CHARLES McKIM'S PENNSYLVANIA TRAIN STATION AND EERO SAARINEN'S TWA AIR TERMINAL BUILDING: AN INTERPRETATION OF TWO CONTRASTING TRANSPORTATION BUILDINGS USING THOMAS THIIS-EVENSEN'S THEORY OF ARCHITECTURAL ARCHETYPES

BY

RAHEL ERKO EGZITI

B.S., Addis Ababa University, Ethiopia, 1993

A THESIS

Submitted in partial fulfillment of the requirements for the degree

MASTER OF ARCHITECTURE

Department of Architecture
College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2004

Approved by:

David Seamon

Major Professor

David Seamon

ABSTRACT

Using Norwegian architect Thomas Thiis-Evensen's phenomenological theory of *Archetypes in Architecture* (Thiis-Evensen, 1987), this thesis interprets two contrasting transportation terminals: Charles McKim's Pennsylvania Train Station (1910—1964) and Eero Saarinen's TWA Air Terminal building (1962—), both located in New York City. These two buildings were constructed at the apex of their building era and were a key architectural interface with the city. They were a major place of transition between the mechanized world of speed and the much slower pace of the human pedestrian.

In his *Archetypes in Architecture* (1987), Thiis-Evensen attempts to conceptualize an experiential language of architecture, which, he argues, is a making of inside in the midst of an outside, through three basic architectural elements, or *archetypes* as he calls them: *floor*, *wall* and *roof.* Working in considerably different ways, these three archetypes separate the interior from exterior and balance the forces of inside and outside.

By using Thiis-Evensen's theory, this thesis identifies and demonstrates some underlying principles of design and existential expressions of Pennsylvania Station and the TWA Air Terminal building. In presenting this interpretation, the thesis takes the following order. Chapter 1 describes the two buildings in terms of their history and architectural character. Next in Chapter 2, some major conceptual approaches to architecture, space and place are reviewed as well as Thiis-Evensen's theory of architectural archetypes. Chapters 3 and 4 provide a detailed interpretation of the two buildings, using Thiis-Evensen's theory as an interpretive framework. Specifically Chapter 3 examines Penn Station, largely in terms of the building's walls, while Chapter

4 presents an interpretation of the TWA terminal, largely in terms of walls and roofs. The final chapter summarizes the interpretation of the two buildings and also considers implications for architectural teaching and design.

TABLE OF CONTENTS

LIST OF FIGURES

ACKNOWLEDGEMENT

I am so grateful to my major advisor, Professor David Seamon, for his constant guidance and impartial motivation in the process of writing this thesis. I have learned a great deal from this thesis and from his valuable counseling. I thank him for his patience, continuous support and advice, which made this thesis worth spending time on. His perceptive and ingenious advice have helped me to understand and see clearly the topic that I wrote about and think deeply so that I can explain some of the taken for granted constant phenomenon on which our existential experience is based, a key to understand architectural expressions of the built environment. I feel so privileged and blessed to have such a considerate and caring advisor who takes so much of his personal time to help students in their study, which I appreciate and treasure in the future.

Similarly, I would like to thank my thesis committee members Professor David Sachs and Professor Gary Coates for their constructive advice and guidance in finalizing my thesis. I really appreciate them for their support in my study. I also wish to thank my brother Amsalu, my sister Hadassa and her husband John. Their constant support has been more than inspirational to me. I thank them for their kind suggestions and morale support, which made it possible for me to finish this thesis successfully.

Finally, I greatly want to thank God for giving me this chance of study and strength to finish it. Especially, I feel compelled to thank my husband Mekuria and my daughter Ruth, more than anybody else, for being patient with me and for encouraging and supporting me in every aspect till the end of my thesis work.

DEDICATION

This thesis is dedicated to my loving and caring parents, to my father Erko Egziti (Abiye) and to my mother Desta Gonffa (Tetiye), for everything they have done for me throughout my life.

CHAPTER 1

INTRODUCTION: MAIN AIMS AND THE TWO BUILDINGS

Using Norwegian architect Thomas Thiis-Evensen's phenomenological theory of *Archetypes in Architecture* (Thiis-Evensen, 1987), this thesis interprets two contrasting transportation terminals: Charles McKim's Pennsylvania Train Station (1910—1964) and Eero Saarinen's TWA Air Terminal building (1962—), both located in New York City. These two buildings were constructed at the apex of their building era and were a key architectural interface with the city. They were a major place of transition between the mechanized world of speed and the much slower pace of the human pedestrian.

In his *Archetypes in Architecture* (1987), Thiis-Evensen attempts to conceptualize an experiential language of architecture. He argues that architecture is a making of inside in the midst of outside, through three basic but very important sets of architectural elements, or archetypes as he calls them: *floor*, *wall* and *roof*. Even if each of these archetypes performs their own very distinct function, all of them can work to create a dynamic interaction between inside and outside. They separate the interior from exterior and balance the force of inside and outside (*ibid.*, p. 19).

The meaning of the three archetypes' dynamic interaction between inside and outside, according to Thiis-Evensen, is expressed through three existential expressions: *motion, weight,* and *substance*. *Motion* refers to the sense of movement of the architectural element: whether it gives the impression of expansion, contraction or remains in balance. *Weight* implies the sense of heaviness or lightness of the element in relation to gravity, while *substance* relates to sensual qualities like softness, hardness,

fineness, coarseness, warmth, cold and so forth. Thiis-Evensen argues that we understand these existential expressions of archetypes based on our common experience of natural phenomena and independently of individual, group, or historic differences. According to Thiis-Evensen, this common experiential quality of architecture shows the universality and timelessness of the experiential language of archetypes.

By using Thiis-Evensen's theory, I attempt to identify and demonstrate the underlying principles of design and existential expressions of Pennsylvania Station and the TWA Air Terminal building. In presenting this interpretation, the thesis takes the following order. The remainder of this chapter describes the two buildings in greater detail in terms of their history and architectural character. Next in chapter 2, some major conceptual approaches to architecture, space and place are reviewed as well as Thiis-Evensen's theory of architectural archetypes.

Chapters 3 and 4 provide a detailed interpretation of the two buildings, using Thiis-Evensen's theory as an interpretive framework. Chapter 3 provides a detailed interpretation of Penn Station, largely discussing the building's walls, while Chapter 4 presents an interpretation of the TWA terminal, largely discussing the walls and roofs. The final chapter summarizes the interpretation of the two buildings through a comparison and contrast. This last chapter also considers implications for architectural education and design.

McKim's Pennsylvania Train Station

As already explained, this thesis interprets McKim's Pennsylvania Train Station and Eero Saarienen's TWA Air Terminal from the perspective of Thiis-Evensen's theory of architectural archetypes. To provide this understanding, I first provide a background portrait of the two buildings.

First, we need to consider McKim's Pennsylvania Train Station, shown in figures 1.1 and 1.2 and McKim's most publicized work. Demolished in 1964, Penn Station was located on a large single block of busy commercial property in Manhattan in New York City. The block was comprised of four contiguous square blocks, bounded by 7th (south) and 8th (north) Avenues and 31st (east) and 33rd (west) Streets. Five hundred buildings and a Manhattan slum known as "Hell's Kitchen" were razed to make room for a nine-acre train station whose concourse was longer than the nave of Saint Peter's Basilica in Rome.

The site chosen for Penn Station was envisaged as New York City's primary interchange for all modes of transportation, including trains, subways, street vehicles, pedestrians and public transportation. Erecting Penn Station took four years (1906—1910) and used 27,000 tons of steel, 17,000,000 bricks, and 64,000 barrels of cement for retaining walls and foundations (Parissen 1996, p.18-19).

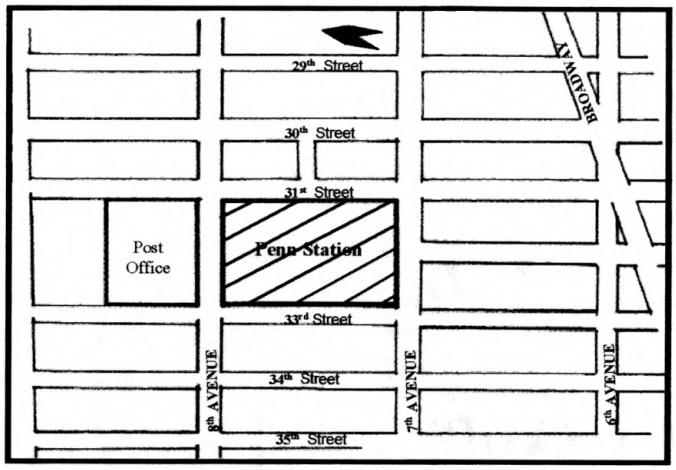


Figure 1.1: Penn. Station, site plan
(Diehl, 1985, p. 52)

Figure 1.2: Penn. Station, aerial view
(Parissen, 1996, p. 22)

When McKim designed Penn Station, he wanted to create freedom and rapidity of movement in, within, and outside the building, which he envisaged as New York City's primary interchange for all modes of transportation (Parissen, 1996, p. 9). The station was intended to be a commercial hub on the inside (Plosky, 1999, p. 12). Given that the station was being inserted into an existing urban fabric and the site was congested, McKim distributed the functions vertically and horizontally based on passenger flow, incorporating an efficient system of circulation through which passengers and traffic were separated by level. William Couper, a historian of the Pennsylvania Railroad Station, explained that, "the entire layout has been so schemed that it is impossible for the inbound and out bound traffic to oppose each other" (Parissen, 1996, p. 11).

We next need to provide a detailed architectural description of Penn Station. First, we consider the four major facades of Penn Station, shown in Figures 1.3-1.6. All four elevations of the station had colonnades and were entirely clad with pink Milford granite. The four exterior elevations of the station had a repetitive procession of "Doric/Tuscan

hybrid" columns, thirty-five feet high (ibid., p. 13).

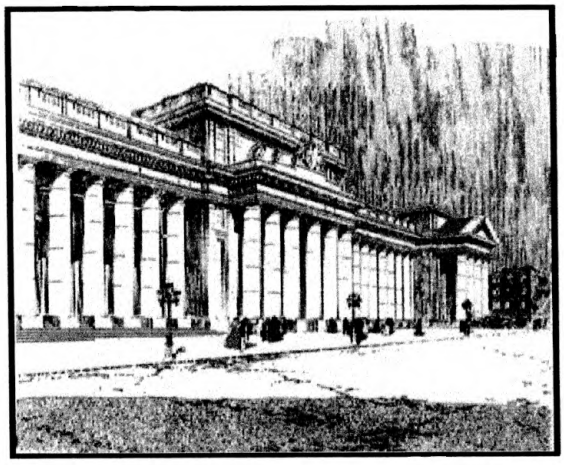


Figure 1.3: Penn Station, 7th Avenue facade main entrance (Parissen, 1996, p. 56)

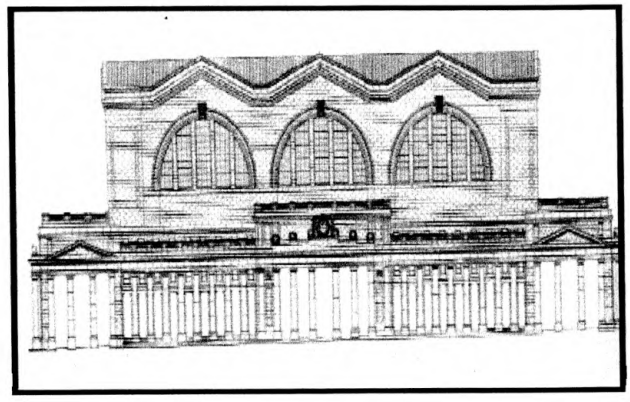


Figure 1.4: Penn Station, 7th Avenue façade, elevation (Parissen, 1996, p. 4)

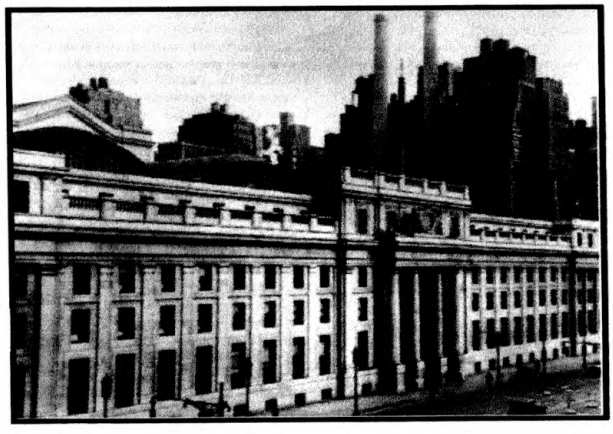


Figure 1.5: Penn Station, 31st Street façade (Parissen, 1996, p. 14)

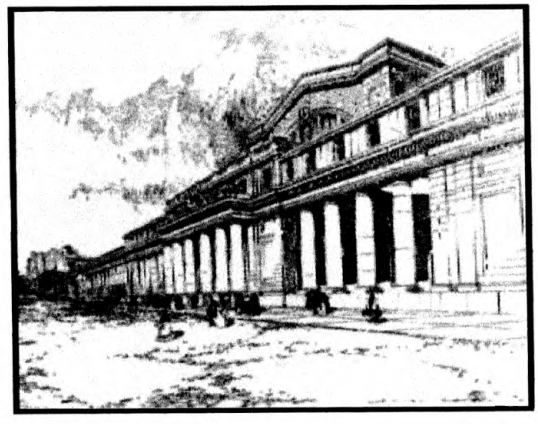


Figure 1.6: Penn Station, 33rd Street façade (Parissen, 1996, p. 14)

On each of the station's four facades there were pedestrian entrances marked with porticos that were surmounted by high continuous, staggered balustraded attics. All the four entrance porticos were adorned by groups of stone sculptures. Each group consisted

of symmetrically composed stone sculptures of six eagles each weighting 5,700 pounds, a seven-feet diameter clock and two maidens leaning on either sides of the clock.

The 7th Avenue elevation (figure 1.4), owing to its accessibility to high pedestrian and automotive traffic flow, was the main entrance façade for the station. All incoming carriages and cars were able to enter the building only from this façade via double colonnades of the sloping carriage driveway. Marked by a low pediment and attic, these two carriageways were located on either end of the 7th Avenue façade, which incorporated gentle steps between all columns, except for the central pedestrian entrance portico columns and the two carriageway entrance columns. In contrast, the east (31st Street), west (33rd street), (figure 1.5 and 1.6), and north (8th Avenue) façades had no steps and much less decoration that the embellished 7th Avenue facade.

Looking at the 7th Avenue façade in greater detail, we note that its central pedestrian entrance portico (figure 1.3) was different from the other three pedestrian entrance porticos, since it had a stepped pediment on which sculptures were set. In addition, the wall located just behind this entrance portico was higher than the similar walls behind the other three entrance porticos.

Next we need to consider the four-leveled floor plan of Penn Station, which is presented in figures 1.7-1.12. Figure 1.7 illustrates the exit concourse level, which was constructed eighteen feet above the train track bed, which was constructed forty-five feet below street level for incoming and out going trains. This exit concourse level had a low-ceiled intermediate area comprised of concourse, baggage passage, rest rooms, and smoking area. This concourse area also included elevators, pedestrian ramps, and stairs leading to the general waiting area level and to the street level. If passengers didn't need

tickets and travel information, they could directly access the concourse area from the 31st and 33rd Street levels via two wide stairs.

The level above the exit concourse was the general waiting room level (figure 1.8), which was thirty-one feet above the train track bed and fourteen-feet below street level. This level consisted of a ticket office, parcel rooms, men and women's waiting rooms, rest rooms and a baggage checking area. The largest space of this level—the spacious general waiting room—was centrally located with stairs and ramps to access street level.

The area above the general waiting room was the street level (figure 1.9), comprised of a walking arcade lined with shops, dinning room, lunchroom, rest room, offices and carriageways. Both pedestrians and carriages or cars could access this street level from the 7th Avenue main entrance. Pedestrians accessing the building from 7th Avenue proceeded through the broad arcade down a forty-feet-wide stair to the general waiting room. Pedestrians could also access the station's street level directly from 31st and 33rd Street or directly from 8th Avenue. All incoming carriages and cars were able to enter the building only from 7th Avenue main entrance via arcaded carriageways located on the east and west end of the 7th Avenue entrance. As we can see in the street level plan of the station (figure 1.9), the location of the four streets bordering the station made access to all levels in the building convenient.

Figures 10-12 illustrates the uppermost levels of the station, which included offices, assembly halls, employer facilities and other uses. Most of these spaces were concentrated on the north end of the building along 8th Avenue and on the north end of the 31st Street façade, and the north end of the 33rd Street façade. These office areas

comprised most of the fourth level and were given over to railroad employee facilities like a YMCA, assembly hall, lecture room, library and bowling alley. These upper levels of the station had their own direct stair access to the street.

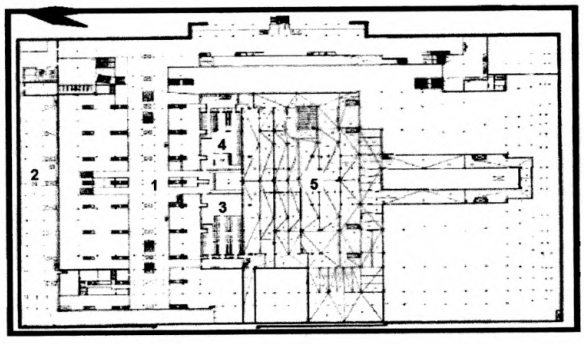


Figure 1.7: Penn Station, exit concourse level plan (Parissen, 1996, p. 48)

1.Exit concourse
2. Baggage passage
3. Woman's rest room
4. Men's rest room
5. Pipe gallery (smoking room)

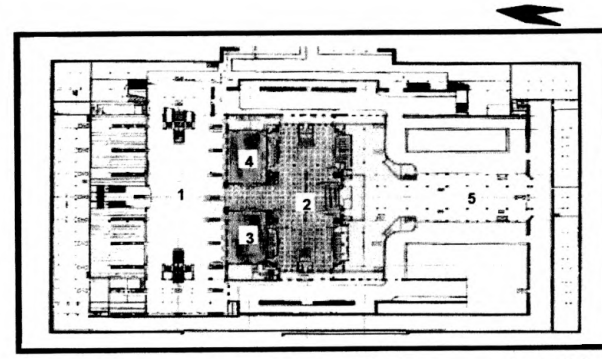


Figure 1.8: Penn Station, general waiting room level plan (Parissen, 1996, p. 48)

1.Concourse
2.general waiting room
3. Woman's waiting room
4. Men's waiting room
5.Baggage room

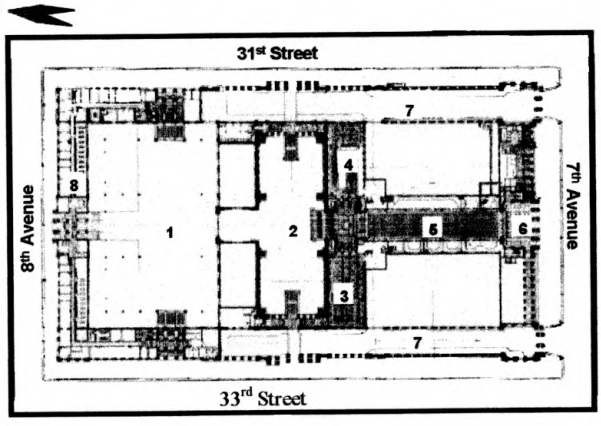


Figure 1.9: Penn Station, street level plan (Parissen, 1996, p. 49)

1. Concourse (on exit concourse level)
2. Waiting room (on exit concourse level)
3.Dining room
4. Lunch room
5. Arcade
6. Main entrance
7. Carriageway
8. Offices

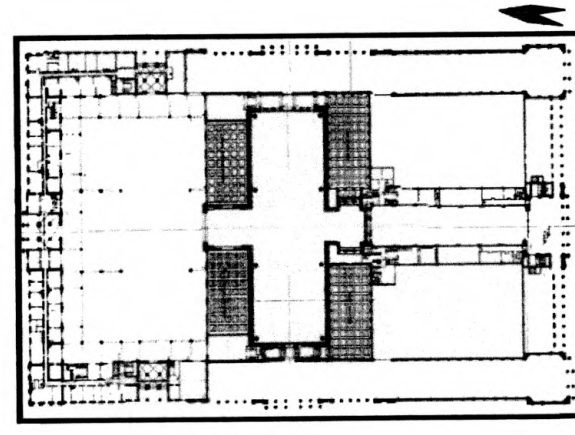


Figure 1.10: Penn Station, second floor level Plan (Parissen, 1996, p. 50)

1. Offices

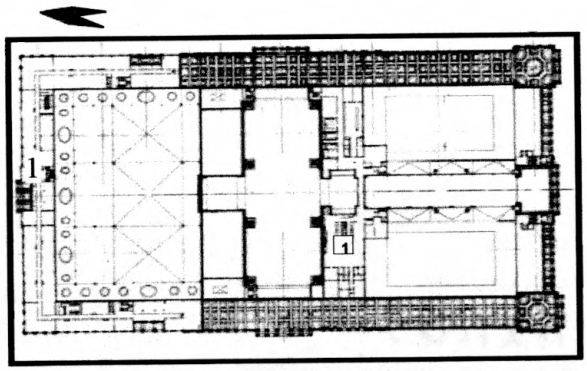


Figure 1.11: Penn Station, third floor level plan (Parissen, 1996, p. 50)

1.Offices

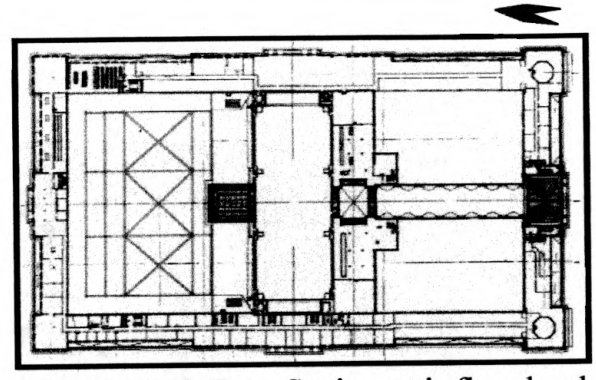


Figure 1.12: Penn Station, attic floor level plan (Parissen, 1996, p. 51)

As we can see in the floor plans of figures 1.7-1.12, McKim tried to create freedom and rapidity of movement in, within, and outside the building by deliberately dividing the station into two main distinct zones: first, a purely utilitarian and structural space, intended primarily for train use; and, second, a purely architectural and classical space, reserved for passengers. In other words, the two zones were the contemporary steel-framed functional area, which incorporated the train concourse with train platforms for trains; and the classical stone-clad service areas that included the general waiting room with its attendant spaces for people.

As an expression of McKim's station's interior space organization, the exterior walls of the building also responded to the dual spacing of the building through different architectural styles and materials (figures 1.13 and 1.14). Colonnades gave the building a neo-classical impression heightened by the three-gabled clerestory of the general waiting room. In contrast, the concourse area, with a glass umbrella roof of exposed steel ribs,

expressed a modernist idiom. These two contrasting dialects were a clear demonstration of Penn Station's exterior response to the idea of creating two distinct zones (figure 1.14).

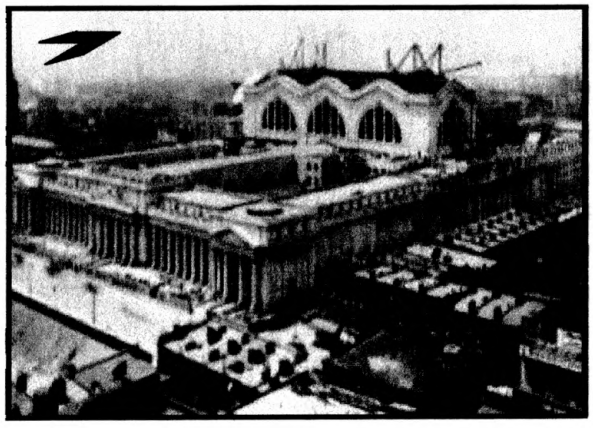


Figure 1.13: Penn Station, axonometric view (Parissen, 1996, p. 8)

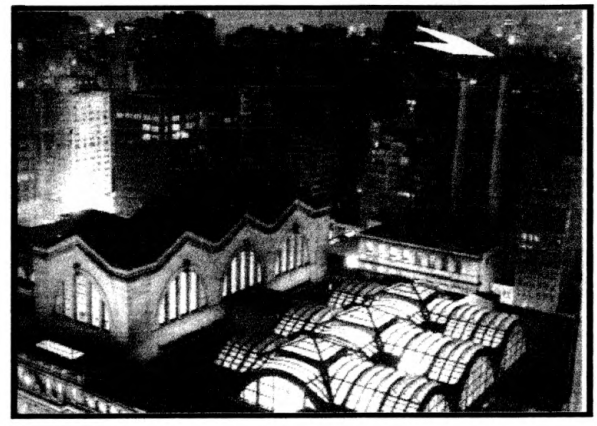


Figure 1.14: Penn Station, roof, north-east view (Parissen, 1996, p. 22)

In keeping with the magnificence of the exterior, the interior of the station had several interconnected grand spaces, each with their own architectural character. Accessing the station from 7th Avenue led the user through the arcade's line of elegant shops (Figure 1.15) and down a magnificent forty-feet-wide staircase to the great space of the general waiting room, with its immense cathedral clerestory and coffered groin vault 150 feet high (Figure 1.16). This room included eight giant Corinthian columns, each sixty feet high, and eight cast iron chandeliers. There were also ionic-order pilasters, thirty-one feet high, which rose to half the height of the wall. Eight lunette windows, each sixty-eight feet in diameter, provided direct light for the interior. Below the lunette windows, there were six large panels containing colored maps portraying all lines of the Penn RR (figure 1.16).

Figure 1.15: Penn Station's arcade (Diehl, 1985, p. 85)

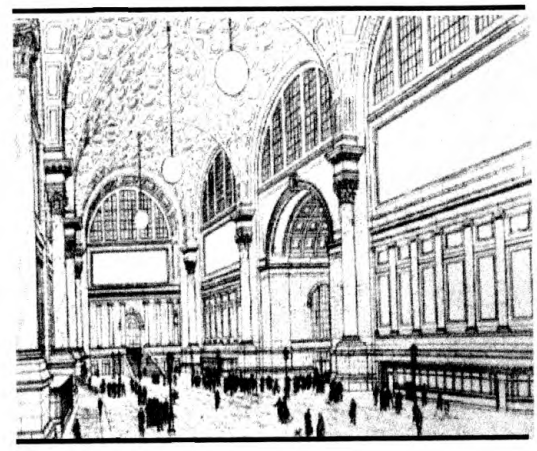


Figure 1.16: Penn Station's general waiting room (Diehl, 1985, p. 85)

As shown in figures 1.17 and 1.18, entering the concourse area was a much different experience than entering the general waiting room where all was classical restraint and formality. The concourse, with its bare structural steel, suggested the motion and power of technology (Diehl, 1985, p. 112). The concourse had sweeping steel arches with glazed umbrella roofs braced with black painted steel, covering 65,520 sq. feet area. If the station's other rooms were Roman, this one was very much American (ibid.). Nevertheless, the separate interior spaces of the station integrated themselves into a unified form to serve their purpose of transportation terminal well.

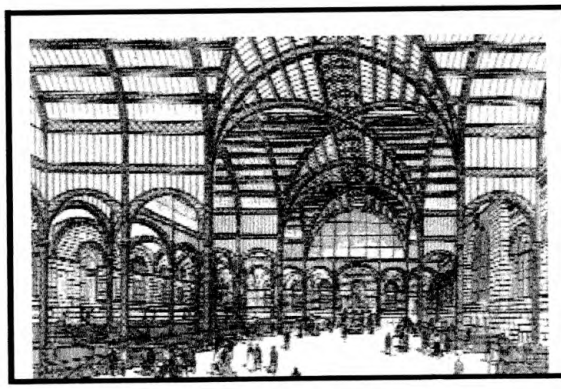


Figure 1.17: Penn Station Concourse (Parissen, 1996, p.5)

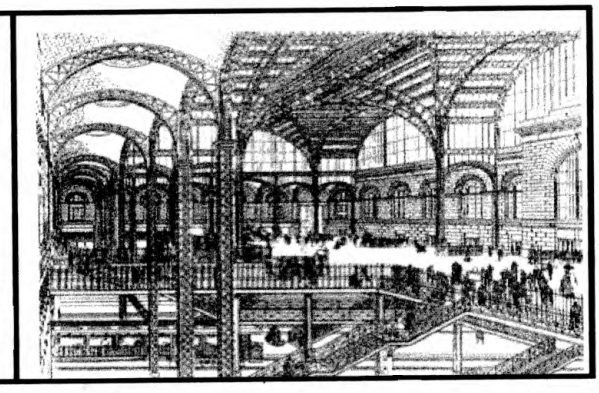
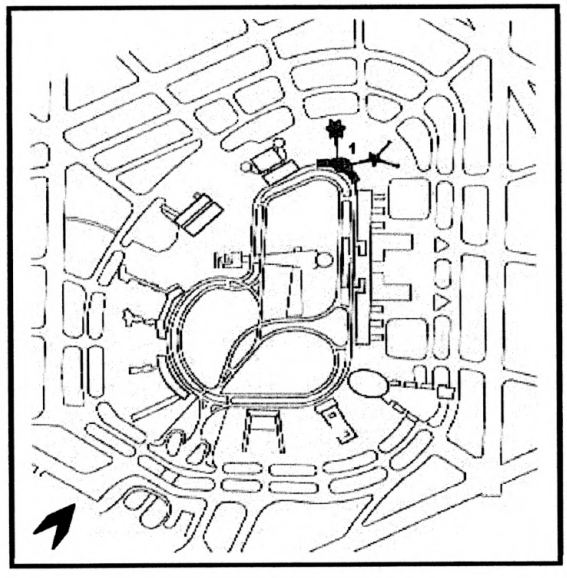


Figure 1.18: Penn Station Concourse and track (Diehl, 1985, p.84)

The TWA Air Terminal

We next need to provide a description of Eero Saarinen's 1962 TWA terminal building, one of Saarinen's most original and most important projects (Prudon, 2003, p. 1). The TWA air terminal building (henceforth called TWA terminal) is built on a prominent, flat site located in Queens, fifteen miles east from midtown Manhattan. The terminal is located on a curve of the JFK airport access road, along which each of the major airlines serving JFK has built terminal buildings (figure 1.19 and 1.20). Erecting the TWA terminal took six years (1956—1962).



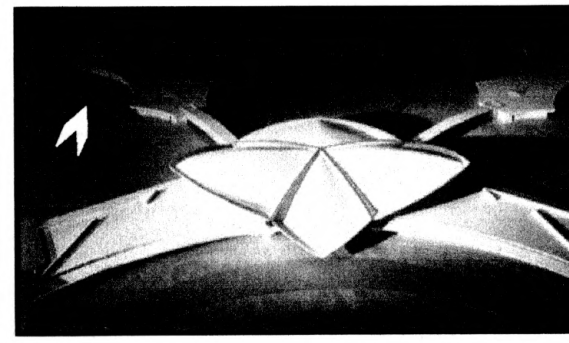


Figure 1.20: TWA terminal, aerial view (model) (Roman, 2003, p. 47)

Figure 1.19: JFK International airport and site of TWA terminal (Stoller, 1999, p. 83)

In designing the TWA terminal, Saarinen intended to create a distinctive and memorable building, which would "express the drama, specialness and excitement of travel" (Temko, 1962, p.45). He also created an efficient system of circulation within the building volume, which was designed as a totality of fluid forms with free flowing space.

