

#### **G-2.4. CDA Control Tower**



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

Chicago Airports District Office  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

November 4, 2019

Mr. Anthony Rubano  
Acting Cultural Resources Coordinator  
State Historic Preservation Office  
IDNR – One Natural Resources Way  
Springfield, IL 62702-1271

Mr. Rubano:

Enclosed you will find a copy of a document entitled, *Determination of Eligibility: City of Chicago Department of Aviation Control Tower, Chicago O'Hare International Airport*. We request that you review the Federal Aviation Administration document to determine if you concur that the City of Chicago Department of Aviation Control Tower is eligible for listing on the National Register of Historic Places under Criterion A: Transportation and Criterion C: Architecture.

If you have any questions, please feel free to call me at (847) 294-7354.

Sincerely,

A handwritten signature in black ink that reads "Amy B. Hanson".

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration

Cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation



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National Register Eligibility, City of Chicago Department of Aviation Control Tower at O'Hare International Airport

10000 W. O'Hare Ave.

SHPO Log #012120219

December 18, 2019

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

Dear Ms. Hanson:

Thank you for requesting comments from our office concerning the possible effects of your project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

We concur with your finding that the City of Chicago Department of Aviation Control Tower at O'Hare International Airport is eligible for listing on the National Register of Historic Places.

If you have any questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman

Deputy State Historic

Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation

Jamie Rhee, Commissioner, Chicago Department of Aviation

# **Determination of Eligibility: City of Chicago Department of Aviation Control Tower**

**Chicago O'Hare International  
Airport**

Prepared for the  
**Federal Aviation Administration**

Prepared by



November 2019



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**Executive Summary****Executive Summary**

The historical evaluation of the Chicago Department of Aviation (CDA) Control Tower at O'Hare International Airport (O'Hare, or "the airport") supports Federal Aviation Administration (FAA) requirements for compliance with the National Environmental Policy Act (NEPA) and Section 106 regulations issued pursuant to the National Historic Preservation Act (NHPA), as amended (36 CFR Part 800). As part of its review of the City of Chicago's proposed Airport Layout Plan (ALP) modification, FAA is conducting a NEPA process for the proposed Terminal Area Plan (TAP) and other ALP modifications. In April 2019 FAA engaged Mead & Hunt, Inc. (Mead & Hunt), through a third-party contract, to complete a National Register of Historic Places (National Register) evaluation of the CDA Control Tower.

The CDA Control Tower is a former air traffic control tower at O'Hare, built by the FAA, and is currently used by CDA airfield operations staff for monitoring the airfield. Construction on the tower began in 1966 and was completed in 1970. It is based on a standardized design developed by I.M. Pei & Associates for the FAA in the early 1960s, and features stark geometric lines, raw bush-hammered concrete exterior, and a minimalism that prioritizes its function over form. The CDA Control Tower is comprised of the tower, base building, atrium enclosure, and the surrounding plaza. It is located between the O'Hare Hilton Hotel and Terminal 2.

The CDA Control Tower was evaluated for National Register eligibility under *Criterion A: History*, *Criterion B: Significant Person(s)*, *Criterion C: Architecture*, and *Criterion D: Information Potential*. The tower represents an important effort on the part of the FAA to standardize air traffic control tower designs. It is a highly visible structure that was crucial to the advancement of the FAA's program of ensuring safety while showing uniformity and beauty of its control towers. Additionally, it embodies the significant characteristics of the FAA standard control tower design deployed in the late 1960s and represents this distinctive property type. The CDA Control Tower retains sufficient historic integrity and is therefore recommended eligible for listing in the National Register under *Criterion A* in the area of Transportation and *Criterion C* in the area of Architecture.

## Executive Summary

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## Section 1 Description

### 1. Description

#### A. Overall setting and context

Located in northeastern Illinois, Chicago O'Hare International Airport (ORD, also referred to as "O'Hare" or "the airport") occupies an approximately 8,200-acre site that straddles the Cook/DuPage County line to include areas within the city limits of Chicago, Des Plaines, Schiller Park, and Rosemont. The airport is sited approximately 17 miles northwest of Chicago's Central Business District and a variety of light industrial, commercial, residential, and public land uses surround the airport property. The airport itself consists of a central group of terminals (Terminals 1, 2, 3, and 5) encircled by taxiways and surrounded by runways (see Figure 1). Cargo facilities are located at southeast, southwest, and northeast portions of the airport. The general aviation facility is in the northeast corner of the airport, and fuel storage facilities are located at the northwest corner. Public surface parking areas are located along the central and northeast portions of the airport. The Federal Aviation Administration (FAA) North Control Tower is in the northwest corner of the property, while the FAA South Control Tower is located in the cargo facilities area on the southwest side of the airport. Other support facilities in the areas on the south, northwest, and northeast portions of the property include those for airline support and maintenance, aircraft rescue and firefighting, a post office, and Transportation Security Administration (TSA).

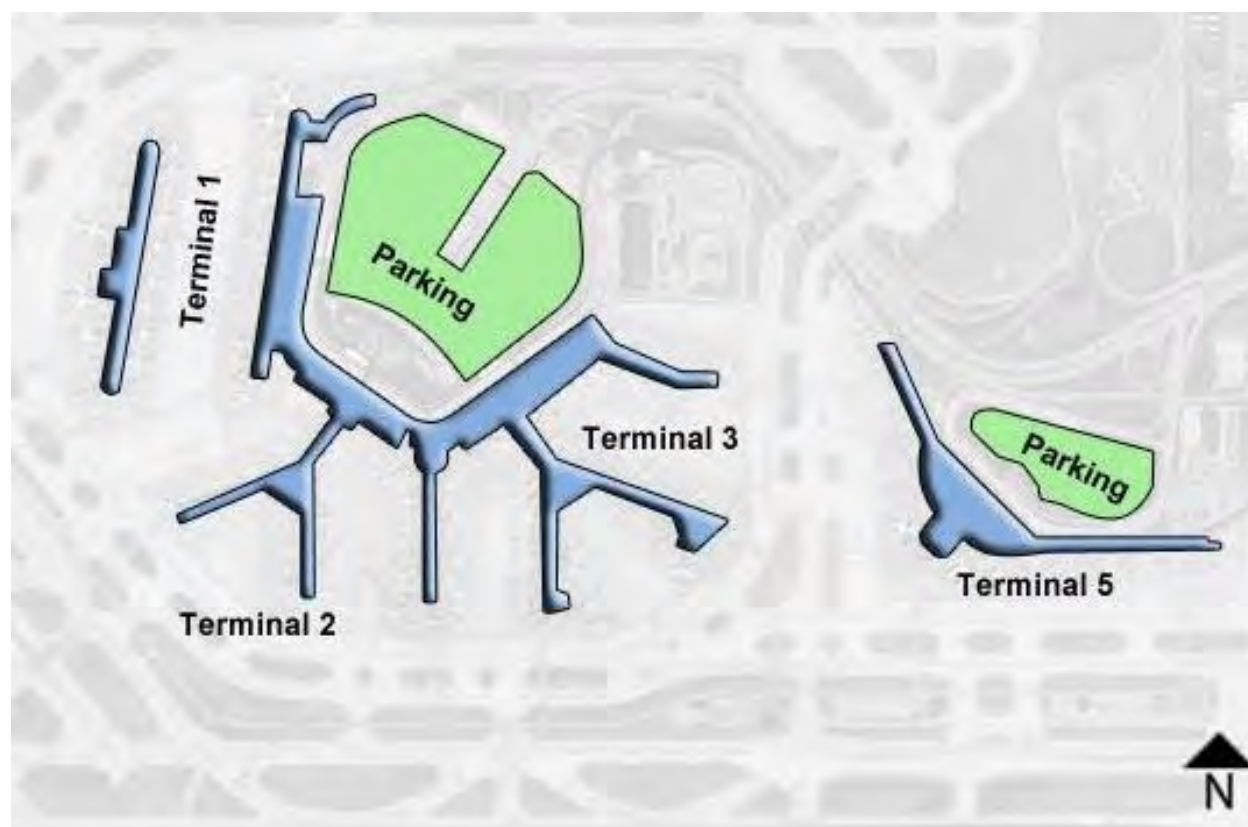


Figure 1. Map of terminals and parking areas at ORD.<sup>1</sup>

<sup>1</sup> "Chicago Ohare (ORD) Airport Terminal Map," *IFly.Com*, accessed June 5, 2019, <https://www.ifly.com/chicago-ohare-international-airport/terminal-map>.

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At the center of the property, Terminals 1, 2, and 3 form the Terminal Core Area, arranged in a U-shaped plan that opens to the northeast. The Heating & Refrigeration Plant and associated facilities are located at the northeast corner of the Terminal Core Area. The interior of the U is occupied by two large parking lots, bisected by a central roadway that provides access to the Elevated Parking Building. Terminal 1 forms the west side of the U-plan. The O'Hare Hilton Hotel is located between the Elevated Parking Building and Terminal 2 (the base of the U), and the subject City of Chicago Department of Aviation (CDA) Control Tower (formerly an FAA control tower) is centered on a grassy plaza that separates the hotel from Terminal 2 (see Figure 2).<sup>2</sup> The Rotunda links Terminals 2 and 3 at the southeast corner of the U, and the FAA Main Control Tower is located immediately adjacent. The outside of the U formed by Terminals 1, 2, and 3 is occupied by a total of 168 contact gates and 15 remote hardstands.<sup>3</sup> Terminals 2 and 3 have concourses that extend onto the aprons in a perpendicular or Y shape, while Terminal 1 has a concourse (Concourse B) with gates along the west side of the main terminal building and a separate, parallel concourse (Concourse C) accessed via an underground tunnel.



Figure 2. Detail of Terminal Core area showing location of the CDA Control Tower.

<sup>2</sup> The CDA Control Tower was also regularly referred to as the City Tower.

<sup>3</sup> Aircraft parked at remote hardstand positions are accessed via shuttle bus rather than jet bridge.

## Section 1 Description

Interstate Highway 190 (I-190) and the Chicago Transit Authority (CTA) O'Hare Rapid Transit Blue Line Rail Service enter the airport from the east. The Blue Line follows the central roadway to the parking area, where the O'Hare CTA Station is located below ground. The Airport Transit System (ATS) links the three domestic terminals, the international terminal, and the long-term parking area to the northeast by rail; the ATS is accessible via a transfer station from the Metra commuter rail service. Within the Terminal Core Area, the ATS tracks and a two-level vehicular circulation roadway separate the parking lot, garage, hotel, and CDA Control Tower from the terminals. The upper roadway level provides access to the ticketing area for departing passengers while the lower level provides access to the baggage claim and transportation for arriving passengers. ATS stations are located opposite each of the three terminals (as well as at Terminal 5) and are linked via covered pedestrian walkways across the roadway.

### B. CDA Control Tower overview

The CDA Control Tower is an air traffic control tower at O'Hare built by the FAA and currently used by CDA airfield operations staff for monitoring the airfield.<sup>4</sup> It is based on a standardized design developed by I.M. Pei for the FAA in the early 1960s as a result of the 1962 congressional mandate that directed the FAA to “design the most contemporary, state-of-the-art control tower which could be repeated across the country as a permanent symbol of air security.”<sup>5</sup> Modernist influences are seen in the stark geometric lines, raw bush-hammered concrete exterior, and minimalism that prioritizes its function over form. The CDA Control Tower is comprised of the tower, base building, atrium enclosure, and the surrounding plaza (see Figure 3).<sup>6</sup>

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<sup>4</sup> The CDA Control Tower is CDA building number 400.

<sup>5</sup> Philip Jodido and Janet Adams Strong, *I.M. Pei: Complete Works* (New York: Rizzoli, 2008), 93–95.

<sup>6</sup> The site plan in the 1966 I.M. Pei & Associates plan set for the CDA Control Tower includes the concrete sidewalks, lawn, and typical details for landscaping elements surrounding the tower. I.M. Pei & Associates, Architects and Planners, Severad Elstad Kraeger Associates, Structural Engineers, and Cosentini Associates, Mechanical Engineers, “Federal Aviation Agency, Air Traffic Control Tower, O'Hare Field, Chicago,” 1966, A-2, available in the Chicago Department of Aviation files, Chicago.



## Section 1 Description



*Figure 3. View of the CDA Control Tower from the west with the O'Hare Hilton Hotel in the background.*

Construction of the tower began in 1966 and was completed in 1970. It was built for use by FAA air traffic controllers and replaced a 1955 control tower, which no longer provided unobstructed views of the entire airfield. The design reflects the FAA's overarching goals at the time, which included separating the towers from airport terminals, improving the visibility of controllers in the uppermost portion or "cab," moving support staff out of tight quarters in the shafts, and locating equipment and radar rooms in underground base buildings.<sup>7</sup> The tower is now occupied by the CDA Airport Operations Division.

The tower is located between the O'Hare Hilton Hotel and Terminal 2 and includes the original tower structure and subgrade base building that extends between the hotel and the terminal roadway, as well as the adjacent atrium enclosure over the entrance to the base building. The atrium enclosure was designed by O'Hare Associates, a joint venture led by Murphy/Jahn, and constructed in 1993 (see Figure 4). The Terminal 2 ATS station and elevated track were also constructed in 1993, which altered the setting of the CDA Control Tower. The atrium enclosure serves as the primary entrance to CDA offices in

<sup>7</sup> Daniel Glover, "I.M. Pei's Imprint on the FAA," *MyFAA*, July 15, 2019, 6, [https://my.faa.gov/focus/articles/2019/07/I\\_M\\_Pei\\_s\\_Imprint\\_o.html?origin=focustoday](https://my.faa.gov/focus/articles/2019/07/I_M_Pei_s_Imprint_o.html?origin=focustoday).

## Section 1 Description

the base building below, which previously housed FAA offices, Terminal Radar Approach Control (TRACON) staff in the radar control room, and equipment for radar and instrument flight control.<sup>8</sup>



*Figure 4. View of the arched, glass-walled atrium enclosure from the north.*

In plan view, the irregular, rectilinear layout of the below-grade base building has a significantly larger footprint compared to the aboveground tower structure itself (see Figure 5). The base building is comprised of two main areas: an atrium space, which was formerly known as the court/reception area and is surrounded by private offices, and several large open workspaces that originally served as the TRACON and radar rooms. Interior access to the upper floors of the tower and tower cab is via the original tower elevator and a square, concrete staircase, which is accessed from the base building. A long, central corridor runs perpendicular to the terminal roadway separating the court/reception and office areas from the TRACON and radar rooms. At the northwest end of the central corridor is a door and passageway that lead to a utility tunnel between the hotel and Terminal 2; however, the passageway and utility tunnel is not part of the subject control tower. On the southwest end of the court/reception area is a door to a corridor that connects to Terminal 2 and has office spaces along one side, which are also not associated with the tower.

<sup>8</sup> TRACON controllers are responsible for overseeing air traffic within a 40-mile radius of O'Hare. Controllers in the tower cab are responsible for overseeing air traffic within a 5-mile radius of O'Hare.

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### Description

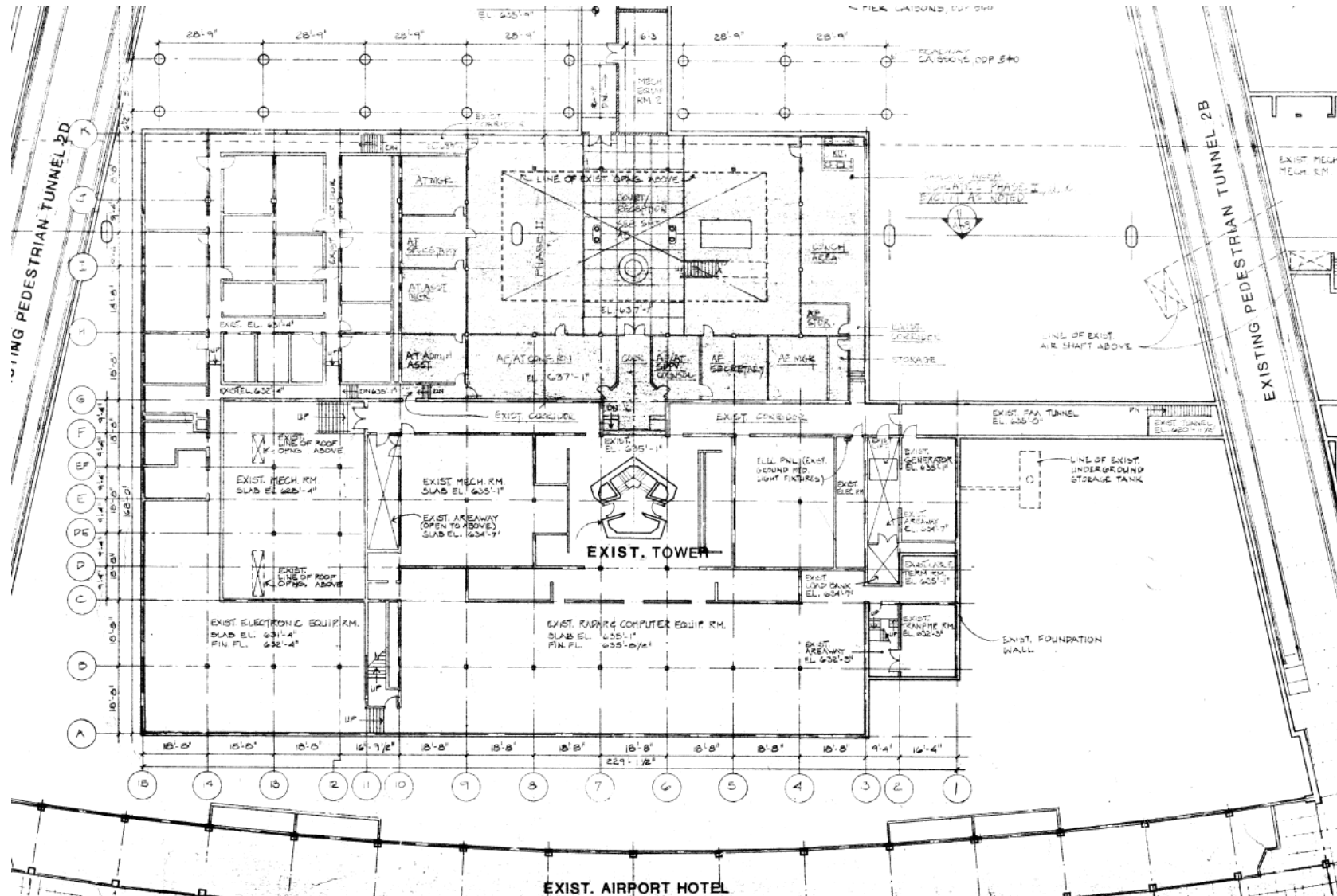


Figure 5. 1987 as-built floorplan showing the base building and tower.<sup>9</sup>

<sup>9</sup> Chicago-O'Hare International Airport Development Program et al., "As-Built Plans for FAA Base Building Modifications, Chicago O'Hare International Airport," 1989, A-2, Available in the Chicago Department of Aviation files, Chicago.

## Section 1 Description

### C. Exterior description

The CDA Control Tower is a modernist, five-sided, reinforced-concrete structure with brutalist influences that rises approximately 180 feet high.<sup>10</sup> It is capped with a prefabricated pentagonal glass and metal cab, designed to eliminate confusing reflections in parallel windows. The tower base is slightly flared for lateral stability and narrows as it extends upward before it gently flares out again beneath the tower cab (see Figure 6). The reinforced-concrete shaft features a horizontally grooved, bush-hammered finish (see Figure 7), a feature common to many of the buildings designed by I.M. Pei & Associates in the 1960s.<sup>11</sup>

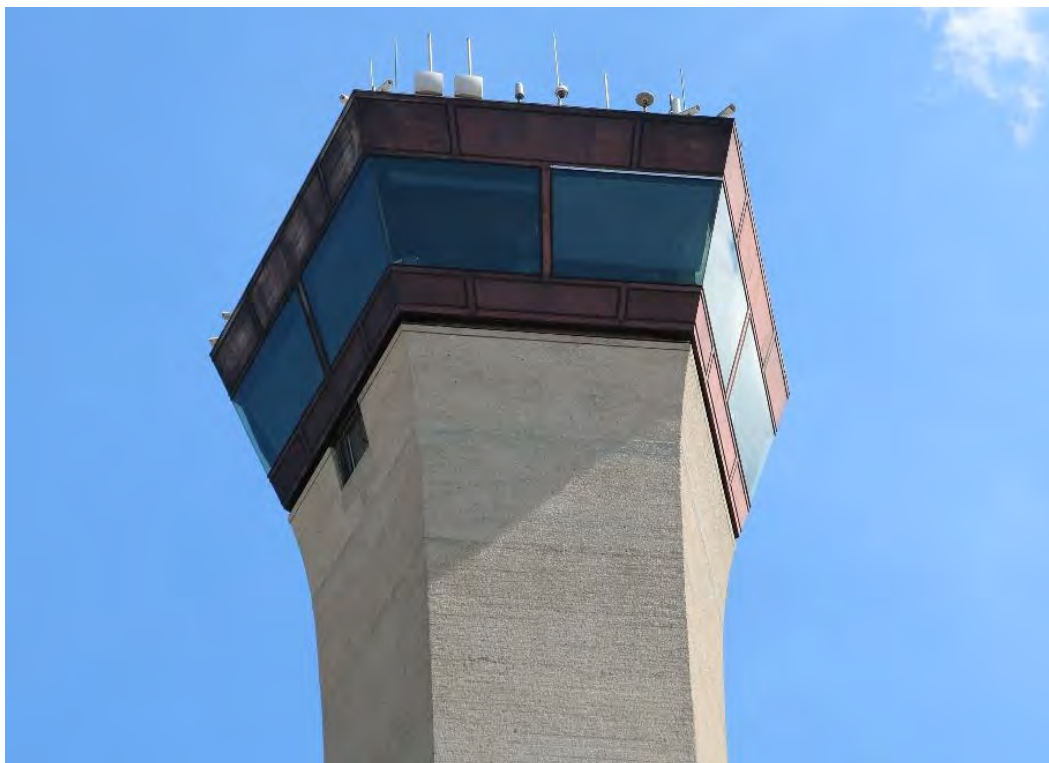


Figure 6. View of gentle flare at the top of the tower shaft and of the tower cab.

<sup>10</sup> The 1966 design drawings indicate that the shaft rises approximately 168 feet from grade level to the floor of the cab; including the sub-grade levels, the shaft is approximately 188 feet tall, and the standard cab design published in a trade journal shows a cab height of approximately 12 feet, not including any roof-mounted equipment. I.M. Pei & Associates, Architects and Planners, Severad Elstad Kraeger Associates, Structural Engineers, and Cosentini Associates, Mechanical Engineers, "Federal Aviation Agency, Air Traffic Control Tower, O'Hare Field, Chicago"; "New Tower to Grace Airports," *Architectural Forum: The Magazine of Building*, November 1963, 114.

<sup>11</sup> The bush hammering technique was "pioneered" by Pei during the construction of the National Center for Atmospheric Research (NCAR) and "was used extensively by Pei in subsequent concrete constructions." "Construction of the Mesa Laboratory | NCAR Archives," accessed August 29, 2019, <https://www.archives.ucar.edu/exhibits/mesalab/construction>.



## Section 1 Description



*Figure 7. Detail of horizontally grooved, bush-hammered finish on tower shaft.*

The tower cab has fixed-pane, aluminum-framed, three-quarter-height, tinted windows on all five sides that follow the angle of the outward flare at the top of the concrete shaft. The glass of the cab cantilevers outward to minimize glare inside the cab, and visibility is optimized with transparent epoxy joints.<sup>12</sup> The pentagonal configuration allows for unobstructed views of the airfield from the tower cab.

The exterior of the tower base is centered within a rectangular plaza that is comprised of concrete sidewalks, landscaping, and other pedestrian features (see Figure 8). The base is surrounded by a circular concrete sidewalk with a narrow, crushed-red-granite border and a square, landscaped lawn, bounded by a concrete perimeter sidewalk. Three large, terracotta planters with low vegetation are located around the circular sidewalk at the base. Modern, exterior, uplight fixtures are located along the perimeter of the circular sidewalk to illuminate the tower at night. At the edge of the circular sidewalk on the north side of the tower, a bronze dedication plaque commemorates the 2018 dedication of the building as the Roman C. Pucinski Tower (see Figure 9).<sup>13</sup>

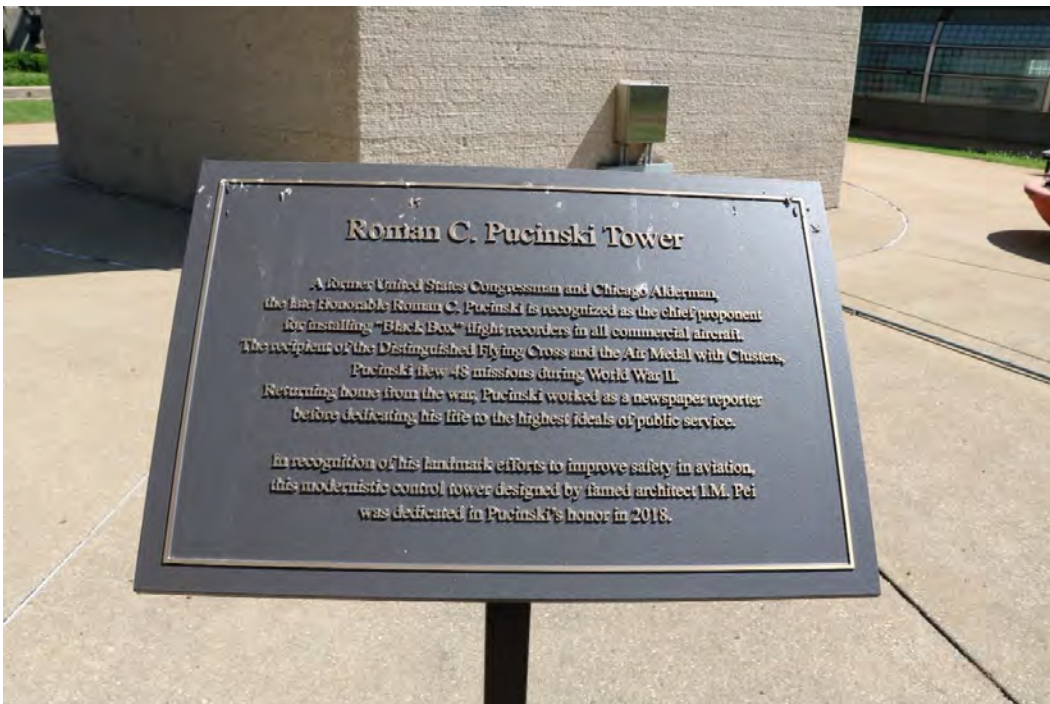
<sup>12</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 94.

<sup>13</sup> The late Roman C. Pucinski was a United States congressman, Chicago alderman, and World War II pilot recognized for his contributions to improving aviation safety, particularly for his influence in the installation of “Black Box” flight records in all commercial aircraft.

## Section 1 Description



*Figure 8. Pedestrian circulation and vegetation surrounding the tower base.*



*Figure 9. Bronze dedication plaque on the north side of the tower.*

Two low, linear, concrete features sit on the northwest and southeast edges of the plaza with adjacent precast, semi-circular concrete exhaust shafts and metal grille panels, as well as low shrubs (see Figure 10). Next to the exhaust shaft on the southeast side is a concrete stairwell with an iron railing that leads into the base building (see Figure 11). Low, polished granite benches stand along the perimeter sidewalk.



## Section 1 Description

The plaza is bound by wide, grassy lawns on the northwest and southeast, the O'Hare Hilton Hotel on the northeast, and the terminal roadway and elevated tracks of the ATS on the southwest. A small employee parking lot is located west of the plaza. A stairwell north of the exhaust shaft on the east side of the tower provides a second point of access to the base building. It is surrounded by an iron railing.



*Figure 10. Concrete bench, metal grille panels, and exhaust shafts on the northwest side of the tower lawn.*



*Figure 11. View from north of at-grade stairwell access to base building.*

The CDA Control Tower originally had an open court that was enclosed in 1993 with the construction of the atrium enclosure. The tower and tower base building were originally accessed by two staircases that

## Section 1 Description

descended into an open court area at the base building level, with globe lighting on the sides. The tower also originally had a “radome” (a transparent globe that enclosed the radar antenna) on the roof (see Figure 12).



*Figure 12. View of the tower from the southwest showing the radome on the roof, globe lighting on the sides, and open court in the foreground. Photograph courtesy of the Federal Aviation Administration.*

The atrium enclosure was added in tandem with the construction of the adjacent Terminal 2 ATS station and shares many of the design elements found in Helmut Jahn’s design for Terminal 1, including the exterior glazing system, fritted glass, and steel framing system with decorative circular cutouts through the webs. The atrium enclosure sits on top of the concrete parapet wall, which had been the grade level wall that surrounded the open court. The atrium enclosure is a barrel-vaulted glass and exposed aluminum curtain wall/arched roof system with glazed aluminum doors on the northwest facade and serves as the primary ground level entrance to CDA offices (see Figure 13). The exposed aluminum is painted white and the arched system, and the roof is infilled by glass with a square pattern in ceramic frit (see Figure 14 and Figure 15). The southeast and northwest elevations have clear glass infill.



**Section 1**  
**Description**

*Figure 13. View of ground level entrance to atrium enclosure.*



*Figure 14. Atrium enclosure as seen from the Terminal 2 island.*

**Section 1**  
**Description**

*Figure 15. Southeast facade of atrium enclosure showing steel trusses with punched holes through the webs.*

Minor alterations to the above-ground portions of the tower include the removal of the radome from the roof, which presumably occurred around the time the FAA vacated the tower in 1996 (see Figure 16).<sup>14</sup> At the cab level, an exterior, “two-man” window washing bucket designed to roll around the five-sided tower on an articulated joint between the cab and shaft was also removed.<sup>15</sup> On the ground level, single globe streetlights along the sides of the surrounding lawn were also removed.

