass cone space is the lobby of the museum. It interweaves with the thick wall, and cuts through it. Most of the glass cone is on the south side of the thick wall, and only a little part on the other side. On both sides there are entrances so that flows from the south and north have their individual gates and plazas.

The glass cone is not only the lobby space opening to the outside, but also a joint of all flows within in the museum. The steel structure is totally covered with glass except the opening on the west, which are two entrances for the visiting tour. The yellow concrete staircase goes up to the second floor of the display portion. The staircase is
attached to the surface structure of the cone so that the space in the middle of the lobby can be used, and the color and the form make the staircase the last thing ignored by visitor as this is designed as the beginning of the visiting tour. Underneath the circular staircase, there are a counter for coat room, a gate works only for staffs, and the north entrance. In the lobby, visitors get their tickets and staffs behind the counter help to keep visitors’ personal bags and coats in the coat room. The glass cone also helps to separate visiting flow and administration flow: visitors go up with the circular staircase or walk to the ground level opening to display areas on the west, and staffs use the other gate on the east, which opens to staffs only. Through this gate, people will soon find the staff staircase and elevator.

Figure 16: The Glass Cone
6.3.3 Elevated Boxes

There are totally five elevated boxes attached to the thick wall: one box is reception space for public activities, and the other four are for art works display. All five boxes are connected by the thick wall on one side, and take he bridge on the other side.

The reception box is the first and largest of a series of boxes. As the circular staircase leads visitors to the second floor, it is viewed as the lobby on the second floor. The color of the floor, which is the same with the circular staircase, is a suggestive architectural strategy to imply the difference between this box and the other four. As this is the box closest to the north plaza, there is a ribbon window on the bottom of the east wall and it extends to part of the floor. The window help to establish a visual link between the reception box and the north entrance plaza: people in each of the place can see what is happening in the other side.

Four boxes are in the similar same form, and are used as display and social activities. The south end of a typical display box is for social activities, and the north for display.

![Figure 17: A Typical Box](image)
As a box has two totally different functions, strategies must be used to indicating the difference. In this case, fenestration is the strategy. There is no windows on walls of the display area because no view from the outside is needed in this area. Instead, skylights are used to provide natural daylight. As this space is for art work display, no direct daylight is welcomed from skylight. To block direct daylight but still provide enough illumination, translucent reflectors will be used in each skylight. By doing this, exhibitions are in a soft lighted space.

The south end of a typical display box is for social activities. Visitors may sit down in this area and have a break. Curtainwalls are applied to provide as much views from the city as possible.

Figure 18: Visiting and Social Circulation
6.3.4 The Bridge and Steel Columns

The bridge is a linear space enclosed by curtainwalls on both sides. From west to east, it goes through all five elevated boxes, and provides extra circulation on the other side. The thick wall space and the bridge on the other side of boxes provide loop circulations so that visitors do not need to go back the same way they are from during their tours.

Because the bridge provides only circulation space between boxes, and the width is 10 feet, which is smaller than the width of display boxes, direct daylight for the bridge area is not a big problem. As a result, curtainwalls can be applied to provide melodic views and daylight on north.

Figure 19: Bridge and Columns
The bridge is supported by a series of steel columns on both sides. These yellow columns are going through the bridge and boxes, and people in display and bridge area can see these columns. As visitors can see and touch these columns, these columns are actually a sign of circulation space.

6.4 Conclusion

This is a museum serves for both art work display and social activities. The lobby, plazas, and the thick wall space provide area for social activities, and part of elevated boxes are for display. As a typical display box has social area and display area, visitors can do both inside the museum.

The project is a test to find the contribution from a museum to the city. The aim is to provide a place for both art works and social activities. From exterior, outdoor plazas under the highway are the transition from the city to the museum even one is not yet inside, and the circulation of traffic around the building attempts to provide convenience for visitors; from interior, flows of different kinds are separated for a better experience, and display boxes host both art work display and social activities.
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