As Jacobus, (1966, p. 160) has pointed out, the TWA terminal stands as an important symbol of flight's transition from its romantic unusualness to a convenient form of mass transportation.

We next need to provide a detailed architectural description of the TWA terminal. First, as shown in figures 1.21and 1.22, we consider the two main facades of the building, for these two sides (front and rear elevations) show the whole building's exterior nature. As indicated in the figures, the whole building is made of a smooth, sculptural concrete shell that incorporates ovals and curves. Looking at the front façade illustrated in figure 1.21, one notes two main features: the high, winglike segmental vaults and the two low east and west wings.

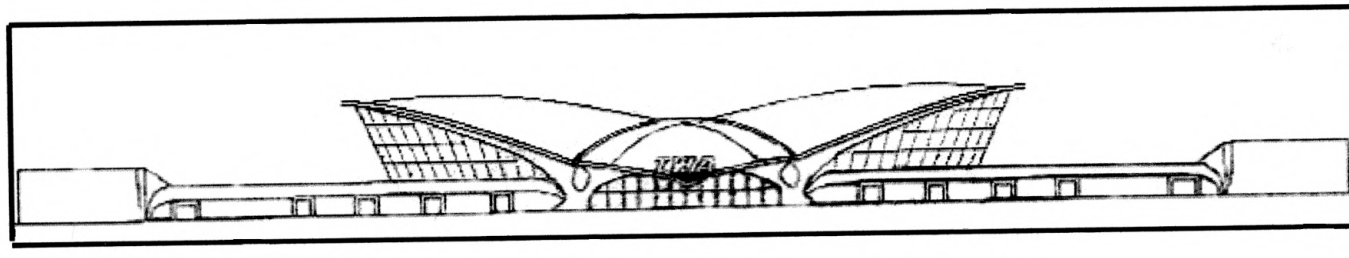


Figure 1.21: TWA terminal, front (south) elevation (Roman, 2003, p. 54)

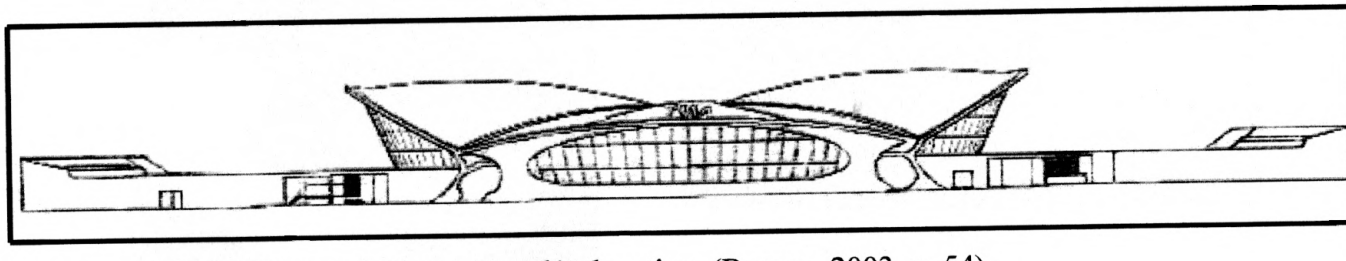


Figure 1.22: TWA terminal, rear (north) elevation (Roman, 2003, p. 54)

As can be seen in the model of figure 1.20, the prominent central roof structure of the terminal is composed of four segmental vaults with bands of skylights at their junctures. These vaults, which run virtually the entire length of the building, are fifty-five feet high and made of four thin, concrete shells, where "their jutting, diamond-shaped contours join on two sides to form a four-pointed star" (Roman, 2003, p. 46). Together, the four segmental vaults form a vast, umbrella-like shell curving over 76,680 square feet of passenger area and supported by four-Y shaped pylons.

Looking at the front elevation in greater detail (figures 1.23 and 1.24), we note that, of the four segmental vaults, the middle vault extends seventy-five feet from the main wall to shelter the main entrance (figure 1.23), while the east and west vaults stretch skyward (figure 1.24). In contrast to the prominent central vaults, the east and west wings of the terminal building have low-ceiled, flat concrete roofs that have cantilevered concrete eves with edges curved towards the ground. These roofs appear to be an extension of the wings' walls because it is hard to tell where the roofs end and the walls begin.

Figure 1.23: TWA terminal, main entrance (Stoller, 1999, p. 25)

Figure 1.24: TWA terminal, east-south view (Stoller, 1999, p.15)

The design of the terminal's walls also gives the building a distinctive visual impression (figure 1.25 and 1.26). The vertically soaring central shell vault has a transparent convex glass wall covering, slanting upward and outward, and extending to the roof and down to the floor without interruption. In turn, the two horizontally stretching east and west concave wings of the building have solid paneled walls dissolving into the floor and roof.

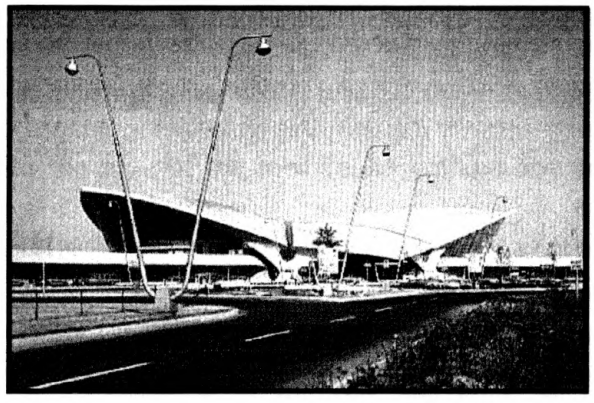


Figure 1.25: TWA terminal, main entrance
(Stoller, 1999, p. 23)

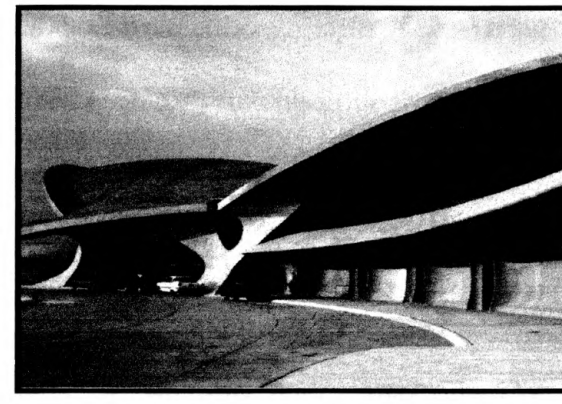


Figure 1. 26: TWA terminal, south view
(Roman, 2003, p. 44)

The other elevation that we need to consider is the rear elevation. Similar to the front elevation, the rear elevation has two dominant features, as shown in figures 1.22, 1.27 and 1.28. These features are the great segmental central vault, and the horizontally stretched wings. Just like the front elevation, the central vault-covered part covered dominates the rear elevation (figure 1.22). Out of these intersecting segmental vaults, the middle shell has a lower apex height than the two lateral segmental vaults stretching skyward east and west (figure 1.27). In contrast to this towering vault roof of the main

portion of the terminal, the two low side wings have low-ceiling flat roofs. These roofs with no eaves work as an extension of the walls (figure 1.28).

The second prominent feature that is visible on this rear elevation (figures 1.27 and 1.28) is the contrasting material nature of the walls: on one hand the soaring, transparent inclined glass walls of the main building structure and on the other hand, the low ground-hugging concrete walls of the two side wings. As in the front elevation, the rear elevation's elevation central domed area is covered with outwardly inclined, soaring glass walls, while the side wings are composed of short solid concrete walls. The soaring transparent glass walls, which run around the vaulted center, stretch up from ground level to the edge of the roof vaults without any interruption. In contrast to the splay of these transparent walls, the two convex wings of the building have short concrete walls with few openings.

Looking at the rear elevation in figure 1.28, we also notice two tube-like passageways, jutting out from the terminal's main structure and leading to the two satellite-boarding lounges. These two passageways have monolithic concrete walls with no openings on their sides.

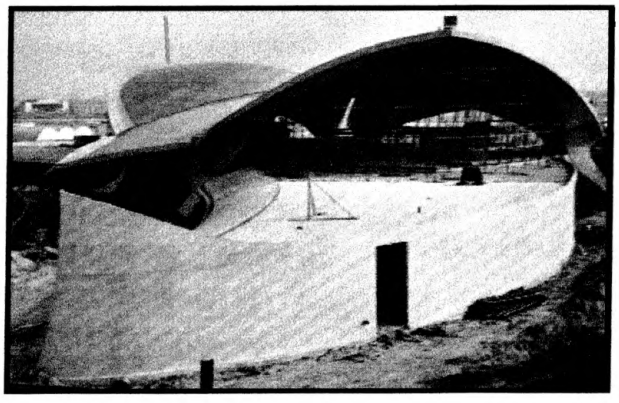


Figure 1.27: TWA terminal, east view, close up (under construction) (Temko, 1962, p.94)

Figure 1.28: TWA terminal, rear (north) view (Fenollosa, National Trust)

Next, we need to consider the two-leveled floor plan of the TWA terminal building, presented in figures 1.29 and 1.30. Figure 1.29 illustrates the terminal's main level, which is comprised of information desk, main lobby, lounge, baggage claim, ticketing, operations kitchen and offices. The ground level covers 71,484 square feet area and is 322 feet long and 222 feet wide at its furthest extremities. The visitor accesses the terminal's main level directly from the street through the main entrance and arrives at the information desk, adjacent to which on east and west sides are ticketing and baggage claim areas, respectively.

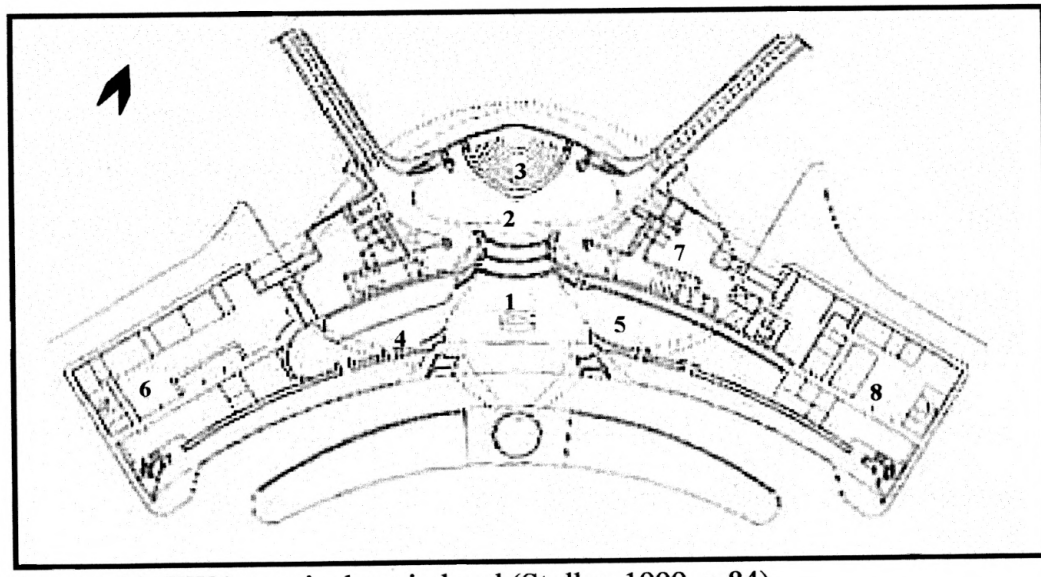


Figure 1.29: TWA terminal, main level (Stoller, 1999, p.84)

1. Information desk
2. Main lobby
3. Lounge pit
4. Baggage claim
5. Ticketing
6. Operations
7. Kitchen
8. Offices

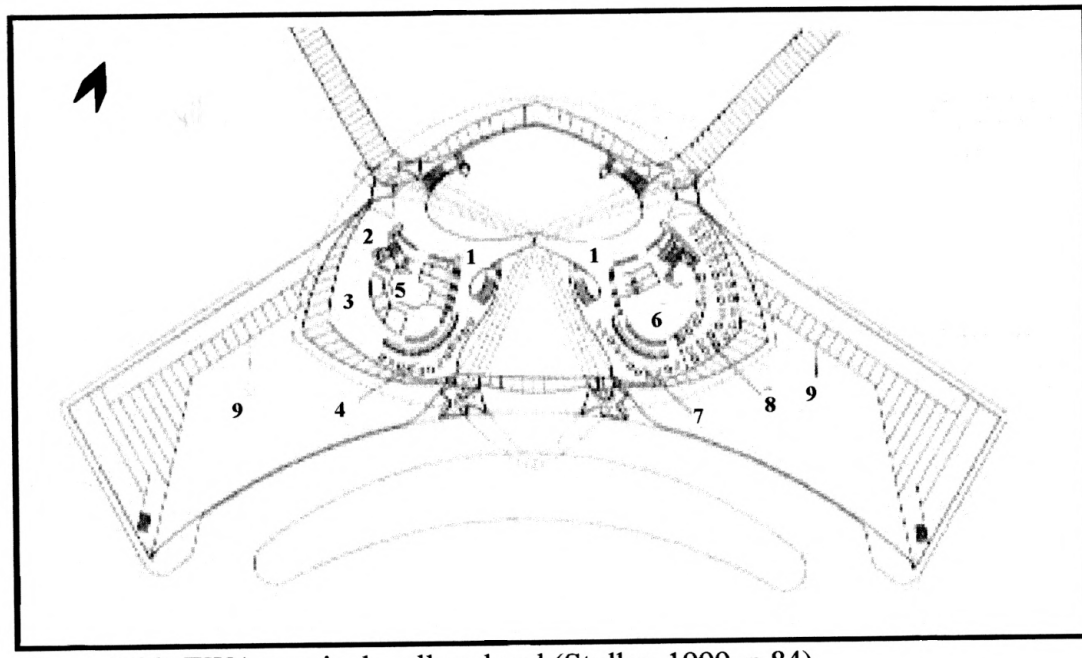


Figure 1.30: TWA terminal, gallery level (Stoller, 1999, p.84)

1. Gallery	4. Bar	7. Coffee shop
2. International lounge	5. VIP lounge	8. Dining area
3. Ambassador Club	6. Service/ Kitchen	9. Observation desk

Passing behind by the information desk area, one goes up fan stairs that lead to the main lobby area and then to a lounge pit with a sunken floor, that is located at the further north end of the main lobby area. The lounge pit has a sunken floor four steps below the main lobby level. The rest of the functions found on this level are situated in the two east and west wings of the terminal and includes offices and operations.

Above the terminal's main floor is the gallery level, comprised of gallery, passenger lounges, coffee shop, dining area, kitchen, and observation desk. This level is approached by four curving concrete gallery stairs, which start from the lobby of the main level. Two of these stairs lead to a gallery-level, landing which provides panoramic

views of the airfield. In turn the other stairs lead to the gallery level's east and west sides that include the functions listed in figure 1.28: coffee shop, dining area and kitchen.

As we can see in the floor plans and elevations of the TWA terminal, Saarinen attempted to create a distinctive building expressing the drama and excitement of air travel, through designing organic volumes with dynamic interior spaces integrated into a unified whole. In order to achieve his goal, Saarinen deliberately divided the terminal's organic volume into two main distinct zones: first, a central space, which is mainly intended for passengers', and second, the two wings that are mainly reserved for staff and practical airlines operations.

As explained above, the terminal's central space is comprised of functions having a public nature: the information desk, lounges and bars. In contrast, the two side wings are comprised of non-public nature: offices and operations. Nevertheless, all spaces work together to serve their purpose of transportation terminal well. This distinct interior spatial organization of the TWA terminal is manifested in the building's outside expression of volume. The interior section is reserved for passengers has a double-storey height and is covered with vault roofing and a convex glass wall. In contrast, the interior section reserved for the airline staffs have a single-storey height and are covered with low flat roofs and solid walls.

In addition, as shown in figures 1.29 and 1.30, the interiors of the terminal appear to be an extension of the exterior. The terminal's external curves reappear on the inside spaces so that every detail belongs to the same family of sculptural forms, which are consistently repeated in the railings, stair shapes, passenger counters, information board, and so forth. As Gossel and Leuthauser (1959, p. 250) explain, "passengers

passing through the building experience the fully-designed environment, in which each part arises from another and everything belongs to the same formal world."

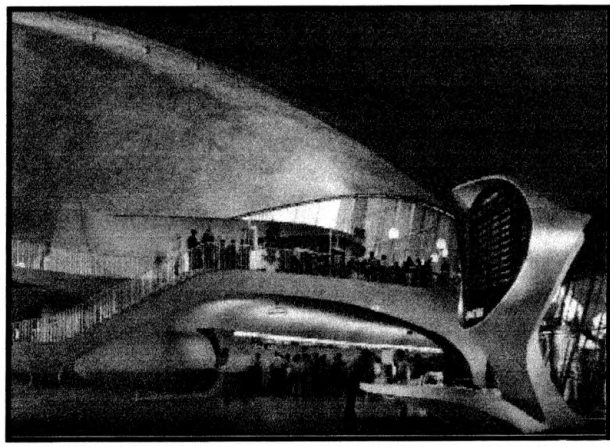


Figure 1.31: TWA terminal, information desk
(Global Architecture, p. 36)

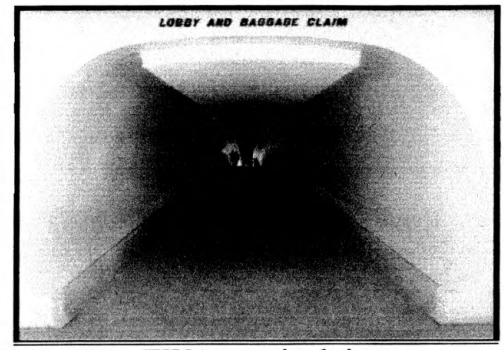


Figure 1.32: TWA terminal, jet-way tunnel
(Stoller, 1999, p. 63)

At the time TWA terminal was built, its style of construction expressed a new architectural vocabulary. The unity of walls, floors, and ceilings all flowing into one another, and the continuity of forms with similar organic shape made the building hard to classify architecturally. Nevertheless, the building general style can be described as "a classic marriage between architecture and engineering" (Casabella, 2002, p. 183). Curiously for the architectural press and lay public, the terminal building was regularly depicted as a giant bird, the beak extending over the roadway to the front, the wing rising as if to check its descent and legs outstretched in anticipation of landing. Saarinen however claimed the bird imagery was entirely "coincidental." (Saarinen, 1968, p.68)

In this chapter I have provided a detailed architectural portrait of the Pennsylvania train station and the TWA air terminal. The next chapter presents some major conceptual approaches to architecture, space, and place, and then reviews the major arguments of

Thiis-Evensen's theory of architectural archetypes, which will be used to interpret Penn Station and the TWA terminal in chapter 3 and 4.

CHAPTER 2

CONCEPTUAL APPROACHES TO ARCHITECTURAL MEANING AND THIIS-EVENSEN'S ARCHITECTURAL ARCHETYPES

This chapter reviews the scholarly literature to identify and describe some fundamentally accepted approaches to understanding the meaning of the built environment. I use different sources to show a particular conceptual approach, since a person and group's reaction to their built environment is very much dependent upon the meanings the environment has for them (Rapoport, 1982). Buildings seem to invoke certain feelings that provide a background for more specific images that are fitted to building's forms, which make people react to them globally and emotionally before analyzing and evaluating them in more specific terms (ibid.). These reactions are based on the meaning that the built form and its particular aspects have for the users involved. In addition, "the direction that contemporary architecture takes in the next generation will greatly depend on how the issue of meaning in architecture comes to be resolved by the architectural profession" (Groat, 1981, p. 84).

So, it is important to ask the question, "On what basis do people give meanings to architecture?" In order to answer this question and to help architects design more thoughtfully, it is appropriate to overview different conceptual ways to define "meaning" itself. Here, after Seamon (1988), four contrasting conceptual ways of studying architectural meanings are considered:

1. Semiotic approach
2. Marxist-Structural approach
3. Post- Structuralism approach
4. Phenomenological approach

I next overview each of these approaches in turn and then review Thiis-Evensen's architectural archetypes as they illustrate one specific example of the phenomenological approach to architectural meaning.

1. Semiotic Approach

The semiotic approach to architectural meaning involves an abstract linguistic model used originally in linguistic research (Rapoport, 1982). This conceptual approach studies signs and their cognitive significances in the built world. The approach defines meaning as a process by which something in the world functions as a sign. The approach stresses that the reading of the meanings requires some cultural knowledge. This approach has three main components: the sign agent (what acts as a sign), its designation (what the sign refers to), and its interpretant (the influence on the interpreter by popularly known qualities through which a thing is a sign) (ibid., p.38). For example, Jencks (1980, p. 72) defines the built environment as " the use of formal signifiers (materials and enclosures) to articulate signified (ways of life, value and functions) making use of certain means (structural, economic, technical and mechanical)."

For this approach, meaning is a derivative of signs whose significance varies in relation to person, group, and historic movement. At the same time, this approach supposes that the built environment has no inherent meaning. Basically this approach that

intends to clarify architectural signs and devise a multi dimensional coding so that everyone can understand built environment more readily. Specific examples of a semiotic approach to architectural meanings are provided by Jencks (1987), Eco, (1972), Groat, (1982), and Sebeok, (1977a).

2. Marxist-Structural Approach

This second approach is mainly concerned with how a particular environment is created by and reflects its underlying ideological, political and socio-economic context and structure (Dovey, 1999; Knox, 1982). This approach assumes that the built environment is a means of reproducing and supporting different social divisions and ideological forces. Marxist-structuralists emphasize the existence of structures that are found as a part of day-to-day ideology and the power structure of society (ibid.). Economic structure is seen as a fundamental basis of individual and societal worlds (Harvey, 1973, P. 292).

For this approach, meaning is considered as a projection of economic and socio-cultural context subtly encoded into the built environment (Dovey, 1999). Meaning is taken as a projection of society related facts, which are not always visible on the surface. As a result, such meanings in architecture symbolize power and therefore legitimatize a particular dominant socio-economic system and ideology by providing a physical focus to which value and feelings can be attached (Dovey, 1999, p. 10-16; Knox 1982/84, p. 110). These symbols, which are represented in part by the built environment, become the visible message that people receive (Knox, 1982/84, p. 119). The work of (Dovey, 1999), Harvey, (1973), and Knox, (1982/84) are good examples of this approach.

3. Post-Structural Approach

The third conceptual approach to architectural meaning is the post-structural perspective, which considers meaning as unclear, non-permanent and relative. It is an approach that considers the environment as something that has no determinant meaning. The approach argues that specific signifiers are multivalent and diverse so that any interpreter creates his or her own unique meaning from them. This approach argues that meaning is an arbitrary process derived from creativity and ever-changing interpretation. The post-structuralists don't believe in intrinsic meanings and structures at all; they take the idea of any universal or inherent meanings to be as "an impossibility and delusion" (Seamon, 1988, p. 73).

This approach believes in the possibility of dividing meanings into parts and, in 'deconstructing' them and constructing new meanings from the fragmented pieces. The aim of the approach is "the freedom to change and reconstitute oneself continually" (Mugerauer, 1988, p. 67). The works of Ingraham, (1987), Kipnis, (1987), and Olsson, (1981) are good examples of this approach to architectural meaning.

4. Phenomenological approach

The phenomenological approach, which I will discuss in greater detail because it is the approach used in this thesis, seeks to identify and clarify the underlying, essential structures of experience and things as experienced. This approach deals with meaning in relation to day-to-day phenomena, people's feeling states, and moods towards the built environment (Moustakas, 1994; Seamon, 1982, 1987a, 1987b, 1988; Spiegelberg, 1982; Stefanovic, 1992).

For this approach, meaning is complex and can be affected by the timing of the moment, the background of the experiencer, and the quality of the environment to be perceived. This approach, unlike the other three approaches above, believes in the "underlying, essential existential structures presented directly in appearance" (Seamon, 1988, p. 72). Fundamentally, the aim of this approach is to find " descriptive means for simplifying the experiential complexity of meaning without converting or reducing it into something it is not." (ibid., p. 68). This results in "a general, descriptive picture of meaning and the meaning experience" (ibid.).

The crux of this approach is the realization of meanings that connect the person with the built environment in a specific moment of understanding bearing a specific sense of meaning. The approach also attempts to find out how this one-to-one correspondence of person, environment, and moment of understanding contributes to meaning and how it varies in intensifying meaning (ibid.). It answers the question "how built form, space and surface gather together and create place that evokes and strengthens environmental and architectural meaning" (ibid., p. 69).

The phenomenological approach attempts to describe and clarify the experiential base of environmental and architectural meaning, which in turn might be able to provide deeper understanding for policy. The works of Groat, (1982), Van Manen, (1990), Harries, (1993), Seamon, (1988) and Norberg-Schulz (1980, 1985) are examples of the phenomenological approach to architectural meaning. Similarly, the work of Thiis-Evensen (1987) uses a phenomenological approach to clarify architectural meanings as experienced, and I use his approach as an interpretive framework for my study of the two transportation terminals. In the next section, I review Thiis-Evensen's work in detail.

Thiis-Evensen's Theory of Architectural Archetypes

We next need to provide a detailed overview of Thiis-Evensen's theory of architectural archetypes. First we need to explain his major argument and major theoretical question and then examine his specific arguments. Thiis-Evensen's main contention is that architecture is a making of inside in the midst of outside, expressed through the expression of three basic but very important sets of architectural elements, or *archetypes* as he calls them: *floor*, *wall* and *roof*. His main concern is whether it is possible to establish a theory, based on the entire phenomenon of these architectural archetypes that can support his argument at the level of universal human experience. As he writes, "we as a human being, have a need for something stable and universal – a base for prediction and recognition [and] the need for personal and emotional identification" (Thiis-Evensen, 1987, p. 8).

Thiis-Evensen provides a definition of architectural archetypes to enable them to "contribute to the understanding of the universality of architectural expressions" (ibid.). He believes the commonalities in our experience of architectural expressions of archetypes and our common experience of the relationship between inside - outside are due to our basic bodily and sensual response to the environment, which we transfer to the buildings and other entities of the world in which we live. He explains this phenomenon to be a "common language of architectural forms and their expressions, which can immediately be understood by anyone, regardless of time place or function or cultural differences." (ibid., p. 15)

Thiis-Evensen argues that this experiential universality of the archetypes is achieved more precisely by a "grammar of architecture" (ibid., p. 17), that he identifies in

terms of floor, wall and roof. Even if these three archetypes serve different purposes in the built environment – i.e., the floor covers the ground and provides support; the wall encloses and delimits space; and the roof spans and shelters a space. Universally, all three elements accomplish the same goal: protecting the interior from the exterior and balancing the relationship of inside and outside (ibid., p. 19). As Thiis-Evensen claims, these archetypes are the concrete realization of the existential struggle between an " 'attacking' exterior and a 'secure' interior" (ibid., p. 21) – what he calls a dynamic dialogue between exterior and interior spaces (ibid.).

As shown in figure 2.1, this "architectural grammar" depicts how the relationship between interior and exterior spaces is achieved through different expressions of archetypes: the floor, through above and beneath; the wall, through within and around; and lastly, the roof, through under and over. In turn, human beings, says Thiis-Evensen (ibid., p. 21), respond to floor, wall and roof through three "existential expressions": *motion, weight* and *substance,* which are illustrated graphically in figure 2.2. First, and as explained in chapter 1, *motion* refers to the dynamic nature of the particular building or architectural element, i.e., whether it seems to expand, contract, remain in balance, and so forth. Second, *weight* relates to the sense of heaviness and lightness of the building's architectural element in relation to gravity and levity. Third, *substance* relates to experiential qualities like softness, hardness, coarseness, fineness, warmth, coolness, color and so forth.

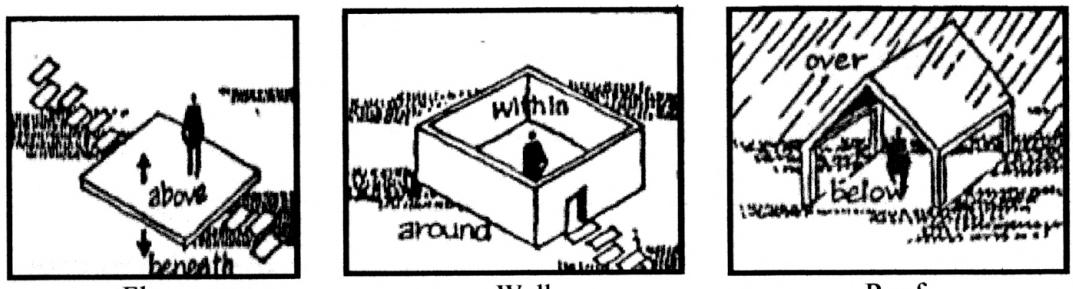


Figure 2.1: Inside and outside relation expressed by the three architectural archetypes (Lin, 1991, p. 15)

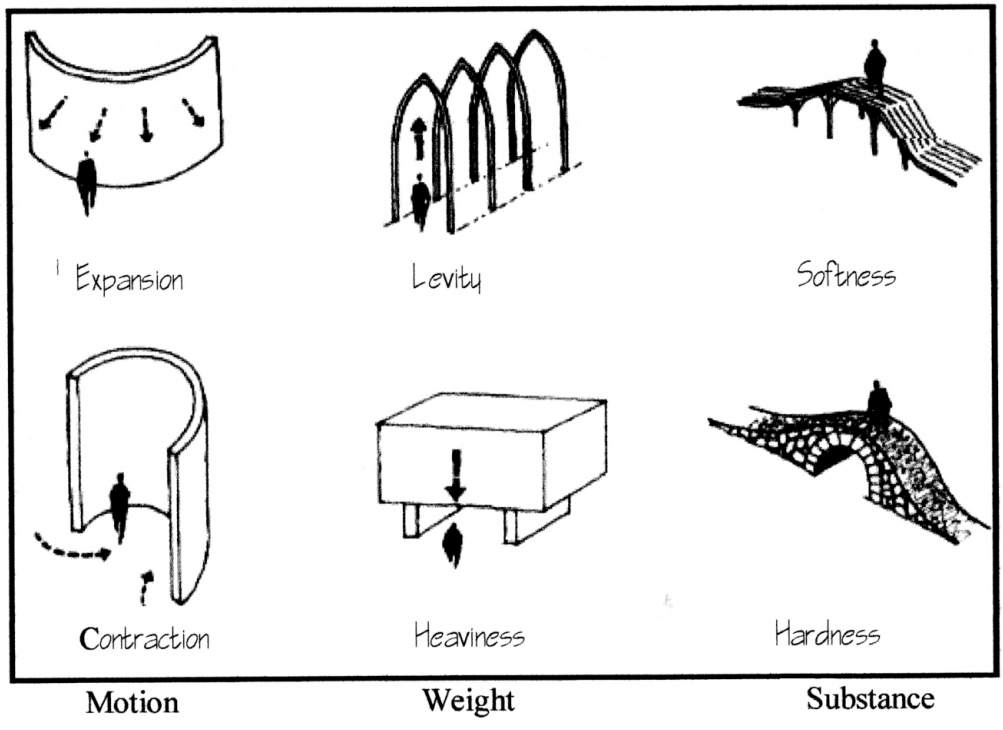


Figure 2.2: Existential expressions in architecture (Lin, 1991, p. 16)

These qualities of archetypes are what we commonly recognize unselfconsciously based on our shared experience of the day-to-day natural and built phenomenon around us. These qualities are claimed by Thiis-Evensen to be "universal and timeless," offering a common foundation of " symbolic meanings with their stylistic and regional variations" (ibid., p. 21). Thiis-Evensen also claims that each of these existential expressions "are linked to the characteristics of a space, which we immediately recognize independently of cultural determinants" (ibid., p. 31).