<sup>14</sup> Ricondo & Associates, Inc., “O’Hare International Airport, Airport Layout Plan,” September 2005, 2, [https://www.faa.gov/airports/airport\\_development/omp/planning/alp/sept2005\\_alp/media/02-ORD-Existing.pdf](https://www.faa.gov/airports/airport_development/omp/planning/alp/sept2005_alp/media/02-ORD-Existing.pdf).

<sup>15</sup> I.M. Pei & Associates, Architects and Planners, Severad Elstad Kraeger Associates, Structural Engineers, and Cosentini Associates, Mechanical Engineers, “Federal Aviation Agency, Air Traffic Control Tower, O’Hare Field, Chicago,” A.17; “New Tower to Grace Airports,” 114.

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*Figure 16. Image of tower cab showing radome and a portion of the window washing bucket to the right.  
Historic photograph credit: ICHI-176501, Chicago History Museum, John McCarthy, photographer, ©  
2019 Chicago Historical Society, all rights reserved.*

**D. Interior description****(1) Enclosed atrium**

The enclosed atrium rests on top of what was formerly a below grade, open courtyard area known as the “court” that had two staircases (see Figure 17).



## Section 1 Description

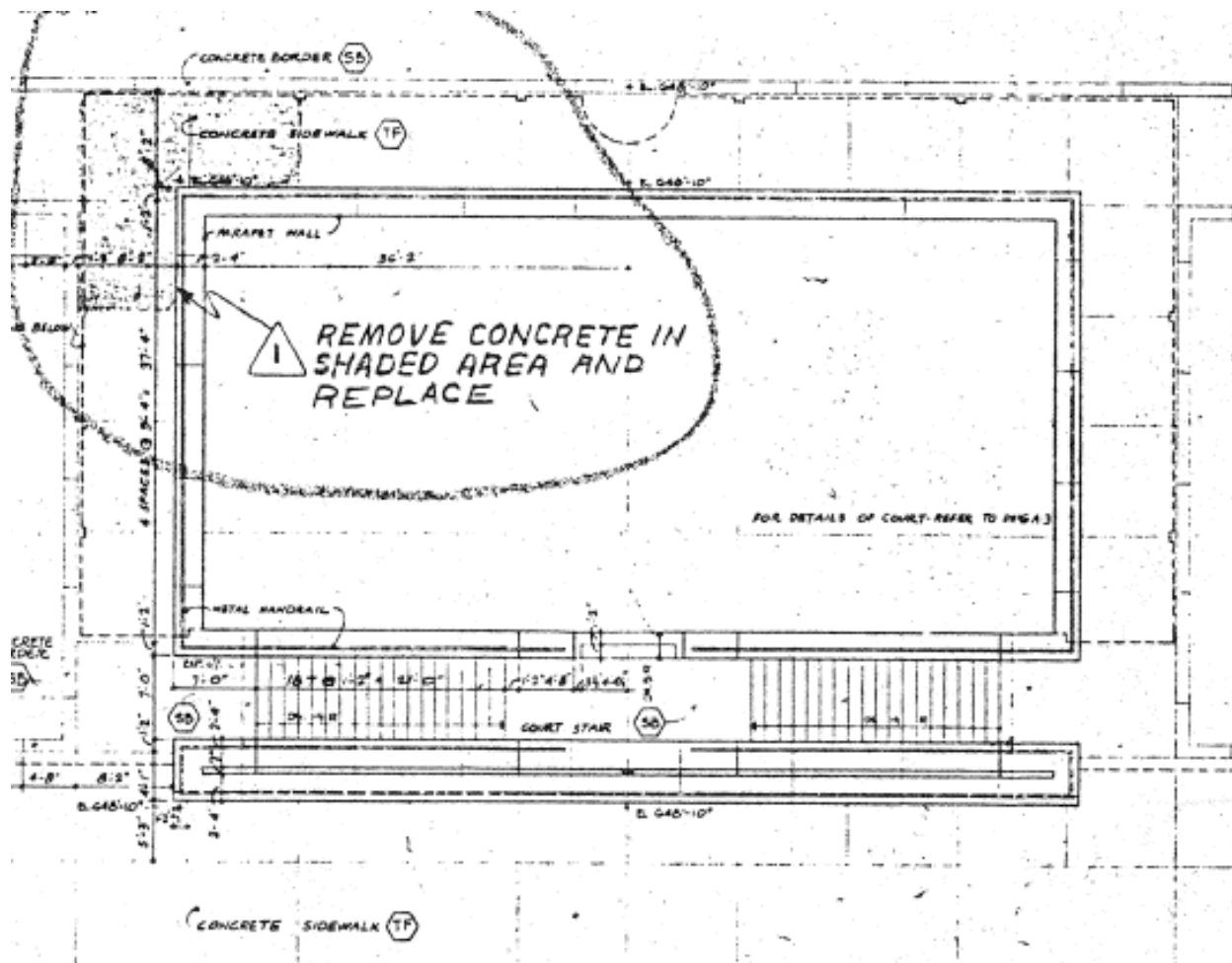
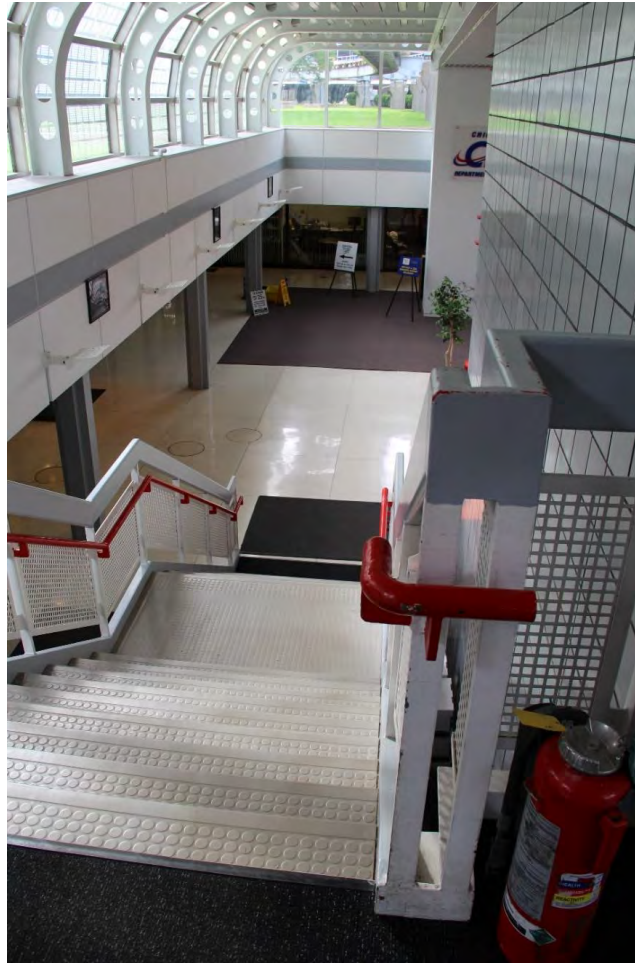


Figure 17. 1966 drawing showing staircases leading into the court area.<sup>16</sup>

Currently, the ground level entrance located on the northwest facade of the atrium enclosure opens to a wide staircase that leads to the open reception area below (see Figure 18). The stair rail has gridwork metal panels that are painted white and rubber tile-covered treads with a raised circular pattern. The 1993 enclosure of the open court included the addition of an elevator shaft adjacent to the staircase that is clad in light gray, glazed brick. New terrazzo floors were added along with carpeting in some areas.

<sup>16</sup> I.M. Pei & Associates, Architects and Planners, Severad Elstad Kraeger Associates, Structural Engineers, and Cosentini Associates, Mechanical Engineers, "Federal Aviation Agency, Air Traffic Control Tower, O'Hare Field, Chicago," A-2.

## Section 1 Description



*Figure 18. Staircase leading from atrium enclosure entrance to reception area.*

A circular reception desk was originally located at the bottom of the staircase in front of the two painted steel bridge columns, which have exposed steel plates, nuts, and bolts at the base (see Figure 19) and were added during the 1993 renovations enclosing the court. The ceiling system in the reception area consists of acoustical metal deck ceiling panels above the exposed steel beams as well as a central, suspended, aluminum panel ceiling system.

## Section 1 Description



*Figure 19. Detail of steel bridge columns and ceiling materials.*

### **(2) Base building**

The base building of the CDA Control Tower originally housed FAA offices, a TRACON room with radar computer equipment, radio and communications rooms, storage, men's and women's bathrooms, a break/meal area, a kitchen, and rooms for mechanical and electrical equipment (see Figure 20). The interior walls and configuration of space appears to be largely intact.

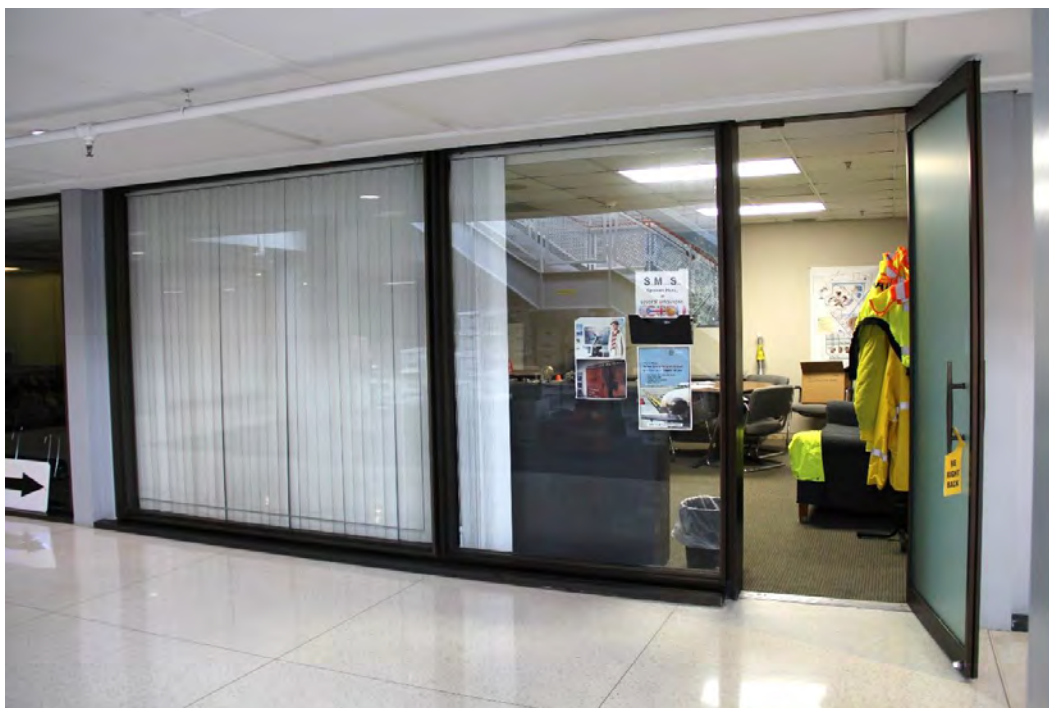
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<sup>17</sup> Chicago-O'Hare International Airport Development Program et al., "As-Built Plans for FAA Base Building Modifications, Chicago O'Hare International Airport," A-1.

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The primary entrance to the base building was originally through the open court. A series of offices with glass curtain walls and frosted storefront doors line the northwest, northeast, and southeast sides of the court (see Figure 21) and appear to have the same configuration shown on the 1966 plans. The offices have dropped, acoustical ceiling panels and carpeting with painted gypsum board walls.



*Figure 21. Typical office area surrounding the court area open to the enclosed atrium above.*

The former TRACON and radar rooms recently underwent asbestos abatement, which involved tearing down the walls to the studs and removing the dropped ceiling.

### (3) Tower shaft

The 188-foot tower shaft begins below the base building level in a mechanical room and extends up 13 floors before reaching the tower cab at the 14<sup>th</sup> floor. The tower shaft footprint is comprised of the stairwell, elevator shaft, duct shafts, and cable shafts (see Figure 22). There is intermediate access between the base building and tower cab via the elevator (see Figure 23) in addition to a square, precast concrete staircase that has painted treads and risers, and rubber tile-covered landings. The stair rail is painted, iron pipe.



## Section 1 Description

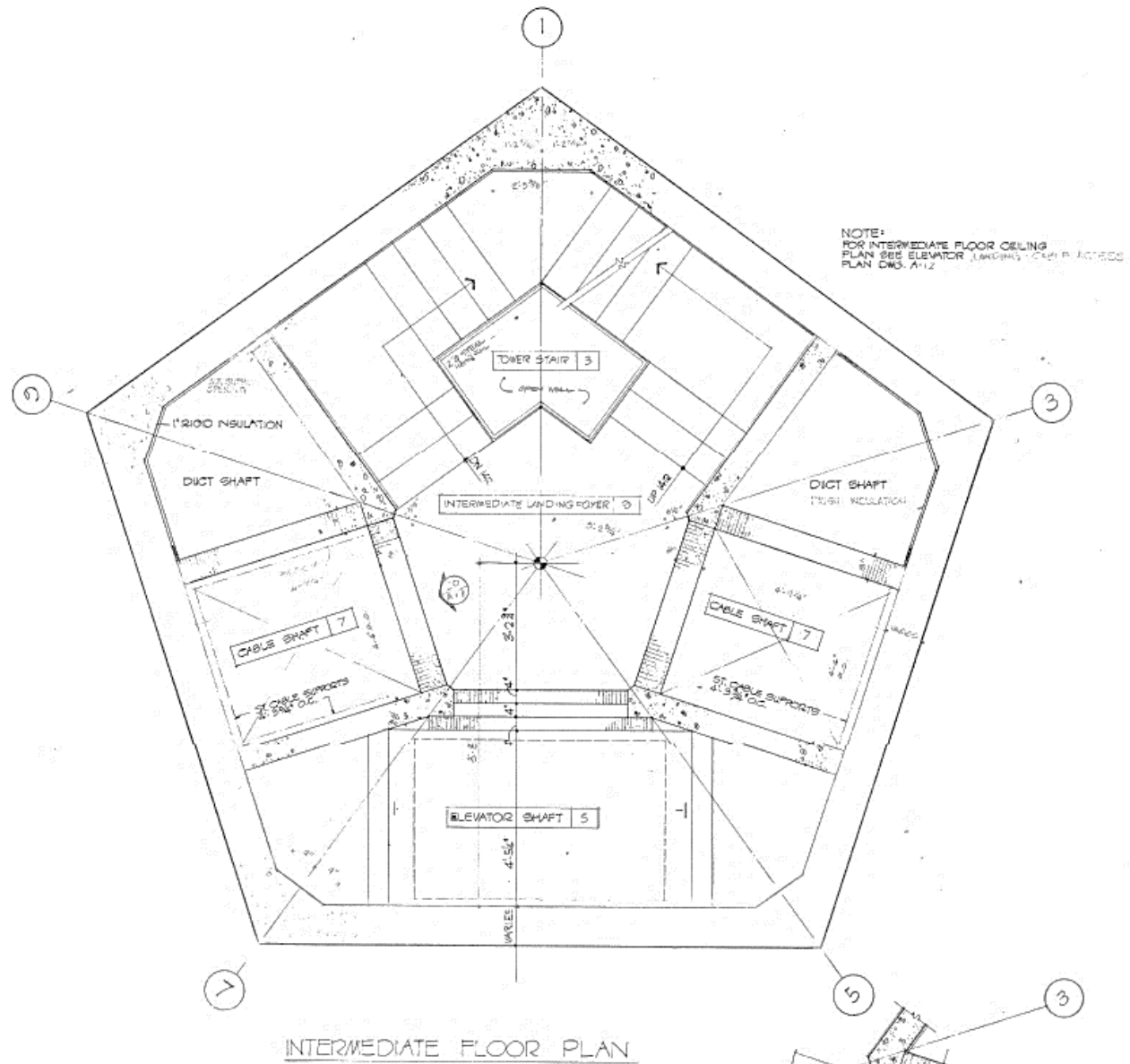


Figure 22. CDA Control Tower floorplan of intermediate shaft floors.<sup>18</sup>

<sup>18</sup> I.M. Pei & Associates, Architects and Planners, Severad Elstad Kraeger Associates, Structural Engineers, and Cosentini Associates, Mechanical Engineers, "Federal Aviation Agency, Air Traffic Control Tower, O'Hare Field, Chicago," P-4.

**Section 1**  
**Description**

*Figure 23. Elevator at base building level.*



*Figure 24. Detail of shaft square spiral staircase and painted iron stair rail.*

The square spiral staircase and elevator access terminate at the sub junction level, or 12<sup>th</sup> floor, where a narrow spiral staircase provides access to the junction level (13<sup>th</sup> floor) and the tower cab (14<sup>th</sup> floor, see Figure 25). The treads on the spiral staircase are rubber tile with a raised circular pattern and the risers are painted to match.

**Section 1**  
**Description**

*Figure 25. Spiral staircase leading to the tower cab.*

Within the tower shaft, the walls on the upper levels are primarily painted or unfinished concrete. There are recesses for fire extinguishers at intermediate floors as well as recessed cutouts in the ceiling at each stair landing with bare bulb light fixtures. A small bathroom is located at the sub junction level, or 12<sup>th</sup> floor, and has ceramic tile on the floor and walls.

**(4) Tower cab**

The tower cab is accessed by a spiral staircase that leads from the sub junction level up to the junction level and cab. Outside the entrance door to the cab is a brass plate push button keypad (see Figure 26) that appears to be an original access control mechanism. The keypad is no longer in use and has been superseded by a modern access control keypad located outside of the entrance door to the tower at the base building level.

**Section 1**  
**Description**

*Figure 26. Push button keypad-controlled entry feature to tower cab.*

The cab has a carpeted floor and suspended acoustical panel ceiling. A central hatch and pulldown ladder provide access to the roof (see Figure 27). A semicircular laminate work surface is at the center of the cab and built-in workstations are arranged around the perimeter of the five-sided cab (see Figure 28). The windows have pull-down solar shades. Pei's design included banks of equipment consolidated in standardized consoles that would be familiar to controllers regardless of which airport they were assigned.<sup>19</sup> Much of the original equipment has since been changed for CDA use with modern computer stations; however, the work surfaces and cabinets below appear to be original (see Figure 29).

<sup>19</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 94.



**Section 1**  
**Description**

*Figure 27. Opened hatch to roof showing extension ladder access.*



*Figure 28. Cab interior view showing central semicircular work surface and perimeter workstations.*

**Section 1**  
**Description**

*Figure 29. Modern air traffic control equipment in the tower cab.*

Push button controls permit access from the base of the tower and appear to be original (see Figure 30). The interior of the cab does not appear to have any major alterations.



*Figure 30. Push button controls for door access to tower.*

**Section 1**  
**Description****E. Summary of alterations**

A summary of alterations to the CDA Control Tower is presented below, separated by exterior and interior and listed in chronological order.

- Exterior:
  - 1993: Open court entrance to base building enclosed with the atrium.
  - Mid-1990s: Removal of the radome, which presumably occurred around the time the FAA vacated the tower.
  - Unknown: Modifications to plaza and relocated/expanded vehicle parking lot on the northwest side of the plaza.
- Interior:
  - 1993: Base building court modifications.
  - 2018-19: Asbestos abatement in former TRACON and radar rooms.

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## 2. Statement of Significance

### A. History of O'Hare International Airport

The first municipal airport to serve Chicago was Chicago Municipal Airport, later renamed Midway Airport, which opened in 1927 on the southwest edge of the city. Due in part to Chicago's central location within the country, passenger traffic at Chicago Municipal increased over 600 percent between 1931 and 1943. By the early 1940s the airport was operating well beyond its capacity. While Chicago's location within the country was a boon to business, the airport's location within the city was not advantageous. Surrounded by growing neighborhoods, Chicago Municipal had no room to grow. The need for more space to accommodate the ever-growing number of passengers and larger aircraft prompted the City of Chicago (City) to search out a location for a new airport.<sup>20</sup>

The development of O'Hare International Airport (O'Hare or "the airport") began in 1942 when the federal government purchased 1,000 acres near the hamlet of Orchard Place on the northwest outskirts of Chicago, which it leased to Douglas Aircraft (Douglas) to build and operate a factory constructing troop transports during World War II. The Orchard Place location was chosen for its proximity to established rail lines and a suburban work force. The Douglas factory closed its doors at the end of the war, but the expanded facilities and potential for future growth made Orchard/Douglas Field an ideal site for the City to build a new and larger airport (see Figure 31). The federal government donated the airport property to the City, and the first commercial flights at Orchard/Douglas Field began in 1946. The airport was renamed Chicago O'Hare International Airport in 1949 in honor of the Chicago-born pilot Edward H. "Butch" O'Hare, who had been shot down in the Pacific during World War II. The village of Orchard Place was eventually absorbed by the expanding airport, but its legacy lives on in the airport identifier for O'Hare, ORD.<sup>21</sup>

Plans were quickly drafted to develop O'Hare into a major international airport that could support the increasing demand at Midway and in the region. City planner Ralph H. Burke drafted O'Hare's first master plan in 1948, envisioning a design with multiple "split-finger" terminals extending from a central "grand concourse," with a single roadway leading to parking areas fronting the central concourse (see Figure 32). Burke's plan took a few years to materialize and his complete design was never fully constructed. By the time of his death in 1956 only one terminal (the original Terminal 1) had been completed.<sup>22</sup>

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<sup>20</sup> David Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 80–83.

<sup>21</sup> Richard P. Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)* (Muncie, Ind.: Ball State University, 1970), 9–11, 27; Anne Royston, "Chicago-O'Hare International Airport," in *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 262.

<sup>22</sup> Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 85–86; Royston, "Chicago-O'Hare International Airport," 262; "The Fascinating History of Chicago's O'Hare International Airport 1920-1960," *Airways*, April 7, 2014, <https://airwaysmag.com/2014/04/07/chicago-ohare-history/>.



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Figure 31. Overview of the locations and relative size of Midway Airport (Chicago Municipal Airport) and the proposed O'Hare (Orchard Place/Douglas Field) facilities in relation to the city of Chicago, 1948.<sup>23</sup>

<sup>23</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for the City of Chicago, January 1948), 21, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.



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*Figure 32. 1948 drawing of Ralph Burke's proposed design for O'Hare featuring a central roadway approaching the grand concourse with split-finger terminals extending into the airfield. Note that Burke's terminology contrasts with modern airport terminology, in which the central structures are referred to as terminals leading to the concourses where aircraft arrive.<sup>24</sup>*

Following the construction of the first terminal, new jet liners introduced in the late 1950s revealed the shortcomings of Burke's initial plan. New aircraft such as the Boeing 707 and Douglas DC-8 not only carried twice as many passengers as earlier commercial aircraft but required longer runways and more space at the terminal gates to accommodate wider wingspans. In 1955 Mayor Richard Daley commissioned the architectural firm Naess & Murphy, renamed C.F. Murphy Associates (C.F. Murphy) in 1960, to review Burke's original plan and build upon it with larger terminals and greater automobile access. C.F. Murphy partnered with the Cincinnati-based firm Landrum & Brown to complete the new airport design. Terminals 2 and 3 (completed in 1961 and officially opened in 1962) were laid out as larger versions of Burke's "split-finger" design. The Rotunda building (1963) was placed between the two new terminals as an open space for travelers to congregate, dine, and view the aircraft moving across the airfield. More so than Burke's smaller Terminal 1, the glass and steel designs of C.F. Murphy's O'Hare Terminal 2 and 3 buildings clearly reflected the Miesian philosophy of modern architecture, characterized by streamlined rectilinear designs and honest use of building materials (see Figure 33). The original Terminal 1 building became the airport's international terminal.

<sup>24</sup> Burke, *Master Plan of Chicago Orchard (Douglas) Airport*, 22.

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Figure 33. View of Terminal 2 at night showcasing C.F. Murphy's minimal modernist design, 1962.<sup>25</sup>

Burke had also underestimated the role of the automobile in air travel. By 1960 a new highway was completed between the Chicago Loop and O'Hare with space in the median for a future commuter train line. C.F. Murphy's design incorporated a bi-level roadway fronting the three terminals, allowing passengers to enter and exit the airport on separate levels.

Further improvements to O'Hare were constructed in the early 1970s (see Figure 34). In 1970 the subject Chicago Department of Aviation (CDA) Control Tower was completed in front of the terminals.<sup>26</sup> A new hotel and parking garage, both designed by C.F. Murphy, were finished in 1972 and 1973, respectively. At the time of construction, the parking garage at O'Hare was the largest in the world.<sup>27</sup> The hotel opened as the O'Hare International Tower Hotel and has been known as the O'Hare Hilton Hotel since November 1974.<sup>28</sup>

<sup>25</sup> Kori Rumore, "From Farmland to 'Global Terminal': A Visual History of O'Hare International Airport," *Chicago Tribune*, March 27, 2019, <https://www.chicagotribune.com/news/ct-ohare-international-airport-development-history-timeline-htmlstory.html>.

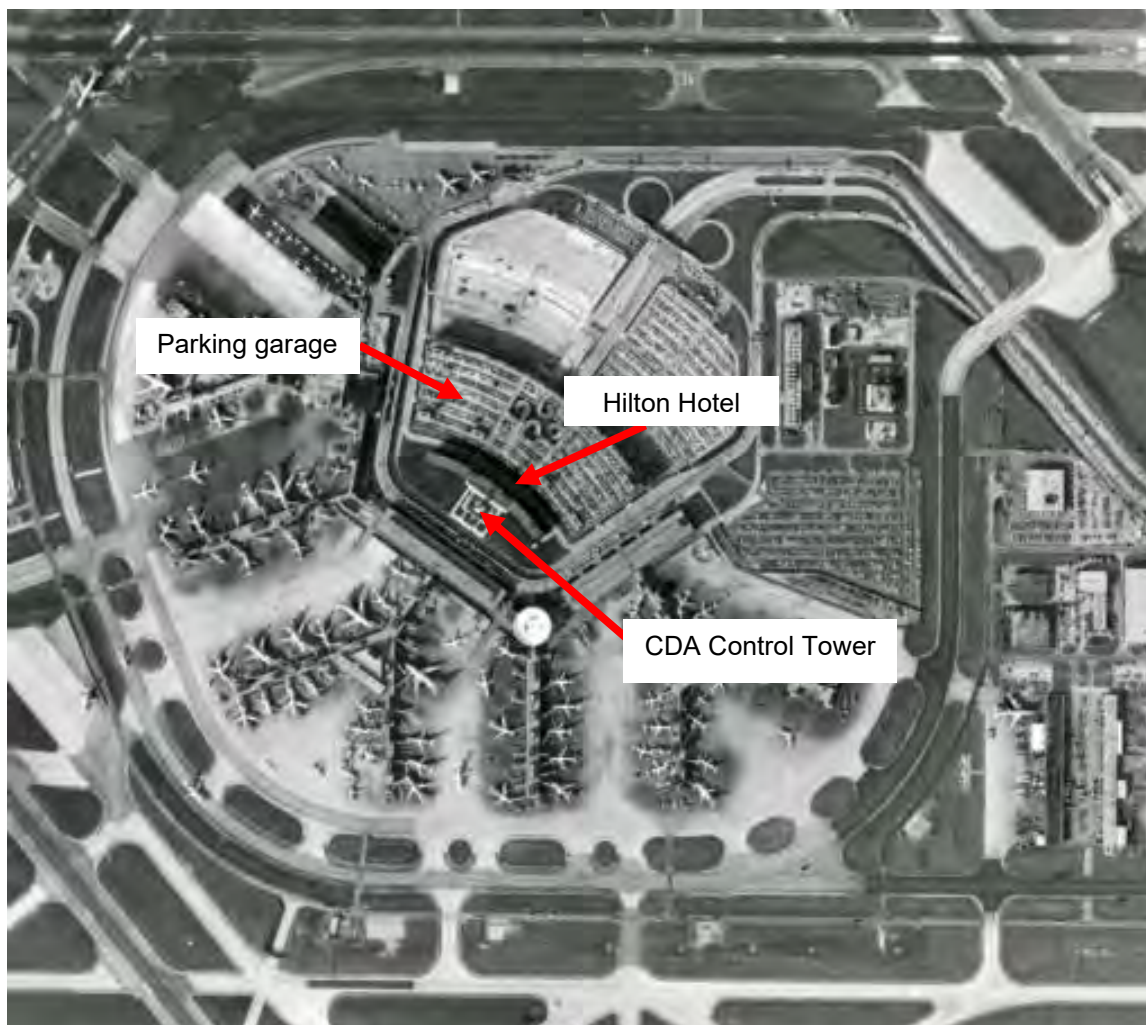
<sup>26</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 93–95.

<sup>27</sup> Construction of the hotel was finished in 1972 with the exception of some interior finishes, and the hotel opened in February 1973. American Institute of Architects et al., *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 265–67; David Brodherson, "'An Airport in Every City': The History of American Airport Design," in *Building for Air Travel: Architecture and Design for Commercial Aviation* (Munich and New York: Prestel and The Art Institute of Chicago, 1996), 84.

<sup>28</sup> "O'Hare Hotel Opens," *Chicago Tribune*, February 10, 1973, sec. 1; "Hilton to Manage 2 Tower Hotels," *Chicago Tribune*, November 26, 1974.

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*Figure 34. Aerial view of completed O'Hare facilities in 1976, including the parking garage, Hilton Hotel, and the CDA Control Tower with a circular roadway between these facilities and the terminals.<sup>29</sup>*

In 1962, following the completion of Terminals 2 and 3, operations at Midway Airport were transferred to O'Hare, which soon became, and has remained, one of the busiest airports in the United States.<sup>30</sup> Every major American city could be reached from Chicago on relatively short flights, which established O'Hare as a primary location for connecting flights across the country. The fact that O'Hare had been specifically designed to accommodate jet liners added to its role as a major airport. O'Hare's importance as a connecting airport increased following the Airline Deregulation Act of 1978. Among other facets, the legislation allowed airlines to establish hubs at specific airports by trading and sharing routes. While Trans World Airlines (TWA) and other airlines had established small hubs previously, the phenomenon took off in the early 1980s. Delta Airlines built a large hub in Atlanta, American Airlines focused its hub at

<sup>29</sup> "O'Hare International Airport," November 1976, Archival Image Collection M525433, The Art Institute of Chicago: Ryerson & Burnham Archives.