Thiis-Evensen explains that his major focus in *Archetypes in Architecture* is the experience of moving from outside a building in, and this emphasis underlies the interpretation of Penn Station and the TWA terminal presented in this thesis. However, Thiis-Evensen also explains that there is also a phenomena of the architectural experience of moving from inside the building out, though he says very little about this possibility, pointed at that it requires its own book-length treatment. Following Thiis-Evensen, in this thesis, I mostly discuss the two transportation buildings in terms of being outside and moving inside.

The Floor

To begin, we need to understand Thiis-Evensen's understanding of the floor as it relates to inside and outside in terms of motion, weight and substance. In exploring the expressive potentialities of the built floor, Thiis-Evensen begins his discussion of the floor by describing its main lived function as "defining an interior space affected by exterior space, which is both above and beneath the floor " (ibid., p. 36). He says floor can work in three ways, which he describes in terms of themes— i.e. the floor can (1) direct, (2) delimit, or (3) support. These possibilities are shown in figure 2.3. We will now consider each of these floor themes in turn.

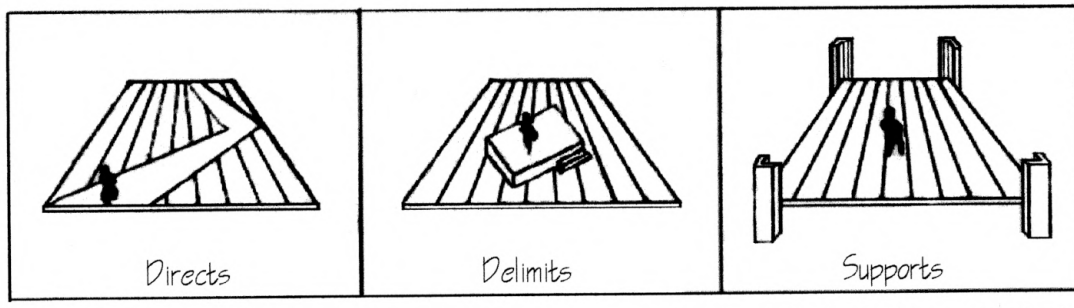


Figure 2.3: The three floor themes (Drawings by author and derived from description provided by Thiis-Evensen, 1987, p. 36-51)

First, the directing floor leads people from place to place. The directing floor creates an "inside" in the sense that it gives direction in that people automatically move along it to get from a "here" to "there." It is mainly concerned with our forward movement (ibid., p. 36). This directional movement is largely bodily and thus primarily involves motion and substance, the latter, for example illustrated by the different existential experiences of walking on a dry sidewalk versus on an icy one.

Next he describes the second floor type: the delimiting floor, which marks a space from its surrounding and creates an "inside" in the sense of being bounded (ibid.). According to Thiis-Evensen, this kind of floor provides a stationary situation by keeping us in a centralized position or containing us within a boundary (ibid.). Like the directing floor, this floor type involves first and foremost an expression of motion and substance (ibid., p. 49). For example, there is a great difference in the way we experience a carpeted floor or a polished marble floor, even if both floors are found in the same space immediately adjacent to each other.

The third floor type Thiis-Evensen discusses is the supporting floor, which provides a firm, taken-for-granted-footing. This floor creates an "inside" in the sense of providing a secure feeling and involves mainly weight and substance (ibid.). For example, the material a floor surface is composed of affects the existential expression of the floor: its degree of firmness and infirmness as well as other lived qualities like sense of softness or hardness, thus, the degree of security we feel on a wooden bridge differs from the degree of security we feel on a concrete bridge. Even if both bridges have the same form and massing, we feel more secure on the concrete bridge than on the wooden one because of the fact that concrete seems more sturdy and that "firmness is a precondition for our existence on earth, embedded within us as a fundamental background for our entire feeling of security" (ibid., p. 37).

Because Thiis-Evensen argues that ultimately the supporting quality of the floor is so central to human existential experiencing, he examines the supporting floor in much greater detail and identifies six major subtypes, or *motifs* as he calls them: (a) attached, (b) detached, (c) open, (d) sunken, (e) rising and (f) directional floor. These six motifs are

illustrated in figure 2.4. The attached floor is composed of a material resembling the ground and thus seems to rest firmly on it by providing a firm footing (ibid., p. 51) (figure 2.4a). In contrast, the detached floor, because of structure or material, seems divorced from the ground or laid lightly on it; it may seem to float above ground (ibid., p. 57) (figure 2.4b). Unlike the attached and the detached floor, the open floor has a quality of downward movement, which is only visual as a result of the use of materials and patterns that emphasize optical depth on the same horizontal plane (ibid., p. 63) (figure 2.4c). This quality leads to several special depth effects in floors that Thiis-Evensen identifies as *transparency* (figure 2.4 c1), *mirroring* (figure 2.4 c2), *reflection* (figure 2.4 c3) and *layering* (figure 2.4 c4). Yet again, the sunken floor is a physically deep floor surface penetrating below the ground in relation to the surrounding horizontal floor plane (ibid., p. 75) (figure 2.4d); while the rising floor involves a situation where the floor is elevated in relation to the surrounding horizontal floor plane (ibid., p. 83) (figure 2.4e).

Last, he describes the directing floor, which he says leads us from 'here' to 'there' and typically involves three situations: the *path* (figure 2.4 f1), *bridge* (figure 2.4 f2) and *stairs* (figure 2.4 f3). The path is a means to lead us towards a destination, while the bridge carries us over an obstacle. Finally, the stair connects below and above in relation to a goal and works as an intermediary between building and surrounding, thus serving as a threshold between inside and outside. Because the stair is so important in the history of architecture, Thiis-Evensen discusses it in considerable detail, and I overview his discussion in the next section.

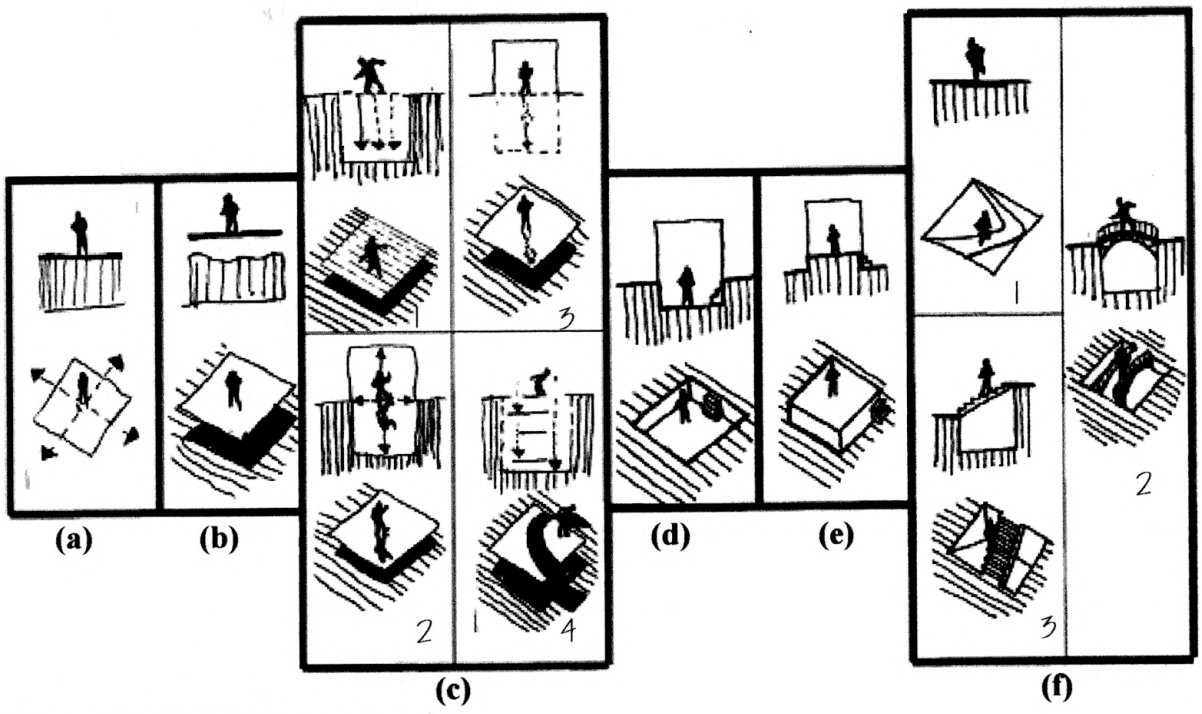


Figure 2.4: The six floor categories

(a) Attached floor
(b) Detached floor
(c) Open floor: 1) Transparency
2) Mirroring
3) Reflecting
4) Layering
(d) Sunken floor
(e) Rising floor
(f) Directing floor: 1) Path
2) Stairs
3) Bridge

(Drawings derived from description provided by Thiis-Evensen, 1987, p. 36- 89)

The Stair

In his study of the directing floor, Thiis-Evensen gives much attention to the stair because it is such a very important architectural element. Compared to other architectural elements, it much more captivates the perceiver's motion and senses, particularly because of safety and the potential for falling. Thiis-Evensen begins by pointing out that "all stair flights spontaneously invite people to go up" (Thiis-Evensen 1987, p. 91). He argues that, specifically, the stair affects motion, weight, and substance through two key aspects: (1) width and, (2) slope. He argues these two themes help to understand the experience of different stairs.

As shown in figures 2.5 and 2.6, the first stair theme that Thiis-Evensen discusses is *width*, which involves the breadth or narrowness of the stair, as perceived in relation to our bodily width, in determining direction of movement. He discusses the existential difference in climbing a narrow stair vs. climbing a broader one. Thiis-Evensen says that a *narrow* stair gives an impression that it is meant for one person (private), which in turn spurs him to feel the urge to hurry up and move quickly up or down the stair (ibid., p. 93). Normally, Thiis-Evensen says, the narrow stair is used for utilitarian purposes.

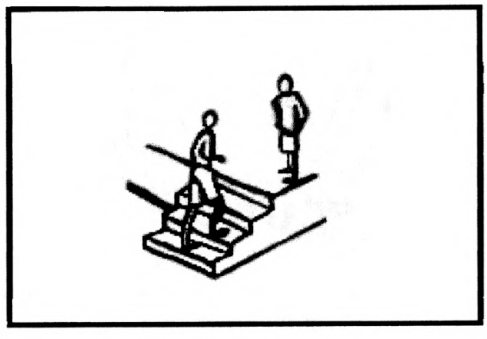


Figure 2.5: The narrow stair

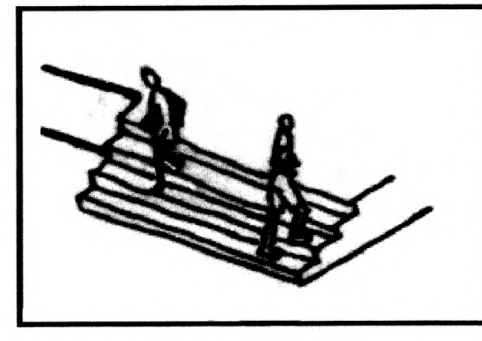


Figure 2.6: The wide stair

(Drawings by the author derived from description provided by Thiis-Evensen, 1987, p. 89-102)

In contrast, the *wide* stair gives an impression, due to its generous spacing, that it is meant for a stream of people, and the experiancer feels relaxed and typically moves up the stair more slowly (ibid., p. 95) (figure 2.6). This slow, forward movement is usually associated with a measured pace and ceremonial events, thus the hasty atmosphere of the narrow step is substituted by solemnity in the ascending motion. This wide stair is typically used in public building to emphasize the grandeur of the building, its entrances and public nature.

As illustrated in figures 2.7 and 2.8, the second key stair theme Thiis-Evensen discusses is *slope*, which involves steepness or gentleness of the stair. He argues that climbing a steep stair is physically exhausting, because the steep stair has narrowly spaced steps, and gravity acts against our intended upward movement (ibid, p. 97)—a resistance, he says, that symbolizes struggle and sacrifice to reach an important goal at the top (ibid.) (figure 2.7). Thus, he says, the steep stair is sometimes used in sacred architecture, for example, the Mayan temple Tikal, Mexico or the sacred stairs of St. Maria in Aracoeli on the Capitoline Hill in Rome.

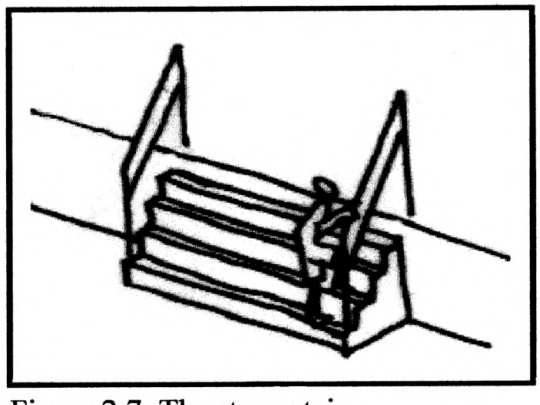


Figure 2.7: The steep stair

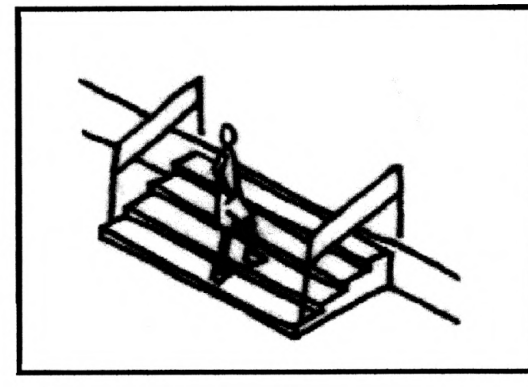


Figure 2.8: The gentle stair

(Drawings by the author derived from description provided by Thiis-Evensen, 1987, p. 89-102)

In contrast, the *gentle* stair invites us to ascend in harmony with our intention because it has widely spaced steps and gentle slope (ibid., p. 99) (figure 2.8). Unlike the steep stair, the gentle stair is less physically demanding and tiring. It needs much less exertion and evokes a calm and comfortable pace leading to a slow, gliding, ceremonial air. A good example is Michaelangelo's stair leading up to on the Capitoline Hill's Campidoglio in Rome.

Having considered the archetype of floor as it relates to inside-outside and motion, weight and substance, we next much review Thiis-Evensen's presentation of the wall.

The Wall

As explained earlier, the floor can play an important role in defining an interior space affected by exterior space in relation to what is above and what is beneath. In contrast, the wall plays a great role in defining territory and dividing in relation to what is within and around it (Thiis-Evensen, 1987, p. 117). Thiis-Evensen writes that " The main purpose of the wall is to delimit a space" and argues that the wall determines not only how inside and outside meet but also the strength of their relationship (ibid.). He refers to this relationship as "degree of penetration" (ibid.), which may vary between expressing complete openness, thus inviting us to enter, or complete closure, inhibiting us from entering.

Next, as shown in figure 2.9, Thiis-Evensen discusses the wall's comparative strength of inside and outside through examining three wall themes—what he calls *breadth*, *height* and *depth*.

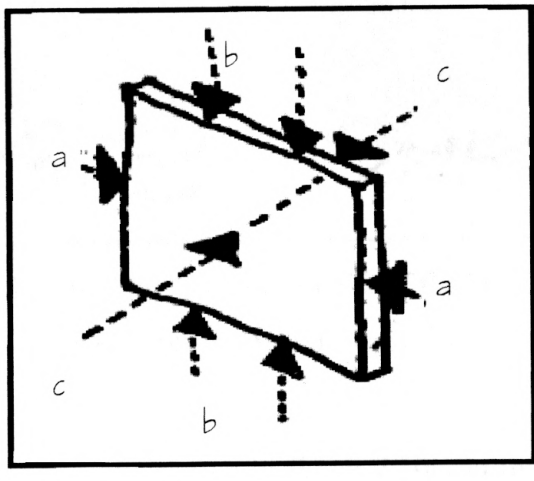


Figure 2.9: The three inside-outside expressions of the wall (Thiis-Evensen, 1987, p. 117)
a) Breadth theme (right and left: horizontal expression of inside-outside)
b) Height theme (above and below: vertical expression of inside-outside)
c) Depth theme (in front and behind)

First, Thiis-Evensen considers the wall's breadth—its horizontal and left and right expression of inside-outside in relation to motion, weight and substance. To examine this relationship, Thiis-Evensen envisions any wall as three vertical fields, where the central field has a dynamic interaction between the two side fields. In other words he wants to know what the horizontal expression of the wall is in terms of inside-outside and motion, weight and substance. For example, does the middle field seem active and the sides less so? Does the middle field seem to expand and open at the expense of the side, or are the side fields dominant?

In surveying the history of architecture, Thiis-Evensen concludes that there are four possible horizontal expressions of the wall—what he calls the *breadth*, *split*, *right* and *left* motifs, all shown in figure 2.10a—d. We must now consider each of these motifs in turn.

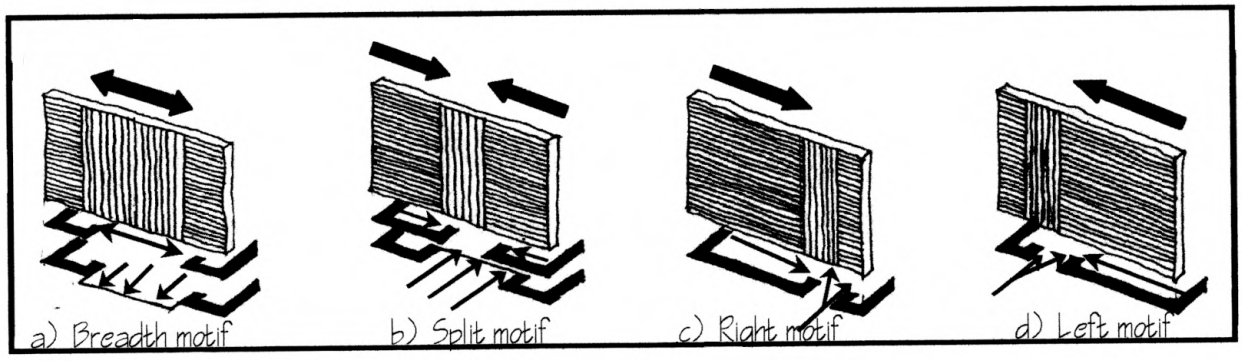


Figure 2.10: The four motifs of the breadth theme
(Drawings derived from description provided by Thiis-Evensen, 1987, p. 119-141)

As shown in figure 2.10a, in the breadth motif, the middle field dominates over the side fields. The middle field is much wider than the sides or is trust forward or springs out towards the experiencer by pushing out the side fields (ibid, p. 125) such that it

creates a sense of openness, which in turn increases the communication between inside and outside. Buildings with this kind of façade motif seems to expand outward to meet us, and to have a facade that is generous and receptive, consequently emphasizing the public nature of the building. Consequently, the breadth motif is mainly associated with public and civic buildings.

In contrast, in the split motif, the two side fields dominate the middle field. In this wall expression, the middle field is pressed together and pulled back in relation to the side fields (figure 2.10b). Thiis-Evensen argues that this implies an increased tendency of closure by "squeezing the middle section together" (ibid., p. 125). In addition, there is suggested an exclusion of the outside and protection of the inside, which evokes a sense of seclusion and safety. This motif seems to reject the outsider and to protect what is inside the building. The split motif is mainly associated with fortresses and castles.

As opposed to the breadth and split motif, where more attention is drawn to the middle portion of the wall, in the right and left motifs, attention is drawn to the two sides of the building wall (figure 2.10c and d). In these side motifs, the right or the left field dominates over the other two fields. The right and left motifs have a shifted field unlike the open and the split motif, where there is a horizontal symmetry and a clear central field. This asymmetrical field of expression gives the building a more private character. Thiis-Evensen claims that this is due to the absence of the public quality resulting from the suggested symmetrical wall expressions of the central field (ibid.).

Next, Thiis-Evensen considers the wall's *height*—its vertical expression of inside-outside and motion, weight and substance. As shown in figure 2.11, he envisions any wall as three horizontal fields where the middle field interacts with the fields above and

below. Thiis-Evensen argues that the top field relates to the sky and levity as opposed to the bottom field, which in contrast relates to the ground and gravity. The middle field establishes a particular relationship between the top and the bottom fields.

In relation to architectural experience, Thiis-Evensen used height as a way to identify the vertical sense of a building inside-outside expression. For example, how does the building seem in terms of earth and sky? Is the building light or heavy? Does the building look secure or about to collapse? What does the middle field say in relation to the fields above it and below it? Does the middle field push away the top and bottom to open up? Is the middle field squeezed by pressure from above or below? Or from both above and below? Does the middle field seem static or dynamic?

Again drawing an example from the history of architecture, he concludes that there are four possible vertical expressions of the wall—what he calls *rising*, *sinking*, *split* and *open* motifs, as shown in figure 2.11a-d. We now consider each of these motifs in turn.

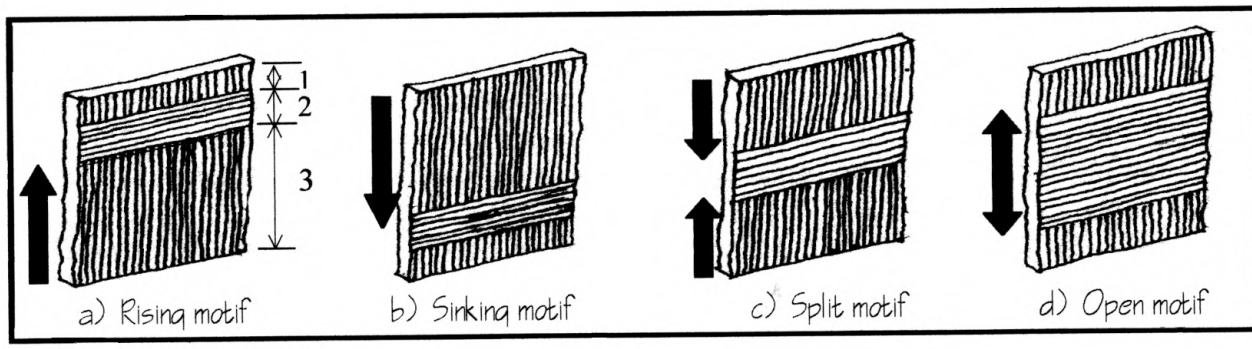


Figure 2.11: The four motifs of the height theme

(Drawings derived from description provided by Thiis-Evensen, 1987, p. 129-139)

As can be seen in figure 2.11a, in the rising motif, the middle field seems pushed upward and the bottom field dominates over the other fields because the lower field is more powerful than the upper field. As a result, weight seems to increase towards the ground and the top seems to lighten up; or the top part lightens up and opens up outward while the lower part closes down, stopping us from moving in. The rising motif gives the building a sense of anchorage or heaviness and yet it is also upright and freestanding, which suggests solidity, pride and the importance of the building (ibid., p. 133), as in many Renaissance Palazzi.

In contrast to the rising motif is the sinking motif, in which the middle field is drawn below the wall's center. As shown in figure 2.11b, the upper field is larger than the other fields below it. In this expression of the wall, the upper field dominates over the other fields and it pushes the other fields downward with its weight, evoking a sense of collapse and threat.

Next, Thiis-Evensen discusses the split motif, which has a narrow middle field compared to the upper and the lower field. As opposed to the rising and the sinking motif's middle fields, which move up or down, the middle field of the split motif is located symmetrically in the center but "squeezed" by the upper and lower fields which are dominant as shown in figure 2.11c. Here the upper field seems to weigh down and the lower field seems to push upward. From this expression, Thiis-Evensen explains the split motif involves a closed façade that terminates motion at ground level because, as he says, the lower field rises and the upper sinks and closes with the result that "the split appears to be on the verge of 'snapping' together at any time" (ibid., p. 135).

Last, Thiis-Evensen describes what he calls the *open* motif, which involves a middle field widened to dominate over the top and the bottom fields, since each of these two fields is narrower than the middle field. As shown in figure 2.11d, the middle field of the wall seems to expand by pushing the top field up and the bottom field down. This makes the wall appear as if it is about to float; at the same time it gives the wall a sense of receptiveness and openness in a vertical direction, which brings about easy entry at ground level, a fact that makes the open motif regularly used for public buildings. Facades with an open motif typically appear upright and triumphal.

The Wall and the Depth Theme

Having discussed the breadth and height themes, Thiis-Evensen next discusses *depth*, which is a much more complicated theme because it is directly concerned with the communication between inside and outside and dictates their spatial relationship (Thiis-Evensen, 1987, p. 117). Because of this complexity, Thiis-Evensen's outline for depth is more elaborate than for breadth and height. As shown in figure 2.12, depth involves four major sub-themes: the *main form* (Figure 2.12a), the *building system* (Figure 2.12b), the *openings* (Figure 2.12c), and the *articulation* (Figure 2.12d) (ibid., p. 140).

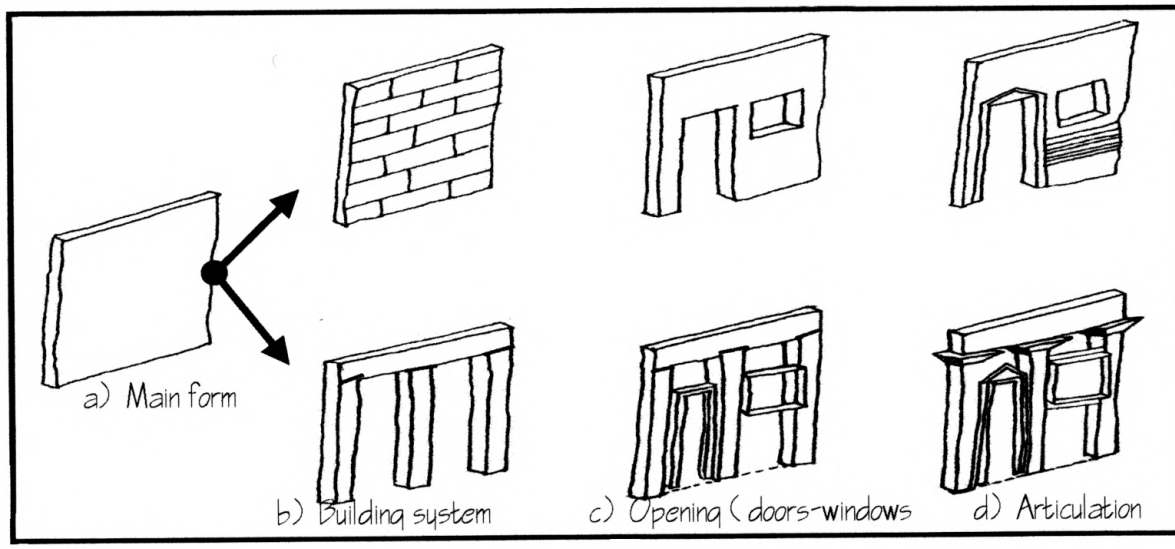


Figure 2.12: The four categories of the wall's depth theme

(Drawings derived from description provided by Thiis-Evensen, 1987, p. 117-140)

First he considers the overall form of the wall, which he discusses in terms of its degree of horizontality and verticality, degree of curvature and degree of slanting. All of these qualities influence our general impression of the wall's depth, and he represents

these qualities in the drawings of figure 2.13 a—h. For example, the horizontal wall, due to its horizontality, feels heavy and weighing against the ground, which in turn gives it a compressed and compact impression. The motion impulse we feel with such a wall is to follow along it linearly (ibid., p. 143). At the same time, the horizontal wall feels closed and doesn't invite our penetration; rather it leads past and away (ibid.). In contrast, the vertical wall is "communicative" because it seems lighter and lifts itself upward, opening up vertically due to its rising expression. Unlike the horizontal wall, the vertical wall, because of its physically dominant height, becomes a stronger focus of attention than the horizontal wall (ibid., p. 145).

Next, Thiis-Evensen considers a wall's kind and degree of curve. Thus a flat wall is a "stiff and impassive plane" because it gives no clue about the inside-outside relation or what is going on inside (ibid., p. 147). On the other hand, as shown in figure 2.13d, we can visualize the interior space behind a convex wall, which is strong and dominant (ibid.), expanding outward and protecting the inside from our penetration. In contrast, as shown in figure 2.13e, a concave wall space seems to yield, embrace and accept us at the same time it opens to our penetration and seems friendly and secure (ibid., p. 149).

Finally, as shown in figure 2.13 (g and h), he discusses the wall's degree of slant. He argues that we have two different intuitive reactions towards the slanted wall that inclines towards us or to the wall that slants away from us. To the wall that seems to slant towards us, we feel insecure, tense and threatened; while in the latter case it does not bother us as much from outside but may threaten whatever is within the wall structure (ibid., p. 152). He believes that these inherent impressions of slanting walls are attributed to the rareness of slanted walls in the history of architecture (ibid., p. 151).

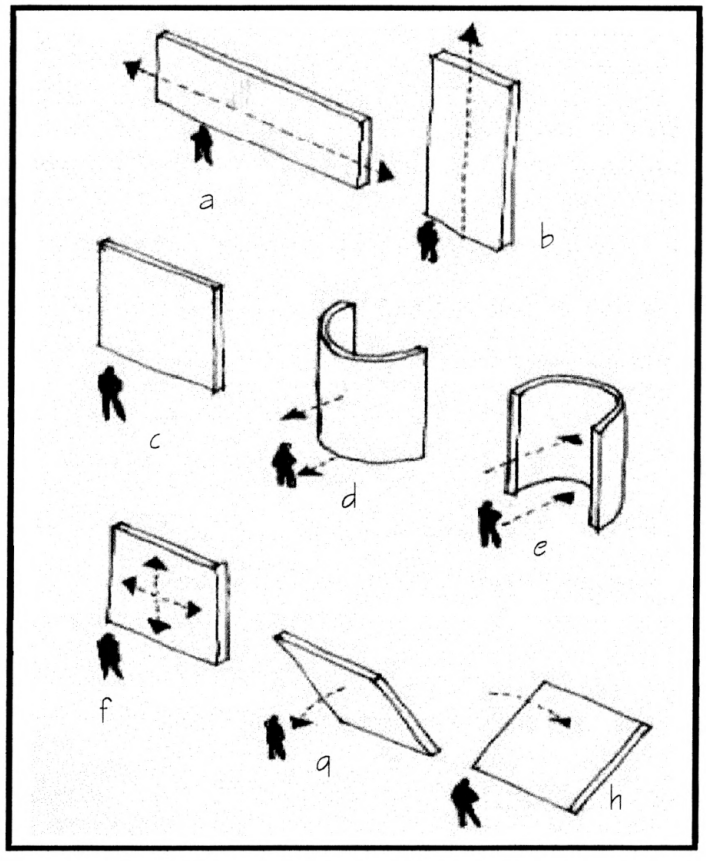
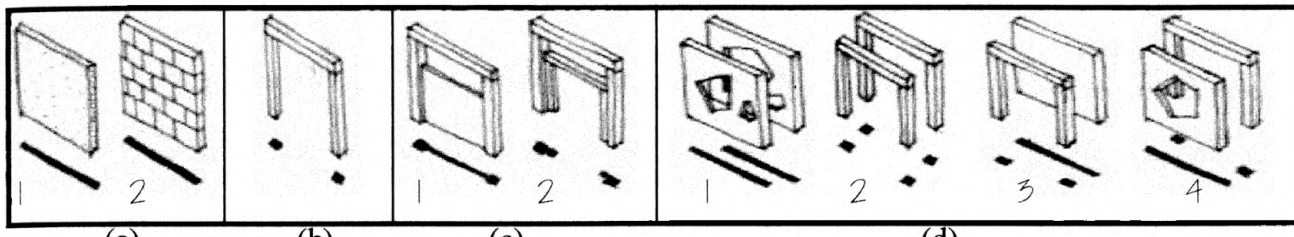


Figure 2.13: The main forms of the wall (Thiis-Evensen, 1987, p. 142)

(a) Horizontal form
(b) Vertical form
(c) Flat form
(d) Convex form
(e) Concave form
(f) Straight form
(g) Leaning toward
(h) Leaning away

Following the discussion of the wall's depth first category of overall form, Thiis-Evensen discusses the second category, the building system, which deals with how the wall's main form is constructed and how, through structural appearance, it affects the experience of transition between inside-outside. In this context, as shown in figure 2.14 (a-d), he categorizes the wall's building system into four types: the massive (solid slab), the skeletal, or a combination of the two (the infill and the layered) building systems (ibid., p. 153). Thiis-Evensen argues that expressions of motion, weight, and substance in these building systems transform the impact of the main form on the experiencer (ibid), so he considers each of the building systems in turn as related to the three existential expressions of motion, weight and substance.



(a) (b) (c) (d)

Figure 2.14: Wall's building system (Thiis-Evensen, 1987, p. 154)

(a) Massive wall ([1] cast wall, [2] block wall)

(b) Skeletal wall

(c) Infill wall ([1] massive wall in skeletal, [2] skeletal in skeletal)

(d) Layered system ([1] massive in front of massive, [2] skeletal in front of skeletal; [3] skeletal in front of massive; and [4] massive in front of skeletal)

Primarily, he considers the building systems' expression of the inside-outside relation in terms of motion. For example, he details the massive system, which involves a wall built as a solid whole where all its parts are of equal value in structural capacity as a solid mass; and the skeletal system, which involves a wall divided into separate units of building parts with varying structural functions with two basic predominant units: posts and lintels comprising a frame. Both the massive and post-and-lintel systems affect the wall's enclosure and inside-outside impression through different vertical support expression but in contrary ways. The massive system closes while and the skeletal system opens up. Yet again, the infill system, which combines the massive and the skeletal system, has a supporting frame covered by a secondary wall that is massive or skeletal and indicates a direct balance between inside-outside (ibid., p. 163), whereas the layered system, which is composed of planes and skeletons juxtaposed in depth, indicates a stage-by-stage motion from outside to inside through depth (ibid., p. 169).

Next, Thiis-Evensen describes building systems' expression of inside-outside relation in terms of weight and substance. He argues that there are three factors that affect the weight expression of a building system. First, he discusses the size of building unit, which relates to whether the building parts seem easily movable or not. For example, a masonry wall with a big boulder size seems heavier than a wall with smaller block size. Second, he discusses method of joining, which relates to whether the wall's joints appear irregular or geometrically precise. For example he argues that the more precise the joint the lesser the weight impression of the wall. Last, he discusses the surface of the wall, which relates to the main form's material nature, texture and color. For example, a glass wall, due to its transparency, looks lighter than opaque walls. At the same time a glass wall seems not to carry any weight and the inside and the outside seem to merge. In short, the glass wall can unite inside and outside like projections on screen (ibid., p. 171-189).

The Window and the Door

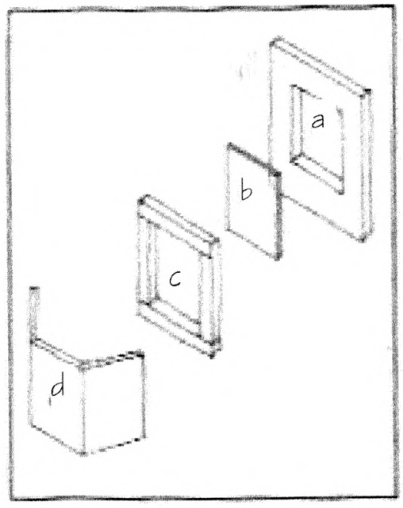
The last aspect of the depth theme that Thiis-Evensen discusses in detail is the wall's openings. He discusses two main opening types: windows and doors, where both are considered as a hole in the wall and stand out as figures in affecting the degree of the inside-outside relation. Thiis-Evensen argues that both windows and doors have different potential expressions of motion, weight and substance.

First, he discusses the window, which he calls "the eye of the building" and says is immediately perceived as an expression of what is inside or an expansion of the interior towards the outside (ibid., p. 251-259). As he explains, " like an eye, the window expresses the interior's outlook over exterior space; announcing our mode of life to the

world at large" (ibid., p. 251). The window depicts whether the interior seems to be drawn outwards or whether it remains protected within. To elucidate these points, he identifies and compares the basic experiential differences of window and door and argues that the "window is meant to be looked through and to admit light, whereas the door is preliminary to be gone through" (ibid., p. 251); and the window is a symbol of what is inside while the door is determined by its relation to what is outside (ibid., p. 283).

Then Thiis-Evensen examines and identifies four elements that determine the window's expression of importance "in opening and in closing" space. As shown in figure 2.14, these elements are the *opening*, *face*, *frame* and *bay*. He also details how the expression of these elements affect the inside-outside expression in relation to motion, weight and substance and the various possible impressions they can impose on the experiencer. For example, a window opening that is just a hole makes the wall appear as "a lifeless skin around a dead and empty interior" (ibid., p. 259). It seems to have been "punched from outside and it reminds one of a ruin, so the interior doesn't seem private, rather a deserted, empty space" (ibid.).

The other elements that affect the expression of the window are its profile and the form. The profile, which represents a cut around the window hole, affects motion from outside and from within. The form, which represents the verticality, horizontality or the centeredness of the hole, also affects movement. For example, as shown in figure 2.15a—c, a window of vertical form suggests movement coming from inside out, while a window of horizontal form suggests a motion that cuts across the inside to outside contact. Yet again, a window of centered form conveys a neutral and reserved motion impulse (ibid., p. 261).



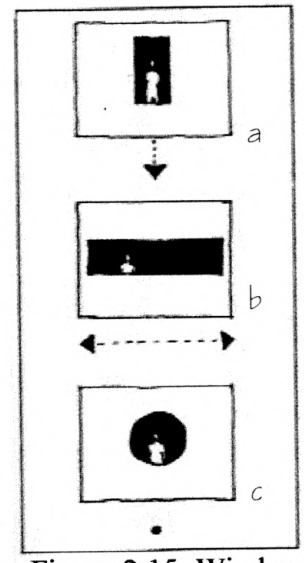
a) Hole

b) Face

c) Frame

d) Bay

Figure 2.14: The window motifs
(Thiis-Evensen, 1987, p. 252)



a) Vertical

b) Horizontal

c) Centered

Figure 2.15: Window forms
(Thiis-Evensen, 1987, p. 261)

In contrast to the window, which brings the inside out, the door brings the outside in (ibid., p. 261). Unlike the window, passing through the door has strong bodily and sensual meaning to the experiencer. Thiis-Evensen explains the experience of entering or passing through the door as an experience of transition—"the distance between qualitatively different places" and "between inside and outside" (ibid., p. 283). He says that "by entering one yields both physically and mentally to the building and occupies it" (ibid.). He justifies this point by describing how many rituals and customs throughout the world relate to entry. He argues that is why we find, throughout architectural history, certain recurring specific door elements that accentuate the very action of entering.

According to Thiis-Evensen's argument, these recurring door motifs are the opening itself and the frame. He explains that the door opening follows the same principles as the window's opening, though windows are allowed a freer form because

the door depends on human form and usually appears as an upright rectangle. Nevertheless, the head of a door can vary according to style and purpose; at the same time its face may also vary in construction, material and location. Then he describes how the doorframe, which serves as casing around the door opening, can affect and reveal different ways of entering and determining the expression of entrances.

As shown in figure 2.16 a—h, he lists eight types of door motifs: (1) the *frame or portal* motif, which accentuates the person who enters; (2) the *split* or *twin tower* motif that conveys an impression of dignity and strength; (3) the *niche* motif, which has receiving and embracing effect; (4) the *shelter* motif, which has an air of protectiveness and shows building's offering nature; (5) the *directional* motif, which provides a feeling of security and dependence; (6) the *side tower* motif, which dramatizes velocity and security; (7) the *path* motif, which suggests active and purposeful action; and (8) the *stair* motif, which suggests an independent and goal oriented action (ibid., p. 293-297).

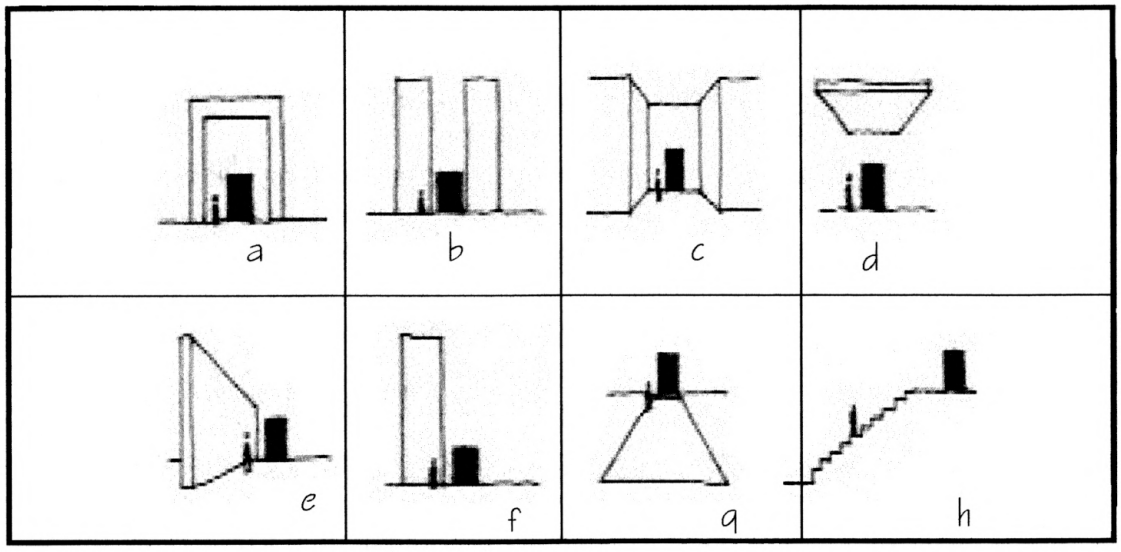


Figure 2.16: Door casing motifs (Thiis-Evensen, 1987, p. 285)

(a) Frame; (b) Split; (c) Niche; (d) Shelter; (e) Directional; (f) Side Tower; (g) Path; and (h) Stair

Having provided a detailed discussion of the wall as it relates to inside-outside and motion, weight and substance, we next need to consider the roof.

The Roof

We finally need to review Thiis-Evensen's description of the third and the last architectural archetype, the roof, as it relates to inside-outside and motion, weight and substance. First, Thiis-Evensen identifies the lived function of the roof as separating the inside and the outside in two ways: it protects the interior from the exterior space which is both over and above in a vertical direction and the space surrounding in a horizontal direction (ibid., p. 301).

He also identifies different movement expressions of the roof in separating inside-outside. For example, the roof in relation to the space over and above in reference to the

sky, it may accept the sky or direct motion downward and bring about a sinking effect, or it may resist the sky to bring about a rising effect. Yet again, it may balance upward and downward motion to bring about a neutral motion expression. Further, the roof may direct motion inward towards the center and close the space to bring about centralizing movement, or it may direct movement outward along a line and open the space to bring about directional movement (ibid., p. 301).

Thiis-Evensen closely examines the roof and discusses it in a considerable detail because he believes it is rudimentary but a very important architectural element in the history of architecture. He says "a series of shelter forms which each in its own way is a variation, vertically and horizontally, of the roof" (ibid., p. 303); basically in relation to the sky and the surroundings. As shown in Figure 2.17, these variations involve five roof types: the *dome*, the *barrel*, the *gable*, the *shed*, and the *flat* roof. Thiis-Evensen describes the first three types as "vertical", for they relate to the sky, and he describes the other two " horizontal themes", for they relate to the ground in a horizontal direction. These five roof types, in turn, result in five diverse existential expressions of motion, weight and substance, bringing about different experiential qualities of the space beneath that include sinking, rising, neutral, centralizing and directing.

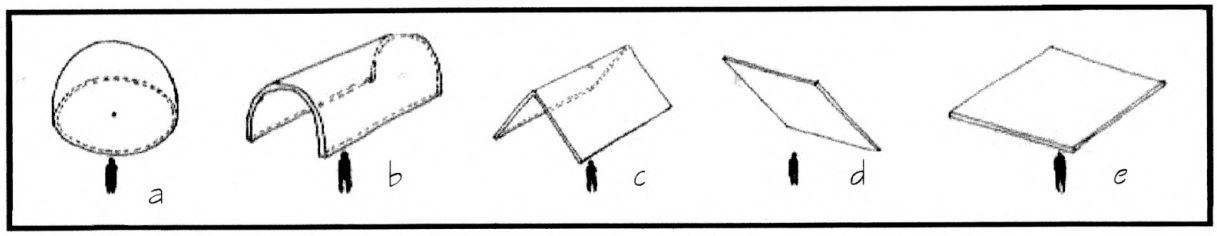


Figure 2.17: Roof themes (Thiis-Evensen, 1987, p. 302)

(a) The domed roof; (b) The barrel; (c) The gabled roof; (d) The shed roof; (e) The flat roof

The Dome

Thiis-Evensen first considers the *dome*, which he describes primarily in terms of motion, weight and substance. Then he discusses the dome's different motifs and variations in the struggle of interior space against the power of the outside environment (Thiis-Evensen, 1987, p. 304). He defines the dome as "an arch in rotation around a vertical axis" (ibid., p. 305) and says its conception is related to the cosmos, for the dome reflects the vault of the sky and has common characteristics with the sky. Thiis-Evensen explains that this characteristic of the dome is related to centrality, continuity and rising, all of which result in a sense of safety, enclosure and centeredness. He argues that it is this nature of the dome and its ability to shelter a space and give a reference center to its interior space that is the " essence of being inside" —that makes the dome the perfect form for insideness (ibid.).

As shown in Figure 2.18, he then categorizes the dome in regard to three motifs in reference to motion expressions: (a) the *conical* or *elliptical dome*, (b) the *spherical dome* and (c) the *flat dome*. All of these motifs refer to degree of rising. For example, the conical dome accentuates rising from the outside and sinking from the inside like in primitive huts. This kind of dome is mainly used to highlight the exterior, because if used as an interior vault it gives the space a funnel-like diminishing effect (ibid., p. 313). In contrast, the spherical dome neutralizes the rising effect and creates balance between rising and falling— it feels at rest and tranquil. The spherical dome has been mainly used in Renaissance architecture, where there was a search for a balanced relation between basic geometric forms (ibid.). Yet again, the flat dome counteracts rising. It seems

weighting down, restraining expansion either from above or from below and conveys the feeling of tension within the space (ibid.).

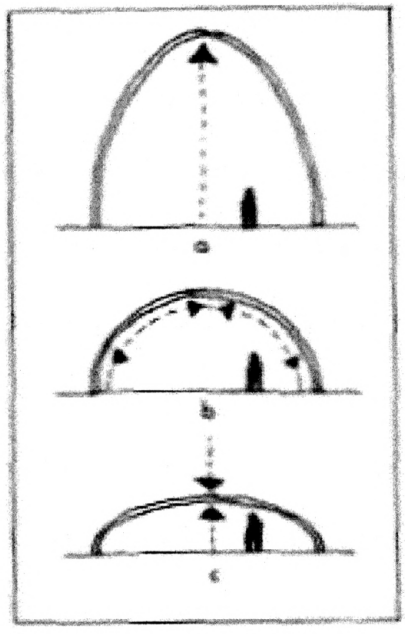


Figure 2.18: Roof motifs (Thiis-Evensen, 1987, p. 307)
(a) conical (elliptical) dome
(b) spherical dome and
(c) flat dome

The Four Other Roof Types

The second roof type Thiis-Evensen discusses is the *barrel-vaulted roof.* Unlike the spherical dome, which is formed by an arch in rotation around a vertical axis, the barrel vault is formed by a series of arches set at intervals along a line (ibid., p. 327). It has two directional motion expressions: horizontal and upward (ibid.). Its directional effect is influenced by three factors: its length-width-height proportion (of the vaulted space); the particular shaping of the vault (for example, flat vs. pointed); and the particular opening and decorative elements of the vault.

The third roof type is the *gabled roof*, which rises towards the ridgeline emphasizing verticality and giving the space heavenly bound characteristics. The gabled roof also expands horizontally, accentuating horizontal motion and sinking diagonally along its surface, qualities which evoke a sense of protection and safety (ibid., p. 337). The gabled roof opens at the ends and closes along the sides, giving the space direction and enclosure, combining all as one protective symbol. The motion expression of the gabled roof is mainly dependent on the angle of the ridge peak. However, the construction method and the roof treatment also affect the enclosing, rising, sinking and directional motion expressions of the roof.

The fourth roof type is the *shed roof*, which is one half of the gabled roof and pitched on one side, creating asymmetric space (ibid., p. 363). The shed roof has longitudinal and transverse spatial directionalities and thus is mainly used as entrance motif. For example, roofs that open to the visitor receive and guide people to the building, but if the high point is opposite to the visitor, the form closes, enfolds and holds the space.

The last roof type is the *flat roof*, which directs space equally in all directions (ibid., p. 371). Motion is spread horizontally in the relationship of above and below. Thiis-Evensen argues that the flat roof doesn't have any expression and it is unaffected by the environment (ibid.). But its expression is influenced by its surface articulation, ceiling wall transition articulation and form articulation.

Conclusion

Having discussed Thiis-Evensen's understanding of floor, wall and roof, I next present my Thiis-Evensen interpretation of the Penn Station and TWA terminal buildings by comparing and contrasting them. I will interpret the two buildings in detail by using Thiis-Evensen's theory as an interpretive framework, beginning in chapter 3 with the walls of Penn Station.

CHAPTER 3

A THIIS-EVENSEN INTERPRETATION OF PENN STATION, WITH AN EMPHASIS ON WALL

In the preceding chapter, I discussed Thiis-Evensen's theory of architectural archetypes in detail to establish a theoretical framework that can be used as interpretive background to analyze the Penn Station and TWA terminal buildings. Specifically, the expression of the inside-outside relationship and motion, weight and substance will now be used to interpret the two buildings.

Throughout my discussion, the interpretation of the two buildings is supported by diagrammatic analysis that illustrates how the inside-outside relationship is expressed architecturally in the two buildings. It is my belief that this interpretation helps to better understand several of the underlying design expressions in the two buildings. In my interpretation, I also argue that Thiis-Evensen's descriptions of the architectural archetypes help us to better understand our everyday experience of the two buildings.

In this chapter we discuss how Thiis-Evensen's approach helps to better understand Penn Station. The primary emphasis of the interpretation will be Penn Station's walls, since it is largely through them that this building's sense of insideness and outsideness is expressed. As already explained in chapter 2, Thiis-Evensen argues that the wall relates inside and outside horizontally through the *within-and-around* space relationship. He also claims that the wall determines the relative strength of the inside-outside relationship through three major expressions: *breadth, height* and *depth*. He says that breadth depicts the horizontal sense of the wall in reference to right and left, while

height depicts the vertical sense of the wall in reference to up and down; and finally, he says that depth depicts the inside-outside interaction in reference to in front and behind. Further, as already explained in chapter 2, he argues that depth relates to the inside-outside dialect of buildings through three major aspects: the *main form*, related to the general shape of the wall; the *building system,* related to the construction quality of the wall; and finally, the *openings*—in other words, windows and doors.

In the following sections, I examine the breadth, height and depth themes as they are expressed in the two major entry facades of Penn Station.

The Breadth Theme and Penn Station

For Penn Station, the breadth theme is the predominant expression of this building's facades in the way they stretch horizontally across the whole city block between 31st and 33rd Street and between 7th and 8th Avenue. In this section, I focus on the two major entrance elevations of Penn Station: its 7th Avenue and the 31st Street facades. As explained in chapter 1, the 7th Avenue façade is the main access for both pedestrian and automobiles, while the 31st Street façade accommodates pedestrians but not vehicles. As we see in figure 3.1, it is obvious that the building has three highly recognizable entrances highlighted by Doric/Tuscan hybrid columns built of Travertine marble.

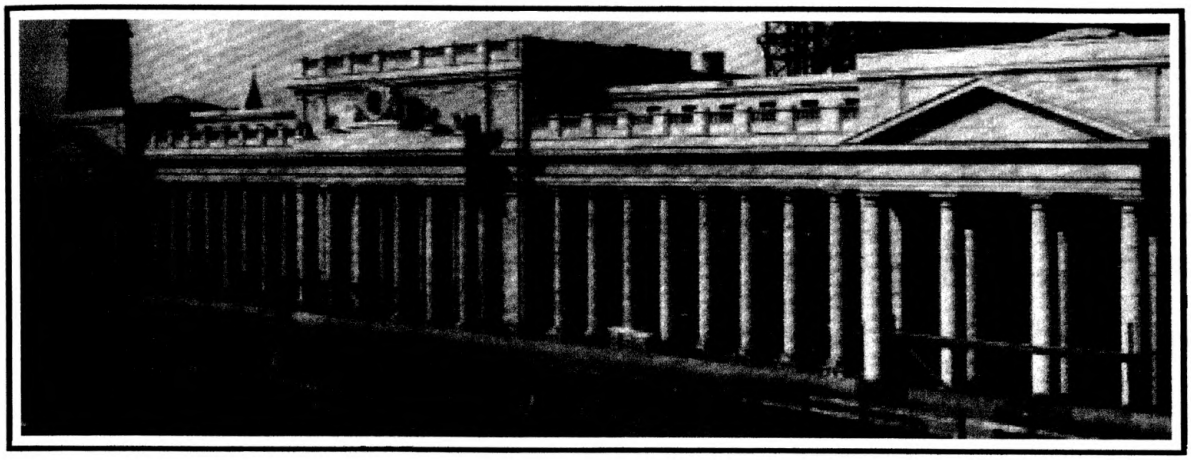


Figure 3.1: Penn Station's 7th Avenue (Main Entrance) façade (Diehl, 1985, p. 100)

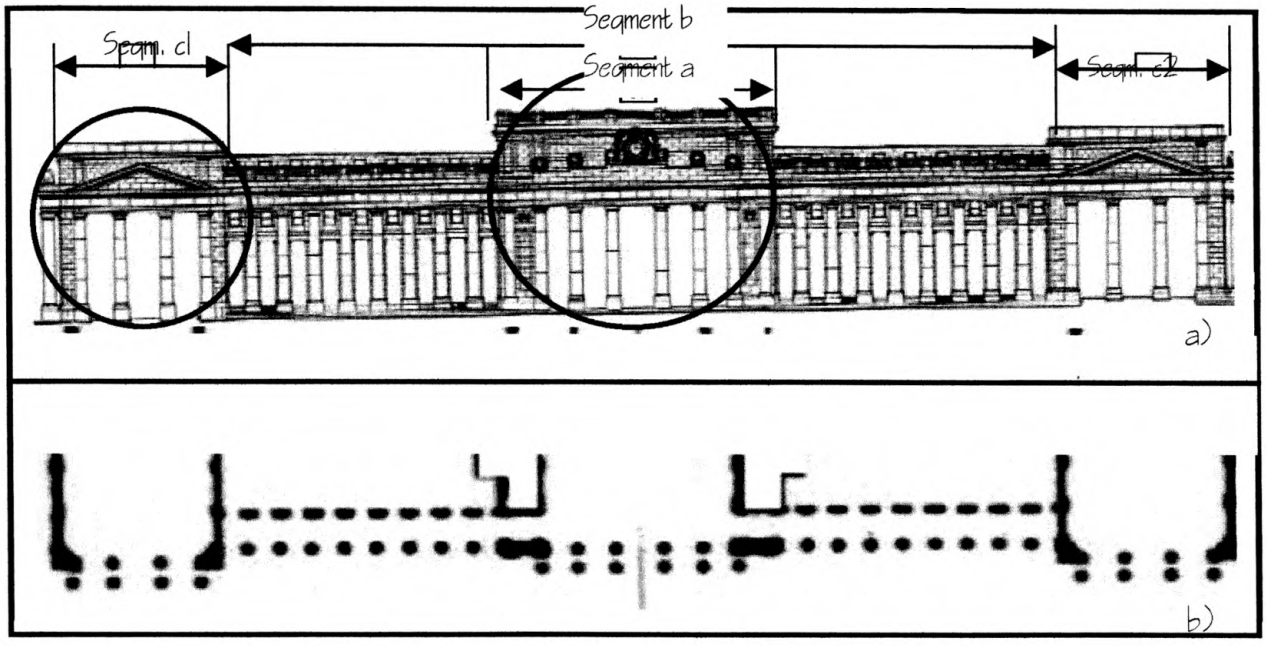


Figure 3.2: Penn Station's 7th Avenue (Main Entrance) breadth segments
([a] Parissien, 1996, p. 50; and [b] Parissien, 1996, p. 56)

As shown in figure 3.2, on the 7th Avenue façade we notice the three main entrances to the building marked by three dominant wall segments, highlighted by protruding arcaded bays that are situated equidistant from each other. As explained in

chapter 1, the middle segment is the main pedestrian access, while the side segments are found on the two far ends are predominantly vehicle access. These three access bays ensure a sense of "welcome" by creating an impulse to enter.

As illustrated in figure 3.2, Penn Station's 7th Avenue elevation has a complicated breadth expression—in other words, one finds three expressions of the breadth theme overlapped as shown in the figure 3.2 a, b, c1 and c2. The first breadth theme that attracts our attention is the central pedestrian entrance, segment a. As shown in figure 3.3, the central access bay (segment a), reminiscent of neo-classical temples, expresses the breadth theme through creating two distinct areas using two elements. The first element is the recessed side pilaster walls, which work as weaker side fields; and the second element is the protruding central colonnaded entrance, which works as a dominant middle field. The side pilaster walls close and hold the space together, while the protruding colonnade opens and lets the interior space communicate with the outside—in other words, the held back pilaster walls accentuate and close the interior while the protruding colonnade mediates and opens the dialogue between inside-outside. As Thiis-Evensen argues, this breadth expression provides "an immediate sense of both strength and publicness" (Thiis-Evensen, 1987, p.123).

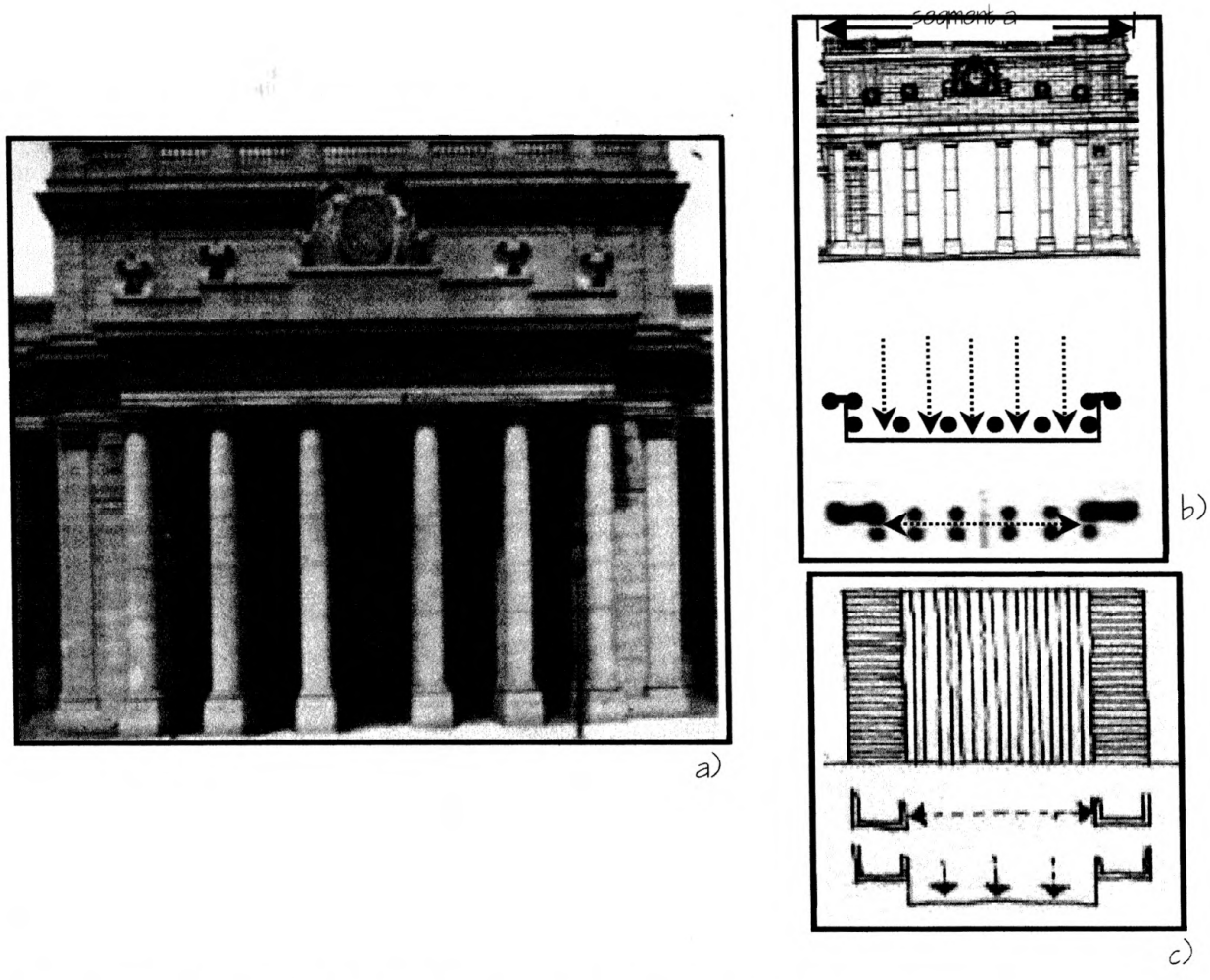


Figure 3.3: Penn Station's breadth expression for segment a
([a] Diehl, 1985, p. 41; [b] Parissien, 1996, p. 50-56; and [c] Thiis-Evensen, 1987, p.123)

As can also be seen in figure 3.3, segment a seems to thrust itself outward to dominate the sides by pushing the corners to the side. Segment a has its sides pushed as if it opens horizontally to its limit to accept anyone who wants to enter the building. At the same time, the middle field expands outward, springing to meet us—a quality, which makes the building seem receptive, welcoming and open to the public (ibid.). This arrangement of segment a also seems to create the feel for the façade to have a sense of

mediating the dialogue between the interior and the exterior, which in turn gives it a public nature. In addition, the horizontally running balustrade on top of the entrance bay creates a pronounced horizontal expression. So, breadth expression of segment a accentuates the space 'Centrum' by helping to create "an immediate sense of both strength and publicness" and to "express an open contact with the world, but at the same time stand[ing] as a guarantee for the protection and stability of the inside" (ibid.).

The second breadth theme of Penn Station's 7th Avenue façade is labeled as segment b. It seems to be the dominant breadth theme of the façade (figure 3.4). The protruding colonnaded main entrance emphasizes the breadth theme of segment b through creating a middle field that pushes the side fields to the right and to the left thus allowing the side fields to dissolve away, while the interior field expands outward. Further, the recessed horizontal, balustraded attic and the strong spreading entablature running continuously from edge to edge further emphasize the dominance of the middle field. These qualities seem to create the sense that the predominant motion expressed by this façade is horizontal. Additionally, the series of attic "eyebrow" windows complement the predominant breadth expression of the building. Similar to segment a, these breadth qualities make the building façade appear receptive and open to public.