<sup>30</sup> The transfer of operations from Midway was temporary as flights returned to Midway in 1964. "Chicago Department of Aviation | O'Hare and Midway International Airports," *Midway History*, accessed July 31, 2019, <https://www.flychicago.com/business/CDA/Pages/Midway.aspx>.

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Dallas-Fort Worth, and United Airlines established its major hubs at O'Hare and Denver's Stapleton Airport.<sup>31</sup>

The planning process for United's new terminal to support Chicago as one of its hubs began in 1980.<sup>32</sup> In 1982 the CDA launched the O'Hare Development Program (ODP) to expand O'Hare's capacity by 1995. The centerpiece of the plan was United's new Terminal 1 building, which would replace the 1955 international terminal. In addition, the ODP included expanding Terminals 2 and 3, building a new international terminal (Terminal 5), a train station for the Chicago Transit Authority (CTA) below the parking garage and hotel, and a "people mover" to transport travelers to more distant parking areas (see Figure 35). During construction efforts a temporary international terminal was established in the first floor of the parking garage. The first phases of the expansion plan were completed in the 1980s with the addition of Concourse L and expansion of Terminal 3 (1984) and the CTA Station (1984). Concourse L, occupied by Delta Airlines, was the first concourse at O'Hare designed specifically as a hub. Delta later shifted its Midwest hub to Cincinnati. Terminal 1 was completed in 1988 and the new international terminal (Terminal 5) opened in 1993, marking the end of the ODP phase of improvements.<sup>33</sup>

Further improvements to O'Hare included the construction of three FAA control towers: the Main Control Tower built in 1996 replaced the CDA Control Tower; the North Control Tower was added in 2008, and the South Control Tower in 2015. Since the FAA vacated the CDA Control Tower, the CDA has used it to direct ground traffic at O'Hare. In 2005 the main facades of Terminals 2 and 3 were extended and a consistent roadside canopy was constructed across all three terminals, replacing the original canopy outside Terminal 1. The most recent addition to O'Hare was the construction of the "stinger" gates in 2018 as an addition to Concourse L, which added five gates.<sup>34</sup>

<sup>31</sup> Leonard R. Bachman, *Integrated Buildings: The Systems Basis of Architecture* (Hoboken, N.J.: John Wiley & Sons, 2003), 220; "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; "Chicago O'Hare Airport Becomes America's Busiest Airport Again," *International Airport Review*, February 6, 2019, <https://www.internationalairportreview.com/news/80867/ohare-americas-busiest-airport/>.

<sup>32</sup> Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 92.

<sup>33</sup> "The Fascinating History of Chicago's O'Hare International Airport 1920-1960"; Robert Davis, "United Plans \$100 Million New Terminal at O'Hare," *Chicago Tribune*, September 20, 1980; David Young, "United Plans New O'Hare Terminal," *Chicago Tribune*, December 10, 1982; John Camper, "O'Hare Project Picks up: Expansion Enters Peak Year of Construction," *Chicago Tribune*, March 1, 1987; O'Hare Associates, "Progress Report, Chicago-O'Hare International Airport Development Program, June 1984," 1; Gary Washburn, "World at City's Doorstep as New O'Hare International Terminal Takes Wing," *Chicago Tribune*, May 28, 1993.

<sup>34</sup> Janan Hanna, "Busiest Airport Lands in the Future," *Chicago Tribune*, October 1, 1996, sec. 2; John Hilkevitch, "\$65 Million Tower to Give New Bird's Eye View for Controller," *Chicago Tribune*, October 8, 2008, sec. 1; "American Airlines Celebrates Opening of Five New Gates at Chicago O'Hare," *American Airlines Newsroom*, May 11, 2018, <http://news.aa.com/news/news-details/2018/American-Airlines-Celebrates-Opening-of-Five-New-Gates-at-Chicago-OHare/default.aspx>.



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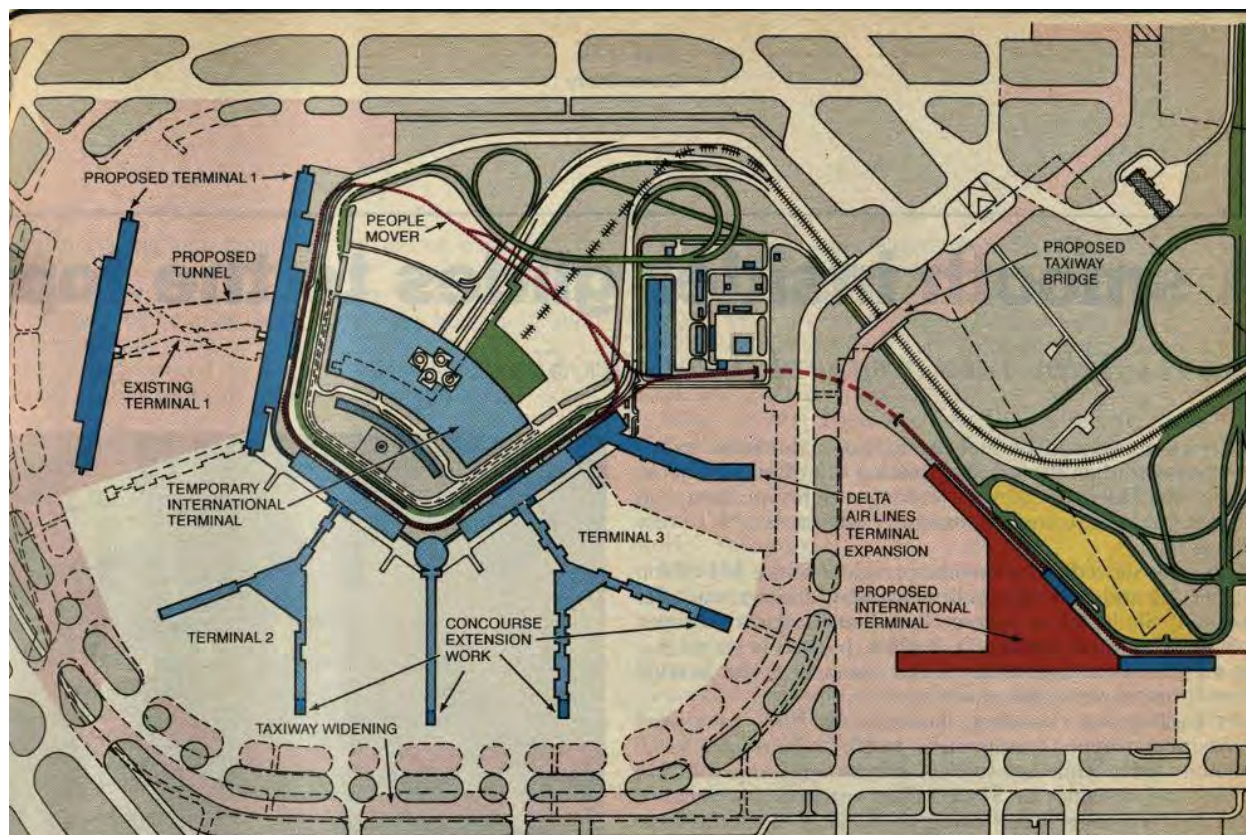


Figure 35. Overview of O'Hare Development Program, 1984.<sup>35</sup>

## B. History and evolution of air traffic control towers

### (1) Pre-World War II development

Prior to the 1930s, airport staff used flags or flashing lights to communicate with pilots as to whether or not it was safe to land.<sup>36</sup> As communications technology improved and became standardized, radio equipment was more commonly used to direct approaching and departing pilots. The concept of the air traffic control tower had already begun to assert itself in the late 1920s in Europe, and the 1926 design of Berlin's Tempelhof Airport included a small observation tower mounted on the roof (see Figure 36). In the United States, early examples of control rooms did not necessarily take the form of a separate, four-sided tower, but terminals often had an office space on an upper level with windows facing the airfield. A typical example was the Washington Airport completed in 1930 in Washington, D.C., which had a semicircular control room on its upper level (see Figure 37).

<sup>35</sup> "O'Hare Airport Expansion Takes Off," *Engineering News-Record* 212, no. 19 (May 10, 1984): 27.

<sup>36</sup> Federal Aviation Administration, "Photo Album – Air Traffic Control," template, accessed August 19, 2019, [https://www.faa.gov/about/history/photo\\_album/air\\_traffic\\_control/?cid=beginns](https://www.faa.gov/about/history/photo_album/air_traffic_control/?cid=beginns).

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Figure 36. View of Tempelhof Airport showing small observation tower with 360-degree views.<sup>37</sup>



Figure 37. Washington Airport, 1930, as seen from the airside.<sup>38</sup>

The Cleveland Municipal Airport, designed in 1929, helped set the pattern for control towers that followed, becoming a model for municipal airport design in the 1930s. It featured a fully glazed, centrally mounted control tower on the terminal building's roof. This tower was the first example in the U.S. to offer 360-

<sup>37</sup> "Air Transportation Buildings: Terminals and Hangars," *Architectural Forum* 53 (December 1930): 737.

<sup>38</sup> "Air Transportation Buildings: Terminals and Hangars."



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degree views and is also credited as the nation's first radio-equipped control tower (see Figure 38).<sup>39</sup> By December 1930 an article in *Architectural Forum* noted that the administrative portions of air terminals should include control and observation rooms with "an unobstructed view of the entire airport."<sup>40</sup> Of the nine U.S. airports profiled in the article (all of which had been constructed in 1929 and 1930), several appear to include a viewing tower and two clearly show a 360-degree observation area: Glendale, California's Grand Central Air Terminal (H.L. Gogerty, 1929) and Detroit Municipal Airport (City of Detroit Engineering Department, 1930).<sup>41</sup> While no specific design standards appear to have been implemented at that time, other early municipal airports soon followed the example of the Cleveland airport. One of these was the Chicago Municipal Airport (later renamed Midway), which featured a central control tower atop the two-story main block of the passenger terminal (see Figure 39).



Figure 38. Original Cleveland Municipal Airport control tower on roof of terminal building, c.1930.<sup>42</sup>

<sup>39</sup> Edward Jay Pershey and Steven E. Daron, *Cleveland Municipal Airport, Cleveland, Cuyahoga County, OH*, HAER (Washington, D.C.: Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1978), 1, 8, Library of Congress Prints and Photographs Division Washington, D.C., <https://cdn.loc.gov/master/pnp/habshaer/oh/oh0100/oh0126/data/oh0126data.pdf>.

<sup>40</sup> Roger W. Sherman, "Planning for Airport Buildings," *Architectural Forum* 53 (December 1930): 712.

<sup>41</sup> "Air Transportation Buildings: Terminals and Hangars."

<sup>42</sup> *Untitled [Cleveland Airport Control Tower]*, Photograph, c 1930, Image No. 2000-6114, National Air and Space Museum Archives, <https://airandspace.si.edu/exhibitions/america-by-air/online/abalmage.cfm?webID=209.p3>.



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Figure 39. Chicago Municipal (Midway) Airport terminal building, 1932, with central control tower enclosed by glass.<sup>43</sup>

Advances in air traffic control continued throughout the 1930s as the rising numbers of aircraft and associated safety concerns prompted new government oversight by the federal Bureau of Air Commerce (BAC) and its successor, the Civil Aeronautics Authority (CAA).<sup>44</sup> Early efforts focused on regional centers that managed en route traffic using a system of maps, blackboards, and markers that were constantly updated with information from radio and telephone communication.<sup>45</sup> In contrast, however, tower controllers (who were typically employed by the airports themselves) had a more narrow scope of responsibility, limited to a three-mile radius around the runways, and relied largely on visual observation.<sup>46</sup> A new Airport Traffic Control Section created within the BAC in January 1938 was expressly charged with standardization of airport control tower equipment, operations, and staff, and soon began certifying tower personnel.<sup>47</sup> Towers were an important part of the CAA's modernization program beginning in 1938, when it absorbed the BAC.<sup>48</sup> New airport construction during this period included control towers, while existing airports had rooftop towers added, if needed (one example is the original Washington Airport, which was built without a tower but had gained a circular glazed turret by the mid-1930s).<sup>49</sup> The rooftop tower was further cemented as a defining feature of the airport terminal in the numerous examples of municipal airports constructed as Works Progress Administration (WPA) projects during the Great Depression. High-profile examples from the 1940s, such as the new Washington National Airport completed in 1941 and Northeast Philadelphia Airport in 1945 (see Figure 40), incorporated a central rooftop tower with the now-familiar canted window walls that would soon proliferate in the post-World War II (postwar) period.

<sup>43</sup> Chicago Department of Aviation, *Chicago's Department of Aviation Annual Report '68* (Chicago: Chicago Department of Aviation, 1968), 4, <http://archive.org/details/annualreport1968chic>.

<sup>44</sup> The CAA absorbed the BAC in August of 1938. "FAA Historical Chronology, 1926-1996," *Federal Aviation Administration*, May 18, 2019, [https://www.faa.gov/about/history/chronolog\\_history/media/b-chron.pdf](https://www.faa.gov/about/history/chronolog_history/media/b-chron.pdf).

<sup>45</sup> Theresa L. Kraus, *Celebrating 75 Years of Federal Air Traffic Control* (Federal Aviation Administration, n.d.), 9–10.

<sup>46</sup> Kraus, *Celebrating 75 Years of Federal Air Traffic Control*, 11–12.

<sup>47</sup> The CAA absorbed the BAC in August of 1938. "FAA Historical Chronology, 1926-1996."

<sup>48</sup> "The Beginning of Air Traffic Control | America by Air," accessed August 19, 2019, <https://airandspace.si.edu/exhibitions/america-by-air/online/innovation/innovation12.cfm>.

<sup>49</sup> *Airports, USA, Virginia, Arlington, Hoover Field (Washington Airport); Airlines, Eastern Air Lines (USA)*. [Photograph], Photograph, mid-1930s, NASM-9A10721, National Air and Space Museum Archives, <https://airandspace.si.edu/collection-objects/airports-usa-virginia-arlington-hoover-field-washington-airport-airlines-eastern>.

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Figure 40. Control tower atop the newly completed Northeast Philadelphia Airport, April 1945.<sup>50</sup>

#### (2) Control towers in the jet age

The dramatic increase in air travel that occurred in the 1950s resulted in a need for improved airport facilities and air traffic control. Technological advances during this period produced a new generation of aircraft, and new electronic technology was being used to address the growing complexity of managing air traffic and communications. In the postwar period the incorporation of military technology, coupled with the rapid expansion of many airports, led to new developments in control tower design. Rather than small roof-mounted turrets, new standalone tower designs first began to emerge in this period, developing into the now-familiar form as the growing size and complexity of airfields required much larger, taller towers to provide increased visibility over longer runways and house new types of equipment and infrastructure.<sup>51</sup>

Foremost among the new types of equipment was the adoption of radar; developed for military use, the technology used radio waves to detect objects and determine their location, course, and speed. Its use in civilian aviation began shortly after the conclusion of World War II; by 1947 the CAA had begun testing ground-controlled approach radar systems at LaGuardia and two other airports.<sup>52</sup> In the 1950s the CAA cooperated with the Air Force to install long-range radars with a detection radius of 322 kilometers (200

<sup>50</sup> "Officials Inspecting Northeast Airport," Photograph, April 18, 1945, P372105B, George D. McDowell Philadelphia Evening Bulletin Photographs, Temple University Libraries, Special Collections Research Center, <https://digital.library.temple.edu/digital/collection/p15037coll3/id/32060/rec/6>.

<sup>51</sup> John Zukowsky and Koos Bosma, *Building for Air Travel: Architecture and Design for Commercial Aviation* (Chicago: Art Institute of Chicago, 1996), 82.

<sup>52</sup> Federal Aviation Administration, *LaGuardia Air Traffic Control Tower: Celebrating a History of Excellence* (U.S. Department of Transportation, 2011), 3, <https://www.faa.gov/about/history/milestones/media/LaGuardiaBooklet%20FINAL.pdf>.

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miles). A network of overlapping radar systems was completed by 1965, allowing continuous monitoring of aircraft in controlled airspace.<sup>53</sup>

Even for more localized use, radar technology proved invaluable for traffic control, and was incorporated into the design of the new air traffic control tower at Idlewild Airport (now JFK). The Idlewild tower set a new standard for modern airports and was one of the earliest freestanding control towers in the world when completed in 1952.<sup>54</sup> Designed to provide views of a 4,900-acre area, the 11-story, 150-foot structure had a largely exposed steel frame with enclosed portions housing an elevator, three office levels, and an octagonal cab with canted window walls (see Figure 41).<sup>55</sup> The Idlewild tower incorporated the most up-to-date technologies, including four different types of radar that enabled controllers to monitor aircraft up to 20 miles away in any direction, even in weather conditions with little or no visibility. Surveillance radar detected aircraft at a distance of 20 miles, while more detailed approach radar located planes at 10 miles. Final approach radar was used to guide the aircraft from a distance of three miles through the landing process, at which time surface radar showed the location of the aircraft on the ground during touchdown and taxiing. Throughout the process, controllers were able to direct pilots via radio.<sup>56</sup>

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<sup>53</sup> Smithsonian National Air and Space Museum, "Air Traffic Control Comes of Age," *Exhibitions, American By Air*, 2007, <https://airandspace.si.edu/exhibitions/america-by-air/online/heyday/heyday05.cfm>.

<sup>54</sup> Zukowsky and Bosma, *Building for Air Travel*, 87.

<sup>55</sup> Carlton Bucher, "Supertower to Direct New York Air Traffic," *Popular Science*, June 1952, 96.

<sup>56</sup> Bucher, "Supertower to Direct New York Air Traffic," 98–99.



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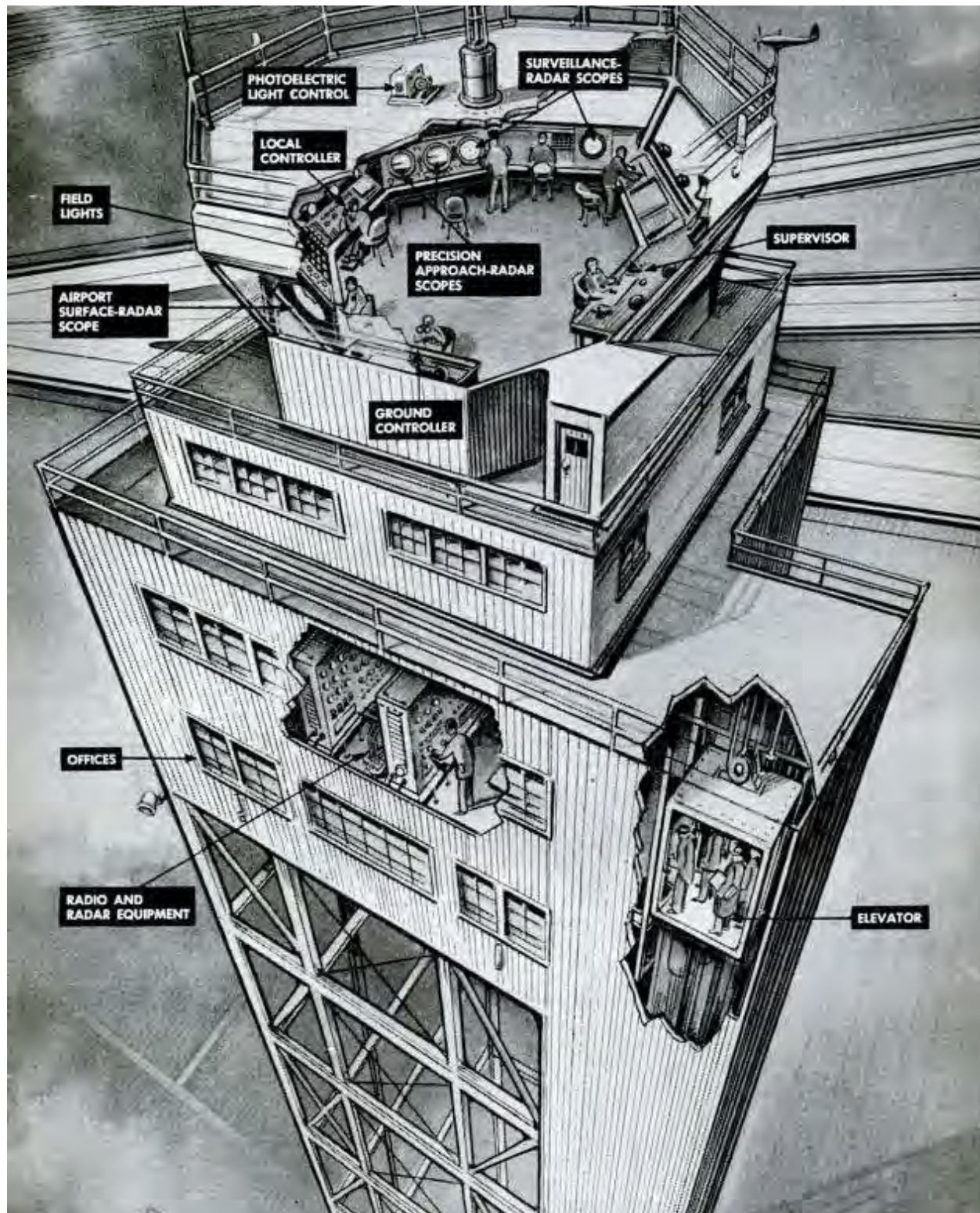


Figure 41. Artist's rendering of the new Idlewild control tower from Popular Science magazine, June 1952.<sup>57</sup>

<sup>57</sup> Bucher, "Supertower to Direct New York Air Traffic," 96.

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Other similar examples soon followed, including towers at London's Heathrow Airport and the first tower at O'Hare (see Figure 42), both of which were completed in 1955.<sup>58</sup> These and other examples all continued to display the character-defining canted window walls implemented in the 1940s, allowing a greater field of vision closer to the tower base, with the cab set atop a four-sided base. As the new building form solidified, the aesthetic form was largely dictated by function; depending on the airport size, a minimum height was required to provide a sufficient viewshed. The cab size itself was determined by the amount of equipment and number of workstations. This combination of functional requirements resulted in a columnar structure with tall narrow base to house infrastructure and fully glazed turret or "cab" at the top that contained workstations for the air traffic controllers.<sup>59</sup>



Figure 42. Original O'Hare control tower, built in 1955, as it appeared in 1963.<sup>60</sup>

While the Idlewild, Heathrow, and early O'Hare towers have a rather utilitarian aesthetic, other examples such as those at LaGuardia and Dulles International Airport have distinctive, almost sculptural forms as architects applied themselves to the task of designing this new building type (see Figure 43 and Figure 44). By their nature, control towers were typically the tallest structure at an airport and, given the

<sup>58</sup> Hugh Pearman, *Airports: A Century of Architecture* (London: Laurence King Publishing, 2004), 148.

<sup>59</sup> "Architecture between Heaven and Earth: Extraordinary Control Tower Design," *Architonic*, accessed August 19, 2019, <https://www.architonic.com/en/story/susanne-fritz-architecture-between-heaven-and-earth-extraordinary-control-tower-design/7000649>.

<sup>60</sup> City of Chicago, Department of Aviation, *Annual Report 1963*, December 31, 1963, 6, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport, Northwestern University Transportation Library, <https://archive.org/details/annualreport1963chic>.



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otherwise horizontal emphasis of most airport designs, offered an opportunity to create a highly visible landmark. La Guardia Airport and Dulles Airport were among the early airports to construct towers that used high-style modern design for this unusual building type.



Figure 43. LaGuardia control tower, 1964.<sup>61</sup>

<sup>61</sup> Federal Aviation Administration, *LaGuardia Air Traffic Control Tower: Celebrating a History of Excellence*, 25.

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Figure 44. Dulles control tower, 1962.<sup>62</sup>

As originally constructed in 1939, LaGuardia had a typical pre-World War II configuration with a roof-mounted control cab atop its central terminal building.<sup>63</sup> In the late 1950s New York's Port Authority began a \$36 million program of reconstruction and improvement at the airport. As part of this program, a new control tower was designed by New York architect Wallace K. Harrison (designer of the Trylon and Perisphere, the iconic tower and globe structures at the 1939 World's Fair in New York). The 150-foot tower, with a streamlined, tapering form and whimsical "porthole" windows, was begun in 1960 and dedicated in 1964.<sup>64</sup> Shortly after designing the iconic TWA Terminal at JFK Airport, Eero Saarinen produced a design for buildings at the new Dulles Airport in Chantilly, Virginia. Unlike LaGuardia, Dulles was a completely new airport and Saarinen designed a comprehensive vision that included the terminal, control tower, and other support buildings. Construction began in 1958 and the airport was dedicated in 1962.<sup>65</sup> While the terminal itself is one of the more iconic examples of 1960s airport architecture, the 193-foot-tall control tower makes an equally striking statement, presenting a massive pagoda-like structure that rests atop a flared concrete pillar. The striking, sculptural designs of towers like LaGuardia and Dulles were the exception, rather than the rule, but served as counterexamples to the largely utilitarian

<sup>62</sup> Balthazar Korab, *Dulles International Airport, Chantilly, Virginia, 1958-63 (Expanded by Skidmore, Owings & Merrill, 1998-2000)*. *Control Tower*, c 1962, Balthazar Korab Collection, Library of Congress Prints & Photographs Division, <https://www.loc.gov/pictures/item/2018673566/>.

<sup>63</sup> Federal Aviation Administration, *LaGuardia Air Traffic Control Tower: Celebrating a History of Excellence*, 4.

<sup>64</sup> "LaGuardia Airport," *National Air and Space Museum*, accessed August 21, 2019, <https://airandspace.si.edu/multimedia-gallery/11167hjpg>.

<sup>65</sup> "History," *Metropolitan Washington Airports Authority*, May 21, 2015, <https://www.flydulles.com/iad/history>.

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towers prevalent in the early 1960s, when the federal government first became interested in the concept of architect-designed, standardized control towers.

#### (3) FAA control tower standardization

Until the mid-1960s control tower design and construction were the responsibilities of individual airport owners, and many simply continued the 1940s practice of installing short towers with glazed control rooms or “cabs” atop the terminal buildings. Although providing the highest possible elevation, this strategy did not always place the tower in the location with the best overall visibility of the runways, nor did it treat the tower as an aesthetic element within the overall design of the airport. When the FAA received congressional approval to finance construction of its own control towers at airports in 1961, the agency held a contest to develop a new standardized tower design. The design was to be freestanding, so that it could be positioned in the optimal location within the airport. It was also intended to be both practical and aesthetically pleasing, what FAA Administrator Najeeb Halaby described as “a symbol of strength, beauty, and safety.”<sup>66</sup>

The FAA's efforts were part of an increased federal interest in architectural design that began with the 1959 Public Buildings Act and received additional impetus from President John F. Kennedy.<sup>67</sup> Dissatisfied with the state of existing federal facilities, Kennedy's Ad Hoc Committee on Federal Office Space issued the “Guiding Principles for Federal Architecture” in 1962, intended to lead agencies in the design and construction of better buildings.<sup>68</sup> In addition to this official mandate, Halaby at the FAA also received private support from John F. and Jacqueline Kennedy themselves in his selection of a committee of design professionals, critics, and art patrons to guide the design of a prototypical FAA air traffic control tower.<sup>69</sup> The FAA then held interviews in which leading architects competed to pitch their ideas for a new design. The firm of I.M. Pei & Associates (later I.M. Pei & Partners) won the commission to design the prototypical air traffic control tower in early 1962.<sup>70</sup>

The standardized design developed by Pei and his associate James Ingo Freed was intended as “the most contemporary, state-of-the-art control tower which could be repeated across the country as a permanent symbol of air security.”<sup>71</sup> The design was to serve as a replacement for the typical roof-mounted tower, allow for a uniform standard at airports of all sizes, and create a clearly recognizable form that viewers could associate with the FAA and federal oversight of civilian aviation.<sup>72</sup> Pei & Associates responded to these requirements, along with the need to provide a cost-effective solution, by reinventing the control tower as a modular, flexible design concept that could be adapted to any airport site and allow for ease of expansion through the use of an underground base building. While not a completely new

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<sup>66</sup> “A Better View at Airports,” *Fortune*, February 1967, 159.

<sup>67</sup> General Services Administration Center for Historic Buildings, *Growth, Efficiency, and Modernism* (Washington D.C.: General Services Administration, 2003), 38,42, <https://www.gsa.gov/cdnstatic/GEMbook.pdf>.

<sup>68</sup> Center for Historic Buildings, *Growth, Efficiency, and Modernism*, 3.

<sup>69</sup> “New Tower to Grace Airports,” 113; Jodido and Strong, *I.M. Pei: Complete Works*, 93.

<sup>70</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 93.

<sup>71</sup> Jodido and Strong, *I. M. Pei: Complete Works*, 93–95.

<sup>72</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 93.