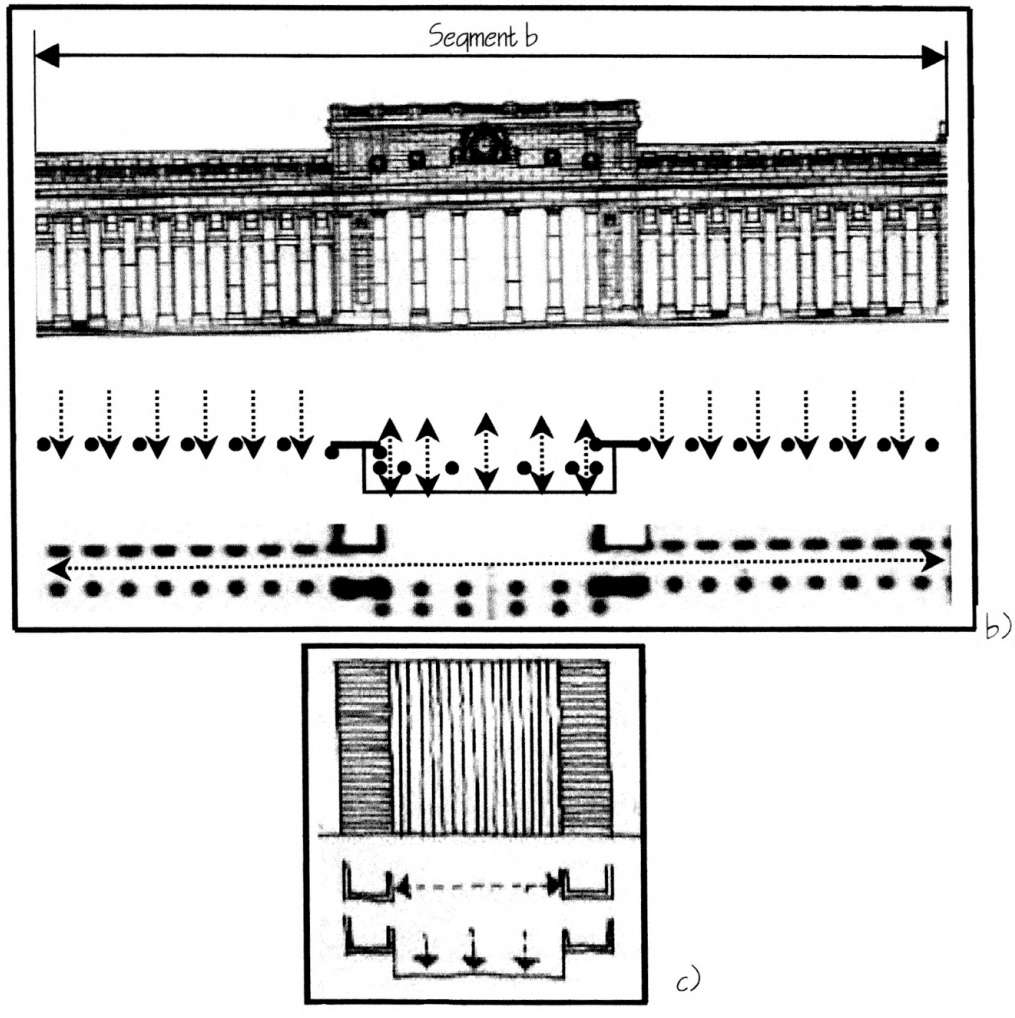


Figure 3.4: Penn Station's breadth expression, 7th Avenue façade, segment b
([a] Diehl, 1985, p. 43; [b] Parissien, 1996, p. 50 and 56; and [c] Thiis-Evensen, 1987, p. 123)

Finally, when we study the façade more carefully, we also notice that the two end entrance bays of the 7th Avenue facade express an additional breadth motif. These two entrance bays are identical and thus have the same breadth expression of a neo-classical temple, where the entrance facades have protruding colonnaded entrances with held-back corner walls. As illustrated in Figure 3.5, just like segment a, the two side fields express a breadth theme through corners closing the space and a protruding entrance colonnade opening up to the outside.

On the other hand, considering the two-side entrance bays (segment c1 and segment c2) in relation to the whole composition, both seem to hold the elevation between them together, thus acting like a "force of resistance" (ibid.). The symmetry of the two bays on the façade contributes to their strength to hold the facade together, accentuating and closing the interior space. When viewing the entire 31st Street facade as a whole, one notices that these two end segments help to terminate the façade, just "as shoulders terminate and secure our bodily extension" (ibid., p.120). These two end segments seem to accentuate the dynamic horizontal expression of the façade; at the same time, they also seem to embrace the façade and restrain the façade's horizontal movement from extending beyond the 31st and 33rd Street limits.

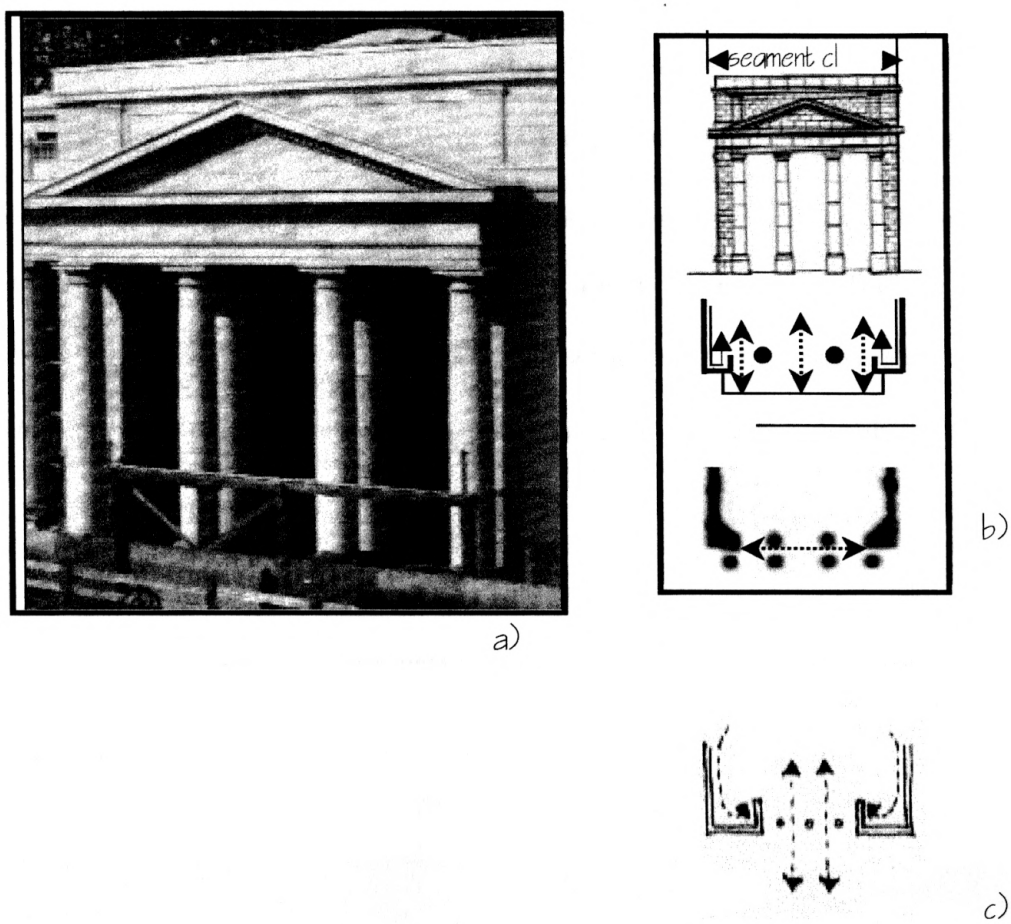


Figure 3.5: Penn Station's breadth expression, 7th Avenue façade's two side bays (segments c1 and c2) ([a] Diehl, 1985, p. 100; [b] Parissien, 1996, p. 50-56; and [c] Thiis-Evensen, 1987, p. 124)

Next, we need to study the 31st Street facade of Penn Station. As explained earlier, the 31st Street façade accommodates pedestrians only. As can be seen in figure 3.6, the 31st Street façade, like the 7th Street façade, has a complicated wall expression and as shown in the figure, we notice four overlapping breadth expressions: the protruding pedestrian entrance (segment d), the central colonnaded segment (segment e), the middle longer section (segment f), and the two side bays (segment g1 and g2). Compared to the 7th Avenue façade, except for the central colonnade, more of the 31st Street facade expression is solid wall in the sense that its decorative elements are largely pilasters rather than the freestanding columns of the 7th Avenue facade.

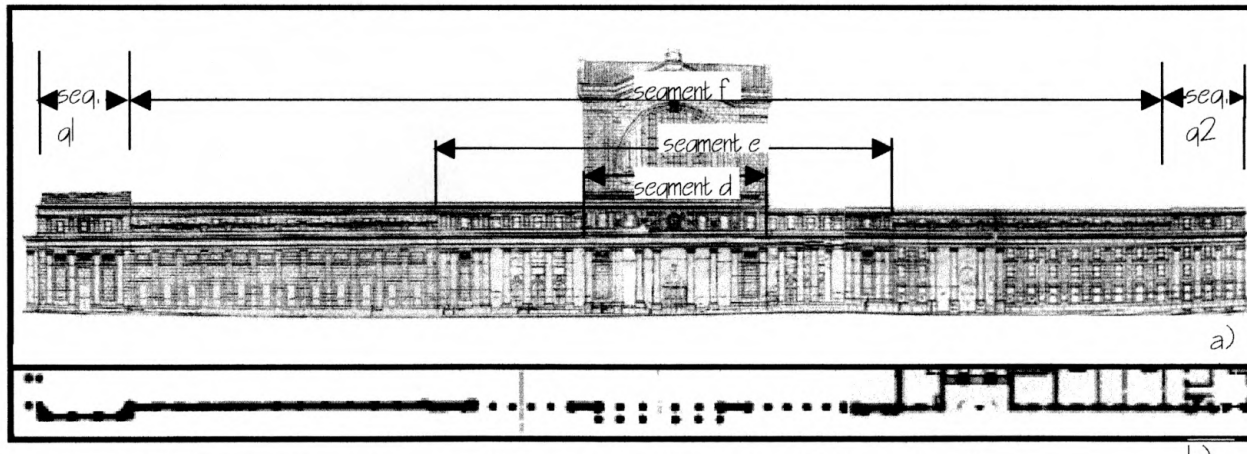


Figure 3.6: The four breadth expressions of Penn Station's 31st Street façade
([1] Diehl, 1985, p. 87; and [2] Parissien, 1996, p. 50-56)

The first breadth expression that we discuss for the 31st Street facade is labeled as segment d in figures 3.6 and 3.7. Just like the 7th Avenue central segment, the 31st Street central segment has a neo-classical temple breadth expression, which is highlighted by protruding colonnade and recessed sidewalls. The center field extends out to meet us and

the two held back pilaster walls close and hold the side space. This center segment expresses breadth through closing its sides and opening the middle part to mediate a spatial dialogue between inside and outside and to strengthen contact with the outside. Similar to the 7th Avenue's center segment, this breadth motif creates a sense that the middle field seems to expand to the outside to welcome us—a quality that suggests a receptive public space within (ibid., p. 123).

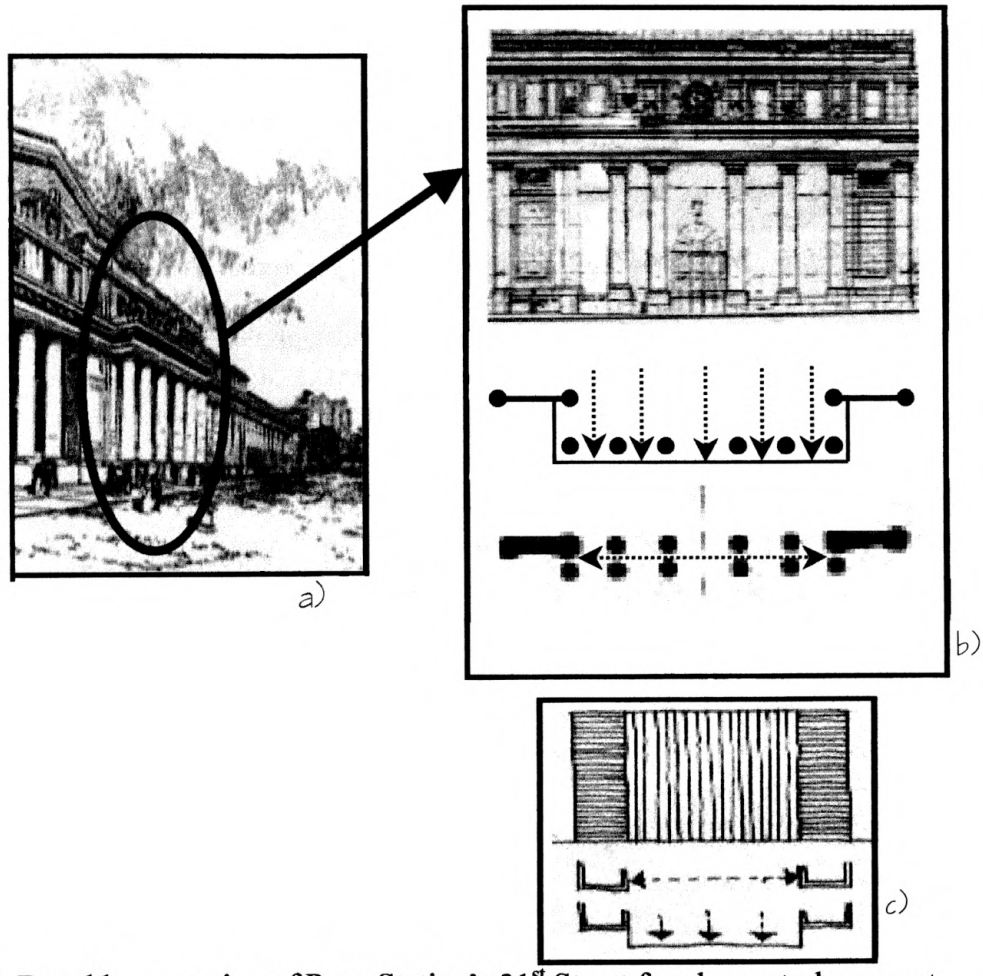


Figure 3.7: Breadth expression of Penn Station's 31st Street façade, central segment —segment d ([1] Parissien, 1996, p. 4; [2] Diehl, 1985, p. 87; and [3] Thiis-Evensen, 1987, p. 124)

The second breadth expression we find for the 31st Street façade is labeled as segment e in figures 3.6 and 3.8. This segment also has dominant breadth expression with a middle field that stretches to the sides, pushing the two weak side field pilaster walls to the right and to the left (figure 3.8). The dominant horizontal movement of this segment is accentuated by the central colonnaded area, which has variously spaced columns and eyebrow attic windows. The columns along segment e are spaced evenly except for the paired engaged columns that help pull the middle section to the sides and there suggest an accentuated horizontality.

Further, as shown in figure 3.8, the cascade of "eyebrow" attic windows and the thick entablature also emphasize the horizontal movement of the façade above the colonnade and across the whole façade. Moreover, the two end walls with engaged columns enhance the predominance of the horizontal movement of the 31st Street façade by closing the space through letting the center field mediate and open a dialogue between interior and exterior space. In short, the breadth expression of segment e provides an immediate sense of both strength and publicness.

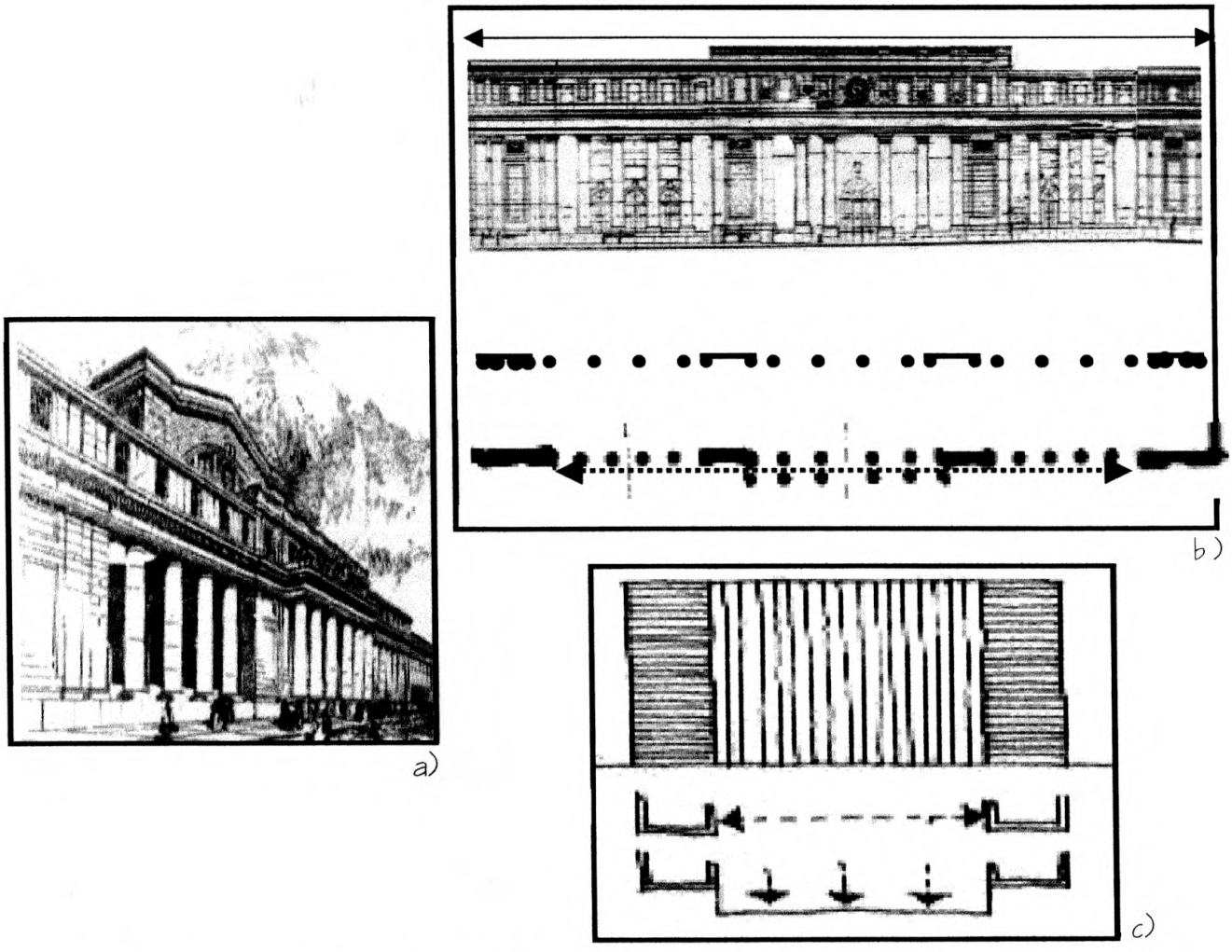


Figure 3.8: Breadth expression of Penn Station's 31st Street façade, segment e
([a] Parissien, 1996, p. 4; [b] Diehl, 1985, p. 87; and [c] Thiis-Evensen, 1987, p. 124)

The third breadth expression that is seen on the 31st Street façade is labeled as segment f. As shown in figure 3.6 and 3.9, this segment, like the other two segments just discussed, has a strong breadth expression in the way its middle field pushes the two side fields to the right and to the left and stretches horizontally across the facade between the two solid corner bays of the 31st Street façade. Further, on the attic level of this segment, the middle field pushes the side fields and thrusts itself forward to open to the outside.

This breadth expression is further accentuated by the recessed horizontal balustraded attic, which starts from the edges of the protruding central colonnaded segment (segment e) and stretches out to the two solid end corners of this façade segment.

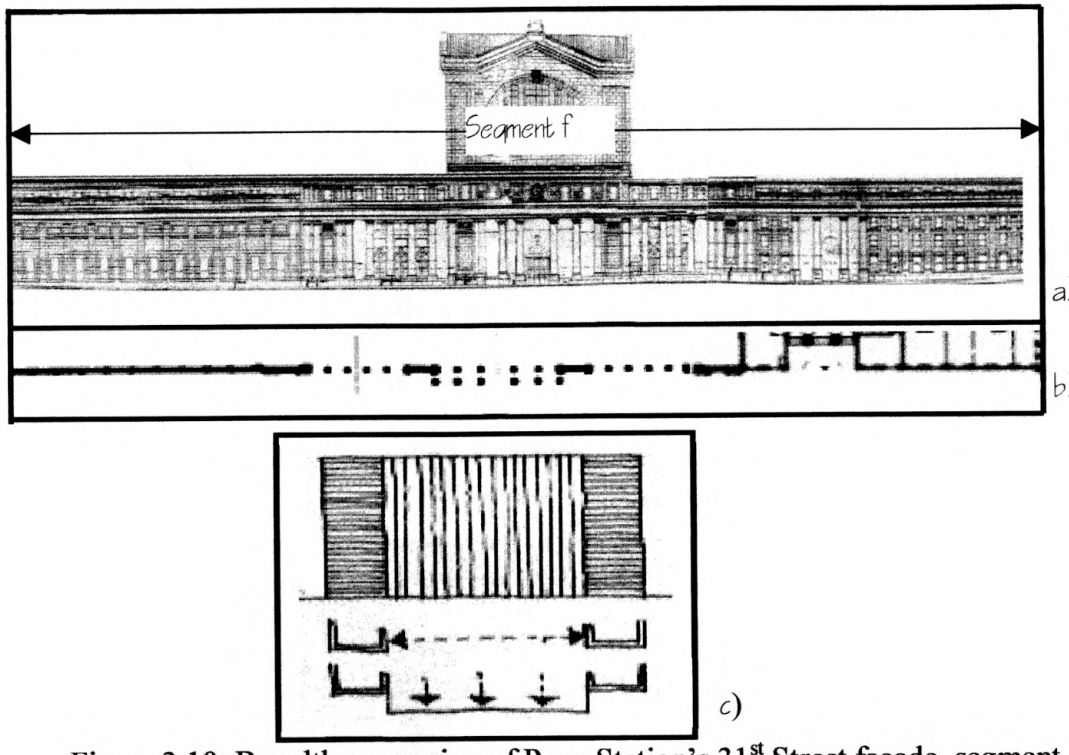


Figure 3.10: Breadth expression of Penn Station's 31st Street façade, segment f ([a] Parissien, 1996, p. 4; [b] Diehl, 1985, p. 87; and [c] Thiis-Evensen, 1987, p. 124)

As shown in figure 3.10, the middle field of segment f seems to communicate with the outside and welcomes us to enter, while the side fields close the space and give a sense of protecting the inside and accentuating the spatial 'centrum' of the facade. In other words, these side fields hold the space together by acting like a "force of resistance" and allowing the central field to expand to the outside to meet us. Overall, the breadth

expressions of segment f gives a sense of strength and publicness, and at the same time expresses a guarantee for the protection and stability of the inside (Thiis-Evensen, 1987).

As shown in figure 3.6, the last breadth expression of the 31st Street facade is labeled as segment g1 and segment g2. As can be seen in figures 3.11 and 3.12, both segments are solid façades, and similar in appearance but not identical. Though segment g1 has fewer windows than segment g2, both give a sense of weight that anchors the two ends of the building securely to the ground. At the attic level, both segments reach out to meet the balustraded attic and hold the balustrade sides securely in place, thus acting as a termination point for the façade's horizontal movement. Both segments seem to help hold the facade together work as weighted blocks to restrain the building's predominant horizontal movement from stretching beyond the limits of 7th and 8th Avenues.

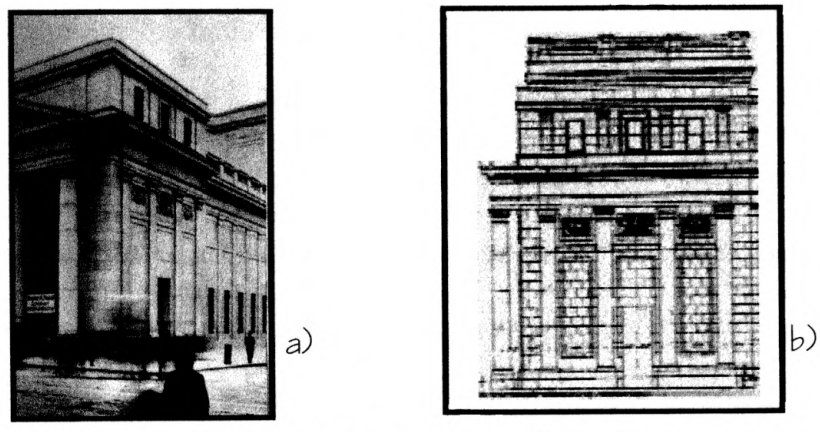


Figure 3.11: Breadth expression of Penn Station's 31st Street façade, segment g1
([a] Parissien, 1996, p. 4; and [b] Diehl, 1985, p. 86)

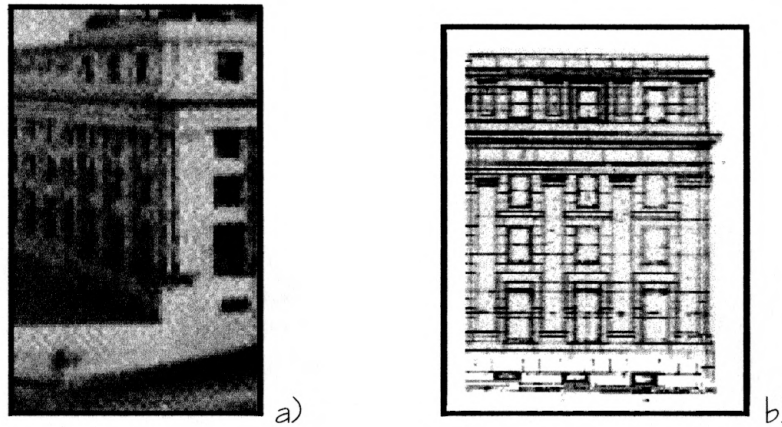


Figure 3.12: Breadth expression of Penn Station's 31st Street façade, segment g2 ([a] Parissien, 1996, p. 4; and [b] Diehl, 1985, p. 87)

To conclude this discussion of Penn Station's breadth theme, it is useful to compare and contrast the building's two major entrance facades already discussed. As can be seen in figure 3.13, Penn Station's 7th Avenue façade is more open in the way its middle field welcomes us and reveals the very public nature of the space that we may encounter on our entry in to the building. In contrast, the 31st Street façade seems more solid and more closed, which in turn projects a sense of safety and stronger enclosure. Though it is true that the 31st Street's middle field horizontal openness gives a sense of publicness, it is also true that the two solid sidewalls framing the middle colonnaded segment suggest a protected and secured interior (Thiis-Evensen, 1987).

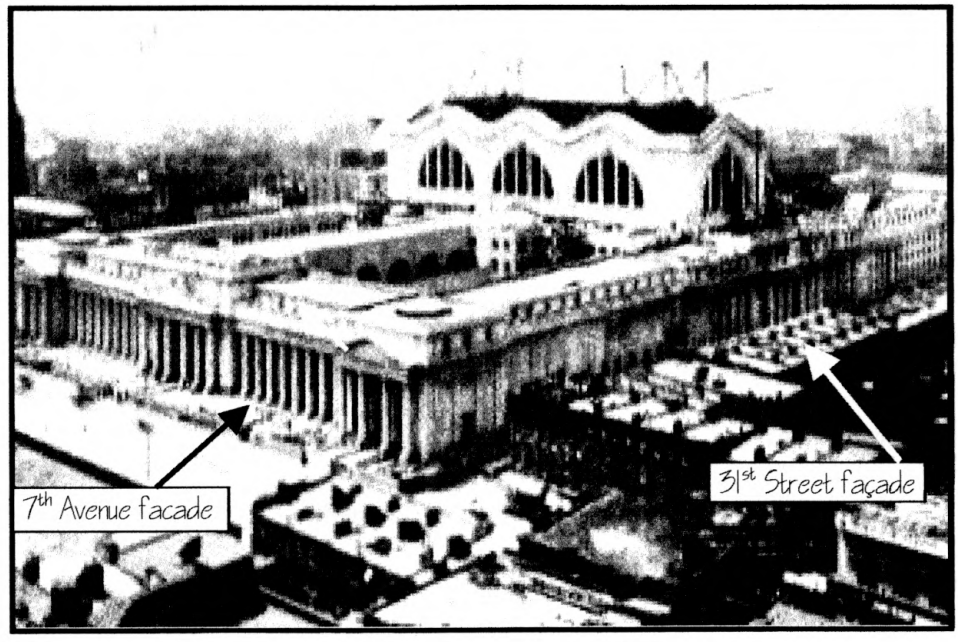


Figure 3.13: Penn Station's axonometric view, the 7th Avenue façade and the 31st Street façades (Parissien, 1996, p. 8)

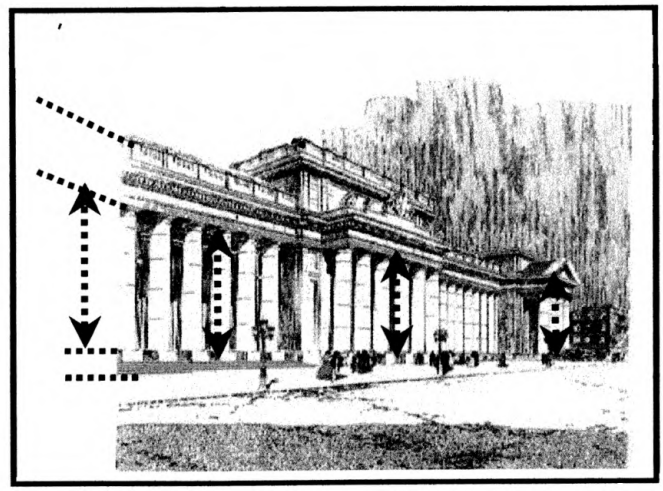
Overall, the predominant breadth expressions for Penn Station's 7th Avenue and 31st Street façades' suggest the open and public nature of the building. Though the two facades have different ways of showing the breadth expression and degrees of openness, the two facades mediate and open a dialogue between interior and exterior and, at the same time, protect and stabilize the inside. As a common feature, both facades' central colonnaded main entrances push the building's corners to the sides and allow the interior to expand outward in welcome.

Having examined the walls of Penn Station from Thiis-Evensen's perspective, we now turn to the walls and roofs of the TWA terminal.

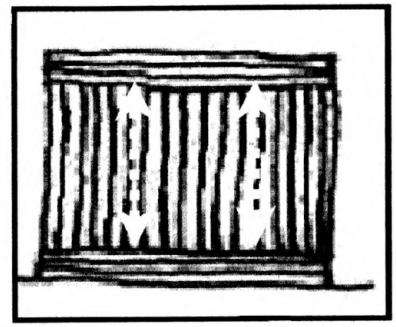
The Height Theme and Penn Station

In this section, I present a Thiis-Evensen interpretation of Penn Station's height theme, which, as already explained in chapter 2, deals with the vertical impression of the walls in reference to up and down. As we have also seen in chapter 2, in expressing the height theme, Thiis-Evensen divides the wall into three horizontal fields and argues that, depending on the strength of the middle field, the wall has four main height expressions: *rising, sinking, split* and *opening motifs* (Thiis-Evensen, 1987, p.133). As in the discussion of Penn Station's breadth theme, I interpret the building's two main entrance facades—7th Avenue and 31st Street.

First, we discuss the 7th Avenue (main entrance) façade. As we approach the building from 7th Avenue, it seems to have a predominant sense of vertical movement and an upright and free feeling. Looking at the station, we notice that it has a colonnaded three-storey façade and an additional attic. The façade is composed of imposing, large, pink, Milford granite, Doric columns extending from plinth to cornice as shown in figure 3.23a. The column shafts seem to press up and down, rising and pushing against the building's upper attic field, while at the same time pressing the lower field of the building's base downward (figure 3.23a). In addition, as shown in figure 3.24, the façade has vertical windows behind the colonnaded forefront, accentuating the vertical sense of the building and strengthening the contact with the exterior space, which in turn helps to accentuate a sense of movement through the vertical columns. This arrangement brings about both a sense of uplift and pride—an important aspect of public buildings, according to Thiis-Evensen (ibid., p. 137).



a)



b)

Figure 3.23: Penn Station, 7th Avenue façade vertical expression
([a] Parissien, 1996, p. 4 and [b] Thiis-Evensen, 1987, p. 133)

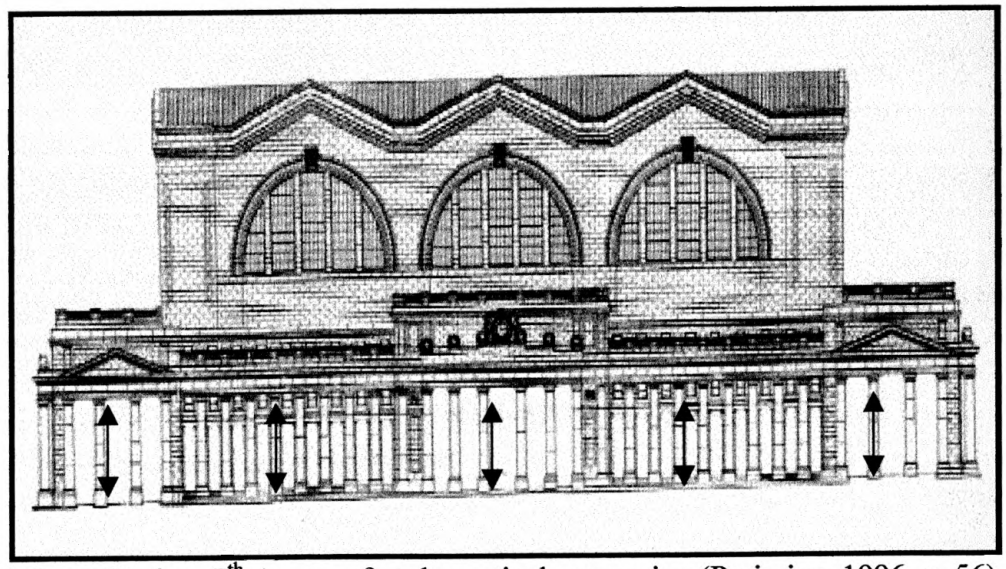


Figure 3.24: Penn Station, 7th Avenue façade vertical expression (Parissien, 1996, p. 56)

Next we discuss Penn Station's 31st Street façade. As with the 7th Street façade, the predominant feeling that we notice is a pronounced vertical movement. As shown in figure 3.25, the columns along the central colonnaded entrance (segment a) and the pilasters on the sidewall (segment b and c) generate a sense of pronounced vertical movement. In terms of Thiis-Evensen's four height motifs, we have two major expressions. As shown in figures 3.26 and 3.27, the central colonnaded entrance of the façade has an open expression where the shafts push the upper and the lower fields further to open up the middle for our penetration. On the other hand, we see an expression of a rising motif for the two side fields of the 31st Street façade (segments b and c). Here, the wall's lower field pushes the middle and the upper fields upward, creating a sense of anchorage and heaviness.

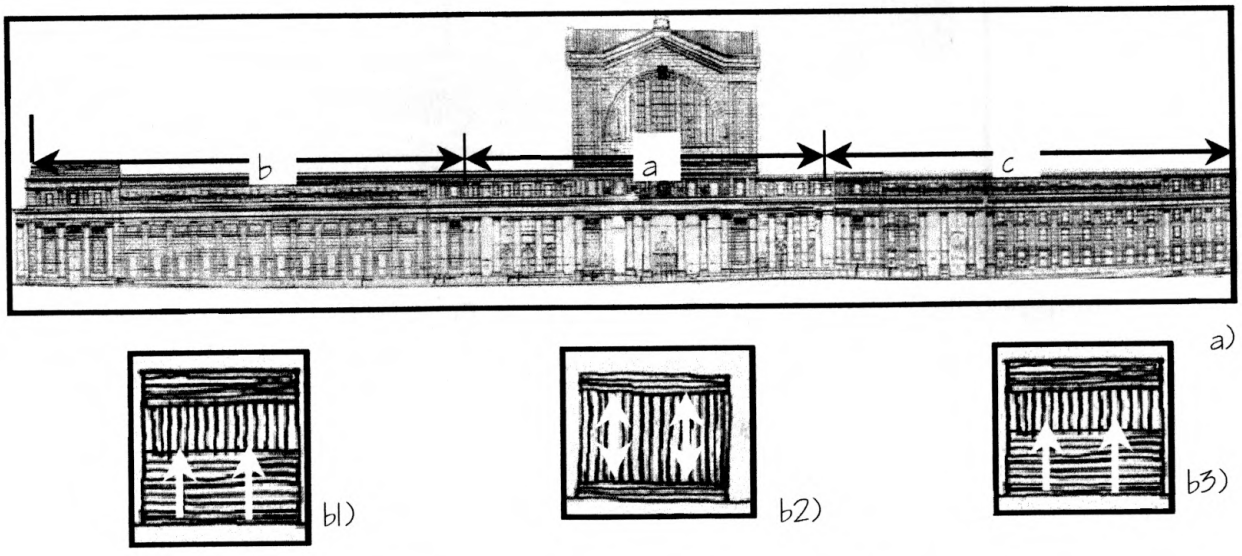


Figure 3.25: Penn station's 31st Street façade expression ([a] Diehl, 1985, p. 87; and [b1—b3] Thiis-Evensen, 1987, p.133)

Figure 3.26: Penn station, 31st Street façade, the central colonnaded area expression (segment a) (Parissien, 1996, p. 56)

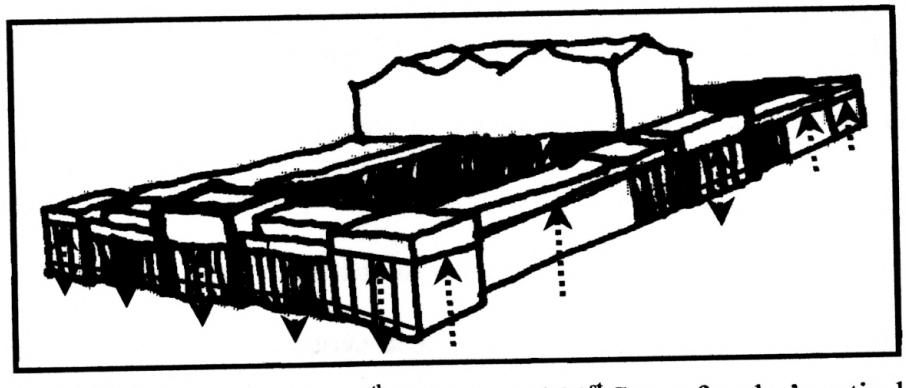


Figure 3.27: Penn Station, 7th Avenue and 31st Street façades' vertical expression (Sketch by author based on Parissien, 1996)

The Depth Theme and Penn Station

As we have discussed in chapter 2, the depth theme helps us to explain the expressiveness of the relationship between the spaces in front of and behind a wall. Thiis-Evensen breaks this theme into three main parts: the *main form*, the *building system*, and *the openings*. The *main form* deals with the relative influence of the height, width, slanting and curving of the wall as these features establish the relative strength of inside outside. The second theme, *building system*, deals with how the wall's main form is constituted: weather it is solid slab, skeletal, or a combination of the two.

In this section, I focus on the depth theme of Penn Station and, as in previous sections, I emphasize the building's 7th Avenue and on the 31st Street facades. I largely focus on Penn Station's building system and openings because these two aspects of the wall play the greatest role in establishing the inside-outside expression of the two facades. Looking closely at the 7th Avenue façade, we notice that Penn Station has a unique building system—i.e., one skeletal system placed in front of another skeletal system composed of giant pillars (figure 3.28). This "wall-on-wall" arrangement gives the wall a layered expression that allows a gradual transition between inside and outside and provides greater perspective depth, which frees and lightens the two skeletal walls' spatial boundaries and thus opens the space.

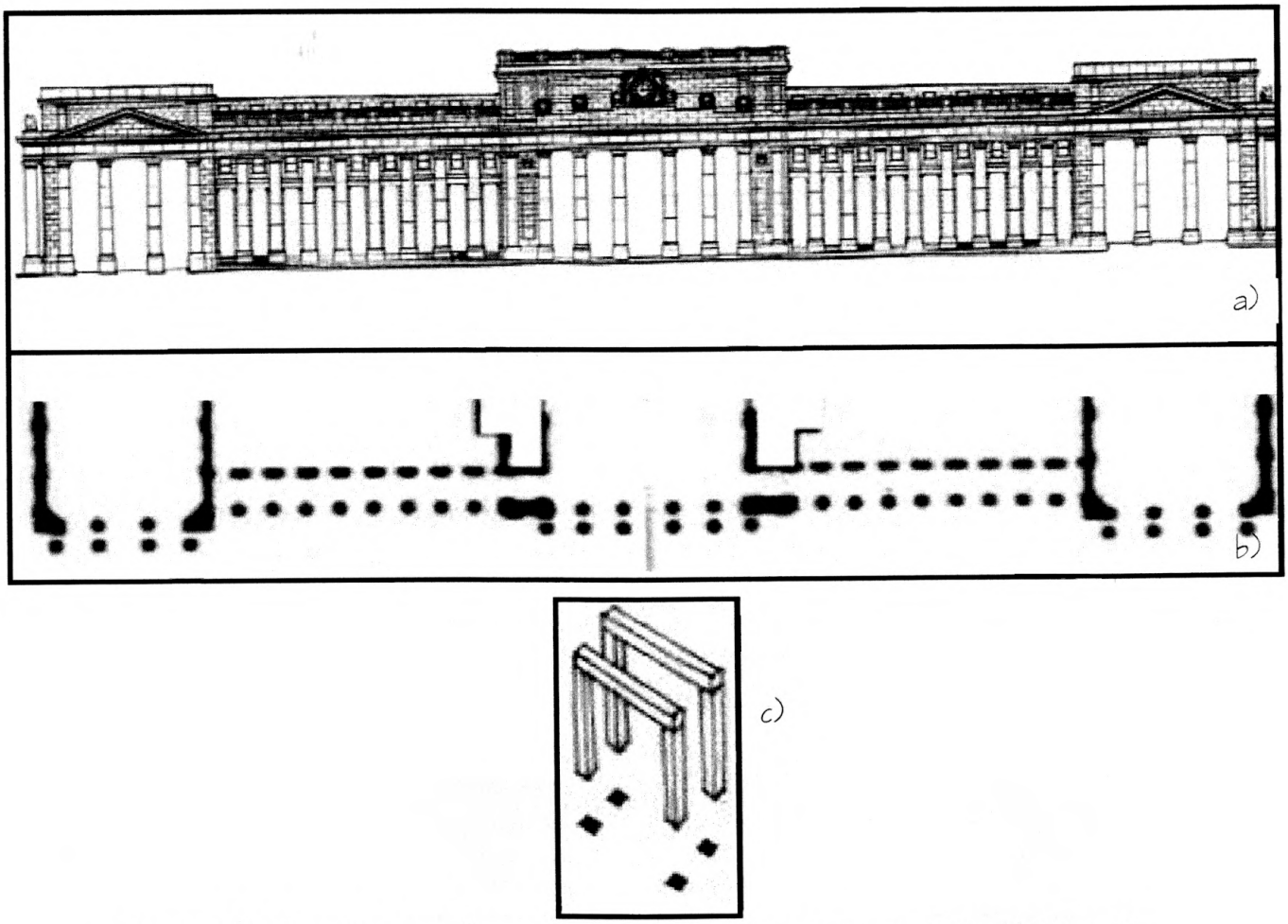


Figure 3.28: Penn Station, 7th Avenue façade skeletal wall ([a] Parissien, 1996, p.50; [b]Parissien, 1996, p.56; and [c] Thiis-Evensen, 1987, p.154)

As shown in figure 3.28, the strong, straight, repetitive colonnaded frame mainly characterizes Penn Station's 7th Avenue façade. The provision of the repetitive and rhythmical straight frames of the colonnade draws the user along the walls as well as through. In spite of their gigantic size, the columns of the colonnades define entryways that open up the building and serve as mediator of motion between the outside and inside.

According to Thiis-Evensen, this mediating quality represents the public aspect of the building by being regal and elegant (Thiis-Evensen, 1987, p.165).

In contrast to the 7th Avenue façade, Penn Station's 31st Street façade's construction system has a more solid nature. As can be seen in figure 3.29, the central colonnade (segment a) has a skeletal on skeletal system while the rest of the façade has a massive system (segment b and c). Except for its central colonnaded entrance that has an open public feature, the 31st Street façade has a dominant, closed, massive solid wall. At first glance, we sense that massive wall seems heavy and imposes a feeling of being "impermeable," yet at the same time it conveys an impression of great structural strength.

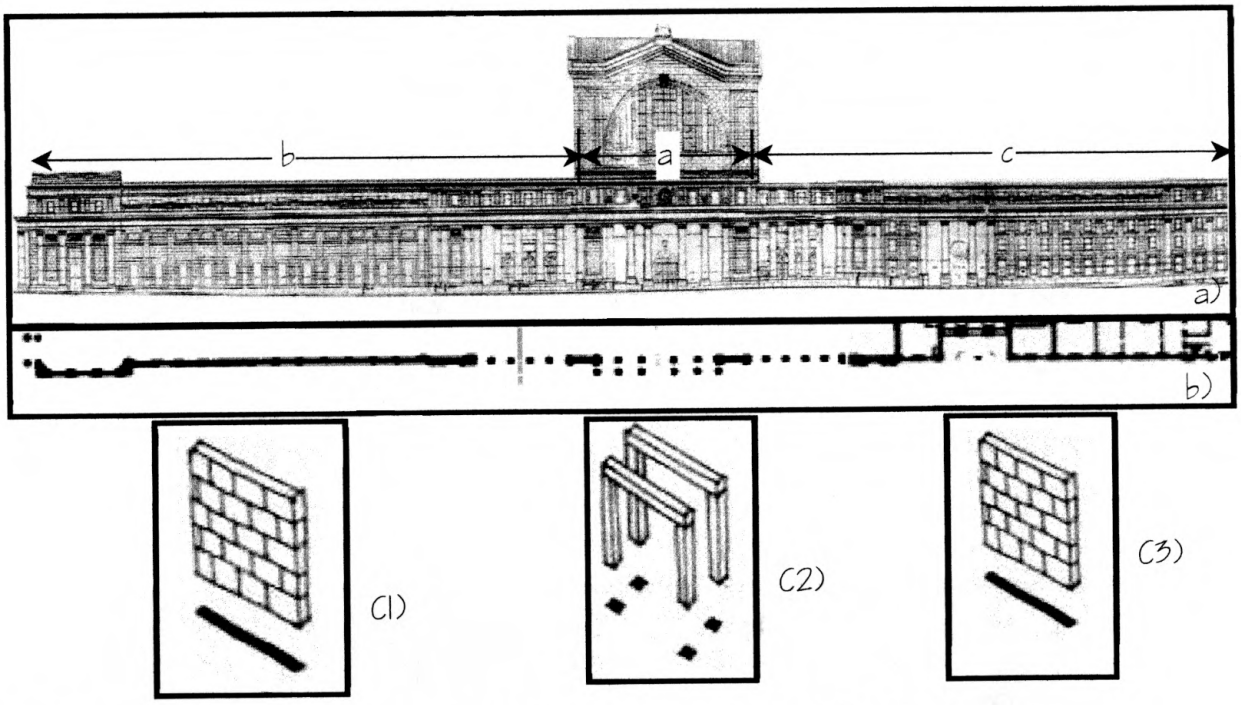


Figure 3.29: The four breadth expressions of Penn Station's 31st Street façade
([1] Diehl, 1985, p. 87; and [2] Parissien, 1996, p. 50-56 and [c1-c3] Thiis-Evensen, 1987, p.154)

Openings and Penn Station

Having considered the construction system of Penn Station, we next need to examine its openings. As mentioned earlier, the 7th Avenue façade has a predominant vertical nature. As shown in figure 3.30, the vertical windows that are found behind the two rows of colonnades accentuate the façade's vertical movement by emerging from the inside and thus strengthening the contact with exterior space and conveying the interdependence and interconnectedness of inside and outside. According to Thiis-Evensen, this experience is related to our physical looking and walking through these vertical openings.

As can be seen in figures 3.28 and 3.30, the other openings that are dominant on the 7th Avenue façade are the two main vehicular porticos on the building's far ends. These accesses are defined by two protruding colonnades and are marked by triangular pediments that accentuate the colonnade's verticality and height. These two entrances create a pronounced vertical opening, which makes the ends of the building seem open to free movement in and out. These two vehicular accesses have no wall barrier behind their colonnaded fronts. The result is a sense of depth, which in turn suggests openness and ease of penetration while at the same time accentuating the façade's vertical sense.

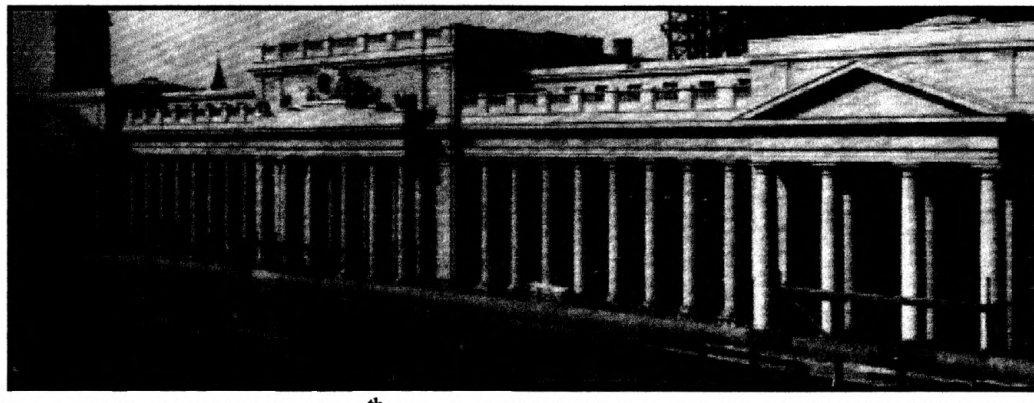


Figure 3.30: Penn Station's 7th Avenue (Main Entrance) façade (Diehl, 1985, p. 100)

On the other hand, looking at the 31st Street façade, (figure 3.31), we notice there are a fewer number of openings. Except for the façade's central colonnaded segment (segment a in figure 3.29), which has a sense of openness, the 31st Street façade has a predominantly closed sense. The fewer number of openings on this façade makes the wall look heavy and to have a closed interior protected from the outside. However, the pilasters found on the façade give a feeling of openness to the building by giving it a greater sense of breadth, while at the same time accentuating the façade's height and giving lightness to the building. The addition of the attic windows creates a sense that the darkest part of the building is at the street level and gradually lightens above. On the other hand, the attic windows sit heavily on the tall columns and pilasters, thus giving a horizontal accent to the motion of the entire wall.

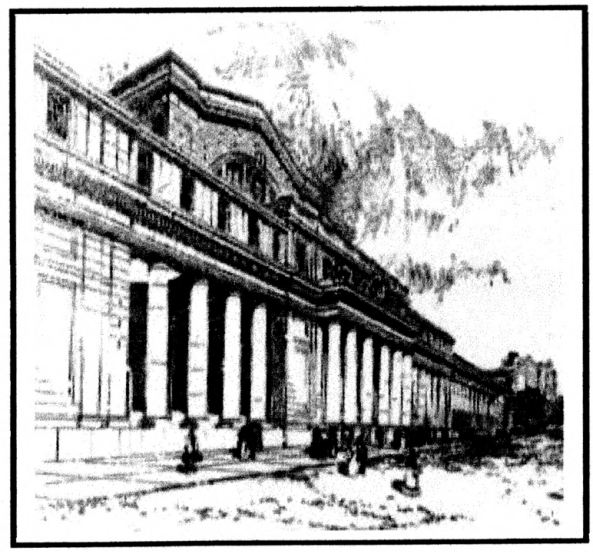


Figure 3.31: Penn Station, 31st Street façade, openings (Parissien, 1996, p. 4)

Conclusion

In this chapter, I have presented Penn Station's 7th Avenue and 31st Street façade expressions in terms of their breadth, height and depth themes by using Thiis-Evensen's theory as interpretive framework. As discussed above, the 7th Avenue façade has pronounced breadth and height expression, which reflect the façade's openness and publicness, at the same time emphasizing the façade's majestic and proud expression showing its publicness and importance. Further, in terms of the depth theme, the 7th Avenue façade's building system and openings free and lighten the spatial boundary of the façade, creating a sense of openness and publicness. Similar to the 7th Avenue façade, the 31st Street façade has strong breadth, height and depth expressions, and all these expressions reflect the façade's central section opening itself to the public while the rest of the façade suggests a much more closed and protected interior. From this interpretation, we can conclude that Penn Station is a majestic, proud and important public building. We can also conclude that its 7th Avenue façade is the most important and influential façade in expressing the building's intention.

Having presented Penn Station's walls in detail by using Thiis-Evensen's theory as interpretive framework, I next present my Thiis-Evensen interpretation of TWA terminal.

CHAPTER 4

A THIIS-EVENSEN INTERPRETATION OF THE TWA TERMINAL, WITH AN EMPHASIS ON WALLS AND ROOF

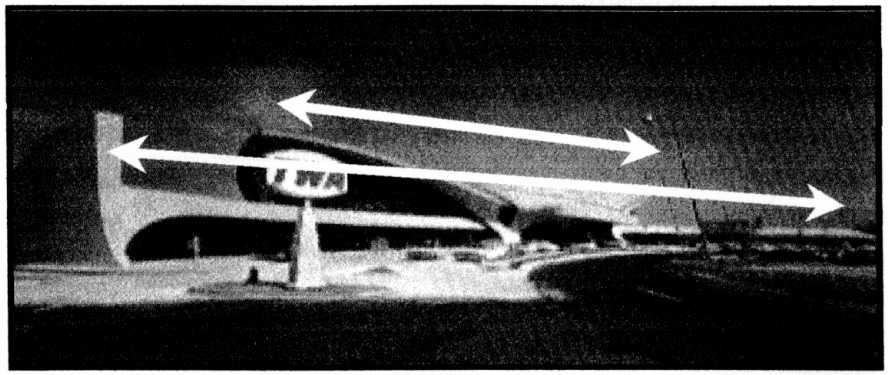
In chapter 3, I presented a Thiis-Evensen interpretation of Penn Station, with a primary emphasis on walls Similar to chapter 3, in this chapter, I present a Thiis-Evensen interpretation of Eero Saarinen's TWA terminal, emphasizing this time an interpretation of the building's walls but also roof, which plays a significant role in the building's aesthetic power and sense of openness and flight.

The Breadth Theme and the TWA Terminal

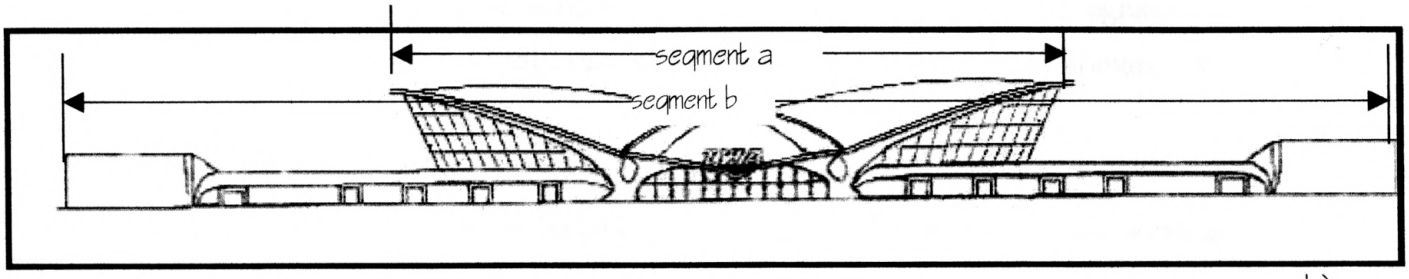
In this section, I discuss the TWA terminal's walls in terms of the breadth, height and depth themes. Following the same format I used for Penn Station, I begin with an analysis of the TWA terminal's breadth theme. In this section, I focus on the two major access facades of the TWA terminal: the south and north facades because it is through these two facades that most users experience the building. As explained in chapter 1, the south façade serves as a main entrance for pedestrians and automobiles and is mostly related to departing travelers, while the north façade is mainly related to boarding and arriving passengers.

In interpreting the TWA terminal in terms of breadth, we notice that, when we look at either south or north façades, they both have a similar expression, thus in the discussion here, both will be discussed as one. As illustrated in figures 4.1 and 4.2, both south and north facades can be broken into two segments: a central segment, marked by

segment a and segment c and an extended building façade marked by segment b and segment d in figures 4.1b and 4.2b.



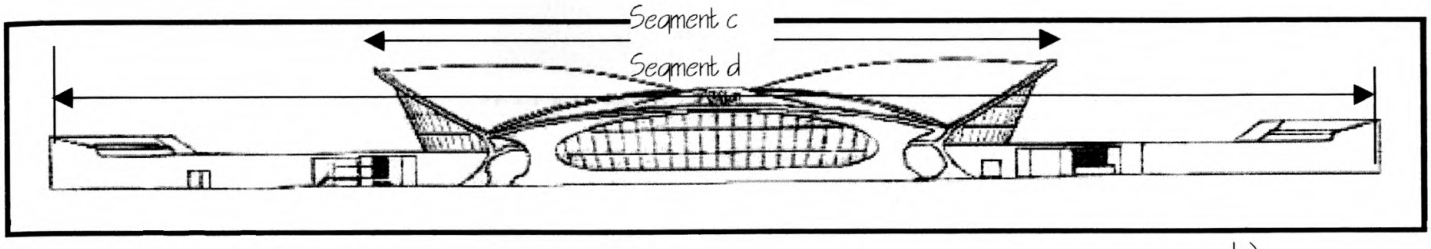
a)



b)

Figure 4.1: TWA terminal, south (Main Entrance) façade ([a]Stoller, 1999, p. 15; [b]Roman, 2003, p. 54)

a)



b)

Figure 4.2: TWA terminal, north façade two segments (segment c and segment d)
([a] Fenollosa, National Trust, http://www.nationaltrust.org; [b] Roman, 2003, p. 55)

First, we discuss the breadth expression of segments a and c—the south and north wall's central portions. When we approach the building from either the south or north, impulsively our attention gravitates to the vaulted part of the building in the middle of the façade. As can be seen in figure 4.3a, the south wall's middle segment seems to pull away rapidly from its widely splayed glass walls and structural columns as if it is pushing down and back from the rest of the building. This expansion and pulling away is also true for the building's north façade (figures 4.2 and 4.4). The walls of both middle segments (segment a and segment c) are lifted up and thrust forward thus emphasizing the openness of the middle field (figures 4.3b and 4.4b). At the same time, the middle field expands outward, springing to meet us—a quality which makes the building seem receptive, welcoming and open to the public (Thiis-Evensen, 1986, p. 123). This sense of expansion

also seems to create a feeling that the façades mediate a dialogue between the interior and exterior, which helps give the building a public expression.

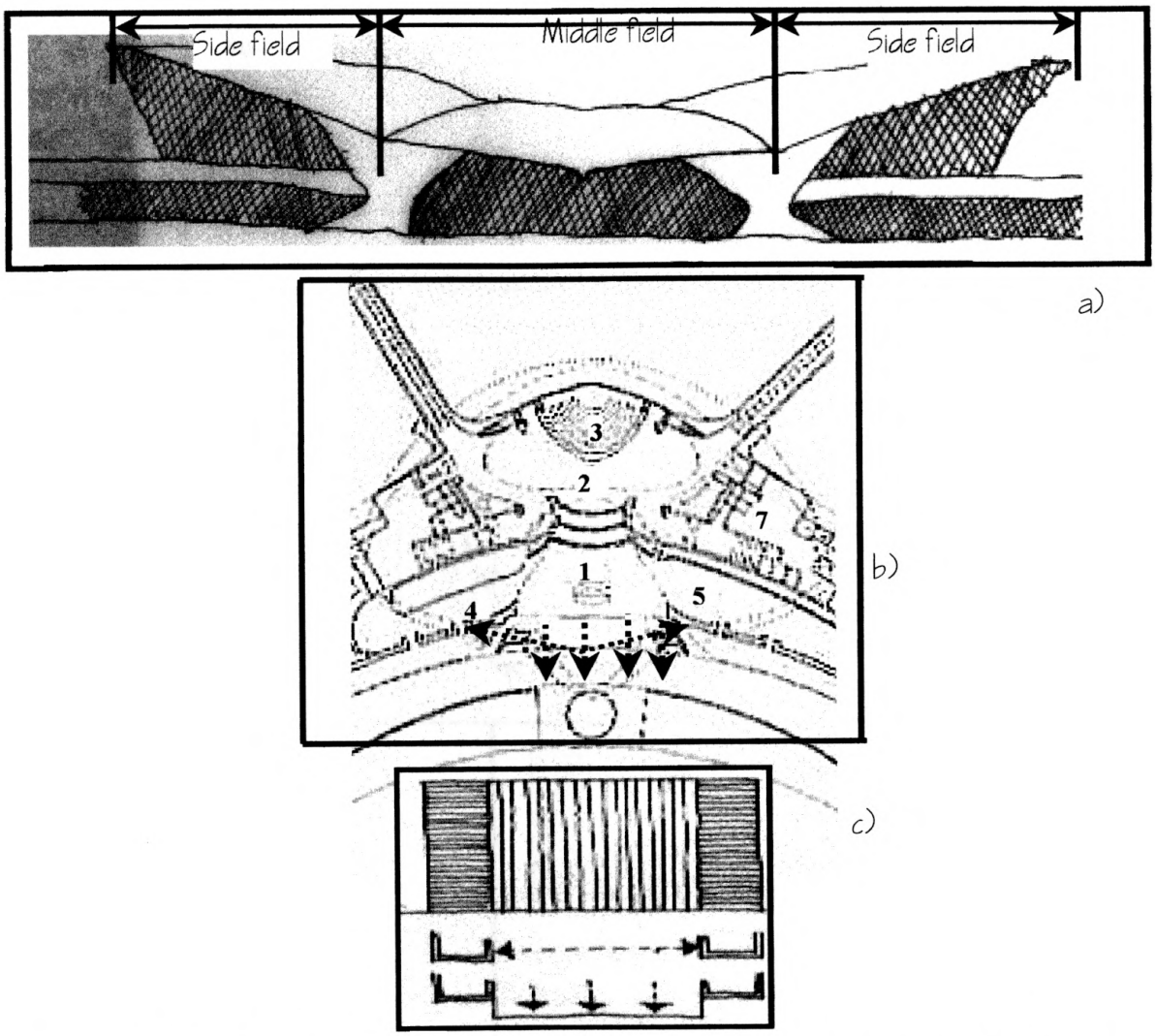


Figure 4.3: TWA terminal, south elevation, the middle segment a (middle field and side fields) ([a] sketch by author based on Stoller, 1999 [b] Stoller, E. 1999 p. 84; and [c] Thiis-Evensen, 1987, p. 124)

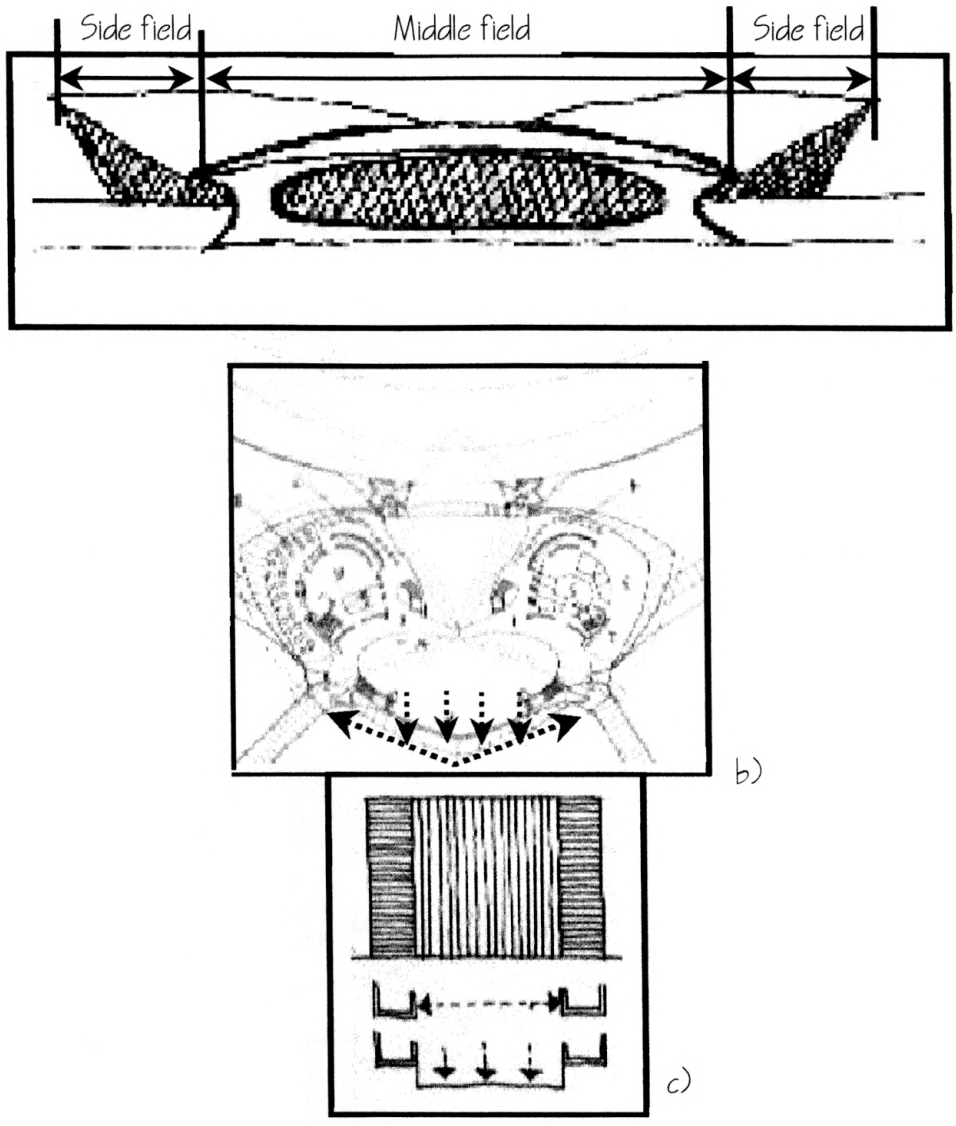


Figure 4.4: TWA terminal, north elevation, middle segment c (middle and side fields)
([a] sketch by author based on Stoller, 1999; [b] Stoller, E. 1999 p. 84; and
[c] Thiis-Evensen, 1987, p. 124)

Having discussed the breadth theme of the central portion of the terminal, we next need to discuss the building's south and north walls in their full extent (segments marked

b and d on figure 4.5a and figure 4.6a respectively). As with the central portion of the Penn Station building, the full length of the TWA terminal's south and north walls has a predominant horizontal expression. The full façades are mainly composed of low solid concrete that stretches horizontally from east to west. In particular, the south façade stretches horizontally as if to embrace the whole length of the terminal's access street and thus as a greeting to arrivals.