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building type, the concept of the standardized, stand-alone tower with base building made this form the rule rather than the exception.<sup>73</sup>

The new tower's essential form was comprised of three modular components: cab, shaft, and base building. As the design was intended to be easily modified to meet the site-specific needs of any airport, different versions of these components could be interchanged accordingly. I.M. Pei & Associates designed five standardized height shafts that could be adapted in accordance with visibility requirements in each location. In 1963 *Architectural Forum* described one of the 13 variations of the I.M. Pei & Associates prototype tower as a "handsome structure" (see Figure 45).<sup>74</sup>

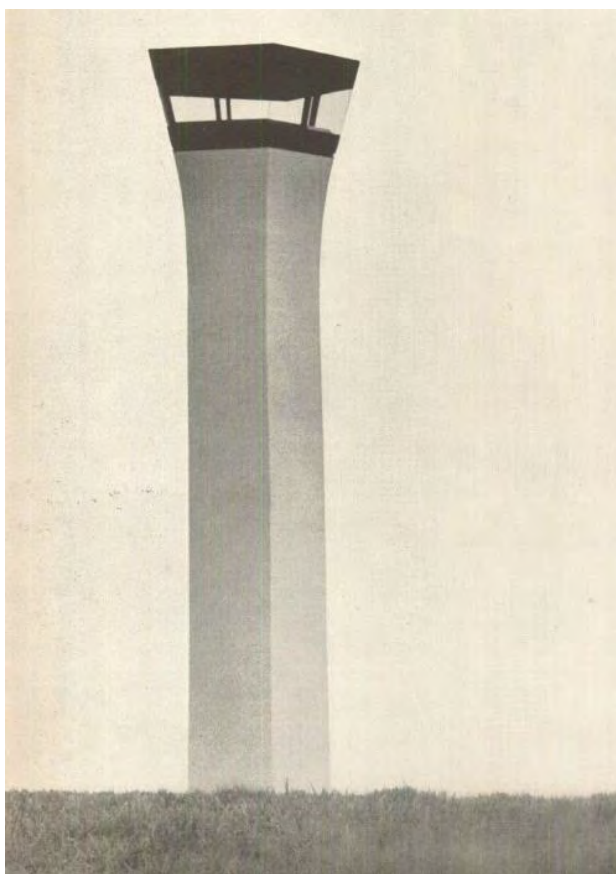


Figure 45. Model of the "handsome structure" featured in the November 1963 issue of *Architectural Forum*.<sup>75</sup>

The cab was designed as a prefabricated, non-directional pentagon and intended to house only those personnel who required visuals of aircraft and runways (see Figure 46). The structural elements of the cab, instrument packages, and mechanical systems were prefabricated in two sizes and shipped as a kit of parts with a manual to be assembled on site. The cab was designed to optimize the visibility of the controllers. Pei opted for five sides to eliminate the confusion of internal reflections that plagued parallel

<sup>73</sup> In 1961 Congress ruled that all future airport towers should be constructed by the FAA rather than local entities.

<sup>74</sup> "New Tower to Grace Airports," 113.

<sup>75</sup> "New Tower to Grace Airports," 112.

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windows, and single glazed, slanted windows with epoxy joints. The cab design also included solutions to the problem of window maintenance; a forced-air system kept the interior free of fog, and a rolling bucket set into the joint between the cab and the shaft allowed staff to wash the windows without need for an exterior platform that could obscure visibility.<sup>76</sup>



*Figure 46. View of standardized cab interior showing equipment consoles.<sup>77</sup>*

For a shaft that could be easily adapted to any airport's needs, Pei and Freed developed a curvature that could be uniformly applied at five different heights ranging from 60 feet to 150 feet (see Figure 47).<sup>78</sup> The preparation of the working drawings was described as being more similar to aircraft or shipbuilding than building construction; the designers prepared full-scale layouts in order to determine the offset dimensions for the shaft's curves (see Figure 48).<sup>79</sup> The design team conducted a survey to determine how best to form the concrete shaft and compared the relative cost and speed of cast-in-place, precast, and slip-form construction techniques. To test the slip-form method, "a special metal jig and swiveling formwork were devised to make the slip-forming of the flared shape possible." It was determined that the slip-forming method could ultimately be the most economical, but the first few towers, including the subject tower at O'Hare, were built using cast-in-place methods so that contractors would have time to

<sup>76</sup> "New Tower to Grace Airports," 114.

<sup>77</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 95.

<sup>78</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 94.

<sup>79</sup> "New Tower to Grace Airports," 114.



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familiarize themselves with the newer slip-forming method.<sup>80</sup> While research did not confirm whether a bush-hammered concrete finish was specified as part of the standard FAA control tower plans, several early examples (including those at O'Hare and Houston Intercontinental Airport) do feature this textured finish. This concrete finish is found on many of Pei's buildings in the 1960s and early 1970s and became recognized as one of the architect's signature design features.

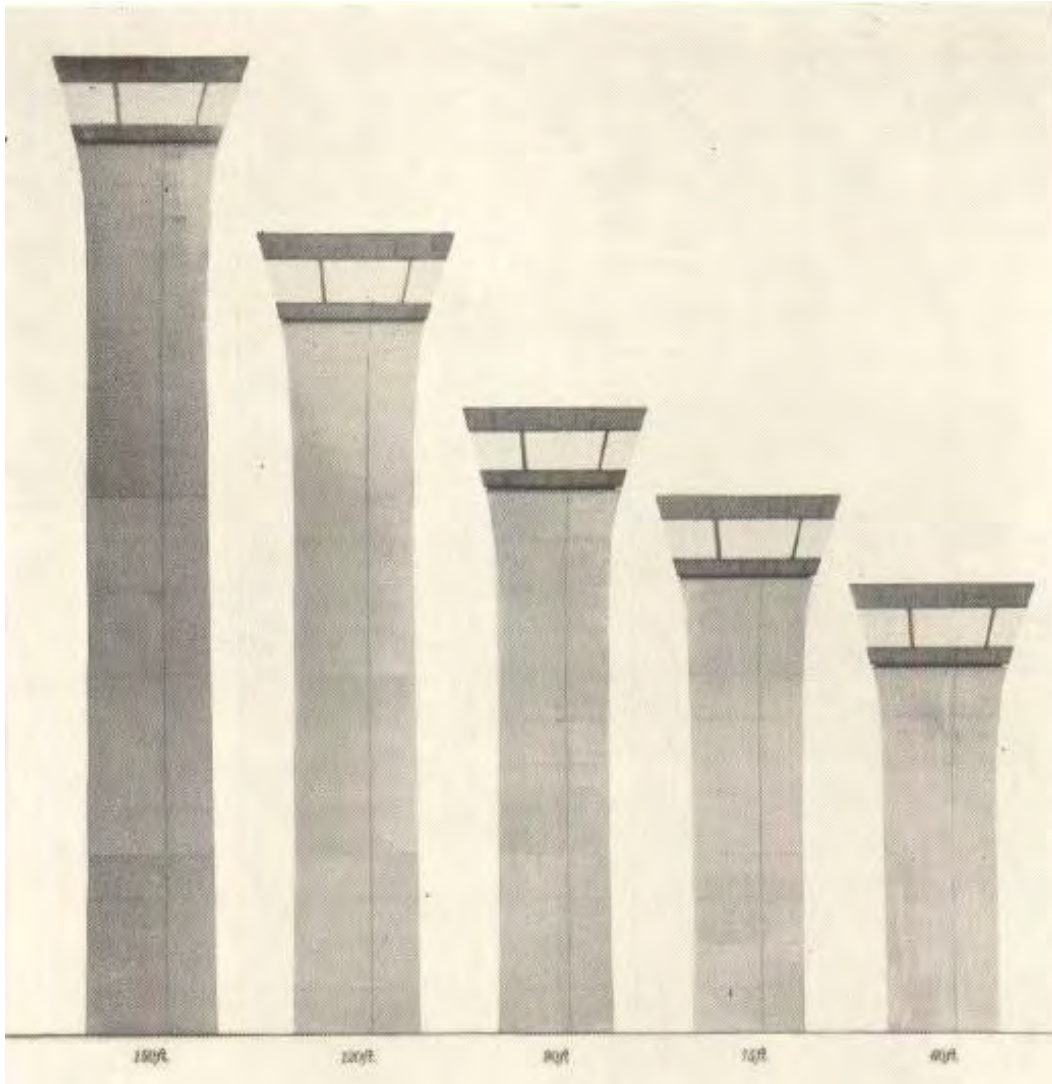


Figure 47. Working drawing showing the five prototype heights of 60, 75, 90, 120, and 150 feet.<sup>81</sup>

<sup>80</sup> "New Tower to Grace Airports," 113.

<sup>81</sup> "New Tower to Grace Airports," 114.

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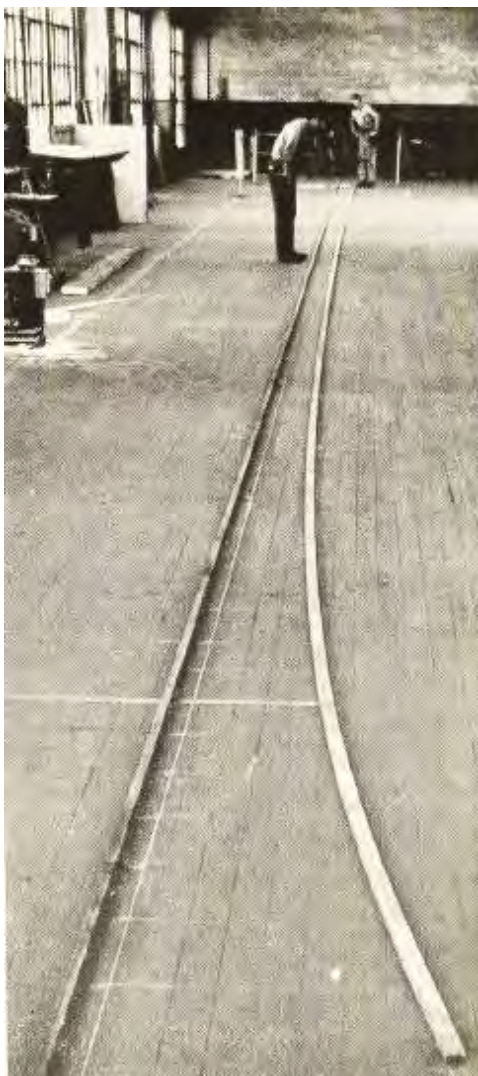


Figure 48. View of shipyard mockup of offset dimensions of the curves of the structure.<sup>82</sup>

Another key difference between Pei and Freed's prototype and previous tower designs is that they took support functions out of the shaft and relocated them to a base building. Earlier examples simply took the layout of the roof-mounted towers and placed them atop a taller structure, so that levels immediately beneath the cab contained radar technicians and others who did not require visual observation to perform their duties. Instead, Pei's concept placed these staff in an adjoining building at the base of the tower so that only those functions that were strictly necessary would be located in the shaft or cab. This was vital in enabling the design of a slender, gently flared shaft, and the resulting aesthetic was a departure from both the wide, boxy appearance of Idlewild and the first O'Hare tower, and the more top-heavy designs of both the Dulles and LaGuardia towers. The base building itself provided another new concept for air traffic control towers in its consideration of future expansion in the design flexibility of the base building.<sup>83</sup> Designed to be largely below ground, the base building could be incorporated into the surrounding landscape, emphasizing the tower shaft. The standard plans provided several expandable layouts for the

<sup>82</sup> "New Tower to Grace Airports," 114.

<sup>83</sup> Rapid City Staff, "Air Traffic Control Tower Design Okayed," *Rapid City (S.D.) Journal*, November 12, 1962.

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base building ranging from 3,500 to 17,000 square feet (see Figure 49).<sup>84</sup> In 1962 this design concept was expected to increase the longevity of the FAA towers by allowing for additions as staff numbers grew to cope with ever-increasing aircraft movements.<sup>85</sup>

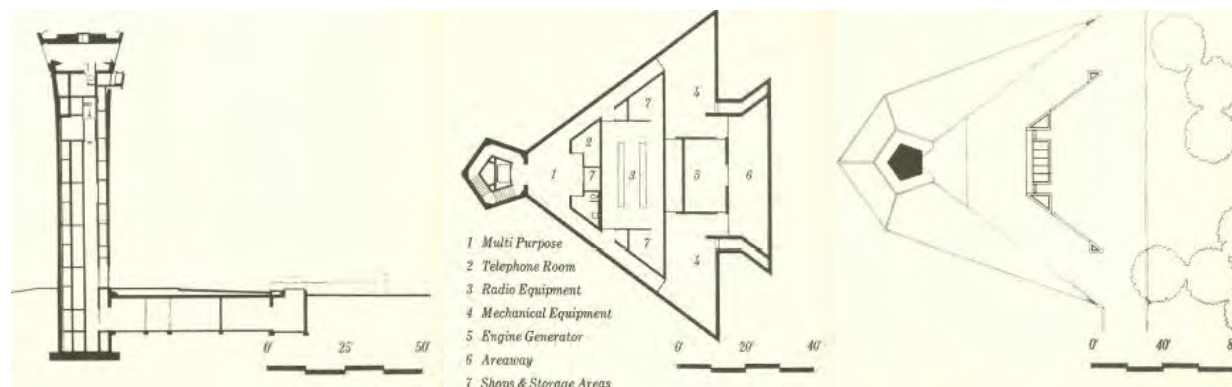


Figure 49. Section, base building plan, and site plan for the plan with the smallest base building.<sup>86</sup>

In total the FAA expected to build up to 77 control towers using the new standard designs; although many conformed to a smaller, steel-framed type intended for smaller airports, 10 of the larger concrete type were under construction by February 1967 and the initial prototype, constructed in El Paso, was nearly complete.<sup>87</sup>

A 1967 article in *Fortune* notes that by that time, the standard tower design had already been revised to save costs by using a smaller, above-ground base building.<sup>88</sup> Although the exact number of towers ultimately constructed using the Pei/Freed models is unknown, a 2016 study found that at least 23 of the larger concrete-type towers were built nationwide between 1967 and 1977; five of these have been demolished.<sup>89</sup> Of the 18 known, extant towers, a review of aerial imagery indicates that only seven display the sub-grade base buildings included in the original Pei/Freed design. Aside from the prototype at El Paso, these include the towers in Houston, Texas; Great Falls, Montana; Elmendorf Air Force Base (Anchorage, Alaska); Sacramento, California; Andrews Air Force Base (Camp Springs, Maryland); and the subject CDA Control Tower at O'Hare.

<sup>84</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 94.

<sup>85</sup> Rapid City Staff, "Air Traffic Control Tower Design Okayed," 3.

<sup>86</sup> "New Tower to Grace Airports," 113.

<sup>87</sup> "A Better View at Airports," 159.

<sup>88</sup> "A Better View at Airports," 160.

<sup>89</sup> Towers were demolished at Memphis International Airport, Huntsville International Airport, Indianapolis International Airport, and Lambert-St. Louis International Airport. The Palm Beach International Airport tower has been demolished since 2016. SWCA Environmental Consultants, *National Register of Historic Places Eligibility Analysis for the Air Traffic Control Tower at George Bush Intercontinental Airport, Houston, Harris County, Texas* (Prepared for Federal Aviation Administration, April 21, 2016), 12.

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#### C. Design and construction of the CDA Control Tower

##### (1) Construction and features of the CDA Control Tower

Within a few years of its construction, the expansion of O'Hare had rendered the airport's original 87-foot control tower built in 1955 inadequate, and the 1962 master plan noted that "a new control tower will be constructed as soon as practical."<sup>90</sup> Less than seven years after its construction in the center of a circular airfield plan, the tower no longer provided visibility for important areas of the airport. Construction of Terminals 2 and 3 had created an elliptical airfield configuration, and the tower was not tall enough to see the ends of the newly lengthened runways. With further expansions planned, it was apparent that a taller tower was urgently needed.<sup>91</sup> In 1964 the FAA indicated that a new tower at O'Hare was a top priority in the nation.<sup>92</sup>

The CDA received pressure from the FAA to locate a new control tower in the center of the parking lot adjacent to the terminal, in the location where City officials also wanted to construct a multi-level parking lot and hotel.<sup>93</sup> Federal funding for the new tower was contingent on this location as specified by the FAA, and thus the construction of a new tower spurred the final planning phase for the hotel and parking structure that the CDA had decided to construct opposite the terminals. The CDA's goal for this new cluster of buildings was "to make them all esthetically compatible with each other and with the other airport structures, and yet as highly functional as possible."<sup>94</sup>

The FAA began planning the new tower in 1966, and elected to build an adapted version of the standardized Pei & Associates tower.<sup>95</sup> The new tower was designed to be taller than the tallest of the standard options (150 feet), with a shaft height of nearly 170 feet above grade.<sup>96</sup> At almost 200 feet including the cab and roof-mounted radome, it was reportedly the tallest control tower in the country at the time of its construction.<sup>97</sup> Work on the tower began in 1966 and was largely complete by the end of 1969, but additional delays in construction and equipment delivery prevented the tower from becoming operational until 1971.<sup>98</sup> When completed, it featured the most modern equipment and provided

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<sup>90</sup> James P. O'Donnell et al., *O'Hare Field--Chicago International Airport Vol. 4 Analysis of Capacity and Master Plan* (Prepared by City of Chicago, 1958), 6, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/oharefieldchicag04odon>, Northwestern University Transportation Library.

<sup>91</sup> Chicago Department of Aviation, *Annual Report for the Year Ending December 31, 1969* (Chicago: Chicago Department of Aviation, 1969), 4, <http://archive.org/details/annualreport1969chic>.

<sup>92</sup> James Howard, "O'Hare Plans New Control Tower in '64," *Chicago Tribune*, February 12, 1962.

<sup>93</sup> Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)*, 308.

<sup>94</sup> Chicago Department of Aviation, *Annual Report for the Year Ending December 31, 1969*, 4.

<sup>95</sup> Zukowsky and Bosma, *Building for Air Travel*, 91.

<sup>96</sup> Design drawings indicate that the shaft rises approximately 168 feet from grade level to the floor of the cab; including the sub-grade levels, the shaft is approximately 188 feet tall, and the standard cab design published in a trade publication shows a cab height of approximately 12 feet, not including any roof-mounted equipment. "New Tower to Grace Airports," 114.

<sup>97</sup> Pamela Zekman, "New O'Hare Field 'Aerie' to Aid Jet-Age 'Eagles,'" *Chicago Tribune*, April 22, 1971, S12.

<sup>98</sup> Chicago Department of Aviation, *Annual Report for the Year Ending December 31, 1969*, 5; Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)*, 308.

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unobstructed views of the entire airfield from the glass-enclosed cab, including the southwest and northeast runways that were under construction at that time. In 1971 an FAA spokesperson described the new tower as being the tallest in the country, with its cab layout custom designed for the controllers, and as “a controller’s dream in modern up-to-date equipment and design.”<sup>99</sup>

The configuration of the cab at O’Hare provided space for seven positions (see Figure 50). The cab interior was designed with standardized consoles to house banks of equipment, allowing for instant familiarity by controllers from other air traffic control locations (see Figure 51 and Figure 52). Equipment was arranged around the perimeter of the cab so that controllers could use numerous consoles and view the planes from all directions. The tower was equipped with the latest technology intended to anticipate needs through the 1980s, described as “the latest and best available.”<sup>100</sup> Modern radar and computer equipment in the control room allowed operators to control aircraft destined for eight other airports within a 50-mile radius of O’Hare. Part of the delay in obtaining equipment was related to the installation of a new computer, one of the first of its type in the country. This technology flashed continuous information on the radar screen informing radar operators not only of an aircraft’s movement, but also its flight number, speed, and altitude. Previously, radar operators and controllers had to remember this information as they watched aircraft movements on the radar or rely on hard-copy information sheets.<sup>101</sup> The new tower also had the technology to operate lights on all runways at O’Hare from a central console.

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<sup>99</sup> Zekman, “New O’Hare Field ‘Aerie’ to Aid Jet-Age ‘Eagles,’” S12.

<sup>100</sup> “O’Hare Tower Is Dedicated,” *Chicago Tribune*, May 5, 1971, C18.

<sup>101</sup> Zekman, “New O’Hare Field ‘Aerie’ to Aid Jet-Age ‘Eagles,’” S12.



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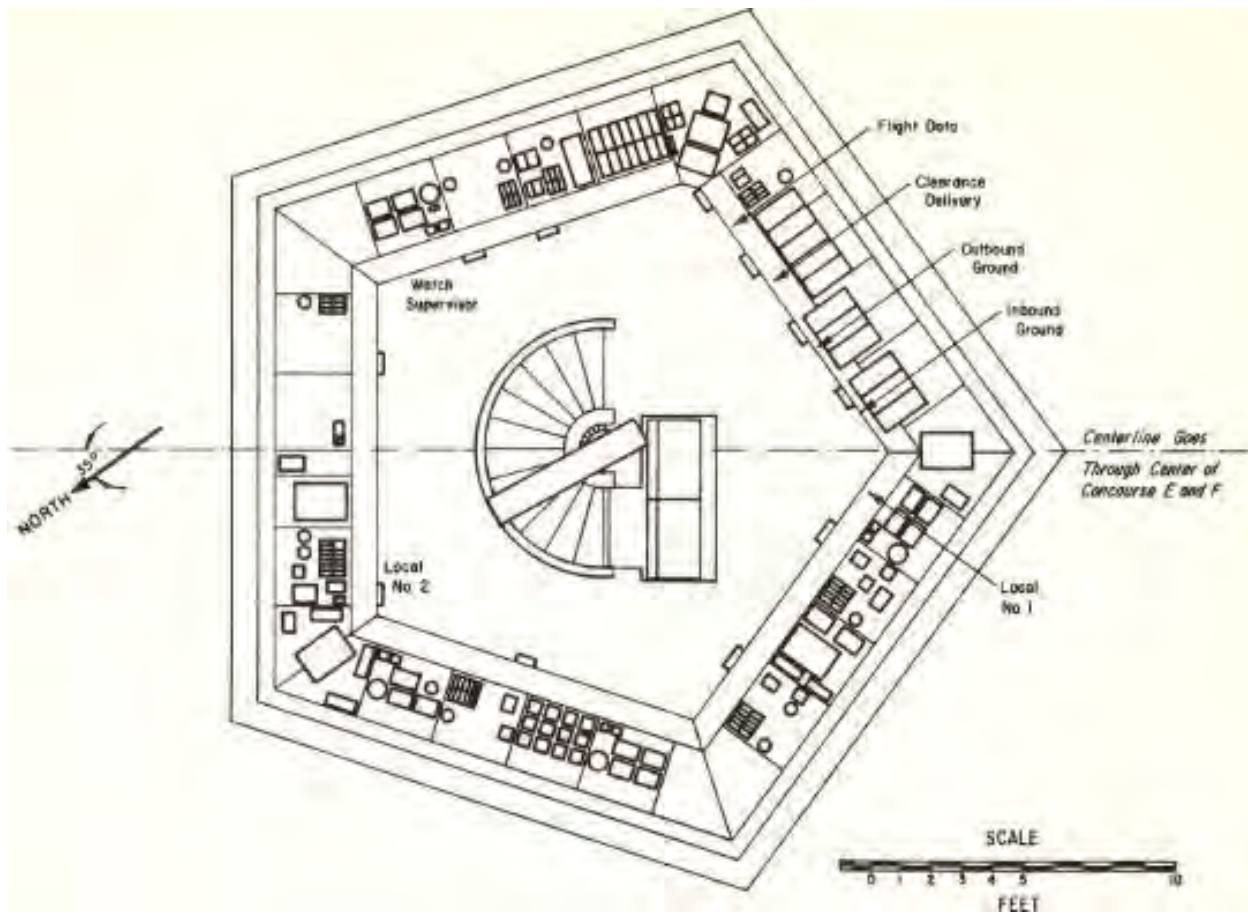


Figure 50. Tower cab floorplan (1974).<sup>102</sup>

<sup>102</sup> F D'Alessandro, Transportation Systems Center, and Computer Sciences Corporation, "Operations Analysis of Airport Surface Traffic Control (ASTC) System at O'Hare International Airport" (Dept. of Transportation, Transportation Systems Center, 1974), 4-3, <https://archive.org/details/operationsanalys01dale>.

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Figure 51. Tower cab interior photos from 1974 showing banks of equipment.<sup>103</sup>

<sup>103</sup> D'Alessandro, Transportation Systems Center, and Computer Sciences Corporation, "Operations Analysis of Airport Surface Traffic Control (ASTC) System at O'Hare International Airport," 4-11-4-13.

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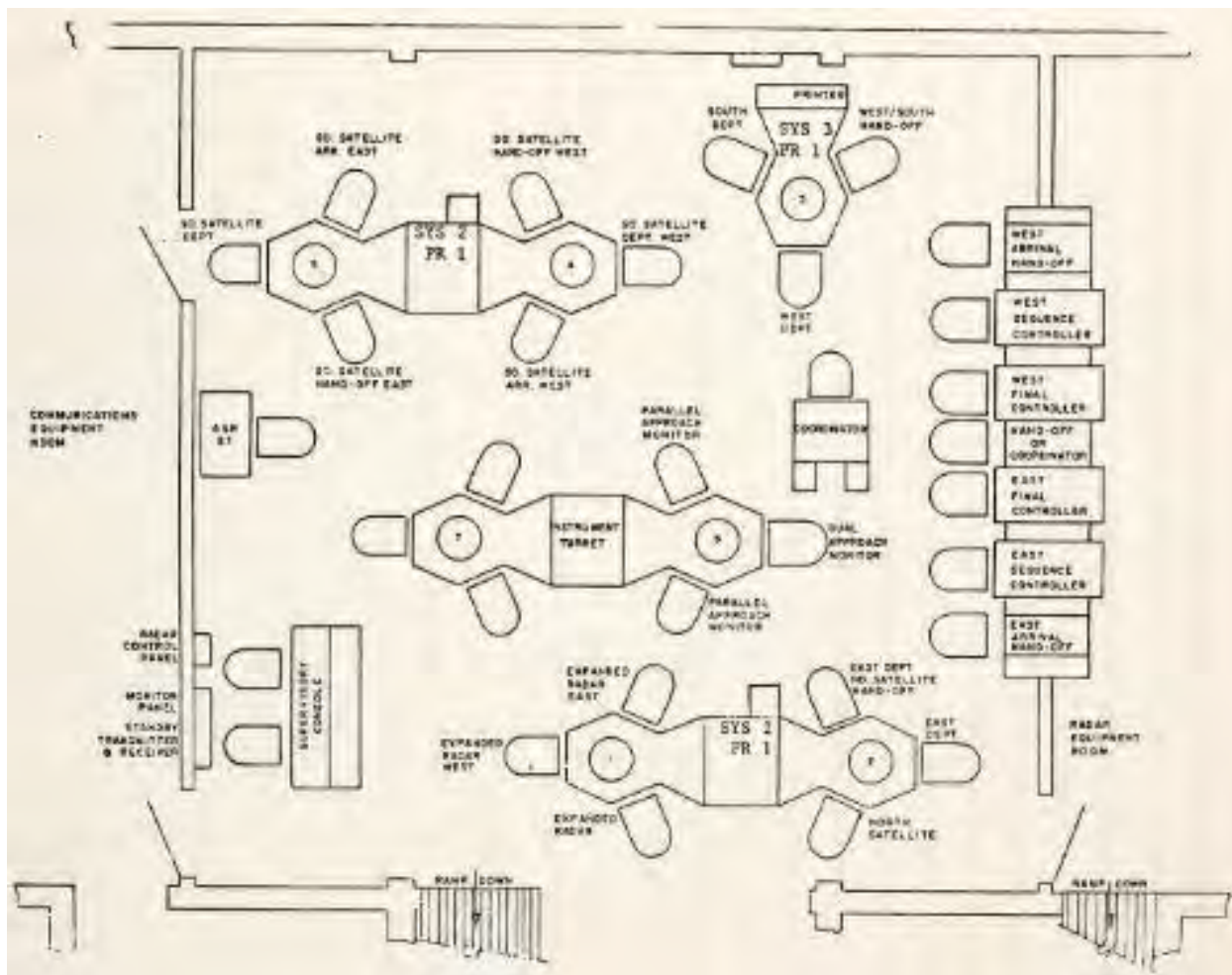


Figure 52. 1974 floorplan of the subject control tower Terminal Radar Approach Control (TRACON) room.<sup>104</sup>

The subject tower served as the air traffic control tower for O'Hare until 1996, when it was made redundant by a new 260-foot tower (Main Tower) constructed adjacent to the Rotunda between Terminals 2 and 3. The FAA vacated the tower, relocating its operations to the new tower and associated three-story office building, and the CDA now uses the subject tower to direct snow removal equipment and monitor construction activity at O'Hare.

#### D. Designers

The FAA tower prototype design produced by I.M. Pei & Associates is primarily attributed to two designers within the firm: I.M. Pei and James Ingo Freed. The prototype tower design is representative of Pei and Freed's larger body of work from the late 1950s through 1970s, which was heavily concentrated on concrete construction and strong, geometric forms. The following section provides information on both Pei and Freed in order to appropriately place the tower design within the context of both architects' careers for the purposes of evaluation under *Criterion C*.

<sup>104</sup> D'Alessandro, Transportation Systems Center, and Computer Sciences Corporation, "Operations Analysis of Airport Surface Traffic Control (ASTC) System at O'Hare International Airport," 4–70.

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#### (1) I.M. Pei

leoh Ming (I.M.) Pei was born in Canton, China, in 1917. He spent his early childhood in Hong Kong until age nine, when his family moved to Shanghai. Pei credited much of his drive and inspiration to become an architect to his young adulthood in Shanghai. He witnessed the transformation of Shanghai's skyline brought on by a building boom during the 1920s and 1930s and later described his sense of fascination watching the construction of a 25-story hotel, attributing his desire to build to this early experience.<sup>105</sup> In addition to urban scenes, Pei also drew inspiration from designed landscapes including the Classical Gardens at Suzhou in China's Jiangsu province, the traditional retreat of the scholar-gentry where his ancestors lived for centuries and where he spent time during the summers.<sup>106</sup> The gardens of his childhood left a lasting impact on Pei, who described them as "the most important inspiration to [him] as an architect."<sup>107</sup>

After completing his secondary schooling in Shanghai, Pei left China to study architecture at the University of Pennsylvania but found the curriculum to be too focused on fine draftsmanship.<sup>108</sup> In 1935 he decided to change courses and enrolled to study engineering at the Massachusetts Institute of Technology (MIT). There the dean of the school of architecture, William Emerson, took note of his design skills and encouraged him to return to the study of architecture.<sup>109</sup> Pei graduated with a Bachelor of Architecture in 1940 from MIT, where he was awarded the American Institute of Architects (AIA) Medal.<sup>110</sup>

Soon after graduation Pei joined the northeastern architecture firm of Stone & Webster and focused on engineering work, in particular concrete technology, which would become an important element of his early architectural work.<sup>111</sup> That same year Pei also enrolled at Harvard in the Master of Architecture program, studying under renowned German architect and Bauhaus School founder Walter Gropius.<sup>112</sup> In 1943 Pei suspended his studies to volunteer for the National Defense Research Committee during World War II, using his expertise to develop methods for destroying buildings.<sup>113</sup> After the war ended in 1945 he returned to Harvard to complete his graduate work and teach as an assistant professor of design.<sup>114</sup>

<sup>105</sup> Fred Bernstein, "How a Multicultural Background Laid the Ground for I.M. Pei's Global Influence," *Architectural Digest, Immigrant Stories*, January 5, 2018, <https://www.architecturaldigest.com/story/i-m-pe-immigrant-architect-global-influence>.