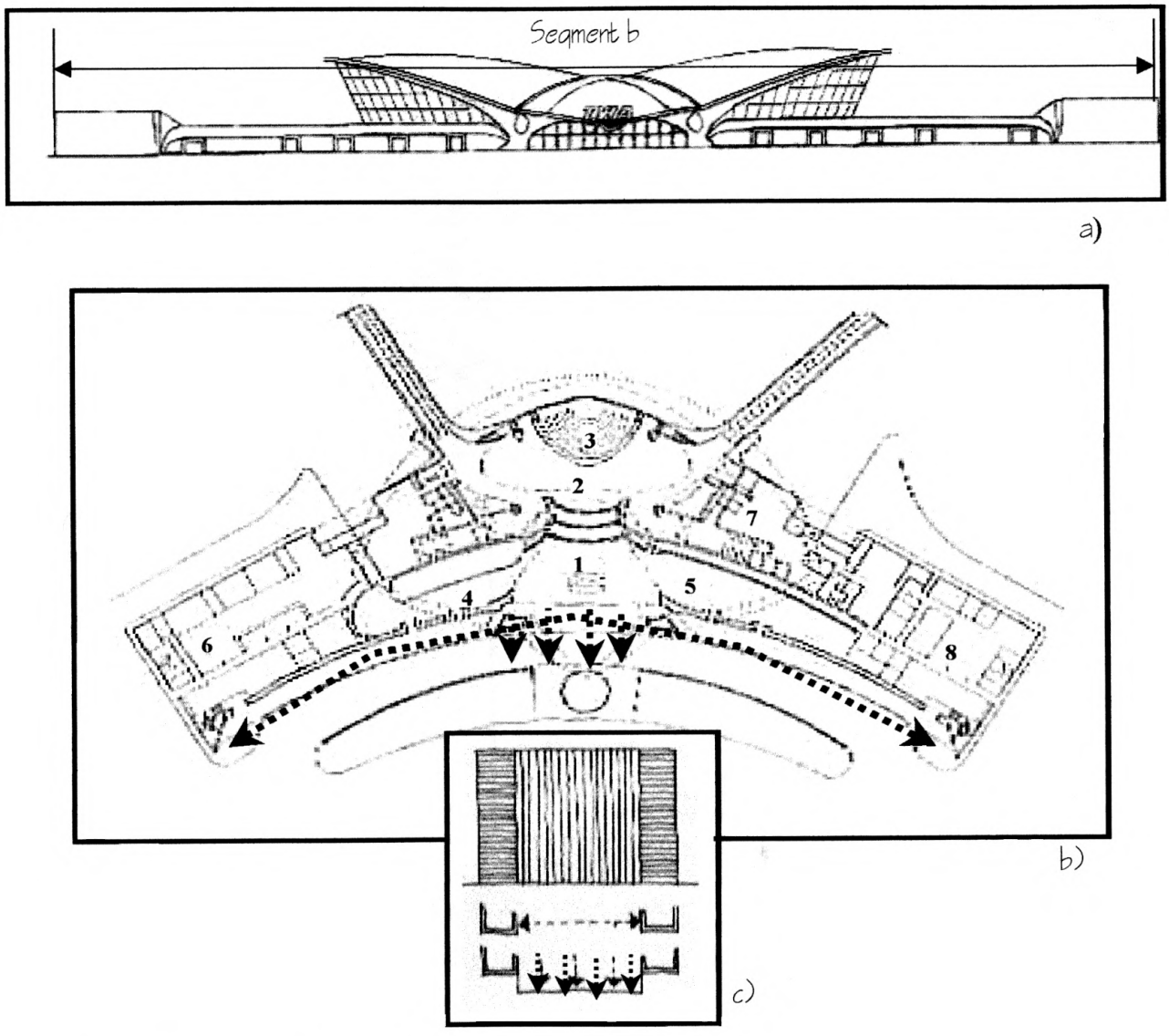
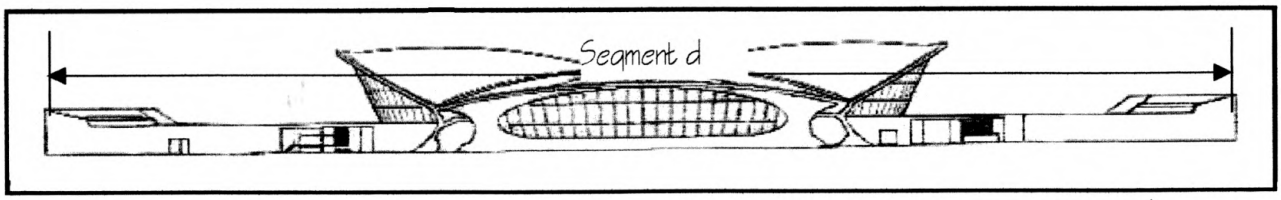
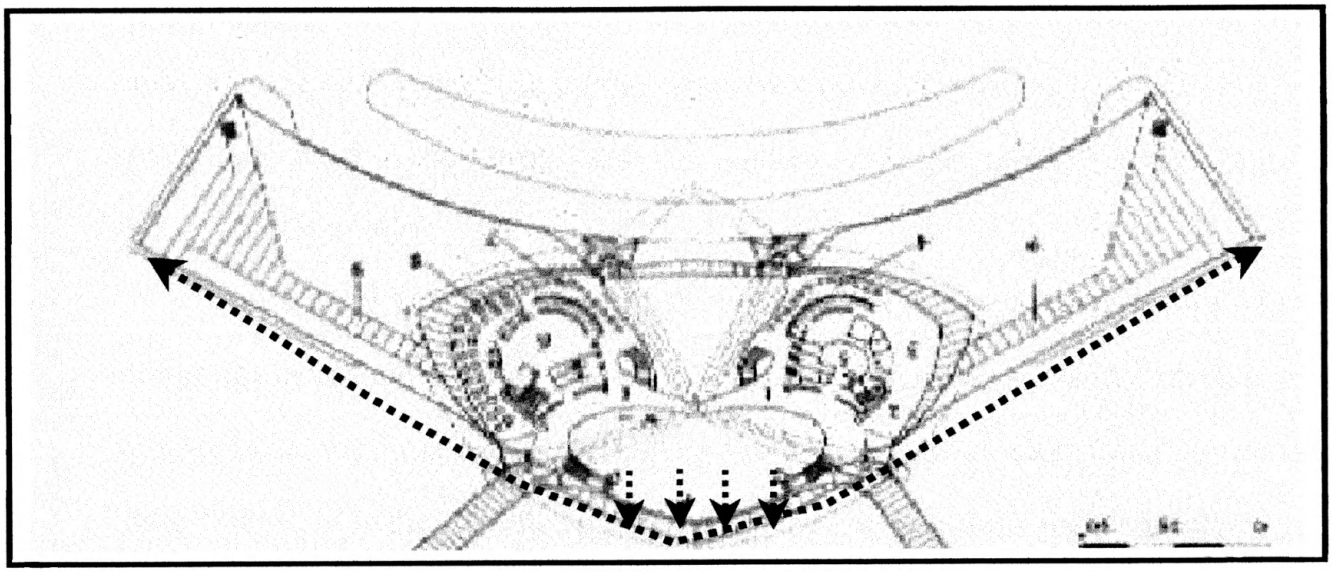


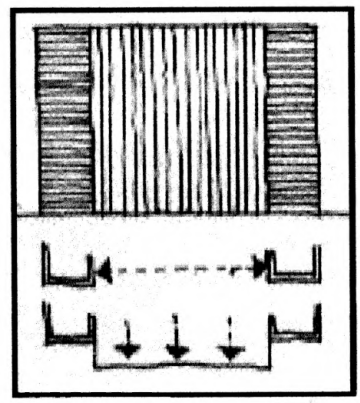
Figure 4.5: TWA terminal, south façade, segment b
([a] Roman, 2003, p. 54; [b] Stoller, E. 1999 p. 84); and [c] Thiis-Evensen, 1987, p. 124)



a)



b)



c)

Figure 4.6: TWA terminal, north façade, segment d

([a]Roman, 2003, p. 55; [b] Stoller, E. 1999 p. 85); and [c] Thiis-Evensen, 1987, p. 124)

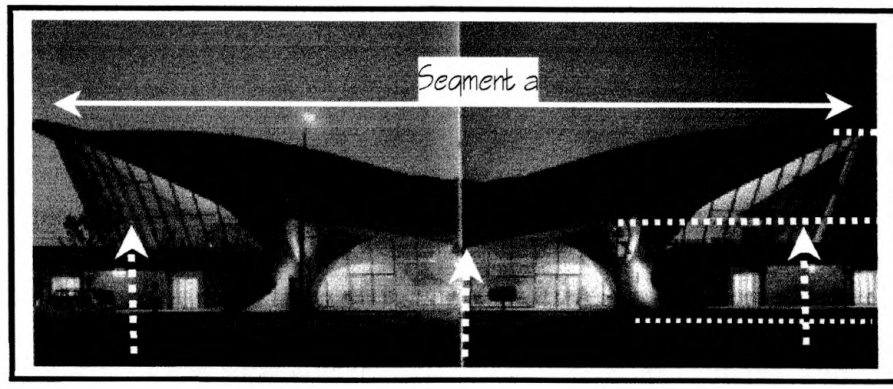
As shown in figures 4.5a and 4.6a, the south and north walls' full horizontal expression is accentuated due to door niches and the sculpted, cantilevered, solid concrete roof ridge of the façades. Looking at these two façades, we get a sense that both seem to have their central field opened up to the two edges of the wall as their side fields are pushed out as far as possible east and west. In this sense, the central field pushes and opens the middle of the façade horizontally. As shown in figure 4.5a, the solid roof ridge of the south facade creates a deep niche that adds a sense of openness to the façade's middle field and mediates a spatial dialogue between inside and outside, strengthening contact with the outside.

On the other hand, the solidity of the two side sections transmits the feeling of closure and safety and acts as a protector of the space behind as at the same time it stretches horizontally and anchors the building firmly to the ground. These two extended "wings" create a feeling that the terminal wishes to accept arrivals with a stretched, friendly hand. Generally, the building invites the whole world by opening its middle segment to the public and at the same time closing its corners as a guarantee of protecting the inside, and thus stabilizing the building.

The Height Theme and the TWA Terminal

In this section, I discuss the TWA terminal's height theme. Again, I consider the two main facades of the building-- the south and north walls—for, as previously explained, it is through these two facades that most people experience the building. In addition to the predominant expression of breadth just discussed in the presiding section, the building has a strong sense of height, which is the other pronounced expression of the building as its central vault soars vertically above the surroundings. As already illustrated in the preceding discussion of breadth, I will consider the terminal's south and north facades in terms of the two wall segments indicated in figures 4.1b and 4.2b.

As illustrated in figure 4.7, the central vaulted section of segments a and c, seem to spring from their widely splayed supports as if taking leave of the ground by pushing down the rest of the building. However, the south façade's central segment has a rising motif while the north façade's central façade has an open motif. As can be seen in fig 4.7, segment a's lower field seems to push the middle and upper field until the upper field largely disappears, a situation that brings about a sense of rising and hovering creating an air of lightness, whereas in the north façade shown in the (figure 4.8), segment c's middle field is broadened and becomes more dominant over the upper and the lower fields. These strong vertical expressions of the middle fields bring about a sensation of lift and pride but also opening and the possibility of penetration and access at the ground level (Thiis-Evensen, 1987, p.137).



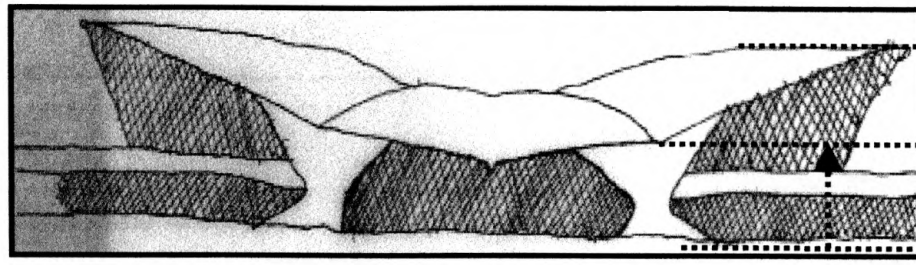
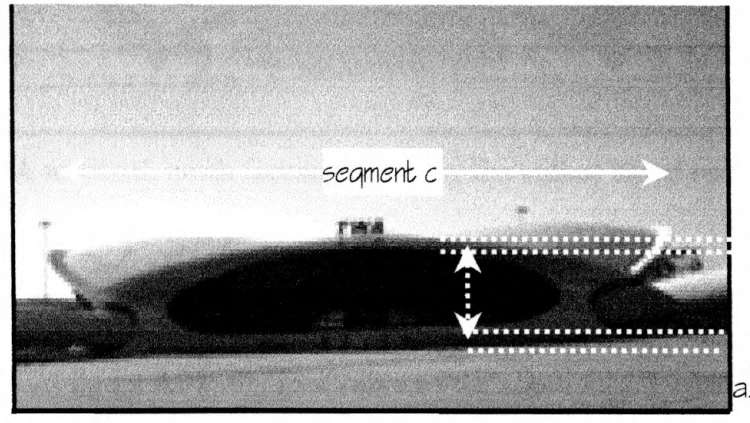


Figure 4.7: TWA terminal, South façade's central segment (Stooler, 1999, p. 80)



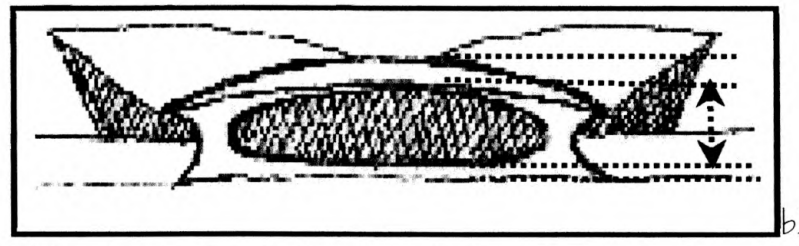


Figure 4.8: TWA terminal, north façade central segment vertical expression (Stooler, 1999, p. 87)

Having discussed the height theme of the central portion of the terminal marked by segment a and c, we next need to discuss the building's south and north walls in their full length, marked by segments b and d on figures 4.1b and 4.2b. Looking at either of these full length walls, as shown in figures 4.9 and 4.10, we experience a pronounced rising of the central segment and a pronounced sinking of the side wings, which are mainly composed of low solid concrete walls that stretch horizontally from east to west.

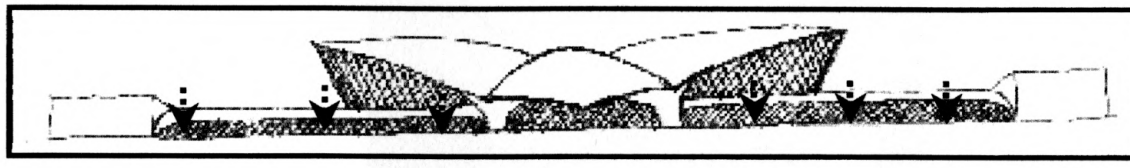


Figure 4.9: TWA terminal, south façade (sketch by the author based on Roman, 2003, p. 54)

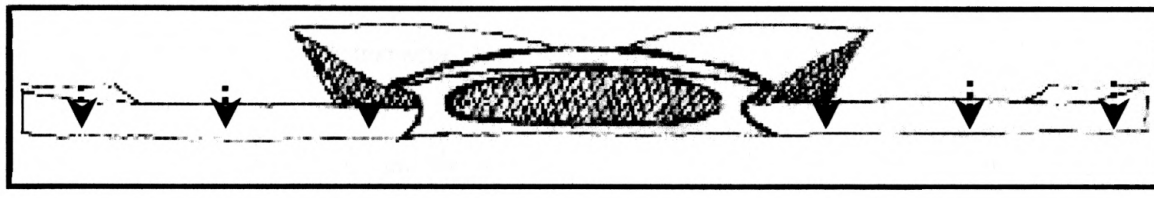


Figure 4.10: TWA terminal, north façade (sketch by the author based on Roman, 2003, p. 55)

As shown in figure 4.11, the roof ridge of the south facade acts as an upper field pushing down the middle and the lower fields as if to give a sense of being pressed together against the ground, or "sinking into the ground" (ibid., p.135). The cantilevered solid concrete roof, which acts as an upper field, weights and presses both fields down giving a "crowded and threatening" feeling because it looks as if it is about to "snap together at any time" (ibid.). At the same time this roof edge gives the feeling of closure,

safety and acts as a protector of the space behind. As we can see from figures 4.9 and 4.10, the short solid side wings let the central segment of the façade open up for outside penetration and at the same time enclose and protects the inside.

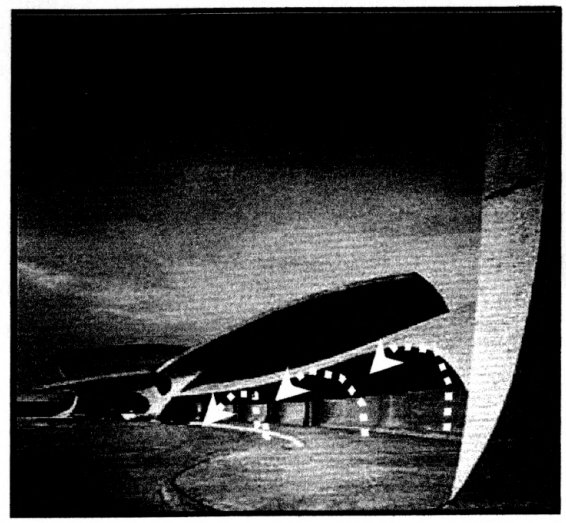


Figure 4.11: TWA terminal, South façade segment b (Stoller, 1999, p. 4)

On the other hand, as shown in figure 4.12, the absence of a roof ridge on segment d of the north wall brings about a pronounced sense of sinking. This is due to the fact that solidness of the façade, and its low height and lack of roof ridge make with stretched long wall and absence of any kind of roof ridge made the façade to weigh down heavily and thus generate sense of sinking. This wall feels as if lower and the middle fields have dissolved into the ground and as if the upper field is also sinking. This expression causes the interior space to have a sense of closure isolating and protecting the inside. In other word, the façade gives a closed, earth bound and immovable sense, which in turn contributes to the building's sense of security.

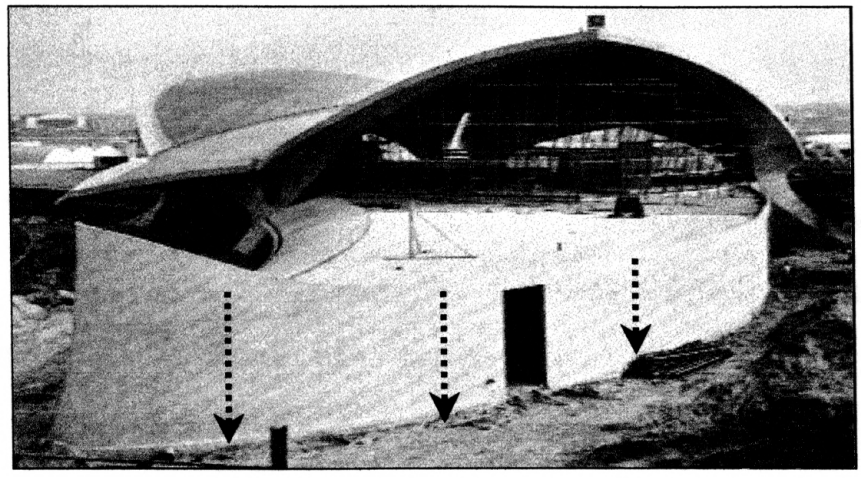


Figure 4.12: TWA terminal, north façade segment d (under construction) (Temko, 1962, p. 94)

The Depth Theme and the TWA Terminal

Having presented the breadth and height themes of the TWA terminal, I next present the depth theme of the building. As discussed in chapter 2, the depth theme of a building expresses the relative strength of the inside-outside relation and helps us to examine the expressiveness of the relationship between the spaces in front of and behind the wall. This theme has three main parts: *main form* deals with the relative influence of the wall's height, width, and degree of slant and curve on the relative strength of inside-outside, while *building system* deals with how the wall's main form is composed: solid slab, skeleton, or a combination of the two. Last, *openings* deal with doors and windows and their relative importance in the inside-outside relation. In this section, I focus on the *building form* and the *openings* of the TWA terminal's facade because these two aspects of the building's depth theme are the major factors that influence the strength of the inside-outside relation.

As I have done in the preceding section on the TWA façade's breadth and height themes, I consider the two main facades of the building—the south and north walls. As previously explained, it is through these two facades that most people experience the building. Again, I consider the terminal's south and north facades in terms of the two wall segments a and c indicated on figures 4.13 and 4.14. As in the preceding sections, I discuss the two walls together. As shown in figures 4.13 and 4.14, looking either at the south or north central segments a or c, we notice that both have a splayed glass wall rising up while the remaining part of the building (segments b and d in figures 4.1b and 4.2b) 'crawl' along the ground. The slanted glass wall of the central façade conveys an

insecure feeling because, according to Thiis-Evensen, it triggers a question of whether the wall might fall or remain secure (Thiis-Evensen, 1987, p.149).

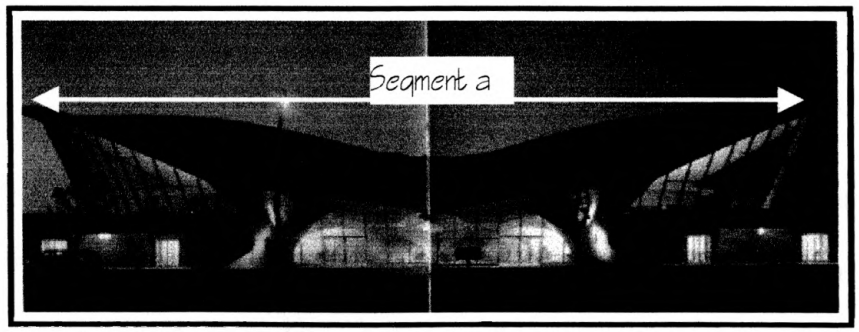


Figure 4.13: TWA terminal, south façade's splayed glass wall central segment (Stooler, 1999, p.87)

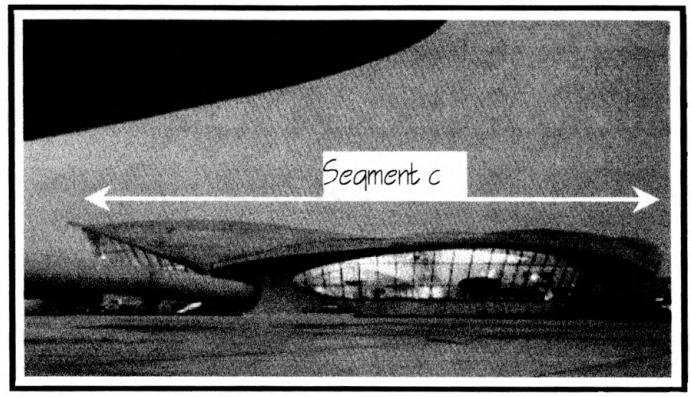


Figure 4.14: TWA terminal, north façade's splayed glass wall central segment (Stooler, 1999, p.87)

On the other hand, the splayed glass wall stretches to touch the roof without any interruption, all the way into the ceiling. This glass wall seems to gesture to the sky proudly and joyfully, as if suggesting an architectural link between the building and flight. The impression given by such expression is of a roof lying above the wall raised up or hovering (figure 4. 13). This roof appears to be detached from the walls below to open and lighten the space beneath (ibid., p. 309). This splayed glass wall also generates a sense that the natural heaviness of the concrete roof has vanished, thus the visual action

of gravity on the structure is diminished. In short, the vertical sense "prevails and renders the sense of victorious action of rigidity with the overcoming of gravity" (ibid.). The splayed glass wall of the central segments a and c give the interior space a sense of freedom, openness and expansion to the outside. The wall stands free, stretching the whole length of the building without visible beams, lintels or columns; this "stretch" accentuates a sense of rising and outward expansion. This expression also strengthens the inside-outside relation because the inside and the outside seem to merge. In other words, the inside continues to the outside.

As shown in figures 4.1b and 4.2b, the full-length wall segments b and d have a façade composed of solid concrete wall, which defines and closes off the space like "a protective screen" (ibid, p.147). As shown in figures 4.15, 4.16 and 4.17, these two segments b and d of the façade stretch from east to west with two different *main forms*: the south façade with a *concave* wall and the north façade with a *convex* wall. In looking more closely at the main form of the south façade (segment b), one notes that its concave form stretches from east to west. The facade seems to be pushed from the outside, creating an interior that yields to the power of the forward movement of the outside. As a result, this façade has a sense of embracing and receiving arrivals.

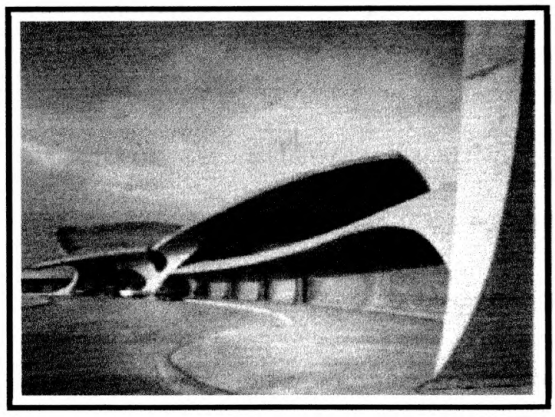


Figure 4.15: TWA terminal, south façade (Roman, 2003, p. 44)

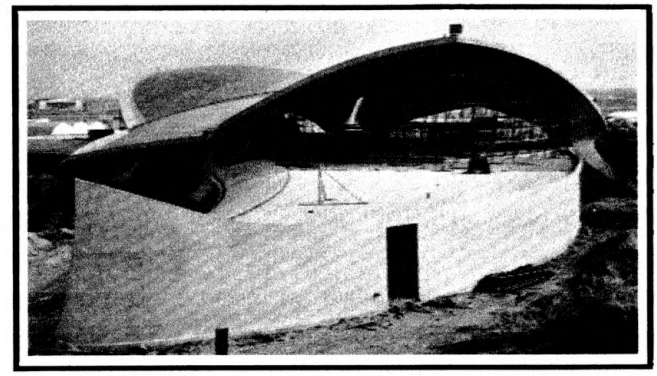


Figure 4.16: TWA terminal, north façade (under construction) (Temko, 1962, p.94)

According to Thiis-Evensen, this kind of wall expression shows friendliness and security, nearness and protection, expressing generosity and expansiveness—"an outside gesture from the inside" (ibid., p.149). As suggested in figure 4.15, this expression also suggests a possibility of penetration from the outside. In addition, the south façade generates a feeling that the whole site, following the concavity of the building, is pushing the outside in because the inside space seems to be directed outward and the wall seems to protect any inward movement from the outside. In this situation, the wall's function as a delimiting element is emphasized without expressing rejection because "within any concave structure there is a receptive, welcoming environment" (ibid.).

In contrast to the concavity of the south facade, the north wall's main form is convex (figure 4.17). According to Thiis-Evensen, this convex wall expression suggests a resistance force from within (ibid., p. 151). Consequently, the interior space behind the wall acts as a strong and dominating space through expanding movement outward, implying the protection of the interior from the exterior. As can be seen in figures 4.15 and 4.16, as we approach the terminal from the north, we feel that the interior resists our

approach and we are kept at a distance, stopped by the interior's own force. Nevertheless, "the interior has an expansive sense which opens towards the outside" and thus strengthens the inside-outside relation (ibid., p.151). Thiis-Evensen describes this experience of a convex façade as "a solid and concrete thing, which gives an outward expansion and an inward looking concentration" (ibid., p.148). Generally, the north façade seems to invites the whole world with stretched arms by opening its middle for our penetration; at the same time it closes its corners as a guarantee for protecting the inside and for stability of the building.