<sup>106</sup> Jonathan Glancey, "IM Pei 2010 Interview: 'Wow! -Perhaps I'm Not so -ancient after All'," *The Guardian*, February 28, 2010, <https://www.theguardian.com/artanddesign/2010/feb/28/im-pe-architecture-interview>; Carter Wiseman, *I.M. Pei: A Profile in American Architecture* (Schaffhausen: Edition Stemmler, 1990), 32–33.

<sup>107</sup> Glancey, "IM Pei 2010 Interview: 'Wow! -Perhaps I'm Not so -ancient after All'."

<sup>108</sup> Wiseman, *I.M. Pei*, 34–35.

<sup>109</sup> Wiseman, *I.M. Pei*, 35.

<sup>110</sup> Wiseman, *I.M. Pei*, 38.

<sup>111</sup> Wiseman, *I.M. Pei*, 38.

<sup>112</sup> "Remembering Pei: Tracing the Architect's Legacy to the Harvard Graduate School of Design - Harvard Graduate School of Design," accessed August 28, 2019, <https://www.gsd.harvard.edu/2019/07/remembering-pe-tracing-the-architects-legacy-to-the-harvard-graduate-school-of-design/>.

<sup>113</sup> Bernstein, "How a Multicultural Background Laid the Ground for I.M. Pei's Global Influence"; Wiseman, *I.M. Pei*, 39.

<sup>114</sup> Wiseman, *I.M. Pei*, 40.

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In 1948 real estate magnate William Zeckendorf hired Pei as a director of the architectural division at Webb & Knapp, Zeckendorf's New York-based real estate development firm.<sup>115</sup> Pei worked at Webb & Knapp for seven years, designing a series of high-rise buildings. By the mid-1950s Pei and many of his colleagues, desiring more artistic independence, began to disassociate from their public image as the in-house design group for Webb & Knapp.<sup>116</sup> In 1955 Pei along with colleagues Henry Cobb and Eason Leonard formed their own firm, I.M. Pei & Associates. They retained a formal teaming relationship with Zeckendorf until 1960, bringing over as many as 70 of their colleagues from Webb & Knapp to work for their new firm.<sup>117</sup> Even after they officially separated from Webb & Knapp, the new firm relied on Zeckendorf as a major client for several years.<sup>118</sup>

In his early career at Webb & Knapp and the first years of I.M. Pei & Associates, Pei worked on a variety of large-scale housing and commercial development projects. His style was characterized by "waffle-like concrete facades."<sup>119</sup> In designs for two large urban housing developments, Kips Bay Plaza in Manhattan (1959-63) and Society Hill in Philadelphia (1964), I.M. Pei & Associates demonstrated its ability to produce practical, attractive designs under constrained budgets and began to establish "a reputation for superior technical know-how and innovation that set them apart from most other architectural firms of the period."<sup>120</sup> While these buildings are not recognized as the firm's best work, the designs exhibit Pei's belief that "architecture is a pragmatic art" that must be "built on a foundation of necessity." Pei would become internationally renowned for his practical approach to design.<sup>121</sup> Architecture critic Paul Goldberger vividly described Pei's approach as "a disciplined intelligence struggling, and succeeding, at the task of forcing design quality into the economic straitjacket of speculative real-estate development."<sup>122</sup>

As his career progressed, Pei's designs evolved past his earlier, concrete buildings that featured stacked windows, producing the effect of gridded facades. He began to take on "a more sculptural but equally modernist approach" with the use of "bold, assertive forms," which would continue to be a trademark of his designs throughout his career.<sup>123</sup> In the 1960s and 1970s Pei's work expanded beyond urban housing projects and commercial real estate to commissions for a variety of high-profile cultural, academic, medical, and civic buildings. These included the Mesa Laboratory at the National Center for Atmospheric Research (1967), National Airlines Terminal (later TWA) at JFK (1970), Dallas Municipal Administration Center (1977), John F. Kennedy Library (1979), and a series of FAA control towers (1962-1972), all of which incorporated concrete construction.<sup>124</sup>

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<sup>115</sup> Wiseman, *I.M. Pei*, 49–50.

<sup>116</sup> Wiseman, *I.M. Pei*, 62.

<sup>117</sup> Slavicek, *I.M. Pei*, 48; Wiseman, *I.M. Pei*, 62; I.M. Pei & Associates became I.M. Pei & Partners in 1966 and later Pei Cobb Freed & Partners in 1989.

<sup>118</sup> Goldberger, "I. M. Pei, Master Architect Whose Buildings Dazzled the World, Dies at 102."

<sup>119</sup> Goldberger, "I.M. Pei, Master Architect Whose Buildings Dazzled the World, Dies at 102."

<sup>120</sup> Slavicek and Pei, *I.M. Pei*, 50.

<sup>121</sup> "Celebrated Architect I.M. Pei Is Dead at 102," *Fortune*, accessed September 4, 2019, <https://fortune.com/2019/05/16/architect-i-m-pe-dead-at-102/>.

<sup>122</sup> Paul Goldberger, "Winning Ways of I. M. Pei," *New York Times*, May 20, 1979, sec. SM.

<sup>123</sup> Goldberger, "I.M. Pei, Master Architect Whose Buildings Dazzled the World, Dies at 102."

<sup>124</sup> Wiseman, *I.M. Pei*, 73, 93, 94, 120.



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With his adherence to simple, geometric forms and consistent use of concrete, stone, glass, and steel, Pei has been considered a disciple of modernist architect Walter Gropius. Pei, however, developed his own unique interpretation of modernism throughout the 1960s and 1970s in his experimentation with sculptural concrete forms. His work continued to evoke straightforward, geometric forms throughout his career, which became another trademark of his designs. Goldberger described Pei as a “committed modernist” and described his take on modernism as “clean, reserved, sharp-edged and unapologetic in its use of simple geometries and its aspirations to monumentality.”<sup>125</sup> Pei developed a reputation for his use of concrete.<sup>126</sup> Many of his buildings from the 1960s and 1970s display monumental slab-like forms and raw concrete surfaces. Numerous examples feature the signature bush-hammered concrete detailing found on the CDA Control Tower, including the Newhouse School of Public Communications at Syracuse University (1964), Everson Museum of Art (completed in 1968), sculpture wing of the Des Moines Art Center (1968), National Center for Atmospheric Research in Boulder, Colorado (1964), and Herbert Johnson Museum at Cornell University (1973).

Over a six-decade career Pei continued to combine his signature use of geometric forms with seamless functional design features, and in doing so became recognized for commissions that “helped reshape cities around the world through the second half of the [twentieth] century.” His best known works include the East Building addition to the National Gallery of Art (1978) and the glass pyramid addition to the Louvre Museum (1989).<sup>127</sup> Pei, who became a citizen of the United States in 1954 and died in 2019, is recognized as an American icon and “one of the most revered architects in the world.”<sup>128</sup> He was a fellow of the AIA and Corporate Member of the Royal Institute of British Architects. He was also elected to the American Academy of Arts and Sciences, American Academy and Institute of Arts, and Letters National Academy of Design.<sup>129</sup> Throughout his career he received numerous architectural awards and professional honors both in the U.S. and abroad. In 1983 he was awarded the Pritzker Prize, which is often referred to as the Nobel Prize of architecture. In its citation the jury wrote that, “Pei has given this century some of its most beautiful interior spaces and exterior forms...His versatility and skill in the use of materials approach the level of poetry.”<sup>130</sup>

The sculptural simplicity of the CDA Control Tower clearly expresses Pei’s adherence to simple, geometric forms steeped in practicality. Key components of his design incorporated the strict, functional requirements of each space while still maintaining a commitment to aesthetics; as Pei himself described at the opening of the FAA tower in Lawton, Oklahoma, “I hope we have proved that beauty and efficiency

<sup>125</sup> Goldberger, “I. M. Pei, Master Architect Whose Buildings Dazzled the World, Dies at 102.”

<sup>126</sup> Scott Willis, “Everson Museum Architect I.M. Pei Remembered as Visionary, Bold,” accessed August 20, 2019, <https://www.waer.org/post/everson-museum-architect-im-pe-remembered-visionary-bold>.

<sup>127</sup> David Dudley, “How I. M. Pei Shaped the Modern City,” *City Lab Design*, May 17, 2019, <https://www.citylab.com/design/2019/05/im-pe-dead-102-architect-history-cities-louvre-dallas/589672/>.

<sup>128</sup> “Notable Naturalized Citizen: I.M. Pei,” *Project Citizenship*, April 2, 2018, <https://projectcitizenship.org/4062-2/>; Goldberger, “I.M. Pei, Master Architect Whose Buildings Dazzled the World, Dies at 102.”

<sup>129</sup> Pei Cobb Freed & Partners, “I.M. Pei FAIA, RIBA,” *Pei Cobb Freed & Partners, About*, n.d., <https://www.pcf-p.com/about/i-m-pe/>.

<sup>130</sup> “I. M. Pei Jury Citation for the Pritzker Architecture Prize.”

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are not incompatible.”<sup>131</sup> The design of the FAA towers highlighted important elements, like the tower shaft and cab, while keeping mechanical and electrical equipment underground. As Pei explained, “Everybody can see the important part...It becomes powerful because it is so simple.”<sup>132</sup> In an article describing Pei’s lasting imprint on the agency, FAA historian Terry Kraus argued that Pei’s tower prototypes were “simple but graceful air traffic control towers” that “combined form with function, creating a modern workspace for FAA employees while at the same time enhancing airport aesthetics.”<sup>133</sup>

#### (2) James Ingo Freed

James Ingo Freed was born in Essen, Germany, in 1930 to a German-Jewish family and immigrated to the United States in 1939 to escape the Nazi regime, eventually settling in Chicago. He attended the Illinois Institute of Technology (IIT) School of Architecture, where he studied under Ludwig Mies van der Rohe (commonly referred to as Mies), and in 1953 graduated with a bachelor’s degree in architecture. Before joining I.M. Pei & Associates in 1956, Freed worked at the office of Mies in New York on the Seagram Building. This structure was a design collaboration between Mies and Philip Johnson, both of whom became recognized as highly influential contributors to modern architecture in cities across the United States.<sup>134</sup> While Freed’s early work reflects Miesian influences, he eventually became dissatisfied with the Miesian modernism that dominated American architecture and developed his own approach to modernism that reflected a greater concern for history and urban context.<sup>135</sup>

Early in his career, as an Associate at I.M. Pei & Associates, Freed built a “well respected portfolio of New York housing and office towers,” including two large-scale urban housing developments in Manhattan, Kips Bay Plaza (1963) and University Plaza (1967), as well as the office tower at 88 Pine Street (1973) that which still serves as the firm’s headquarters.<sup>136</sup> Freed and Pei are credited as lead designers on Kips Bay as well as University Plaza, both of which are characterized by gridded, “waffle-like concrete facades” that are representative of the styles seen in the early, large-scale housing and office building developments the pair had completed while at Webb & Knapp.<sup>137</sup> These early housing projects completed by Pei and Freed reflect the slab-like forms associated with Mies’s skyscrapers, but diverge in their

<sup>131</sup> Rapid City Staff, “Our Tower Architect Believes in Beauty, Efficiency,” *The Lawton Constitution And Morning Press*, April 11, 1965.

<sup>132</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 95.

<sup>133</sup> Glover, “I.M. Pei’s Imprint on the FAA.”

<sup>134</sup> American Institute of Architects, “James Ingo Freed, FAIA, 1930–2005,” *The American Institute of Architects*, December 2005, [http://info.aia.org/aiarchitect/thisweek06/1230/1230obit\\_freed.htm](http://info.aia.org/aiarchitect/thisweek06/1230/1230obit_freed.htm).

<sup>135</sup> Benjamin Forgey, “James Freed and Building Blocks of the Past,” *Washington Post*, April 18, 1993, <https://www.washingtonpost.com/archive/lifestyle/style/1993/04/18/james-freed-and-the-building-blocks-of-the-past/976fd040-4fec-42d0-84ba-83eafe772b8e/>; Joe Holley, “Architect James I. Freed Dies,” *Washington Post*, December 17, 2005, <https://www.washingtonpost.com/archive/local/2005/12/17/architect-james-i-freed-dies/249b5924-3e13-49b1-9d40-7bd63a969f5c/>.

<sup>136</sup> American Institute of Architects, “James Ingo Freed, FAIA, 1930–2005.”

<sup>137</sup> Pei Cobb Freed & Partners, “James Ingo Freed, FAIA,” *Pei Cobb Freed & Partners, About*, accessed August 20, 2019, <https://www.pcf-p.com/about/james-ingo-freed/>; Goldberger, “I.M. Pei, Master Architect Whose Buildings Dazzled the World, Dies at 102.”

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translation of this form with their use of concrete.<sup>138</sup> The 88 Pine Street office tower similarly features a “crisp grid of pristine white cladding framing” surrounding broader windows that alludes to a Miesian influence in the materials and detailing.<sup>139</sup> According to Freed’s obituary published by the *New York Times*, Museum of Modern Art chief curator of architecture and design Terence Riley described 88 Pine Street and University Plaza as “two of the most refined examples of modern design in all of Manhattan.”<sup>140</sup>

Freed is also recognized for his significant contributions to the standardized control tower prototype developed for the FAA by I.M. Pei & Associates.<sup>141</sup> While I. M Pei is typically credited with the design of the prototypes, Freed is believed to have played a lead design role in the development of the prototypes. Freed’s sketchbooks, preserved in the Library of Congress, include multiple preliminary sketches of the towers and base buildings and in *I.M. Pei Complete Works* (2008), he is credited with the sculptural effect of the simplified FAA tower form that contradicts the “tremendous effort” behind this achievement.<sup>142</sup> Since the signature elements of the prototypes are their graceful, sculptural form combined with the functional composition of work space in the easily expandable base building, Freed’s contributions are noteworthy, though they may not be widely recognized for a direct association with him.

By the mid-1970s Freed became part of a group of postmodern architects in Chicago known as “The Chicago Seven.” Beginning in the late 1960s, the postmodern movement evolved as a rejection of the work of Le Corbusier, the Miesian and Wrightian schools, the International style, and the sleek, functional buildings modernism spawned in the postwar period. Postmodern architects returned to the use of ornament (particularly with historical reference) and sought to blur the boundaries between “high” and “low” culture, in some cases drawing upon mass/popular culture, kitsch, and the consumer-oriented architecture of advertising and roadside buildings.<sup>143</sup> As a former student of Mies, it was an unexpected alliance for Freed since the Chicago Seven were known for their critique of what they believed was an overwhelmingly Miesian focus in Chicago’s architecture, including the works of Mies himself as well as his students and imitators. The Chicago Seven is recognized for its efforts to diversify the Miesian modernism that had overtaken the city by advocating for a more inclusive, wider range of architects and styles.<sup>144</sup>

<sup>138</sup> Marcus Whiffen and Frederick Koeper, *American Architecture: 1860-1976* (Cambridge, Mass.: MIT Press, 1983), 421; Vincent Scully, *American Architecture and Urbanism* (San Antonio, Tex.: Trinity University Press, 2013), 186.

<sup>139</sup> “Obituary: James Ingo Freed, Architect,” *The New York Times*, December 19, 2005, sec. World, <https://www.nytimes.com/2005/12/19/world/americas/obituary-james-ingo-freed-architect.html>; Peter Blake, “I.M. Pei & Partners,” *Architecture Plus* 1, no. 1 (February 1973): 58.

<sup>140</sup> “Obituary.”

<sup>141</sup> Pei Cobb Freed & Partners, “James Ingo Freed, FAIA.”

<sup>142</sup> Jodido and Strong, *I.M. Pei: Complete Works*, 345.

<sup>143</sup> Fredric Jameson, “Postmodernism and Consumer Society,” in *Postmodern Debates*, ed. Simon Malpas (London: Macmillan Education UK, 2001), 1–2, doi:10.1057/978-1-137-04505-8\_3.

<sup>144</sup> Blair Kamin, “James Ingo Freed,” *The Chicago Tribune*, December 17, 2005, [https://www.chicagotribune.com/news/ct-xpm-2005-12-17-0512170083-story.html?int=lat\\_digitaladshouse\\_bx-modal\\_acquisition-subscriber\\_ngux\\_display-ad-Interstitial\\_bx-bonus-story\\_\\_\\_\\_\\_](https://www.chicagotribune.com/news/ct-xpm-2005-12-17-0512170083-story.html?int=lat_digitaladshouse_bx-modal_acquisition-subscriber_ngux_display-ad-Interstitial_bx-bonus-story_____).

*James Ingo Freed Video Interview on the Chicago Seven*, 2013, <https://interactive.wttw.com/beeby/chicago-seven>.

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In 1989, reflecting the increasing influence of Freed and Henry Cobb as well as Pei's desire to begin scaling back his work, I.M. Pei & Partners became Pei Cobb Freed & Partners. At Pei Cobb Freed & Partners, Freed worked on major public building and museum commissions across the U.S. He is best known as the lead designer of the United States Holocaust Memorial Museum (1993) in Washington, D.C., for which he received the AIA Honor Award in 1994. Freed was also the designer of other prominent structures, including the airy, glass-enclosed Jacob K. Javits Convention Center (1986) in New York; the United States Air Force Memorial (2006) in Arlington, Virginia, an abstraction of modern, arching steel spires; and the Ronald Reagan Building (1998) in Washington D.C., the second largest United States government building after the Pentagon, a limestone building that combines Neoclassical and modernist design elements that meld into the Neoclassical surrounds of Federal Triangle.<sup>145</sup>

Freed held several teaching positions throughout his career and received numerous awards for his buildings, as well as industry honors. He served as the dean of the IIT School of Architecture from 1975-1978, and also held teaching positions at Cooper Union, Cornell University, the Rhode Island School of Design, Columbia University, and Yale University. Freed was initially recognized for his architectural achievements and contributions, even before some of his most notable projects were completed, when he was elected to the College of Fellows of the AIA in 1977. Later in his career he was awarded the Arnold W. Brunner Memorial Prize in Architecture from the American Academy and Institute of Arts and Letters in 1987, the AIA Honor Award in 1988, the AIA Thomas Jefferson Award for Public Architecture in 1992, a Presidential Citation for Lifetime Achievement in 1998, and the National Medal of Arts in 1995, the highest honor awarded to artists by the U.S. government.<sup>146</sup>

Freed, like his partners, is known for taking a "singular approach" to each commission and adapting his style to each building he was involved in designing.<sup>147</sup> However, with this tailored design approach, there is little uniformity in terms of a "typical" style when compared to Pei's work, as each of Freed's buildings is described as responding "singularly and uniquely to its calling, its site, and its surround, creating a diverse portfolio of architectural beauty and utility."<sup>148</sup> His early work was primarily focused on office buildings and high-rise housing projects that reflected "a modernism based in functionalism and minimalism," and in later years he exhibited a "quiet yet powerful design strength," which came to be known as a signature in his designs for public buildings.<sup>149</sup> His design for the Jacob K. Javits Convention Center embodied a luminous, glass, enclosed exhibition hall supported by an "intricate framework" of steel that architectural critic Paul Goldberger described as a "wonderful contradiction," and reminiscent of "an airplane hangar in

<sup>145</sup> American Institute of Architects, "James Ingo Freed, FAIA, 1930–2005"; "RRB Building History," *U.S. General Services Administration*, accessed August 30, 2019, <https://www.gsa.gov/real-estate/gsa-properties/visiting-public-buildings/ronald-reagan-building-and-international-trade-center/whats-inside/rrb-building-history>.

<sup>146</sup> "James Ingo Freed (1930–2005)," *United States Holocaust Memorial Museum*, accessed August 30, 2019, <https://www.ushmm.org/information/press/in-memoriam/james-ingo-freed-1930-2005>.

<sup>147</sup> "Obituary."

<sup>148</sup> American Institute of Architects, "James Ingo Freed, FAIA, 1930–2005."

<sup>149</sup> "The Architecture of Death: To Design the U.S. Holocaust Museum, James Freed Had to Challenge the Values That Had Guided His Work--and Confront Old Horrors," *Los Angeles Times*, April 18, 1993, <https://www.latimes.com/archives/la-xpm-1993-04-18-tm-24163-story.html>; American Institute of Architects, "James Ingo Freed, FAIA, 1930–2005."



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which one felt moved to hear chamber music.”<sup>150</sup> Freed’s “ethereal” design for the Air Force Memorial in Arlington, Virginia, (2006) featured a trio of asymmetrical, arcing, stainless steel spires to mimic the contrails of Air Force jets diverging from each other in a “bomb burst” maneuver.<sup>151</sup> Freed had yet another vastly different approach in his design for the Washington, D.C., Holocaust Memorial Museum (1993), which has been identified as his “breakthrough” building.<sup>152</sup> He immersed himself in a massive research effort that included multiple visits to remnants of concentration camps to evoke the darkness, brutality, and aftermath of the Holocaust in his design. Freed combines a Neoclassical limestone and brick exterior with a “factory-like” interior that incorporated features seen in concentration camps. The resulting design has been described as “an implicit criticism of modernism, of the industrial culture and technology that drove modernism and helped make the Holocaust possible.”<sup>153</sup>

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<sup>150</sup> “Obituary.”

<sup>151</sup> Pei Cobb Freed & Partners, “James Ingo Freed, FAIA”; “Obituary”; American Institute of Architects, “James Ingo Freed, FAIA, 1930–2005.”

<sup>152</sup> American Institute of Architects, “James Ingo Freed, FAIA, 1930–2005.”

<sup>153</sup> “THE ARCHITECTURE OF DEATH.”

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### A. Significance

The CDA Control Tower was evaluated for National Register of Historic Places (National Register) eligibility under *Criteria A, B, C, and D*. Evaluation under each of the National Register Criteria and discussion of period and level of significance and historic integrity is provided below.

#### (1) Criterion A

Under *Criterion A*, "Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history."

The CDA Control Tower at O'Hare represents an important effort on the part of the FAA to standardize air traffic control tower designs. It is a highly visible structure that was crucial to the advancement of the FAA's program of promoting a sense of safety and strength through the uniformity and beauty of its control towers. While the subject tower was not the first of the towers constructed (the prototype in El Paso was completed in 1967), it is the tallest and is located in a prominent location at one of the busiest airports in the country that allows it to physically represent and communicate the FAA's agenda to the largest possible audience.<sup>154</sup> Of the six other extant towers that incorporate the original design including the subgrade base building, two are located on military bases and not accessible to the public, and only one of the remaining four, at the Sacramento airport (SAC) is visible from a roadway as travelers approach the airport. The remaining three are sited in areas away from easy public view. In comparison, the CDA Control Tower at O'Hare occupies the center of the terminal core area, adjacent to the primary roadway. Construction of subsequent adjacent improvements, such as the elevated ATS tracks and Hilton Hotel, has not substantially compromised the view of the tower shaft and cab from the upper or lower roadway loops and the tower is visible to practically anyone arriving at or departing from the airport. This makes it one of the examples best able to serve as what FAA Administrator Najeeb Halaby described "a symbol of strength, beauty, and safety."<sup>155</sup> Its monolithic stature within this highly visible location, coupled with its notable height, make it an especially prominent symbol of federal involvement in civilian air traffic control and aviation. As such, the CDA Control Tower possesses significance under *Criterion A* in the area of Transportation.

#### (2) Criterion B

Under *Criterion B*, "Properties may be eligible for the National Register if they are associated with the lives of persons significant in our past."

The CDA Control Tower is not associated with any persons of historical significance outside of its architects, engineers, and designers, who are addressed under *Criterion C*. As such, it is recommended not eligible for listing in the National Register under *Criterion B*.

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<sup>154</sup> El Paso's tower is located in a cargo area far from the terminal, Houston's is off to one side of the terminal complex and not necessarily seen by those entering the airport, and the Great Falls tower is a smaller example located between a hangar area and an economy parking lot.

<sup>155</sup> "A Better View at Airports," 159.

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#### (3) *Criterion C*

Under *Criterion C*, “Properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.”

Although the CDA Control Tower is undisputedly the design product of master architects I.M. Pei and James Ingo Freed, it is not recognized as among their best work. Both architects designed nationally or internationally renowned works such as the Mesa Laboratory and the Louvre (Pei), and the United States Holocaust Museum (Freed). Within the context of Pei and Freed’s larger bodies of work, the tower does not express an important phase in their careers or an important aspect of their bodies of work. As such, the CDA Control Tower does not possess significance under *Criterion C* as the work of a master.

The CDA Control Tower presents a limited reflection of the modernist characteristics favored by Pei & Associates in its stark simplicity and use of raw concrete, particularly the bush-hammered finish. Nevertheless, while the structure is an example of “good design” as applied to a utilitarian building, it does not clearly represent an architectural style. The function-driven design of the prefabricated cab represents the sole visible fenestration, and the proportions of the shaft do not, on their own, embody any particular architectural style. The standardized design developed for the FAA was intended to be built economically and in a modular fashion, using prefabricated components (in the case of the cab). The CDA Control Tower therefore does not possess significance under *Criterion C* for high artistic value.

The CDA Control Tower embodies the significant characteristics of the FAA standard control tower design deployed in the late 1960s and represents this distinctive property type. The standard design arose from the FAA’s desire to replace older control towers with technologically advanced, aesthetically pleasing structures that met both the increased technical demands of jet age aviation and the new architectural expectations for federal agencies. Following the 1959 Public Buildings Act, the Kennedy administration placed a strong emphasis on design and construction of federal buildings through the 1962 “Guiding Principles for Federal Architecture.”<sup>156</sup> Developed shortly thereafter, Pei and Freed’s standardized control tower design is part of this larger trend and is the FAA’s manifestation of these Kennedy-era initiatives aimed at improving the overall quality and appearance of federal buildings. The CDA Control Tower clearly conveys the character-defining elements of Pei and Freed’s new concept for air traffic control towers. It represents a departure from earlier pre-standardization models in its slender, graceful form, extreme height, and interior layout with all but the necessary functions relocated from the upper levels to the base. The design itself is representative of the Kennedy-era policy encouraging the use of modern designs that “embody the finest contemporary American architectural thought.”<sup>157</sup> Although it is one of multiple examples of a standard design, the CDA Control Tower is one of the clearer expressions of Pei and Freed’s initial vision. While at least 18 examples of the standard design remain standing, only seven were constructed using Pei and Freed’s original design with the sub-grade base building; the remainder were constructed to a revised, cost-saving design with an above-ground base building.<sup>158</sup> The CDA

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<sup>156</sup> Center for Historic Buildings, *Growth, Efficiency, and Modernism*, 3.

<sup>157</sup> Center for Historic Buildings, *Growth, Efficiency, and Modernism*, 6.

<sup>158</sup> “A Better View at Airports,” 160.

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Control Tower is one of these seven known examples of the original design and appears to be unique among even these seven as a special adaptation of the modular system using a taller shaft to provide a tower that measures almost 200 feet tall overall—nearly 50 feet taller than the largest of the five standard sizes—and was reportedly the tallest control tower in the country at the time of its construction.<sup>159</sup> The CDA Control Tower is therefore recommended to possess significance under *Criterion C* as an important example of the standardized control tower design developed for the FAA.

#### (4) *Criterion D*

Under *Criterion D*, “Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history.”

The design, construction, and alterations of the CDA Control Tower have been well documented, and it is unlikely that the building has potential to yield important information that is not otherwise accessible. As such, it is recommended not eligible for listing in the National Register under *Criterion D*.

#### (5) *Period of significance*

The period of significance was determined to coincide with the years of construction (1966-70) and extend to when the tower became operational (1971), giving it a period of significance of 1966 to 1971.

#### (6) *Level of significance*

The CDA Control Tower was evaluated for significance at the national level, both for association with the influence of federal authority on civilian aviation in the 1960s and 1970s, and as an unusually tall example of the distinctive group of control towers designed by I.M. Pei & Associates and installed at airports nationwide.

### B. Integrity

To be eligible for inclusion in the National Register, a property must exhibit sufficient historic integrity to convey its significance, in addition to being associated with one or more of the National Register Criteria listed above. The CDA Control Tower was evaluated based on the seven aspects of integrity below: location, design, setting, materials, workmanship, feeling, and association. The evaluation of integrity for the tower according to each aspect is detailed below.

- **Location** – The tower remains in its original location and therefore retains integrity of location.
- **Design** – The tower retains the character-defining design features representing its modular, standardized design, including the sub-grade base building; flared, tapered concrete shaft with bush-hammered finish; and pentagonal prefabricated cab. The enclosure of the atrium diminishes the integrity of the depressed open court providing access to the base building but does not compromise the overall integrity of the tower itself. The tower therefore retains sufficient integrity of design.

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<sup>159</sup> Zekman, “New O’Hare Field ‘Aerie’ to Aid Jet-Age ‘Eagles,’” S12.



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- **Setting** – The setting adjacent to the tower has historically contained a number of airport buildings and facilities. The setting has been altered since the period of significance with the construction of the O'Hare International Tower Hotel (renamed the O'Hare Hilton Hotel in 1974), which was part of the same planned developmental program as the tower. However, this change does not substantially detract from the tower's ability to convey its historic significance. The tower maintains its position within the terminal core and the layout of the airport access drive. Additional changes to the setting include the addition of the elevated Airport Transit System (ATS) above the base building and construction of the covered atrium; however, these do not significantly diminish the setting of the tower. Overall the tower retains sufficient integrity of setting.
- **Materials** – The tower retains its integrity of materials, including the glass-walled cab, bush-hammered concrete shaft exterior, and concrete structural system of the base building; while portions of the base have been renovated, the shaft has not been altered. Important interior finishes, such as the concrete walls of the tower shaft, were historically utilitarian and are generally retained. The enclosure of the open court resulted in the introduction of interior finishes in a previously exterior space but does not compromise the overall integrity of the tower itself. The tower therefore retains sufficient integrity of materials.
- **Workmanship** – The tower retains its integrity of workmanship, particularly in the bush-hammered concrete detail of the tower exterior.
- **Feeling** – The tower retains integrity of feeling through its continued use by the City of Chicago to monitor airport operations and retains the character-defining 360-degree view of the airport.
- **Association** – The tower continues to convey its historic association with aviation and air traffic control. It retains its airport location and continues to function as a control tower, albeit for ground traffic rather than airborne traffic; therefore, it retains good integrity of association.

The CDA Control Tower retains sufficient historic integrity in each of its seven aspects, although the enclosure of the atrium and construction of the ATS after its period of significance has somewhat diminished integrity of setting, materials, and design. Despite several changes over time, the CDA Control Tower has not undergone substantial alterations that would affect its eligibility for listing in the National Register under the eligibility criteria for which it was found to be significant.

### C. Eligibility

The CDA Control Tower displays significance under *Criterion A* in the area of Transportation and *Criterion C* in the area of Architecture and retains sufficient integrity to convey both of these areas of significance. Therefore, the CDA Control Tower is recommended eligible for listing in the National Register.

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## **G-2.5. Terminal 2**



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

Chicago Airports District Office  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

November 4, 2019

Mr. Anthony Rubano  
Acting Cultural Resources Coordinator  
State Historic Preservation Office  
IDNR – One Natural Resources Way  
Springfield, IL 62702-1271

Mr. Rubano:

Enclosed you will find a copy of a document entitled, *Determination of Eligibility: Terminal 2, Chicago O'Hare International Airport*. We request that you review the Federal Aviation Administration document to determine if you concur that Terminal 2, including Concourses E&F, is not eligible for listing on the National Register of Historic Places.

If you have any questions, please feel free to call me at (847) 294-7354.

Sincerely,

A handwritten signature in black ink that reads "Amy B. Hanson".

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration

Cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation





## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271

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Cook County  
Chicago

National Register Eligibility, Terminal 2 and Concourses E & F at O'Hare International Airport  
10000 W. O'Hare Ave.  
SHPO Log #014120219

December 18, 2019

Amy Hanson  
U.S. Department of Transportation  
Federal Aviation Administration  
Chicago Airports District Office  
2300 E. Devon Ave., Suite 201  
Des Plaines, IL 60018

Dear Ms. Hanson:

We have reviewed the information you have provided concerning the referenced project.

We concur with our finding that these structures lack sufficient significance for listing on the National Register of Historic Places.

This letter does not constitute a State Historic Preservation "Sign-off" on the project for the purposes of Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any further questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman  
Deputy State Historic  
Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation  
Jamie Rhee, Commissioner, Chicago Department of Aviation

# **Determination of Eligibility: Terminal 2**

## **Chicago O'Hare International Airport**

Prepared for the  
**Federal Aviation Administration**

Prepared by



[www.meadhunt.com](http://www.meadhunt.com)

November 2019

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## Executive Summary

The historical evaluation of Terminal 2 at O'Hare International Airport (O'Hare, or "the airport") supports Federal Aviation Administration (FAA) requirements for compliance with the National Environmental Policy Act (NEPA) and Section 106 regulations issued pursuant to the National Historic Preservation Act (NHPA), as amended (36 CFR Part 800). As part of its review of the City of Chicago's proposed Airport Layout Plan (ALP) modification, FAA is conducting a NEPA process for the proposed Terminal Area Plan (TAP) and other ALP modifications. In April 2019 FAA engaged Mead & Hunt, Inc. (Mead & Hunt), through a third-party contract, to complete a National Register of Historic Places (National Register) evaluation of Terminal 2.

Terminal 2 consists of a main terminal building and Concourse E & F that projects from the main terminal building. Designed by Naess & Murphy and completed in 1962, the main terminal building is Miesian in its original character, with its exterior dominated by tinted glass and aluminum curtain walls. A curtain wall addition was constructed on the northern facade in 2006. Concourse E & F (also completed in 1962) share similar exterior design cues. Terminal 2 exhibits modifications carried out at various times that include several additions to its original plan, as well as changes to some exterior and interior finishes.

Terminal 2 was evaluated for National Register eligibility under *Criterion A: History*, *Criterion B: Significant Person(s)*, *Criterion C: Architecture*, or *Criterion D: Information Potential*. Terminal 2 possesses significance under *Criterion A* in the area of Transportation as it exemplifies the 1961-63 expansion of O'Hare to serve an important transportation need. Terminal 2 also possesses significance under *Criterion C* for airport design of this period as it embodies significant characteristics of an airport terminal of the "jet" age, which heralded the introduction of jet-engine-powered aircraft into commercial transportation in the late 1950s, and represents this distinctive property type. However, it does not retain sufficient integrity with relation to design, materials, workmanship, or feeling to convey National Register significance. Therefore, Terminal 2 is recommended not eligible for listing in the National Register.

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## 1. Description

### A. Overall setting and context

Located in northeastern Illinois, Chicago O'Hare International Airport (ORD, also referred to as "O'Hare" or "the airport") occupies an approximately 8,200-acre site that straddles the Cook/DuPage County line to include areas within the city limits of Chicago, Des Plaines, Schiller Park, and Rosemont. The airport is sited approximately 17 miles northwest of Chicago's Central Business District and a variety of light industrial, commercial, residential, and public land uses surround the airport property. The airport itself consists of a central group of terminals (Terminals 1, 2, 3, and 5) encircled by taxiways and surrounded by runways (see Figure 1). Cargo facilities are located at southeast, southwest, and northeast portions of the airport. The general aviation facility is in the northeast corner of the airport, and fuel storage facilities are located at the northwest corner. Public surface parking areas are located along the central and northeast portions of the airport. The Federal Aviation Administration (FAA) North Control Tower is located in the northwest corner of the property, while the FAA South Control Tower is located in the cargo facilities area on the southwest side of the airport. Other support facilities in the areas on the south, northwest, and northeast portions of the property include those for airline support and maintenance, aircraft rescue and firefighting, a post office, and Transportation Security Administration (TSA).

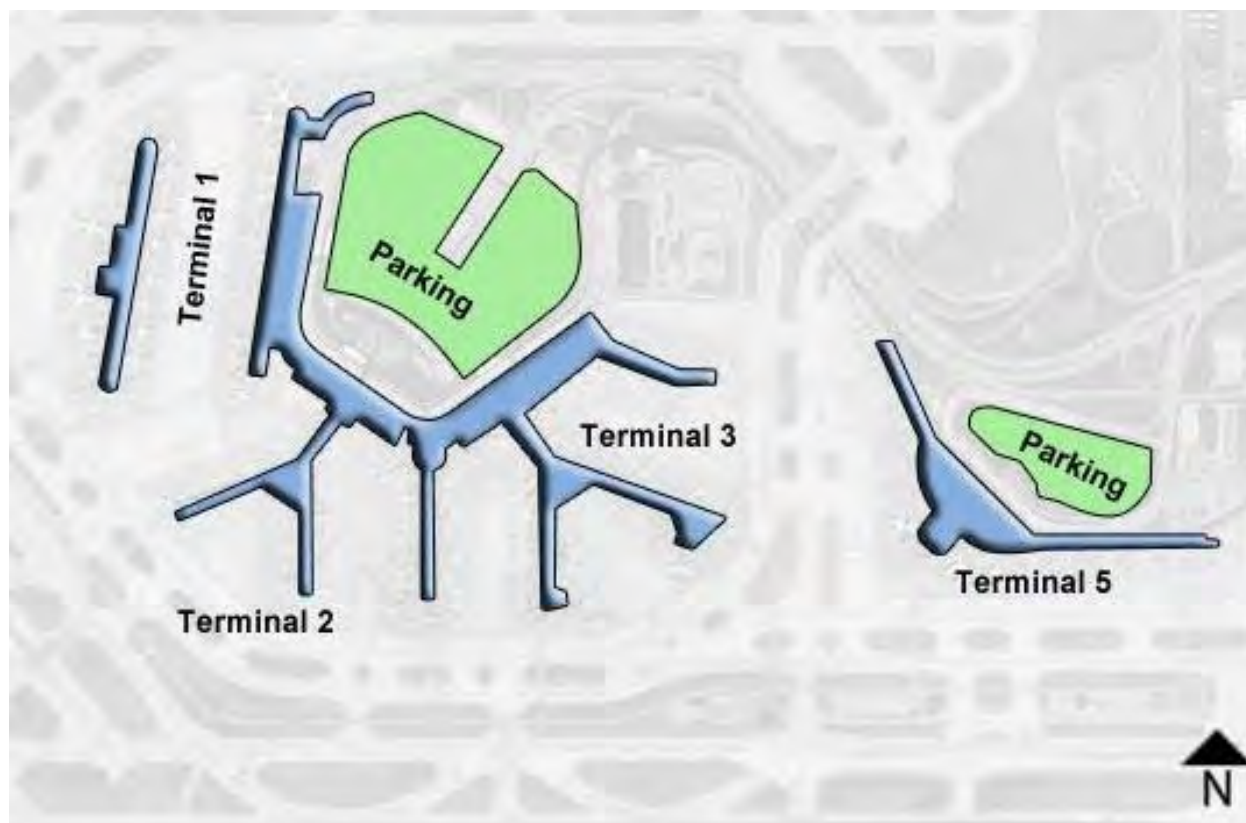


Figure 1. Map of terminals and parking areas at O'Hare.<sup>1</sup>

<sup>1</sup> "Chicago Ohare (ORD) Airport Terminal Map," *IFly.Com*, accessed June 5, 2019, <https://www.ifly.com/chicago-ohare-international-airport/terminal-map>.

At the center of the property, Terminals 1, 2, and 3 form the Terminal Core Area, arranged in a U-shaped plan that opens to the northeast. The interior of the U is occupied by two large parking lots, bisected by a central roadway that provides access to the Elevated Parking Building. Terminal 1 forms the west side of the U-plan. The O'Hare Hilton Hotel is located between the Elevated Parking Building and Terminal 2 (the base of the U), and the City of Chicago Department of Aviation (CDA) control tower (formerly an FAA control tower) is centered on a grassy plaza that separates the hotel from Terminal 2. The Rotunda is located at the juncture of Terminal 2, Terminal 3, and Concourse G. Glass-enclosed concourse-level walkways link the Rotunda to Terminals 2 and 3. Immediately adjacent to the north perimeter wall of the circular Rotunda is a three-story FAA office building, which was designed to match the curve of the building but does not touch the building, and the 1995 FAA Main Control Tower. Concourse G is attached to the southern perimeter of the Rotunda and connects directly into the Rotunda (unlike Terminal 2 and 3). The southern exterior of the Rotunda faces airside taxiways, airline gates, and aircraft service area.

The outside of the U formed by Terminals 1 to 3 is occupied by a total of 168 contact gates and 15 remote hardstands.<sup>2</sup> Terminals 2 and 3 have concourses that extend onto the aprons in a perpendicular or Y shape, while Terminal 1 has a concourse (Concourse B) with gates along the west side of the main terminal building and a separate, parallel concourse (Concourse C) accessed via an underground tunnel.

Interstate Highway 190 (I-190) and the Chicago Transit Authority (CTA) O'Hare Rapid Transit Blue Line Rail Service enter the airport from the east. The Blue Line follows the central roadway to the parking area, where the O'Hare CTA Station is located below ground. The Airport Transit System (ATS, or "people mover") links the three domestic terminals, the international terminal, and the long-term parking area to the northeast by rail; the ATS is accessible via a transfer station from the Metra commuter rail service. Within the Terminal Core Area, the ATS tracks and a two-level vehicular circulation roadway separate the parking lot, garage, hotel, and CDA control tower from the terminals. The upper roadway level provides access to the ticketing area for departing passengers while the lower level provides access to the baggage claim and transportation for arriving passengers. ATS stations are located opposite each of the three terminals (as well as at Terminal 5) and are linked via covered pedestrian walkways across the roadway.

## **B. Overview of Terminal 2**

Terminal 2 is located at the southwestern end of the Terminal Core, which consists of Terminal 1, Terminal 2, and Terminal 3 and their associated concourses arranged around the pentagon-shaped looping roadway. Terminal 2 faces landside to the north, and is connected to the Rotunda at the east and Terminal 1 to the west.

Terminal 2 consists of a main terminal building and Concourse E & F that projects to the southwest (see Figure 2 and Figure 3).<sup>3</sup> Designed by Naess & Murphy and completed in 1962, the main terminal building is Miesian in its original character, with its exterior dominated by tinted glass and aluminum curtain walls. Both the main terminal building and associated Concourse E & F exhibit modifications carried out at

<sup>2</sup> Aircraft parked at remote hardstand positions are accessed via shuttle bus rather than jet bridge.

<sup>3</sup> Terminal 2 is comprised of CDA Building numbers 200 (main terminal building), 205 (Concourse E & F stem and apex), 210 (Concourse E branch), and 215 (Concourse F branch).

various times that include several additions to their original plan, as well as changes to some exterior and interior finishes. Terminal 2 currently houses the operations of Delta Airlines and its subsidiary airlines, as well as Air Canada, Alaska Airlines, and some operations of United Airlines.



Figure 2. Location of main Terminal 2 building and Concourse E & F.





*Figure 3. Overview of Terminal 2 from the CDA control tower, with the main terminal building at bottom, and the Y-shaped Concourse E & F at top.*

The main terminal building and Concourse E & F were designed in tandem and completed in 1962. The main terminal building consists of ticketing and baggage claim areas, a secure concourse, back-of-the-house services related to baggage handling, and various spaces for administrative use by the airlines. The main terminal building consists of three floors, including a lower (apron) level, a first (concourse) level, and a second (mezzanine) level, as well as a basement (tunnel) level below grade. A mechanical penthouse projects above the roofline along the central east-west spine of the building. The north (landside) elevation of the main terminal building fronts the roadway and includes ticketing and baggage areas. The south (airside) elevation of the main terminal building includes airline contact gates and associated jet bridges, with the connection to Concourse E & F, and airside ramp space for aircraft parking.

Concourse E & F projects southwest from the main terminal building, with contact gates lining most elevations, and taxi lanes located between the concourse and neighboring Concourse C at Terminal 1 and Concourse G. Similar to other concourses at O'Hare, the functional elements and spaces in Concourse E & F include a main circulation spine at the first (concourse) level flanked by concession areas, hold rooms, contact gates, service areas, and preferred customer lounges. The apron and tunnel levels of the concourse are primarily utilitarian and provide back-of-the-house support spaces and airline administrative offices. The concourse has been modified over time but retains its general design and form from its original construction.

## C. Main terminal building

### (1) Overview

The main terminal building consists of the ticketing and baggage claim areas, TSA security screening, a secure concourse with concessions, administrative offices, and back-of-the house support. The apron level houses the baggage claim area, baggage handling area, and offices operated by individual airlines. The concourse level consists of ticketing, TSA security screening, and some administrative offices, with additional offices at the mezzanine level. The basement (tunnel) level holds mechanical equipment, janitorial and other offices, as well as a branch of O'Hare's utility tunnel system.<sup>4</sup>

The rectilinear building has a flat roof with mechanical penthouse that projects above the roofline (see Figure 4). The original dimensions of the main terminal building were approximately 750 feet in length and 140 feet in width prior to any additions. The ticketing and baggage areas are aligned with the stacked, double roadway system that loops around the Terminal Core, with the ticketing area located on the roadway's upper "departure" level and the baggage claim located on the apron "arrivals" level. An elevated pedestrian bridge, completed in 1992, provides access from the main terminal building to the parking garage and ATS (or "people mover") located opposite the roadway.<sup>5</sup>

A 1984 addition to the south elevation was constructed to increase interior space and accommodate enlarged security screening areas, and is located at the connection between the main terminal building and Concourse E & F. Later alterations in 2006 introduced a new curtain wall to the north elevation of the main terminal building (see Figure 5 and Figure 6) as part of a larger facade enhancement project known as the Facade and Circulation Enhancements (FACE) renovation project, which also introduced a canopy extending across the roadway-facing elevations of all three terminal buildings at the Terminal Core. These 2006 alterations also expanded the interior space of the ticketing and baggage areas. Taken together, all additions have enlarged the main terminal building's width by approximately 35 feet from its original plan. Currently, the main terminal building is approximately 750 feet long and varies from approximately 140 feet (the original plan width) to approximately 175 feet wide.

<sup>4</sup> The utility tunnel refers to the utility tunnel that distributes and returns various resources from the Heating & Refrigeration Plant through the airport terminals and concourses, including lines for hot water, chilled water, domestic water, and fire protection.

<sup>5</sup> Carol Ross Barney Architects, Inc., "Plans for the Automated Guideway Transit System Central Core Stations," June 1964, Available in the Chicago Department of Aviation files, Chicago.



*Figure 4. North (landside) elevation of the main terminal building from the roof of the main parking garage, view facing south showing new curtain wall facade*



*Figure 5. East and north elevations of the main terminal building, view facing west with elevated corridor to the FAA building at left. This image shows the original curtain wall at both elevations.*





*Figure 6. North and west elevations of the main terminal building at center, view facing southeast, with original west elevation curtain wall visible at center, and new curtain wall addition at north elevation visible at left. Passageway to Terminal 1 visible at right.*

The concourse level interior is defined by double-height public spaces within both the secure and non-secure areas. Two, two-story blocks of administrative offices span the east-west central spine of the building at the concourse and mezzanine levels, and separate the non-secure ticketing area along the northern end of the building from the secure concourse area along the southern end of the building (see Figure 7). TSA security screening areas and secure exits are located within the intervening spaces, providing access points to the secure area of the terminal. Elevated pedestrian passageways link Terminal 2 to the Rotunda, the FAA building at its eastern end, and Terminal 1 at its western end.



*Figure 7. Interior of the ticketing area of the main terminal building with the end of an administrative office block at the concourse and mezzanine levels visible at left.*

## (2) Exterior

The exterior of the main terminal building is a union of the original Miesian design and materials and contemporary elements added to the building over time. An addition to the south elevation in 1984 and an addition to the north elevation in 2006 introduced more contemporary design elements and materials to the building's exterior.

The north elevation mainly consists of a curtain-wall addition (north elevation addition) constructed in 2006, as part of the FACE renovation project, located along the upper and lower roadway levels, and expands the building's original footprint approximately 15 feet (see Figure 8). The north elevation addition was designed by JAHN—the successor to Murphy/Jahn—and is contemporary in its design and construction, consisting of a curtain wall system with glass panels at butt joints secured by clips and a steel cable primary structure, with side elevations of the addition consisting of glass panels secured to a vertical steel reinforcement structure. The design is integrated into the structure of the canopy that extends across the curbside elevations of the Terminal Core buildings. The canopy was also designed by JAHN and completed in 2006 as part of the FACE renovation project, and is an uneven-V fin shape with slotted glass skylights. The canopy sits upon large, round, metal columns spaced every 30 feet. It serves as a roof for the north elevation addition and shelters the sidewalk and nearest lane of traffic (see Figure 9).





*Figure 8. North (landside) elevation of the main terminal building showing the original exterior composition at far left and the contemporary curtain wall addition at center and right, view facing southwest.*



*Figure 9. Contemporary canopy that spans the Terminal Core at curbside, with original north elevation visible at far left, and curtain wall addition visible at center, view facing west.*

The north elevation addition features a series of entry vestibules and curbside check-in/baggage collection rooms (see Figure 10). The entry vestibules at both levels consist of double-door, bi-parting, aluminum, automatic entry systems. Some of the entry vestibules are wider, consisting of two adjacent automatic entry doors rather than one (see Figure 11). Both the entry vestibules and curbside check-in/baggage collection rooms are rectangular rooms delineated by open metal framing. These rooms are clad in glass panels facing the interior ticketing area, and have operable partition doors and are fitted with vertical bi-fold metal doors for enclosing and securing the space facing the sidewalk (see Figure 12). At the concourse level, the sidewalk extends to the entrance edges of the vestibules and curbside check-in rooms. Between these entrances are open area wells down to the apron level, which is bordered at the concourse level by a guardrail system with horizontal cables passing through thin aluminum fins (see Figure 13).



*Figure 10. Entry vestibule (center) and closed curbside check-in/baggage collection room (far left) at first-floor curbside at north elevation of the main terminal building.*

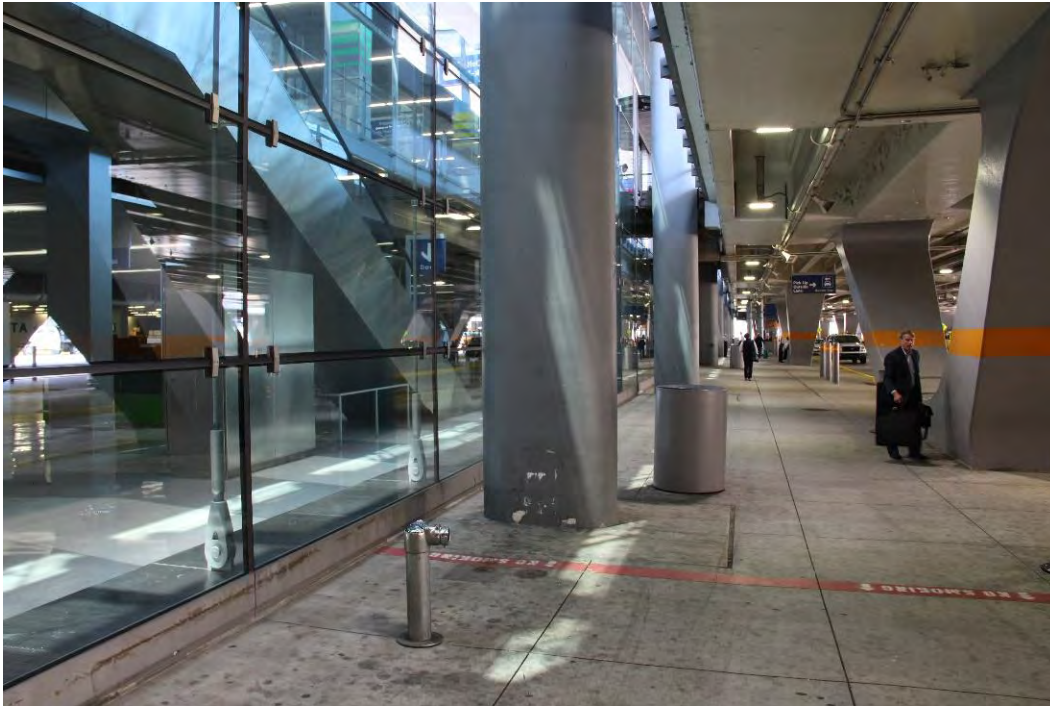




*Figure 11. Entry vestibule with two sets of doors at the apron-level curbside at the north elevation of the main terminal building.*



*Figure 12. Check-in/baggage collection room at first-floor curbside at the north elevation of the main terminal building.*



*Figure 13. Apron level at the north elevation of the main terminal building, showing the open well between the entry vestibules and columns supporting the canopy.*

The elevated enclosed pedestrian bridge is located near the center of the north elevation and consists of a Warren truss with vertical supports atop two exposed I-beams (see Figure 14). The bridge is clad in laminated glass with a striped acid-etch pattern like that found in Terminal 1. At the end nearest the main terminal building, the bridge rests on steel supports that exhibit lateral steel bracing in the form of I-beams with round punched holes (see Figure 15). A glass-enclosed penthouse adjacent to the bridge projects above the canopy, which provides a sheltered landing for the stairs and elevator that lead to the bridge.





*Figure 14. Elevated bridge from main terminal building to the ATS.*



*Figure 15. Steel supports at the elevated bridge from the main terminal building to the ATS.*

The original exterior composition of the building was dominated by a series of tinted plate glass windows separated by vertical I-beam mullions. The east, west, and the majority of the south elevations of the main terminal building maintain this original exterior composition, which is also visible adjacent to the 2006 contemporary curtain wall addition at the north elevation and the 1984 addition at the south



elevation (see Figure 16). At the apron level, the original exterior composition consists of high-aggregate, precast concrete panels topped by a band of clerestory windows, most of which appear unaltered.



*Figure 16. Apron-level original exterior of the east elevation of the main terminal building, view facing southwest.*

The south elevation of the main terminal building follows the general exterior composition of the west and east elevations, except for the 1984 south elevation addition that was constructed to create additional space within the secure concourse to accommodate increased security screening. A continuous curtain wall/arched roof skylight system consisting of tinted glass serves as the primary exterior enclosure of this addition, which is located at the connection between the main terminal building and Concourse E & F (see Figure 17).



*Figure 17. South elevation of the main terminal building showing the 1984 south elevation addition at center-right and Concourse E & F at right, view facing northeast.*

### **(3) Concourse-level interior**

#### **(a) Ticketing area**

The ticketing area encompasses most of the northern section of the building's concourse level and is accessible from the roadway's upper departure level via a series of entry vestibules. The entry vestibules are recessed within the 2006 addition, and consist of one-story spaces framed by metal I-beams with flat glass ceilings, interior aluminum storefront windows, and white terrazzo floors (see Figure 18). The ticketing area is an expansive, two-story space framed by square columns with a flat metal grating ceiling, and terrazzo flooring that features a chevron stripe pattern of dark grey and white. There are open area wells down to the apron level interior between the entry vestibules, baggage collection rooms, and elevators. These wells are bordered by tubular metal and glass panel guardrails at the concourse level. Five escalators are located within these wells and provide access between the baggage claim and the ticketing area. These escalators were constructed as part of the 2006 FACE renovation project and replaced previous escalators that were located within the former perimeter of the main terminal building.





Figure 18. Interior of entry vestibule at concourse level, with curbside check-in/baggage collection room visible in the background.



Figure 19. Interior of ticketing area, showing the two-story mezzanine along the building's central spine.

The primary space consists of a central circulation space with ticketing services along the building's two-story central spine. At the front of the ticketing area are walk-up airline self-check-in kiosks and movable queue rope barriers (see Figure 20). Baggage collection desks and associated conveyor belts are located

behind the kiosks, and line the majority of the interior walls along the central spine's first-floor offices. Most of the physical signs throughout the space are hung from the ceiling by thin metal posts.



*Figure 20. Ticketing area, showing the ticketing agent desks and baggage conveyer belts.*

The administrative blocks that span the north-south spine of the building at the concourse and mezzanine levels break at the mid-point of the building. This choke point serves as the main terminal building's only TSA screening area and provides access from the ticketing area to the concourse. There is a secure exit between the concourse and the ticketing area that separates the two spaces with a glazed partition wall and two metal revolving doors (see Figure 21).





Figure 21. Secure exit between the concourse and the ticketing area, viewed from the concourse.

The central ticketing/TSA security areas have experienced changes over time. The passenger check-in process is now partially driven by self-service kiosks and baggage hand-off, offering time savings over the original configuration of conventional check-in counters lining the space to manage the check-in process. The TSA screening checkpoint space requirements have also increased with changes in security needs.

The western end of the ticketing area marks the only secure portion of the concourse level that extends into the northern portion of the building. An exit, guarded by TSA employees, marks this boundary. Within this secure area is an interpretive display area, which currently presents models, photographs, and other images related to the proposed O'Hare 21 project as well as a permanent exhibit that displays a restored Grumman F4F Wildcat aircraft honoring the airport's namesake Edward Henry "Butch" O'Hare (see Figure 22).<sup>6</sup>

<sup>6</sup> "Airport Honors Original O'Hare," *Baltimore Sun*, August 24, 1997.





Figure 22. Interpretive display area at the northwestern end of the main terminal building.

**(b) Concourse area**

The concourse area is located along the south side of the main terminal building and has similar design elements and finishes as the ticketing area along the building's north side. Like the ticketing area, the two-story space is framed by square columns, with wall finishes that mainly consist of phenolic interior wall panels and gypsum board, flooring that consists of a chevron stripe pattern of dark grey and white terrazzo, and a ceiling that consists of flat metal grating (see Figure 23).<sup>7</sup> A circulation corridor runs the length of the concourse, flanked by concession areas, three contact gates, and two hold rooms.

<sup>7</sup> Phenolic wall panels refer to the contemporary, composite building material that consists of a cellulose fiber core, and is often finished with a laminate or resin coat.



*Figure 23. Concourse of the main terminal building with glazed partition walls visible in the background associated with the TSA security screening area.*

The security screening and secure exit serve as access between the non-secure ticketing area and the concourse area. Access between ticketing and the concourse was originally unrestricted in the areas around and between the building's center spine, as shown in as-built plans from 1964. Full-height and partial-height partition walls around the TSA security screening area appear to be removable.

Some concessions extend into the circulation space to accommodate additional seating for dining (see Figure 24). Doors to offices and other spaces located along the central spine of the building can also be accessed from the concourse. An escalator provides access from the concourse to the baggage claim at the apron level, and is located adjacent to the TSA security screening area near the connection of the main terminal building with Concourse E & F.



*Figure 24. Concession area in concourse that extends into the circulation area.*

An addition along the south elevation of the main concourse at the connection with Concourse E & F was constructed in 1984 to accommodate additional space in the concourse area for increased security screening (see Figure 25). The design of this addition consists of a continuous curtain wall/semi-arched roof skylight system with an exposed interior steel semi-arched structure that serves as the primary exterior enclosure. Each steel truss is perforated with punched oval holes, and with the etched skylight glazing, reflects similar design cues to Terminal 1. The side elevations of the addition are infilled with glass in metal frames that display a semi-fanlight design following the steel trusses. At the locations where the concourse transitions to Concourse E & F, the flooring changes to a white terrazzo. Three contact gates and associated hold rooms extend into the circulation area of the concourse in the main terminal building (Gates E1, F1, and F3) (see Figure 26).





Figure 25. South elevation addition, visible at left, and main circulation of the concourse, visible at right.



Figure 26. Contact Gate E1 and associated hold room within the concourse of the main terminal building, with the connection to Terminal 1 visible at far left.