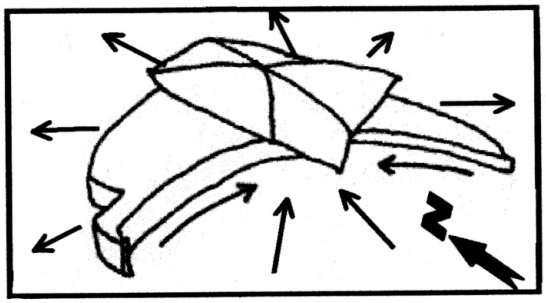


Figure 4.17: TWA terminal, expression of concave and convex movement (sketch by author based on Stooler, 1999)

Openings and the TWA Terminal

As discussed in chapter 2, an opening in a wall occurs when the wall's structural system is interrupted either in the form of a hole or change of rhythm on the wall (Thiis-Evensen 1987, p. 245). Openings stand out as figures in affecting the degree of the inside-outside relation. These openings are usually perceived as an expression of interior expansion towards the outside and vise versa; their way of incision determines the feeling of motion and weight of the wall (ibid.). In this section, I first present a Thiis-Evensen interpretation of TWA terminal's windows, which Thiis-Evensen calls "the eye of the building" (ibid. p. 251) and which are immediately perceived as an expression of what is inside or an expansion of the interior towards the outside. Second, I present the expression of the TWA terminal doors, which are a transition space from one "world" to another. As Thiis-Evensen explains, the door is a place of "existential transition" (ibid., p.283). The door brings the outside into the inside (ibid., p. 261). Passing through a door has strong bodily and sensual meaning to the experiencer.

First, I present TWA terminal's windows. Looking at the facades of the TWA terminal, one notices that the glass walls serve as windows. As shown in figure 4.18, the TWA terminal's windows are extended to the full height of the façade and seem to lead the inside out and vice versa, suggesting a potential space in front of the opening by giving an "impression of a face belonging to the exterior space" (ibid., p.268). As shown in figure 4.19, this setting results in an interior that seems to strain forward from within and leads motion outward from within.

The TWA windows show how the facade resists expansion. The interior space pushes outside from within the building. Due to this effect, the slanting nature of the

TWA building windows seem so because of the power of the inside, which appear to have difficulty with holding the space back with the result that the wall has a sense of plasticity. This struggle between expansion and control is revealed in the windows' expression of "ready to burst," which at the same time opens the space within.

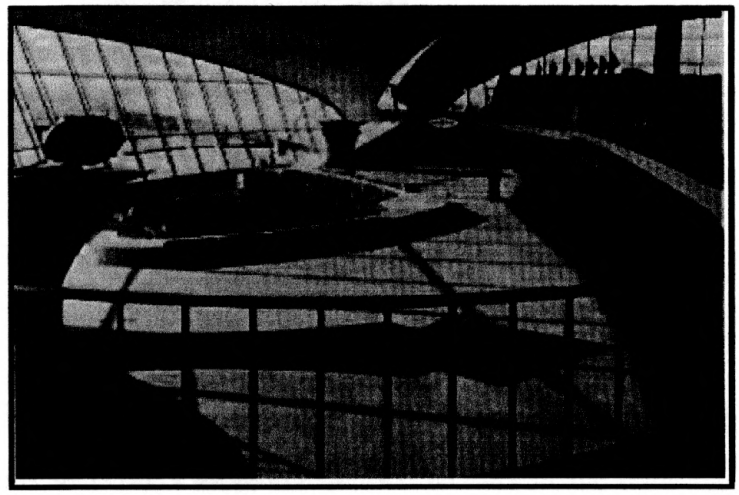


Figure 4.18: TWA Terminal, splayed windows (Stooler 1999, p.85)

Figure 4.19: TWA Terminal, splayed windows (Stooler 1999, p.87)

Furthermore, the slits of skylight windows that follow the vaulting intersections of the roof shells add to this impression of expansion and the "ready to burst" sensation within the space beneath. The skylights seem as if they are the only things that hold the

building roof together so that it does not break apart. These lines of skylights help to create an interior that opens and expands towards the outside.

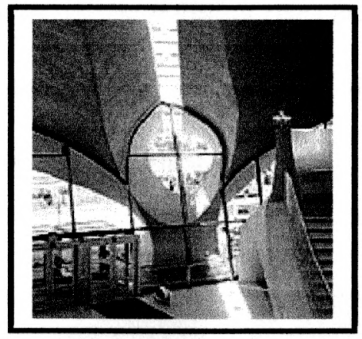


Figure 4.20: TWA Terminal, skylight (www.greatbuildings.com)

Next, I present a Thiis-Evensen understanding of the doors of the TWA terminal. As in the previous sections, I focus on the two facades of the building: south and north façades. As discussed in chapter 1, a seventy-five-foot cantilevered roof shell that seems to protect the waiting space beneath shelters the south façade main entrance door. This entrance acts as a strong frame highlighting the main entrance glass door of the building. Standing near this glass door, one feels as if he or she is already in the building, due to the protective nature of the entrance roof and the transparent nature of the glass door, which brings about an open and continuous flow of space. On the other hand the eight entrances found on the south façade's solid wings are diagonally cut into the wall (figure 4.20). These entries seem to "resist" motion from the outside (ibid., p.259). Also, the narrowing diagonal door opening, in addition to the concavity of the facade, strengthens the sense that the wall is about to close. These entries add weight to the wall because their diagonal profile conveys an impression of greater thickness than the wall actually possess (ibid.).

Looking at the north façade of the wall, we notice a fewer number of doors, all with no frame, a situation which gives a sense that the entry openings are punched from the outside and the inside closed off (figure 4.22). Generally, the central portion of the building rises and opens up to our penetration, while the side wings "crawl" along the ground, weighing down and closing the interior from the intrusion of the outside.

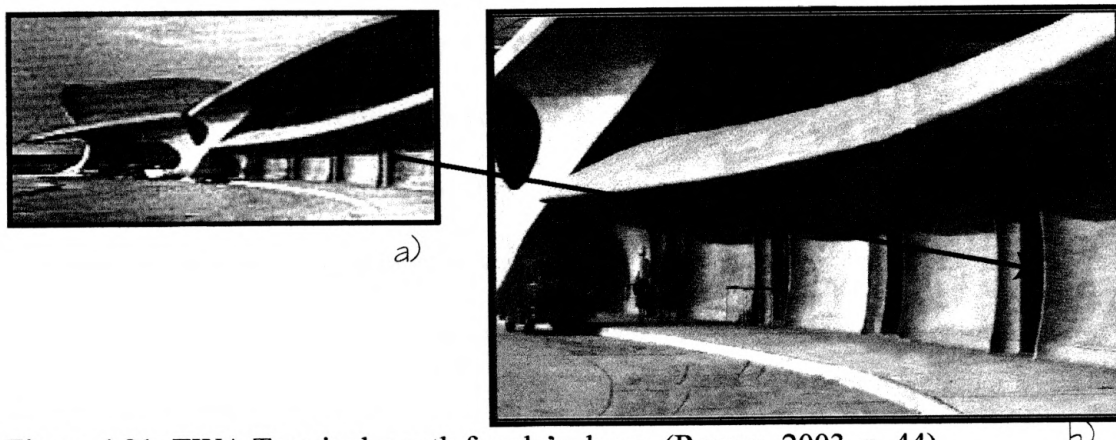


Figure 4.21: TWA Terminal, south façade's doors (Roman, 2003, p. 44)

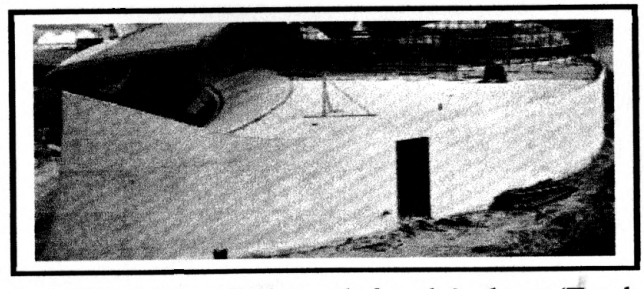


Figure 4.22: TWA Terminal, north façade's door (Temko, 1962, p.94)

The Roof and The TWA Terminal

In the previous section, we discussed the wall expressions of the TWA terminal in terms of Thiis-Evensen's theory. Now we discuss TWA terminal's roof expression, which is the most dominant and unique feature of the terminal building with a sculpted concrete roof merged with the façade and four diamond-shaped roof shells intersecting to cover the central section of the building (segment a in figure 4.23). As discussed in chapter 2, Thiis-Evensen identifies the lived function of the roof as " separating the inside and the outside in two ways: [it] protects the interior from the exterior space which is both over and above in a vertical direction and the space surrounding in a horizontal direction" (Thiis-Evensen, 1987, p. 301). Just like the previous discussions, in this section, I present the two predominant segments of the façade, marked as segment a and b on figure 4.23. These wall segments are again made use of because they mark the major roof division of the building.

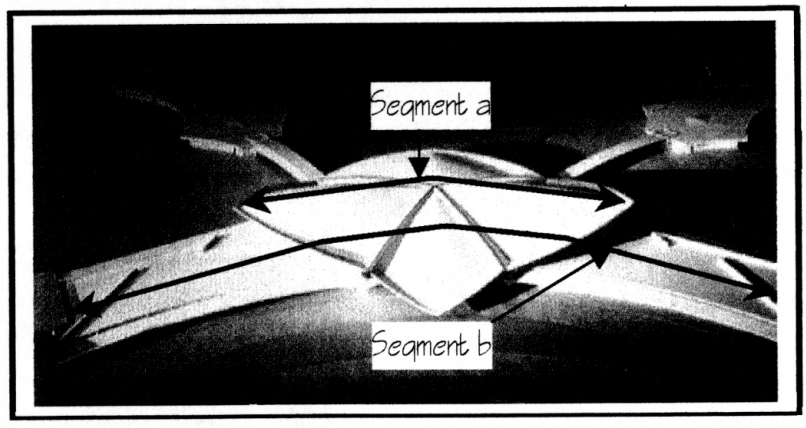


Figure 4.23: TWA Terminal roof, segments a and b (Roman, 2003, p. 47)

First, I present the central portion of the facade (segment a), which has a vaulted roof structure (figure 4.24). As can be seen in figure 4.25, unlike most buildings, the vaulted roof structure of the terminal building makes the walls appear as one continuous surface without the traditional conflict between vertical and horizontal members—i.e., wall and roof. The glass walls of segments a and b stretching from floor all the way into the ceiling area without interruption give a sense that the roof soars or hovers above the walls. As a result, the roof appears to be detached from the walls below and opens up and lightens the space beneath (ibid., p. 309). At the same time, the roof has lost the natural heaviness of concrete with the result that its vertical sense "prevails and renders the sense of victorious action of rigidity with the over coming of gravity." (ibid.)

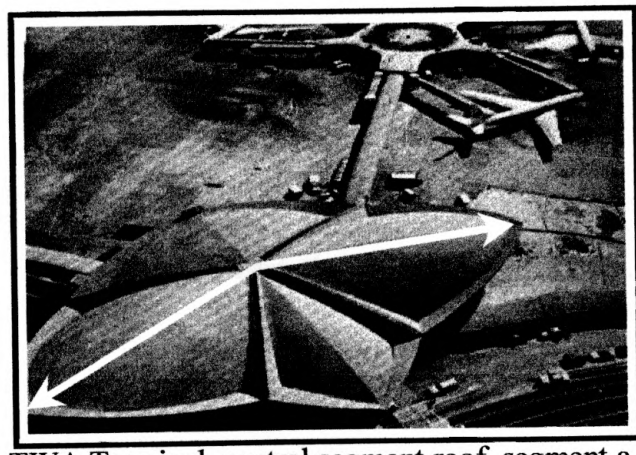


Figure 4.24: TWA Terminal, central segment roof, segment a (Temko, 1962, p. 97)

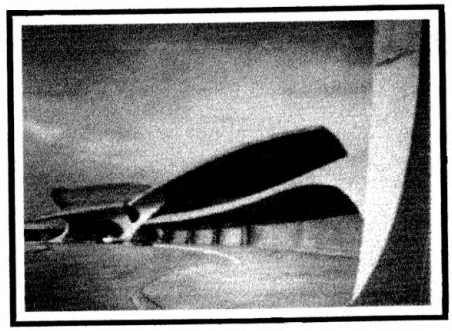
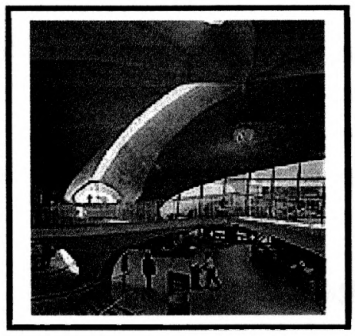


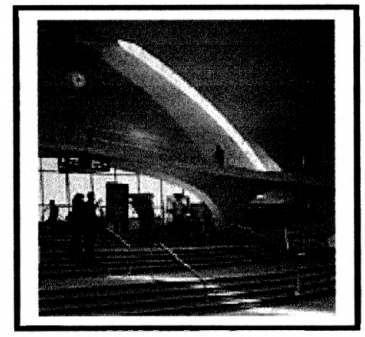
Figure 4.25: TWA Terminal, segment b roof (Roman, 2003, p. 44)

In addition, studying the TWA terminal's roof closely, we notice that the central vaulting creates a spacious hall and movement in the space beneath. As Thiis-Evensen explains, the curves in the central vaulting suggest "one is always on the move through a pulsating unrest of contractions, expansions and accelerations" (ibid., p.331). The curves of the vaulting direct spatial movement both horizontally and vertically, which is reflected in the corresponding motions within the interior space proper, which is mainly longitudinal and transversal.

Furthermore, the vaulting intersections that are lined up by slits of skylights also add an impression of motion for the space beneath (figures 4.26a and 4.26b). These lines of skylights seem to create an interior that opens and expands towards the outside. The skylight slits act as interior eyes peeping over the exterior space thus creating a dialect between inside-outside. These lines of skylights seem to allow the exterior into the interior by receiving the sky during daytime and letting the interior out by emitting light in to the exterior during nighttime. These features strengthen the inside-outside dialogue of the space as at the same time they create a hovering and uplifted sense due to a resulting sense of detachment from the walls below. The result is an opening and lightening of the space beneath this hovering roof. Generally speaking, the roof arched by the strong, short and sturdy columns and the walls stretched skyward from ground to the ceiling give the terminal a sense of confidence and a steady wing-like uplift.



a)



b)

Figure 4.26: TWA Terminal, central segment roof sky lights (www.greatbuildings.com)

In contrast to the prominent central hovering vault, the wing that stretches from east to west (segment b in figure 4.23) over the terminal's full façade has a low-ceiled, flat, concrete roof. The south facade has a solid, cantilevered, concrete eve with edge curved towards the ground. This expression of the roof gives rise to a sense that the space under the roof is protected and closed.

Generally speaking, both central vaulted roofs as well as the full-length flat roofs have two completely different roof expressions. The low height and solid flat roof of the full-length segment b leads movement along the horizontal façade, whereas the roof of the central segment a leads movement up and along the directions of the intersecting vaults that cover the central portion of the building.

Furthermore, the central vaulting raised high and above the other parts of the façade gives a sense of hovering, lift, and pride. The building feels open to the public and suggests a possibility of access to our penetration (ibid., p. 137), while the side wings' roof weighs down on the walls, a situation that evokes a closed, sinking, "crowded and threatening" feeling (ibid.). Nevertheless, as Thiis-Evensen implies, both roofs serve the same purpose: to protect the inside from the outside.

CHAPTER 5

THIIS-EVENSEN'S VALUE FOR ARCHITECTURAL DESIGN AND EDUCATION

In the previous chapters, I have presented a detailed interpretation of two transportation buildings—Penn Station and the TWA terminal—by using Thomas Thiis-Evensen's architectural archetypes as an interpretive framework. In doing so, my presentation took the following order. In the first chapter, I described the historical and architectural characteristics of the two buildings. Then in the second chapter, I discussed the major underlying conceptual approaches to architecture and reviewed Thiis-Evensen's theory of architectural archetypes. In the third and fourth chapter, I presented an interpretation of Penn Station's wall and the TWA terminal's wall and roof, respectively, by using of Thiis-Evensen's phenomenological theory of architectural archetypes as an interpretive framework. My presentation highlighted the detailed experiential qualities of Penn Station's wall and the TWA terminal's wall and roof, for these archetypes are used as major elements to communicate the architectural intention and meaning of the two buildings.

In this last chapter of my thesis, I finalize my interpretive case study of Penn Station and the TWA terminal. I integrate and generalize the major experiential qualities that are described in the previous two chapters, through highlighting the two buildings' experiential similarities and differences. Mainly, this chapter attempts to identify and demonstrate the underlying design principles of the two buildings' expression irrespective of their contrasting functional programs grounded in train vs. air travel.

Moreover, this chapter indicates some applications related to architectural design and education.

Primarily, the fact that both Penn Station and the TWA terminal share the same intention of creating a grand architectural space in regard to their respective site and function aroused my interest to study them closely. As I have discussed in chapter 1, both designs respond straightforwardly to the contextual nature of their site. Thus, Penn Station is a closed, controlled, and massive structure, partly because of the high density of its urban surroundings. The station is located in high-density Manhattan, where the adjoining district is full of busy commercial structures. In response to its context, Penn Station has a compact horizontal design expression, whereas the TWA terminal spreads winglike across the airport landscape, responding to function as well as to the open landscape context. In short, both buildings extend their architectural presence into the surroundings but in different ways. Moreover, both buildings' architecture evokes great emotion, demonstrating that "mankind can build nobly." (Pariseen, 1996, p.22)

As described in chapter 1, Penn Station and the TWA terminal are unique to their architectural periods in that both are symbols of power and romance of land and air transportation, respectively. Both buildings reigned supreme and mark the peak of their building era. Literally, at their peaks, thousands of people saw New York City for the first time as they passed through these two buildings. When it was first decided to demolish Penn Station, there was much public outcry to save the building and, presently, there is strong outcry to preserve the TWA building (Dunlap, 2003, p. A28).

Thiis-Evensen's Architectural Archetypes and the Two Buildings

Interpreting Penn Station and the TWA terminal from the conceptual view point of Thiis-Evensen (1987) indicates that there are some common experiential parallels between the two buildings. As we have seen in chapters 3 and 4, Penn Station's wall and the TWA terminal's wall and roof play a significant role in expressing the relative strength of inside-outside relationship either by opening or closing the building to the outside. Penn Station and the TWA terminal have predominantly a pronounced breadth and rising expression revealed through walls and roofs. However, both buildings have their own way of presenting their specific breadth and rising expression.

On one hand, Penn Station's strong horizontal expression, which is emphasized by the station's horizontal entablatures and attic space, a situation which increases the inside-outside relation and suggests freedom of movement into and within the space. On the other hand, the TWA terminal's horizontal expression is emphasized through the terminal's horizontally stretching short, winglike walls, which create a compressed, compact impression that in turn give the terminal's interior a closed and delimited sense suggesting a strong tie to the earth. Nevertheless, both buildings have their middle sections open wide, a situation that mediates a dialogue between interior and exterior, which in turn gives an immediate sense of both strength and publicness.

Then again, both buildings have a strong vertical expression also revealed largely through walls. Penn Station's vertical expression is evoked in the tall, majestic Tuscan/Doric columns and pilasters lining up the façades, which gives a sense that, the building is well anchored and heavy yet at the same time open, solid and proud. In contrast, the vertical expression of the TWA terminal is expressed through the central

portion of the building, which soars and points to the sky at the same time it is ready to take leave by pushing down. This vertical movement expressed in the building gives the building an air of soaring and free sensation. In general, the vertical movement expressed in both building's walls allows both buildings to open up for the public and to evoke an architectural importance and pride.

However, it is not only walls that can depict the relative strength of the inside-outside relation. For this reason, chapter 4 on the TWA terminal highlights the building's roof, which also plays a significant role in expressing the relative strength of inside and outside horizontally and vertically. Especially, the TWA terminal's central vaulted roof soars and hovers by opening the space beneath and at the same time strengthening the inside-outside relationship. This roof's skylights, lining up the intersection of the four diamondlike roof vaultings, increase the sense of airiness and uplift and at the same time strengthen the dialogue between inside and outside. In general, the roof gives a sense of shelter, safety and an enclosed refugee from the outside even as it reaches skyward.

Another important part of a Thiis-Evensen interpretation of the two building is an interpretation of the building's depth expression, which also contributes to the relative strength of the inside-outside relationship. Penn Station's breadth expression suggests travelers' freedom to move through the building. Similarly, the breadth expression of the TWA terminal invites travelers and then draws them in. Even if both buildings have different breadth expressions, the similar result is a sense of publicness, openness, receptiveness, and friendliness.

One of the primary findings of this thesis is that the vertical and horizontal expressions of walls and roofs play crucial role in emphasizing the strength of inside and

outside relationship. The breadth and the height expressions of both buildings' walls and roofs emphasize openness and strength. As discussed in chapter 3, Penn Station has very complicated and overlapping expressions on its two major facades; this overlap leads to some difficulty in using Thiis-Evensen's theory as an interpretive framework, for Thiis-Evensen himself does not indicate clearly how several overlapping expressions can be separated out for analysis. In addition, I believe it is important to mention that it has been difficult to analyze both buildings' facades using Thiis-Evensen's theory, for it does not encompass the interpretive possibilities for all kinds of roofs. For example, the unique kind of roof and wall structure of the TWA terminal is a distinct form that Thiis-Evensen never discusses in his theory.

In conclusion, all expressions demonstrated by the different parts of both buildings have intricate relationships to each other that engender various architectural expressions of the inside-outside relationship articulated through motion, weight and substance—a situation that we normally experience as a taken–for-granted whole in its totality as a unity of architectural expressions. Generalizing from my two buildings, one notices that different buildings with different functional programs and site contexts have remarkable formal power to evoke different methods in altering the communication of architectural intentions. As I hope my thesis demonstrates, it is also possible to see through Thiis-Evensen's theory the considerable potential of his archetypal expressions in presenting the intentions of a building design. We also realize, however, how experiential commonalities and understandings among the archetypal expressions evoke similar architectural expressions, though the building's design program and site requirements are considerably different.

Thiis-Evensen and Architectural Education

As presented in the previous chapters discussion revealed architectural expressions that help to understand more thoroughly and precisely the intended meanings of Penn Station and the TWA terminal. Through the interpretation of these two buildings, one can see more clearly the strength of Thiis-Evensen's theory of architectural archetypes in understanding the goal of architectural expressions of buildings as well as their contextual intent.

Before I started work on this thesis, I had an intuitive feeling towards architectural expressions and an understanding of architectural forms without any clear interpretive basis. Nevertheless, in regard to the two buildings I interpreted, Thiis-Evensen's theory provided me with a good basis for seeing and understanding more explicitly the two buildings' architectural expressions. In my analysis, I intended to gain more precise knowledge of interpreting architectural expressions of these two different buildings based on the same theoretical interpretive framework. As has been seen in the previous chapters, the theory has shown strength and at the same times some weakness in the interpretation of the two buildings. Ultimately, however I conclude that the use of Thiis-Evensen's conceptual stature has led to a more precise and deeper understanding of the two buildings' architectural expression.

Generally, it is possible to say that Thiis-Evensen's theory can be considered as a valuable means of interpreting architectural expressions of buildings regardless of functional variations. The theory can also be considered as a powerful device to help architectural education in directing the beginning student to a well channeled and purpose

-driven professional training process in which design intentions can be understood and communicated more precisely. But it should be noted that to use Thiis-Evensen's theory to reach a deeper and wider interpretation of diverse building types, the theory should extend its scope so that it may fit into a larger picture of architectural teaching and practical design work.

In conclusion, from my analysis of the two buildings, one can see how Thiis-Evensen's theory of architectural archetypes helps to understand architectural expression in a way that explores and identifies architectural patterns of expressions that have typically been taken for granted. This in turn brings awareness to the fact that the power of Thiis-Evensen's phenomenological approach is in understanding and analyzing any architectural form. In turn, this interpretation brings awareness to architectural teaching about the need for considering the everyday relationship of people with their built environment through examining people's experience of describing and interpreting expressions of their built surroundings. By doing so, architectural schools might produce architects who can better design a more meaningful and humane environment that is beautiful and functional and, at the same time, a better place in which to live.

REFERENCES

Appleyard, D. (1979). The Environment as a Social Symbol. *Journal of American Planning Association*, vol. 45, pp. 143-153.

Ballon, H. (2002). *New York's Pennsylvania Station.* New York: W.W. Norton & Co.

Blow, C. (1996). *Airport Terminals*. London: Riba.

Papademetriou, P. (2002). Eero Saarinen. *Casabella*. December, vol. 65, pp. 21-33.

Cerver, A. (1997). *Stations and Terminals.* New York: Arco.

Dennis Sharp D. (2002). *Twentieth Century Architecture: A Visual History.* London: Images Pub.

Diehl, B. (1985). *The Late Great Pennsylvania Station.* New York: American Heritage.

Dooran, D. (2002). *Twentieth-Century Architecture.* New York: Prentice Hall.

Dovey, K. (1999). *Framing Place: Mediating Power in Built Form.* London: Routledge.

Dunlap, D. (2003). Finding a New Function for a Jet Age Landmark. *The New York Times*, October 2, pp. A28.

Eco, U. (1972). *A Componential Analysis of the Architectural Signs*. London: Macmillan Press.

Edwards, B. (1998). *The Modern Terminal*. London: E and FN Spon.

Fenollosa, M. (2003). http://www.nationaltrust.org/11most/list.asp?i=145. Retrieved on September 2003.

Gossel, P. and Leuthauser G. (1959). *Eero Saarinen: Architecture in the Twentieth Century.* London: Taschen.

Groat, L. (1981). Meaning in Architecture. *Journal of Environmental Psychology,* vol. 1, pp. 61-72.

Groat, L. (1982). Meaning in Post Modern Architecture: An Examination Using Multiple Sorting Tool. *Journal of Environmental Psychology*, vol. 2, pp. 3-22.

Harries, K. (1993). Thoughts on a Non-arbitrary Architecture, In Seamon, D. (Ed.), *Dwelling, Seeing, and Designing: Towards a Phenomenological Ecology.* Albany, New York: SUNY Press.

Harvey, W. (1973). *Social Justice and the City.* London: Arnold Hayes.

Ingraham, E. (1987). Slow Dancing. *Inland Architect*, vol. 31, pp. 44-48.

Jacobus, J., (1966). *Twentieth Century Architecture: The Middle Years 1940-65*. New York: Frederick A. Praeger.

Jencks, C. (1973, p. 197). *Modern Movements in Architecture.* Baltimore: Penguin Books.

Jencks, C. (1980). *The Architectural Sign.* In Broadbent, Bunt, and Jencks. New York : Rizzoli.

Jencks, C. (1987). *The Language of Post Modernist Architecture*. London: Academy Editions.

Kipnis, J. (1987). Architecture: The Sacred and the Suspect. *Journal of Architectural Education*, vol. 40, pp. 33-35.

Knox, L. (1982/84). Symbolism, Styles and Settings. *Architecture and Behavior,* vol. 2, pp. 107-122.

Lin, Y. (1991). *Le Corbusier's Chapel at Ronchamp, Frank Lloyd Wright's Utilitarian Church, and Mies Van Der Rohe's Chapel at IIT: A Phenomenological Interpretation of Modern Sacred Architecture Based on Thiis-Evensen's Archetypes in Architecture.* Kansas: Department of Architecture, Kansas

State University.

Matthews, K. (1994-2004). http://www.greatbuildings.com/architects/Eero_Saarinen.html. Retrieved on October, 2003.

Meeks, L. (1956). *The Railroad Stations: An Architectural Building*. New Haven: Yale University Press.

Moustakas, C. (1994). *Phenomenological Research Methods.* California: Sage.

Mugeraur, R. (1988). Derrida and Beyond. *Center,* vol. 4, pp. 66-75.

Mulugeta, E. (2002). *Interpreting Frank Lloyd Wright's Falling Water and Alvar Alto's Villa Mairea Using Karsten Harries' Natural Symbols and Thomas Thiis-Evensen's Architectural Archetypes.* Kansas: Department of Architecture, Kansas State University.

Norberg-Schulz, C. (1975). *The Meaning in West Architecture*. New York: Praeger.

Norberg-Schulz, C. (1980). *Genius Loci: Towards a Phenomenology of Architecture.* New York: Rizzoli.

Norberg-Schulz, C. (1985). *The Concept of Dwelling: On the Way to Figurative Architecture.* New York: Rizzoli.

Olsson, G. (1981). On Yearning for Home: An Epistemological View of Ontological Transformations. In D. C. D. Pocock, ed. *Humanistic Geography and Literature*. London: Croom Helm, pp. 121-129.

Parissien, S. (1996). *Pennsylvania Station*. London: Phaidon Press Ltd.

Plosky, E. (1998). Monumental Sacrifice: The Destruction of Pennsylvania Station and the Creation of New York City Landmarks Preservation.

http://www.subjectverb.com/www/writing/pennStation.pdf. Retrieved on October 2003.

Plosky, E. (1999). Planning to Greatness to Come. *New York Times Editorial*, May 20, pp. A23.

Prudon, T. (2003). http://www.scandinaviandesign.com/eero_saarinen/index.htm. Retrieved on October 2003.

Rapoport, A. (1982). *The Meaning of the Built Environment: A Non-verbal Communication Approach.* Beverly Hills: Sage Publications.

Relph, E. (1976). *Place and Placelesness*. London: Pion Limited.

Roma'n, A. (2003). *Eero Saarinen: An Architecture of Multiplicity*. New York: Princeton Architectural Press.

Saarinen, E. (1968). *Eero Saarinen on his work.* London: Yale University Press.

Saarinen, E. (1973). TWA Terminal Building, Kennedy Airport, New York, 1956-62: Dulles International Airport (Washington, D.C.), Chantilly, Virginia, 1958-62. *Global Architecture,* vol. 26.

Seamon, D. (1982). The Phenomenological Contribution to Environmental Psychology. *Journal of Environmental Psychology,* vol. 2, pp. 119-140.

Seamon, D. (1987a). The Phenomenological Contribution to Environment–Behavior Research. In Gary T. Moore and Ervin H., Zube, Eds. *Advances in Environment, Behavior, and Design,* vol.1, pp. 3-27, New York: Plenum.

Seamon, D. (1987b). Phenomenology and Vernacular Life Worlds. In D.G. Saile, ed. *Architecture in Cultural Change*. Lawrence, Kansas: University of Kansas, pp. 17-24.

Seamon, D. (1988). Towards a Phenomenology of Environmental Meaning: The Example of Flow Forms. *The National Geographical Journal of India*, vol. 34, pp. 66-74.

Seamon, D. (1993). *Dwelling, Seeing, and Designing: Toward a Phenomenological Ecology.* Albany, New York: SUNY Press.

Sebeok, T. (1977). *A Perfusion of Signs*. Bloomington: Indiana University Press.

Spiegelberg, H. (1982). *The Phenomenological Movement*. Netherlands: Martinus Nijhoff.

Stefanovic, L. (1992). The Experience of Place: Housing Quality from a Phenomenological Perspective. *Canadian Journal of Urban Research,* vol. 11, pp. 211-225.

Stoller, E. (1999). *The TWA Terminal*. New York: Princeton Architectural Press.

Temko, A. (1962). *Eero Saarinen*. New York: George Braizller.

Thiis-Evensen, T. (1987). *Archetypes in Architecture.* Oslo: Oxford University Press.

Van Manen, M. (1990). *Researching Lived Experience.* Albany, New York: SUNY Press.

Whiffen, M. and Koeper, F. (1984). *American Architecture*. Cambridge, MA: MIT Press.

Wylde, K. (2003). Death by Preservation. *New York Post*, August 12, p. 4.