#### (4) Mezzanine level

The second-floor mezzanine level is located in two sections along the central east-west spine of the main concourse and includes administrative offices and conference rooms located above similar-use spaces at the concourse level (see Figure 27). The mezzanine has a wraparound single-loaded corridor (rooms accessed from one side only) enclosed on the exterior by aluminum interior storefront windows with both translucent and transparent glazing, and is accessed by stairs and elevators located at the ends of each block (see Figure 28). Where it occurs, the transparent glazing provides views to the ticketing area and the concourse area (see Figure 29). The walls along the interior of the mezzanine mainly consist of full-length plate glass windows and doors with transoms, with some areas clad in gypsum board or square tiling. The ceiling consists of open metal grating to diffuse the light and provide separation of the mechanical units from the space below. The flooring along the corridors consists of a light-yellow terrazzo. The interior finishes at these administrative offices are modern throughout, and mainly consist of carpeting, gypsum board, and T-bar ceilings with acoustical tile (see Figure 30).



Figure 27. Mezzanine from ticketing area.





*Figure 28. View down single-loaded corridor at the mezzanine, with the offices and conference rooms lining the corridor at right.*



*Figure 29. View toward the ticketing area from the single-loaded corridor at the mezzanine level.*



*Figure 30. Typical interior office space at the mezzanine in the main terminal building.*

**(5) Apron-level interior**

**(a) Baggage claim**

The apron level mainly serves as baggage claim, with two primary areas that consist of a circulation corridor at the north side of the building and baggage claim conveyor belts and associated spaces at the south side of the building (see Figure 31). The north side of the building fronts the lower, arrivals level of the roadway, with entry/exit vestibules located within the 2006 addition at the north elevation (see Figure 32). The circulation corridor includes information desks and concession areas. Secondary areas located along the southern, eastern, and western ends of the circulation area include toilet rooms, baggage customer service offices, and an art gallery that is currently under construction. Concession and retail kiosks have also been added to the circulation areas over time. Throughout the circulation spaces, ceiling-mounted signage and electronic information boards dominate overhead.





Figure 31. Baggage claim area showing the conveyor belts.

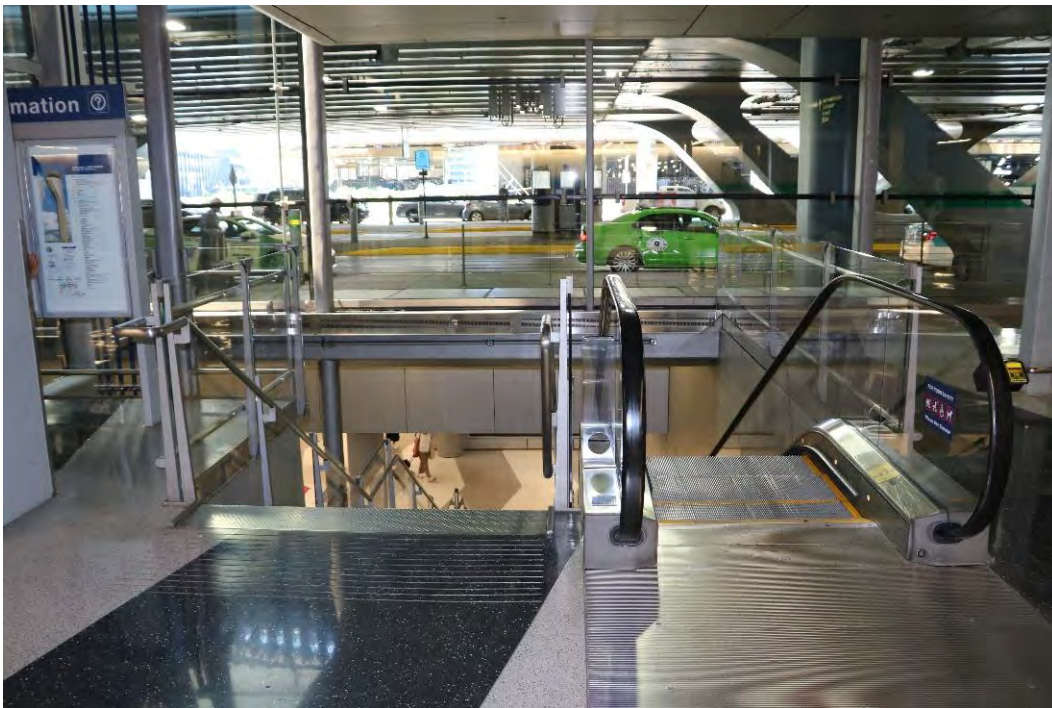


Figure 32. Entry vestibule at interior of the apron level.

The rear walls are generally clad with white textured fiber reinforced polymer (FRP) interior wall panels or dark gray phenolic interior wall panels (see Figure 33). These apron level interior areas also contain the same chevron pattern of terrazzo floor as the primary spaces on the concourse level; however, the terrazzo is a pattern of light grey and white with an area of black chevrons near the northwest corner of the main terminal building. The ceilings are composed of a variety of metal tiles, including scalloped texture tiles, smooth finish tiles, and open metal grating. Ceiling tiles have rounded edges where the ceiling transitions to different heights or around soffits. Flanking each side of the elevators are pairs of escalators and stairs that lead down to the tunnels to the parking garage, Hilton Hotel, and the CTA Station (see Figure 34). Escalators located parallel to the building's north elevation lead to ticketing at the concourse level (see Figure 35).



*Figure 33. Baggage service room with rounded ceiling edge and other interior finishes at the apron-level baggage claim area.*



*Figure 34. Interior of the apron level showing escalator and stairs to tunnel level toward the parking garage, Hilton Hotel, and CTA Station.*

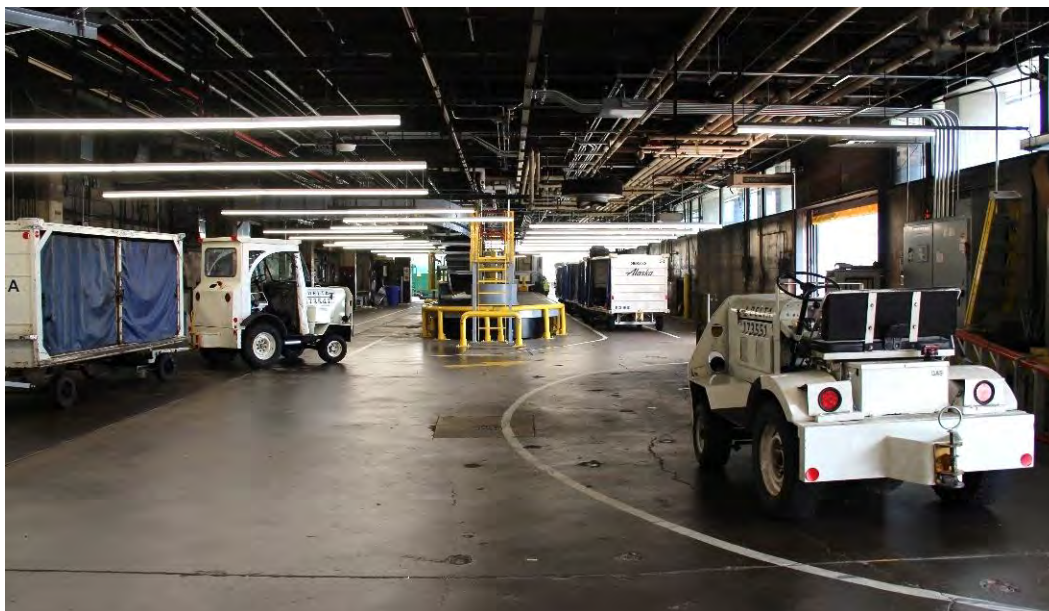




*Figure 35. Escalator leading from the ticketing area at the concourse level to the baggage claim at the apron level.*

**(b) Baggage handling area**

The baggage handling area refers to the location where checked baggage is sorted and loaded onto carts for transport to appropriate aircraft. At Terminal 2, this area is located to the south of the baggage claim area in the main terminal building. This space has concrete-paved circulation lanes for access by motorized carts at the northern end, which are separated by long conveyor belts (see Figure 36). Airline personnel manually handle some of the baggage to sort for delivery to appropriate aircraft. The space's utilitarian function is reflected in its features and finishes, which include square concrete columns, poured concrete floor, and various pipes and other metal features such as bollards and guardrails. There are various large openings within the exterior walls of this area that allow for the motorized carts to travel to and from the ramp.



*Figure 36. Circulation area for motorized carts with conveyor belt shown at center.*

#### **(6) Tunnel-level interior**

The tunnel level is located below grade and includes both public spaces and secure, back-of-the-house spaces. The public spaces at the tunnel level are accessible through two access points, which consist of stairs, escalators, and elevators that connect the baggage claim area to pedestrian tunnels that lead to the Hilton Hotel, the parking garage, and the CTA station (see Figure 37).<sup>8</sup> These two spaces share the same interior finishes and elements, including escalators, stairs, and elevators leading from baggage claim, chevron-pattern terrazzo flooring, metal grating ceiling with diffused lighting, and phenolic wall panels, and are considered to be part of the main terminal building, distinct from the tunnels themselves. The ceiling directly above the mid-landing at the stairs appears to be cast-concrete and has a dimpled design (see Figure 38).

<sup>8</sup> These tunnels are referred to as 2A, 2B, 2C, and 2D, with tunnels 2B and 2D leading to the Hilton Hotel and tunnels 2A and 2C leading from the Hilton Hotel to the parking garage and CTA Station via the underground pedestrian concourse. The tunnels connecting Terminal 2 to the CTA Station and parking garage are a separate pedestrian tunnel system that was planned in 1971. C.F. Murphy Associates, "Plans for Pedestrian Tunnels, Chicago O'Hare International Airport," 1971, Available in the Chicago Department of Aviation files, Chicago.



Figure 37. Pedestrian concourse at the tunnel level of Terminal 2 leading from the escalators, stairs, and elevators to the baggage claim at the apron level of the main terminal building.

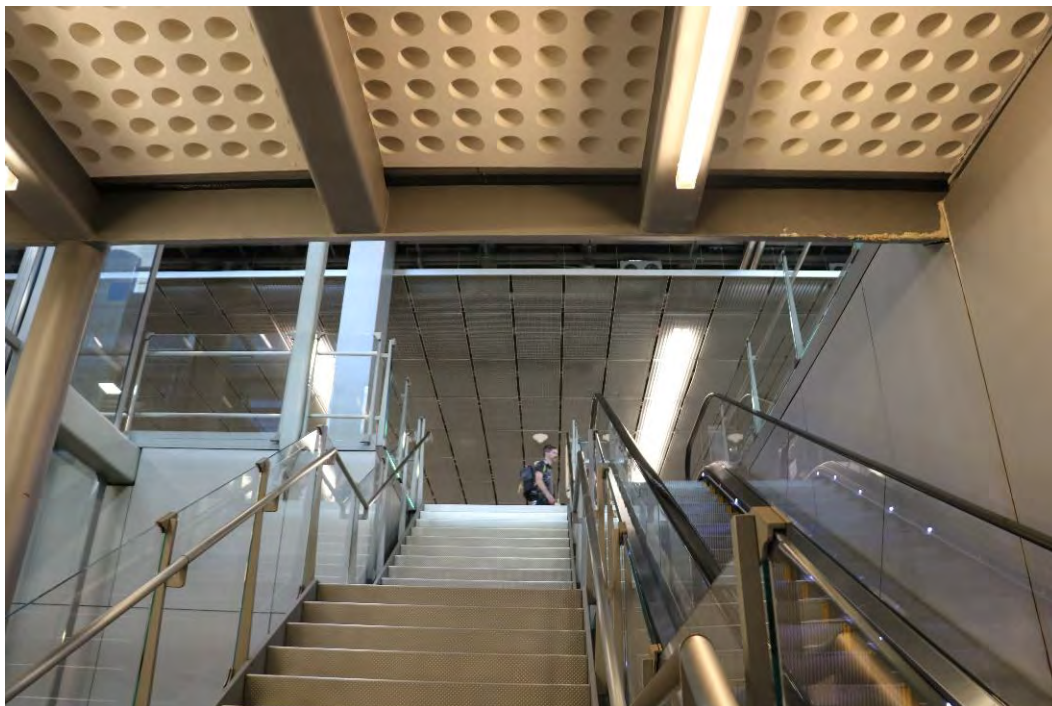


Figure 38. Detail of the dimpled concrete ceiling above the mid-landing of the stairs that lead from the apron-level baggage claim to the pedestrian concourses toward the parking garage, Hilton Hotel, and CTA station.



The secure, back-of-the-house spaces at the tunnel level of Terminal 2 include a single-loaded corridor extending the length of the main terminal building, with adjacent mechanical rooms, custodial offices, and other utilitarian rooms along the north side (see Figure 39). The airport utility tunnel is accessible from this corridor. The utility tunnel has a tunnel branch that extends into the main terminal building of Terminal 3 and continues through the tunnel level of the concourses. These utility tunnel branches are utilitarian in design and construction, and consist of long circulation corridors flanked by large, color-coded utility pipes that line the tunnel walls.



*Figure 39. Corridor at the tunnel level of the main terminal building at Terminal 2.*

## **D. Concourse E & F**

### **(1) Overview**

Concourse E & F extends from the main terminal building at Terminal 2. It has a Y-shape plan defined by four main segments: the stem, which projects from the main terminal building; the concourse apex (hereafter referred to as “apex”), where the stem meets the two concourse branches; and the two concourse branches that diverge from the apex and serve the E gates and F gates, respectively referred to as Concourse E and Concourse F (see Figure 40, Figure 41, and Figure 42).<sup>9</sup> The concourse varies in height among these segments, but all share a continuous basement (tunnel) level that consists of a branch of the utility tunnel to accommodate utility delivery and return, as well as a lower (apron) level associated with ground crew operations and offices for airline administration.

<sup>9</sup> Some materials also reference the stem area as the “throat.”





*Figure 40. Birds-eye view of Concourse E & F from the CDA control tower.*



*Figure 41. View in between the Y-branches of Concourse E & F, with Concourse E at left, and the apron through second floors of the concourse apex at center and right.*



*Figure 42. East elevation of Concourse F, with viewing platform and ramp tower at apex visible in background.*

The stem is two stories in height, with a basement (tunnel) level for utility delivery and return. The apron level consists of ground crew operations and airline administration, and the concourse level serves as the stem's principal public area, with a central circulation corridor mainly flanked by contact gates, toilet rooms, and concessions. Three small mechanical penthouses are mounted on the roof.

The apex is three stories in height, with the concourse level mainly consisting of the Delta Sky Club lounge, the reception room associated with the United Club lounge, various offices operated by the CDA and airline administration, and concession areas. The second floor of the apex consists of the United Club lounge's principal level, which is accessible via a set of escalators from the reception area at the concourse level, as well as administrative offices. The roof of the second floor formerly served as a public viewing area but closed at some point in the 1980s.<sup>10</sup> This viewing area was accessible via a third-floor entry, which serves as the base for the ramp tower for ground traffic control operations.

The concourse branches, Concourse E and Concourse F, share a similar plan consisting of a central circulation corridor flanked by contact gates, toilet rooms, and concessions, with the major difference in that Concourse F contains an addition at its southern end for housing contact gates at the apron level. The roof of each concourse branch houses mechanical equipment.

Concourse E & F has undergone several modifications over time with most of the existing finishes dating to 1990. Some of the major changes include the infill of nose pockets at contact gates during multiple

<sup>10</sup> An exact date for closure of the observation deck could not be determined. Smith, Sam, "A Survival Guide to Chicago's O'Hare Airport," *Chicago Tribune*, May 19, 1980, sec. 1; Granger, Bill, "More Ideas from Readers on Improving the City," *Chicago Tribune*, September 17, 1989, Chicago Tribune Magazine edition.

periods between 1966 and 1989, the ca. 1970 construction of a ramp tower at the apex, and the expansion of the Concourse F branch with the 2002 construction of an addition at the southern end.<sup>11</sup>

## (2) Concourse exterior

Despite several alterations over time, Concourse E & F continues to convey elements of its original Miesian exterior design. The apron-level exterior mainly consists of concrete masonry units and has various garage openings and access doors to both the interior of the apron level and to interior stairs to the concourse level. The first-floor exterior is generally defined by grid blocks of vertical window panels or high-aggregate pre-cast concrete panels separated by concrete gridlines. The mechanical penthouses are clad in vertical standing seam metal sheets, and display metal louver vents.

The second floor of the concourse apex projects above the rooflines of the adjacent concourse segments, and the walls share the general exterior grid block design of the concourse level. The roof of this second floor was originally constructed for use as a viewing platform, which closed to the public at some point in the 1980s. This viewing platform has modified bitumen roofing that serves as the deck flooring and is surrounded by a parapet and chain-link fencing. The two-story ramp tower extends above the viewing platform, and consists of a base clad in high-aggregate pre-cast concrete panels, with fully-glazed entry doors leading from the public entry to the viewing platform, and wide overhanging concrete boxed eaves supported by square concrete columns that wrap around the base (see Figure 43). The cab is located above this base and has a nearly identical design to other ramp towers throughout the airport, with wraparound tinted windows that are angled downward and separated by metal mullions. The ramp tower is capped with wide overhanging boxed eaves.



*Figure 43. Viewing platform and two-story ramp tower at concourse apex, facing east.*

<sup>11</sup> Nose pockets refer to recesses in the concourse footprint to accommodate the close parking of an aircraft to the gate.



### (3) Concourse interior

The concourse interior is generally organized into primary public spaces that include circulation corridors, hold rooms, food courts, toilet rooms, and concession spaces, and secondary non-public and semi-private spaces that include the United Club and Delta Sky Club lounges, administrative spaces, viewing platform entry, and the ramp tower, as discussed below.

#### (a) Circulation corridors

A central circulation corridor dominates the interior of the concourse stem, which is flanked by concessions, contact gates, and back-of-the-house service rooms (see Figure 44). The interior walls of the circulation corridors mainly consist of gypsum board, with areas of large, contemporary, backlit advertisements and electronic flight information display. The flooring consists of a grid pattern of off-white terrazzo, with transecting gridlines set at 45-degrees that create smaller, triangular panels of grey-blue terrazzo. Acoustic drop ceiling tiles that alternate shaded stripes of an off-white color are interspersed with strips of fluorescent lighting.



Figure 44. Central circulation corridor in the stem of Concourse E & F.

#### (b) Concourse hold rooms

Directly adjacent to the central corridors are the hold rooms, which exhibit carpeted floor finishes (see Figure 45). Tinted windows line the exterior wall and provide views out to the airfield. Window panels are arranged in groupings of four, sporadically interrupted by groupings of four high-aggregate, precast concrete panels.





*Figure 45. Typical hold room transition from the main circulation area.*

The hold rooms have contemporary gate agent desks and seating composed of a modern version of the Eames tandem-sling seating that was originally designed for use throughout O'Hare's Terminal 2 and Terminal 3. The gate agent desks and signage backdrops vary slightly in appearance based on airline, but all appear to be made from plastic laminate, with some exhibiting metal panel trim (see Figure 46).



*Figure 46. Typical contemporary gate agent desks and backdrops.*

#### (4) Concourse apex

The concourse apex occurs where the stem connects with the Concourse E and Concourse F branches (see Figure 47). The apex has the largest vertical massing of Concourse E & F and holds concessions and preferred customer lounge spaces at the concourse and second levels, with the remaining areas serving secondary functions including administrative offices and the ramp tower.



*Figure 47. South elevation of the concourse apex, showing the apron level through second floor, with the viewing platform and ramp tower visible in background.*

The concourse apex is dominated by concessions, the Delta Sky Club lounge, and the reception to the United Club lounge at the concourse level, which spans both concourse branches (see Figure 48). This area is roughly triangular in plan, consisting of concessions facing the corridors at Concourse E and Concourse F. There are two corridors referred to on plans as “cross overs”, which connect the Concourse E and Concourse F branches, and provide access to various administrative offices (see Figure 49 and Figure 50). The longer, southernmost corridor appears to be part of an addition to the concourse apex area, that was first expanded outward by 1972.<sup>12</sup>

<sup>12</sup> While the exact date of this alteration could not be determined, this change likely occurred in 1971 along with other airline-specific infill and alterations to Concourse E & F. This is substantiated by an available aerial photograph from 1972 that shows this outward expansion of the concourse apex.





Figure 48. Concourse E & F apex at center, with Concourse F at left and Concourse E at right, view from concourse stem.



Figure 49. View down shorter "cross over" at the concourse apex from Concourse E branch toward Concourse F branch.



*Figure 50. View down longer “cross over” at the concourse apex from Concourse E branch toward Concourse F branch.*

A substantial portion of the apex consists of spaces associated with preferred customer lounges, including the Delta Sky Club lounge at the concourse level and the United Club lounge at the concourse level and the second level (see Figure 51 and Figure 52). All areas associated with these preferred customer lounges display modern finishes, as the Delta Sky Club and the United Club were remodeled to their current configurations in 2001 and 2014, respectively.<sup>13</sup> The interior offices at the concourse level feature minimal architectural detail, with modern finishes that consist of gypsum board, T-bar ceiling, and carpet flooring (see Figure 53). A stairwell within these offices provides access to the ramp tower.

<sup>13</sup> The respective remodel dates were conveyed verbally by representatives of Delta Air Lines and United Airlines during the survey of these spaces.





*Figure 51. Interior of Delta Sky Club lounge at the concourse level.*

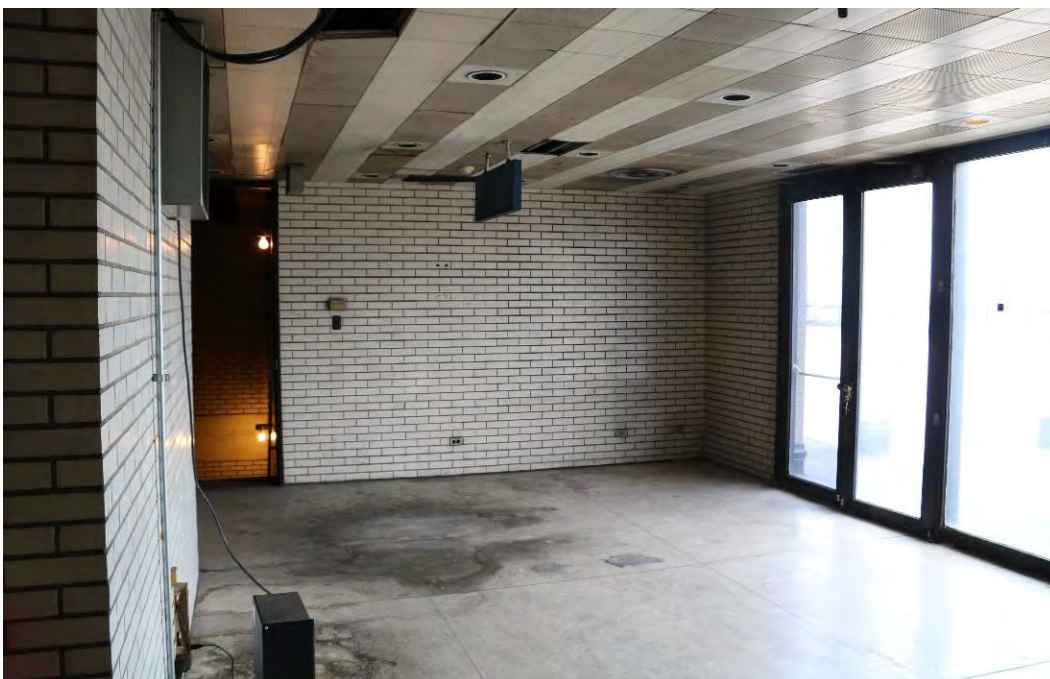


*Figure 52. Interior of the United Club at second floor.*



*Figure 53. Interior of a concourse level office at the apex.*

The viewing platform entry is located at the third floor and accesses the viewing platform that serves as the roof of the apex's second floor (see Figure 54). The entry to the viewing platform has been closed to the public since 2001, and exhibits white glazed brick walls, grey terrazzo flooring, and acoustic ceiling tiles in a pattern of dark grey and white stripes with recessed can lighting. Access to the platform is through two sets of fully glazed metal double doors that are separated by a metal plate glass window.



*Figure 54. Interior of viewing platform entry, with doors to viewing platform visible at right.*



The control room for ground traffic around Concourse E & F is located at the ramp tower, directly above the entry to the viewing platform. The interior of the tower generally consists of carpet flooring and a T-bar ceiling, with perimeter walls consisting of the downward-angled windows for ground traffic observation (see Figure 55). Closely grouped workstations occupy the open floorplan.



*Figure 55. Ramp tower interior.*

#### **(5) Concourse E and Concourse F branches**

The concourse stem splits at the apex to become two concourse branches that serve E gates and F gates, referred to as Concourse E and Concourse F. Both concourses exhibit nearly identical interior appearances and finishes at the concourse level as the concourse stem and are defined by a central circulation corridor flanked on either side by hold rooms, concessions, toilet rooms, and back-of-the-house service rooms. Flooring, wall materials, and ceiling finishes continue uninterrupted between the stem and the concourse branches (see Figure 56 and Figure 57).



*Figure 56. End of the circulation corridor in the Concourse E branch.*



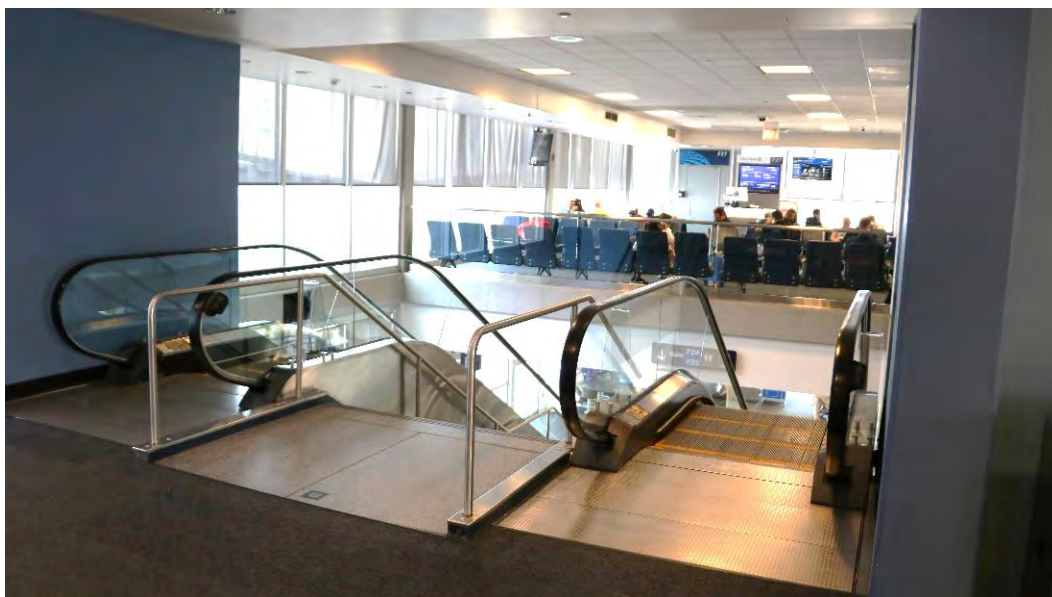
*Figure 57. Main circulation corridor in the Concourse F branch.*

Concourse F was extended with an addition constructed in 2001 that includes a concourse level and apron level. The concourse level retains the same materials and feeling as the remainder of the concourse branch; however, the apron level accommodates two contact gates accessible from the concourse level via adjacent stairs, escalators, and an elevator (see Figure 58 and Figure 59).





*Figure 58. Concourse F extension; the metal joint in the floor appears to show the original end to the Concourse F branch.*



*Figure 59. Stairs and escalators leading from the concourse level to the apron level contact gates at the Concourse F extension.*

#### **(6) Apron-level interiors**

With the exception of the apron-level contact gates and associated hold rooms at the Concourse F extension, the apron level of Concourse E & F consists entirely of back-of-the-house functions (see Figure 60). Two contact gates, hold rooms, and toilet rooms are located within the public space at this apron level, with finishes that generally match those at the concourse level. The exterior walls at the apron level of the Concourse F extension differ from the remaining areas at the concourse's apron level and consists of full-height plate glass windows with fully glazed emergency exit doors.



*Figure 60. Apron level within the Concourse F extension, showing escalators and stairs leading to the concourse level.*

The back-of-the-house spaces at this concourse include mechanical areas, airline administrative offices, ground crew offices, and associated locker rooms and break rooms, or “ready rooms.” Some rooms are accessible from the exterior of the apron level, and others are accessible via interior stairs from the concourse level and via interior corridors. Finishes in these spaces typically consist of a mixture of painted concrete masonry walls and gypsum board, with linoleum flooring and acoustical tile ceilings (see Figure 61).



Figure 61. Typical administrative office located at the apron level at Concourse E & F.

## E. Summary of alterations

A summary of the alterations to Terminal 2 are presented below by area and in chronological order.

### (1) Main terminal building

- 1971: New canopy design for curbside of main terminal building of Terminal 2, which was ultimately replaced by the FACE canopy completed in 2006.
- 1984: South elevation addition to main terminal building at connection with Concourse E & F, designed by Murphy/Jahn.
- 2006: Facade enhancement, known as the FACE renovations, designed by JAHN, that included construction of current curtain wall addition to the north elevation of the main terminal building and the continuous exterior canopy. New interior finishes throughout the ticketing and concourse areas of the main terminal building included new terrazzo flooring, phenolic wall paneling, and new escalators, stairs, and glass-enclosed elevators.
- Continuous: Modifications to retail food/concession areas.
- Continuous: Modifications/modernization of administrative spaces at concourse, apron, and mezzanine levels.

**(2) Concourse E & F**

- Circa 1971: Concourse E & F apex expanded outward, designed by C.F. Murphy Associates.
- 1971-1977: Infill of nose pockets.
- Circa 1975: Ramp tower constructed at apex.
- 1971: Construction of United lounge addition to apex, designed by C.F. Murphy Associates.
- Circa 1985: Public viewing platform closed.
- 2000: Delta Air Lines World Club (now Delta Air Lines Sky Club) renovated to current finishes.
- 2001: Construction of Concourse F branch extension.
- 2014: United Club lounge upgrades.
- Continuous: Modifications to retail food/concession areas.
- Continuous: Modifications/modernization of lower/apron level support spaces, and modifications/modernization of administrative spaces.



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## 2. Statement of Significance

### A. History of Terminal 2

#### (1) Burke's master plan for O'Hare

In the early 1940s, increased traffic at Midway Airport on the south side of Chicago prompted the City of Chicago (City) to study how to improve Chicago's ability to accommodate the nation's general trend of growing air travel. The City determined that Midway Airport was not a candidate for expansion, given the substantial existing residential neighborhoods that surrounded the airport on all sides. The City selected planner and civil engineer Ralph Burke to lead the study on how the City should grapple with this problem, and in 1944 Burke outlined his findings in the *Report of Commercial Airport Requirements for Chicago*. This report identified the existing Douglas manufacturing plant and associated airfield northwest of downtown Chicago as a potential site to develop as the City's second commercial airport, which eventually became the site of O'Hare (see Figure 62).<sup>14</sup> Burke believed the future of Chicago as a world-class city depended on a well-planned strategy to secure its position as a travel center, as air travel was envisioned as taking over rail travel—a mode of transportation for which Chicago had been the nation's leading center since the early twentieth century.<sup>15</sup>

Burke quickly drafted plans to develop O'Hare into a major international airport that could support the increasing demand at Midway and in the region and allow Chicago to remain a central city for transportation. O'Hare's first master plan in 1948 envisioned a "tangential scheme" design with multiple "split-finger" terminals extending from a central grand concourse.<sup>16</sup> This plan devised several runways radiating from the terminal building at incremental angles like a pinwheel, with a single roadway leading to parking areas fronting the central concourse (see Figure 63).<sup>17</sup> Burke's plan took a few years to materialize and his complete design was never fully constructed. By the time of his death in 1956 only one terminal (the original Terminal 1) had been completed, which was designed by Bill Priestley of Skidmore, Owings and Merrill (SOM).<sup>18</sup>

<sup>14</sup> David Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 75.

<sup>15</sup> Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 75.

<sup>16</sup> Franz Schulze, *Oral History of Carty Manny* (Chicago: Art Institute of Chicago, 1995), 184.

<sup>17</sup> Schulze, *Oral History of Carty Manny*, 184.

<sup>18</sup> Schulze, *Oral History of Carty Manny*, 181; Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 262.



Figure 62. Overview of the locations and relative size of Midway Airport (Chicago Municipal Airport) and the proposed O'Hare (Orchard Place/Douglas Field) facilities in relation to the city of Chicago, 1948.<sup>19</sup>

<sup>19</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for the City of Chicago, January 1948), 21, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.





*Figure 63. 1948 drawing of Ralph Burke's proposed design for O'Hare featuring a central roadway approaching the grand concourse with split-finger terminals extending into the airfield. Note that Burke's terminology contrasts with modern airport terminology, in which the central structures are referred to as terminals leading to the concourses where aircraft arrive.<sup>20</sup>*

Following the construction of the first terminal, the new commercial jet aircraft revealed the shortcomings of Burke's initial plan. The Boeing 707 and Douglas DC-8 not only carried twice as many passengers as earlier commercial aircraft but required longer runways and more space at the terminal gates to accommodate wider wingspans. The deliveries of these new jet-engine-powered aircraft to the main airlines was set to begin in 1958 and increase in 1959, which put pressure on Chicago to hasten the planning process and to ensure these aircraft could be accommodated through upgrades at O'Hare.<sup>21</sup>

There were a few additional issues with Burke's plan. The radiating runway design of Burke's "tangential scheme" presented risk related to potential aircraft collisions, due to the convergence of multiple

<sup>20</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for City of Chicago, January 1948), 22, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.

<sup>21</sup> Naess & Murphy, Landrum & Brown, and James P. O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program* (Prepared for the City of Chicago, 1958), 3, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/chicagoohareinte00odon>, Northwestern University Transportation Library.



runways.<sup>22</sup> Burke's plan had also underestimated the role of the automobile in air travel. By 1960 a new highway was completed between the Chicago Loop and O'Hare with space in the median for a future commuter train line.

In 1955 Mayor Richard Daley commissioned the architectural firm Naess & Murphy to review Burke's original plan and build upon it with larger terminals and greater automobile access. Naess & Murphy selected Stanislaw Z. Gladych as the chief designer for the O'Hare project alongside Carter Manny, Jr.<sup>23</sup> The design and planning team partnered with the Cincinnati-based airport consulting firm Landrum & Brown to complete the new airport design and to work with existing airlines at O'Hare to accommodate individual needs, and assess the airline's statistics for anticipated future air traffic. In assisting with the design, Landrum & Brown focused on the concepts of "concentration, consolidation, and connections."<sup>24</sup> By this time, the expansion of O'Hare had become the largest public project in the history of Chicago.<sup>25</sup>

## **(2) Naess & Murphy master plan design**

By 1958 Naess & Murphy had redesigned Burke's 1948 plan to eliminate the grand, single terminal building for a more favorable, widened, U-shape terminal arrangement. This plan was selected for reasons of economy and efficiency, including the assurance that this U-shape design would allow for "more maneuvering and parking room for planes" and would enhance ground transportation around the terminals for efficient curbside passenger loading and unloading in the growing automobile age.<sup>26</sup> Additionally, this plan could better accommodate any potential future airport expansion projects than could Burke's single terminal design. Under Naess & Murphy's plan, two additional terminals were proposed to operate alongside the original terminal building, which was to undergo some alterations to serve as O'Hare's new international terminal. This scheme maintained some of Burke's "split-finger" Y-shaped concourses, and alternated with simpler, linear concourses (see Figure 64). A central circular restaurant building was proposed to be constructed between the two new terminals, and an area to the northeast of the three terminal buildings was proposed as a utilitarian area with a Heating and Air Conditioning Plant (later referred to as the Heating & Refrigeration Plant) and other support buildings.<sup>27</sup>

<sup>22</sup> Schulze, *Oral History of Carty Manny*, 188.

<sup>23</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals," *Chicago Tribune*, January 4, 1982.

<sup>24</sup> American Institute of Architects et al., *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 262.

<sup>25</sup> American Institute of Architects et al., *AIA Guide to Chicago*, 275.

<sup>26</sup> Thomis, Wayne, "Newest O'Hare Plan Results in More Room," *Chicago Daily Tribune*, March 5, 1958, sec. 1.

<sup>27</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 9.



*Figure 64. Image of the proposed new terminal buildings (and the existing original Terminal 1) and plan for O'Hare based on the 1958 master plan.<sup>28</sup>*

Landrum & Brown encouraged extensive use of concession spaces to maintain traveler comfort and focused on a centralized location for principal concessions. This concept developed into the proposal for two, multi-story, circular buildings to be located between the terminals that would house a restaurant and other concessions.<sup>29</sup> The proposal to design a circular building between the western new terminal and the existing terminal building was abandoned, and the Rotunda was the only circular building retained in the final design.

The two terminal buildings were originally referred to as Terminal C and Terminal D; however, by the time of completion the terminals were labeled Terminal 2 and Terminal 3, respectively.<sup>30</sup> In his design for the concourses, Gladych devised a modular system based on 5-foot intervals, where all spaces had dimensions in multiples of 5 feet. This modular system ensured uniformity among use by multiple airlines and ease of potential future concourse expansion. In this scheme, the concourse corridors were designed

<sup>28</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 9.

<sup>29</sup> Schulze, *Oral History of Carty Manny*, 228.

<sup>30</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 30.

to be 20 feet in width, and projecting hold rooms to be 15 feet in length.<sup>31</sup> According to Manny, Gladych had implemented this system with the assumption that the spaces between these projecting hold rooms would be infilled over time to accommodate increased aircraft parking.<sup>32</sup> While this standardization allowed the design to be consistent throughout, particular airlines continued to operate with their own preferred methods, including differences in aircraft parking and enplaning procedures. The center split Y concourses were designed to have additional space above the rooflines to serve as public observation decks, to provide viewing space for passengers.<sup>33</sup> This amenity reflected the character of the jet age, with public enthusiasm for the new jet-engine-powered aircraft and an increased interest in air travel.

Similar to other major airports that had been operating at the time, the master plan implemented the dual-level roadway system to separate departure passengers from arrival passengers for efficiency.<sup>34</sup> One of the earliest examples of this separation was at the Washington National Airport (now Ronald Reagan Washington National Airport); however, in this case, it was not a dual-level roadway. Instead, the terminal building was constructed on a slope, with the separation built into the interior plan only. For O'Hare, this design not only allowed for the interior levels to be tailored to functions related to inbound and outbound passengers, but also prevented unnecessary transferring between levels for outbound passengers entering from the roadway through ticketing, then from the concourse to the aircraft. Features designed for passenger comfort included the development of canopies to provide passengers with shelter while enplaning and deplaning in inclement weather, where airlines did not desire to utilize telescoping or swinging jet bridges.<sup>35</sup>

The interior of the new terminal buildings included a first floor with mezzanine level, where the mezzanine would provide "airline offices, rental offices, airline clubs, and airport administrative offices," with baggage claim at the lower level.<sup>36</sup> The design and dimensions of the interiors were influenced by minimum size requirements for ticket counters and circulation space determined by Landrum & Brown, as well as the interior design vision of Harvey Stubsjoen from Naess & Murphy.<sup>37</sup> Stubsjoen designed the signage, ticket counters, areas for public seating, and established design standards with Hayward Blake, a graphics consultant, to retain consistency and uniformity among the varied branding elements of individual airlines.<sup>38</sup> Stubsjoen commissioned Charles Eames to design chairs in the waiting areas of the terminal,

<sup>31</sup> Schulze, *Oral History of Carty Manny*, 212.

<sup>32</sup> Schulze, *Oral History of Carty Manny*, 212.

<sup>33</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 34–35.

<sup>34</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 30.

<sup>35</sup> City of Chicago, Department of Aviation, "Annual Report 1961," 1961, 12–13, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/annualreport1961chic>, Northwestern University Transportation Library; "Our Two Largest Airports," *Progressive Architecture* XLIV, no. 8 (August 1963): 102.

<sup>36</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 31.

<sup>37</sup> Schulze, *Oral History of Carty Manny*, 211.

<sup>38</sup> Schulze, *Oral History of Carty Manny*, 211–13.

which developed into the tandem-sling chairs that were used throughout O'Hare.<sup>39</sup> These chairs were manufactured through Herman Miller and influenced seating design in other airports, including Dulles International Airport.

Terminal 2 and Terminal 3 were both completed in 1961 and opened to passenger travel on January 15, 1962, ahead of schedule (see Figure 65 and Figure 66). At this time, the Rotunda was in the beginning stages of its construction, due to its supporting role in the overall function of the airport, and would not be completed until 1963. As Concourse G had been completed and opened at the same time as the new terminals, a temporary walkway was constructed around the Rotunda for through-access.



Figure 65. View of Terminal 2 at night showcasing Naess & Murphy's minimal Modernist design, 1962.<sup>40</sup>

<sup>39</sup> Schulze, *Oral History of Carty Manny*, 223.

<sup>40</sup> Kori Rumore, "From Farmland to 'Global Terminal': A Visual History of O'Hare International Airport," *Chicago Tribune*, March 27, 2019, <https://www.chicagotribune.com/news/ct-ohare-international-airport-development-history-timeline-htmlstory.html>.





Figure 66. Interior, southern concourse portion of the main terminal building at Terminal 3.<sup>41</sup>

### (3) Opening and critical reception

O'Hare's new terminal buildings opened on January 15, 1962, and O'Hare's expansion was formally dedicated in March 1963, upon completion of the Rotunda. The opening was heralded with a ceremony that included President John F. Kennedy, Chicago Mayor Richard J. Daley, the design team for the new terminals, and other prominent civic leaders. By this time, Naess & Murphy had been renamed C.F. Murphy Associates after the retirement of partner Sigmund Naess in 1959.<sup>42</sup>

C.F. Murphy Associates was honored in 1963 by the Chicago Association of Consulting Engineers for the design of the terminal buildings and Rotunda.<sup>43</sup> An August 1963 issue of *Progressive Architecture*

<sup>41</sup> "Our Two Largest Airports," 108.

<sup>42</sup> After Sigmund Naess's retirement in 1959, the firm was renamed C.F. Murphy in 1960.

<sup>43</sup> City of Chicago, Department of Aviation, "Annual Report 1963," December 31, 1963, 6, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/annualreport1963chic>, Northwestern University Transportation Library.

outlined the design of the new O'Hare plan, stating that it “lacks the brilliance and originality of Dulles” but with strength in details such as “the meticulous care with which the individual buildings were designed; in the expert integration of structural and mechanical services; in the orderly and craftsman-like execution of the interiors, which have visual harmony in spite of the diverse requirements of 13 different airlines; and in the well-designed adjunct service structures, such as the fire station, the heating and refrigeration plant, and the central telephone exchange...”<sup>44</sup>

In 1962, following the completion of Terminals 2 and 3, operations at Midway Airport were transferred to O'Hare, which soon became, and has remained, one of the busiest airports in the United States.<sup>45</sup> Every major American city could be reached from Chicago on relatively short flights, which established O'Hare as a primary location for connecting flights across the country. The fact that O'Hare had been specifically designed to accommodate the jet liners of the 1950s and 1960s added to its importance as a major airport.

#### **(4) Later alterations**

Through the latter years of the 1960s, the nose pockets that were originally designed at the concourses began to be infilled by various airlines due to increased passenger traffic that necessitated creation of additional hold room space. This infilling continued through the 1970s, along with further improvements to O'Hare that included the construction of a new control tower in 1970. This control tower, based on a standardized design developed for the FAA by I.M. Pei & Associates in the early 1960s, was constructed in front of the terminals.<sup>46</sup> It was also around this time that ramp towers were constructed at the apex of the Y-shape concourses of Terminals 2 and 3 to monitor and control ground traffic around the concourses. A new hotel and parking garage, both designed by C.F. Murphy, were completed in 1972 and 1973, respectively. At the time of construction, the parking garage at O'Hare was the largest in the world.<sup>47</sup> Part of this project included the construction of multiple pedestrian tunnels linking the parking garage and hotel with each of the three terminal buildings.<sup>48</sup>

In 1975 the consulting group O'Hare Associates began exploring a \$1 billion upgrade plan for O'Hare, which was later influenced by the Airline Deregulation Act of 1978, as well as design-related goals and operational-related goals.<sup>49</sup> Passenger and airfield traffic was expected to rise through the 1980s and 1990s, and the increased use of wide-body “jumbo jet” aircraft such as the Boeing 747, the McDonnell Douglas DC-10, and the Lockheed L-1011 TriStar influenced the need to expand existing concourses at

<sup>44</sup> “Our Two Largest Airports,” 103.

<sup>45</sup> The transfer of operations from Midway was temporary as flights returned to Midway in 1964. “Chicago Department of Aviation | O'Hare and Midway International Airports,” *Midway History*, accessed July 31, 2019, <https://www.flychicago.com/business/CDA/Pages/Midway.aspx>.

<sup>46</sup> Philip Jodido and Janet Adams Strong, *I.M. Pei: Complete Works* (New York: Rizzoli, 2008), 93–95.

<sup>47</sup> American Institute of Architects et al., *AIA Guide to Chicago*, 265–67; David Brodherson, “An Airport in Every City: The History of American Airport Design,” in *Building for Air Travel: Architecture and Design for Commercial Aviation* (Munich and New York: Prestel and The Art Institute of Chicago, 1996), 84.

<sup>48</sup> C.F. Murphy Associates, “Elevated Parking Structure,” September 15, 1968, Available in the Chicago Department of Aviation files, Chicago.

<sup>49</sup> O'Hare Associates was a joint venture led by Murphy/Jahn (previously C.F. Murphy & Associates). Allen L. Pomerance, “O'Hare's Showstopper Terminal,” *Civil Engineering (New York)* 57, no. 11 (1987): 40–43.

Terminal 2 and Terminal 3.<sup>50</sup> Additionally, increased security needs and individual airlines' desires for more modern appearances initiated interior design changes to Terminal 2, Terminal 3, and their associated concourses. In 1980 the O'Hare Development Program (ODP) evolved to include a proposal for the expansion of Terminal 3 and construction of a new associated concourse, additional pedestrian tunnel to the parking garage, construction of a new Terminal 1, relocation of flight kitchen and maintenance facilities (see Figure 67).<sup>51</sup> During this time, the designs for work by O'Hare Associates on various buildings was overseen by architecture firm Murphy/Jahn. This plan also included a new Terminal 1 to replace the existing international terminal, completed in 1988 by Murphy/Jahn.<sup>52</sup>

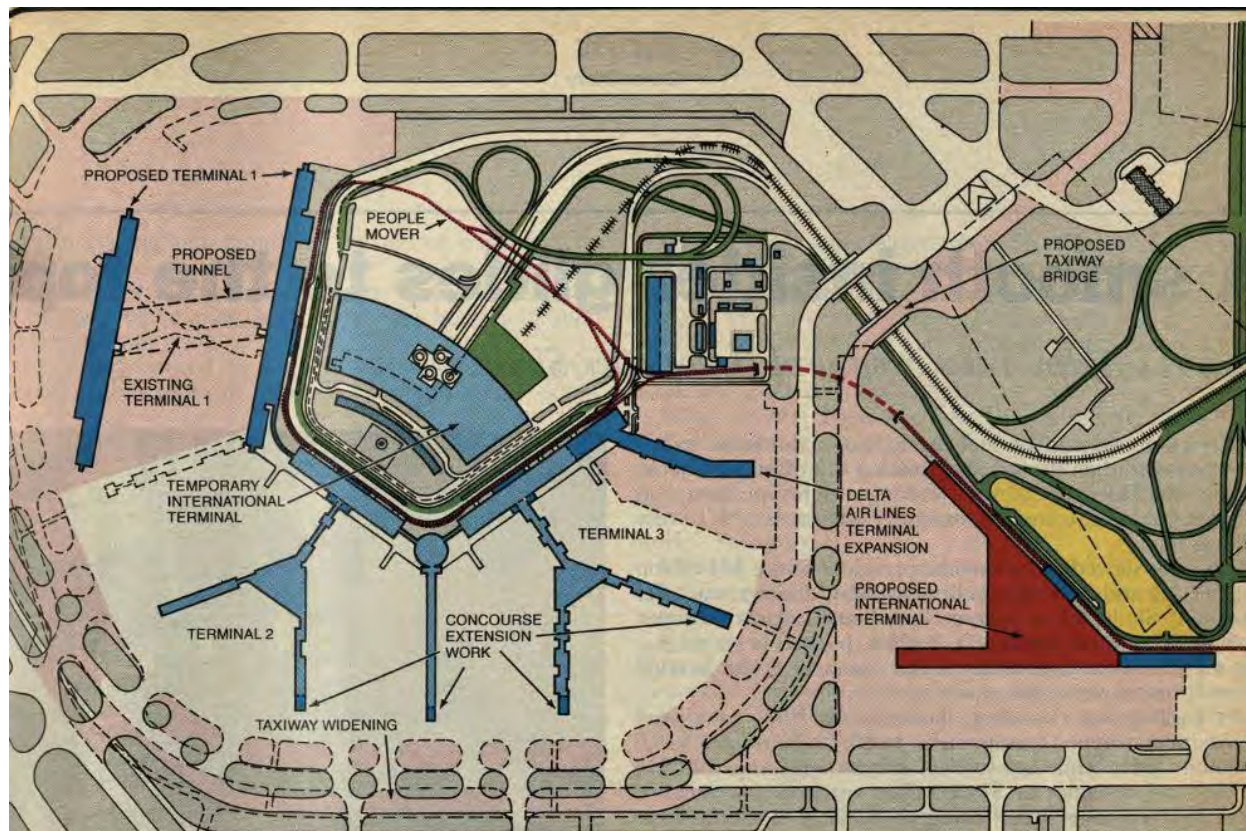


Figure 67. Overview of the O'Hare Development Program, 1984.<sup>53</sup>

Proposed changes to Terminal 2 were outlined in the ODP document from October 1981, which involved the extension and upgrades to the interior spaces of Concourse E & F, as well as changes to baggage handling facilities at the apron level.

A south elevation addition to the main terminal building at Terminal 2 provided additional interior space to accommodate increased security screening. Completed in 1984, this south elevation addition was

<sup>50</sup> Young, David, "FAA Gives OK to Start Rehabilitation of O'Hare," *Chicago Tribune*, July 23, 1982, sec. 2.

<sup>51</sup> Young, David, "FAA Gives OK to Start Rehabilitation of O'Hare"; O'Hare Associates, *O'Hare... Tomorrow... Today: The Chicago O'Hare International Airport Development Program*, October 1983, 4.

<sup>52</sup> Young, David, "FAA Gives OK to Start Rehabilitation of O'Hare."

<sup>53</sup> "O'Hare Airport Expansion Takes Off," *Engineering News-Record* 212, no. 19 (May 10, 1984): 27.

designed by O'Hare Associates with Murphy/Jahn as architect and preceded the similar design cues the firm used for Terminal 1 completed four years later. Murphy/Jahn utilized this curved punched hole steel truss design in other areas around the Terminal Core, including the new atrium at the old FAA tower (now the CDA tower), completed in 1995.

Concourse E & F was proposed to be expanded and modified as part of the O'Hare Development Plan, with each concourse branches extended south supporting more gate frontage as well as additional building space for hold rooms and concessions. However, only Concourse F was extended as planned, with a 100 linear foot addition designed by HNTB Corporation and constructed in 2001. This addition provided an additional 419 linear feet of gate frontage along all sides of the Concourse F branch and allowed for additional hold room space.<sup>54</sup>

In 2006 the FACE renovation project was completed and consisted of a new north elevation curtain wall addition located along the upper and lower roadway levels and expanding the building's original footprint approximately 15 feet. The north elevation addition was designed by JAHN—the successor to Murphy/Jahn—and is contemporary in its design and construction, consisting of a curtain wall system with glass panels at butt joints secured by clips and a steel cable primary structure, with side elevations of the addition consisting of glass panels secured to a vertical steel reinforcement structure. The design is integrated into the structure of the canopy that extends across the curbside elevations of the Terminal Core buildings. Also designed by JAHN and completed as part of the FACE project, the canopy is an uneven-V fin shape with slotted glass skylights supported by regularly spaced, large, round, metal columns. The canopy serves as a roof for the north elevation addition and shelters the sidewalk and nearest lane of traffic.

## **B. Airport design**

The design of airport terminals has evolved over time as the function of the terminal itself has changed. Early terminals were essentially a sheltered waiting area for passengers, and as they became more sophisticated designers considered the spatial needs inherent in moving people through a single building that acted as a bridge between air and ground transportation. In the post-World War II (postwar) period terminals began to sprawl, offering new retail and entertainment amenities and spawning purpose-specific wings (the boarding pier, later the concourse) to provide access to boarding gates. The “jet age” heralded the introduction of jet-engine-powered aircraft into commercial transportation in the late 1950s, and architects responded with new and modified terminals that eventually developed to include multiple, distinct concourses.

The following section discusses the development and evolution of airport terminals as a property type, including layout changes that shaped new terminal design. The era in which a terminal is built is reflected in its design; thus, to establish potential for significance of Terminal 2 and its associated concourse, it needs to be placed within an appropriate historic context of airport design of the era in which it was built, as well as being considered with a contextual understanding of any prior periods that influenced its

<sup>54</sup> Chicago Department of Aviation, “Chicago O'Hare International Airport Master Plan Study,” July 1984; HNTB Corporation, “UAX Relocation and Addition, Terminal 2, Concourse F,” January 16, 2001, Available in the Chicago Department of Aviation files, Chicago.



design. This historic context provides the background within which to understand how the design of Terminal 2 and its associated concourse represent a shift from the minimal terminals of the propeller aircraft age to larger terminals of the jet age. New and expanded terminals and concourses accommodated the increase in passenger travel associated with the introduction of larger jet-engine-powered aircraft such as the Boeing 707 and McDonnell Douglas DC-8. Additionally, historic context for later periods of airport layout and terminal designs provides an understanding of events, such as airline deregulation, that precipitated later alterations and additions to Terminal 2 and its concourses.

### **(1) Pre-World War II beginnings**

The period between World War I and World War II saw the birth of both commercial passenger aviation and the airport terminal as a distinct architectural property type.<sup>55</sup> Prior to that time airfields were either purely utilitarian (a landing field, perhaps with storage facilities) or designed as sporting venues similar to horse racing tracks, where spectators could watch air contests and demonstrations.<sup>56</sup> World War I served as an impetus for the rapid advances in both aircraft and airfield development, and at the war's conclusion Europe's aviation infrastructure was far more developed than that of the U.S.<sup>57</sup> The 1910s and 1920s saw the conversion of European military airfields for civilian use, and through much of the interwar period Europe dominated the forefront of airport design and development.<sup>58</sup> Major interwar examples included Paris's Le Bourget, Berlin's Tempelhof, and the Hendon, Croydon, and Hounslow airports outside London.<sup>59</sup>

Early terminal buildings at these airports varied widely; aesthetically, many employed architectural styles popular at the time, while others were designed to evoke existing, familiar architecture precedents. At Le Bourget, the first design included a group of small buildings, each of which housed different functions, rather than a single terminal; the buildings were arranged around a central plaza reminiscent of an urban city square. The first "integrated terminal" design was constructed in 1922 at the Königsburg airport in East Prussia (now Kaliningrad, Russia). The facility combined passenger and administrative spaces in a single building, located at the corner of the airfield and flanked by hangars. The Königsburg concept was employed in Berlin on a far grander scale with the landmark construction of the first terminal at Tempelhof in 1926 (see Figure 68). At Tempelhof, the airport facilities included a central control tower, hangars, and a two-story terminal building. The terminal itself featured a Modernist design with a long, linear form and bands of windows. Notably, its designers anticipated future expansion and expected that additions would extend at either end to accommodate larger numbers of passengers.<sup>60</sup>

<sup>55</sup> Hugh Pearman, *Airports: A Century of Architecture* (Laurence King Publishing, 2004), 42; Alastair Gordon, *Naked Airport: A Cultural History of the World's Most Revolutionary Structure* (Henry Holt and Company, 2014), 10–13.

<sup>56</sup> Gordon, *Naked Airport*, 10–13.

<sup>57</sup> Pearman, *Airports*, 41.

<sup>58</sup> Gordon, *Naked Airport*, 10–13.

<sup>59</sup> Pearman, *Airports*, 42.

<sup>60</sup> Pearman, *Airports*, 53.

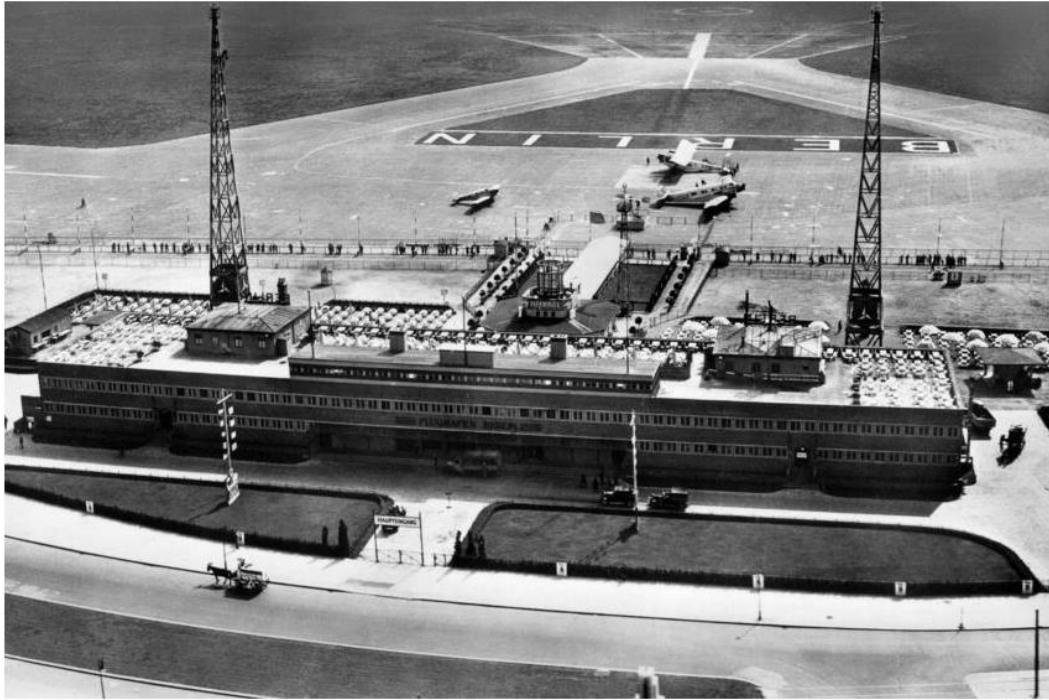


Figure 68. Photograph of the 1926 Tempelhof terminal building, shown in 1928.<sup>61</sup>

London's Croydon, constructed in 1928, serves as another milestone in airport design. In this case, an imposing building reminiscent of a country estate included a four-story, crenellated control tower at the center of the facade and the interior layout provided what author Alastair Gordon describes as “the conceptual beginnings of airport circulation” (see Figure 69).<sup>62</sup> The symmetrical floorplan divided both cargo and passengers into arrivals and departures, and even included separate lavatory facilities for landside and airside staff.<sup>63</sup>

<sup>61</sup> SPIEGEL ONLINE, “Fotostrecke - Bild 2 - Abschied von Tempelhof,” *SPIEGEL ONLINE*, October 29, 2008, <https://www.spiegel.de/fotostrecke/abschied-von-tempelhof-fotostrecke-107840-2.html>.

<sup>62</sup> Gordon, *Naked Airport*, 16.

<sup>63</sup> Gordon, *Naked Airport*, 15.

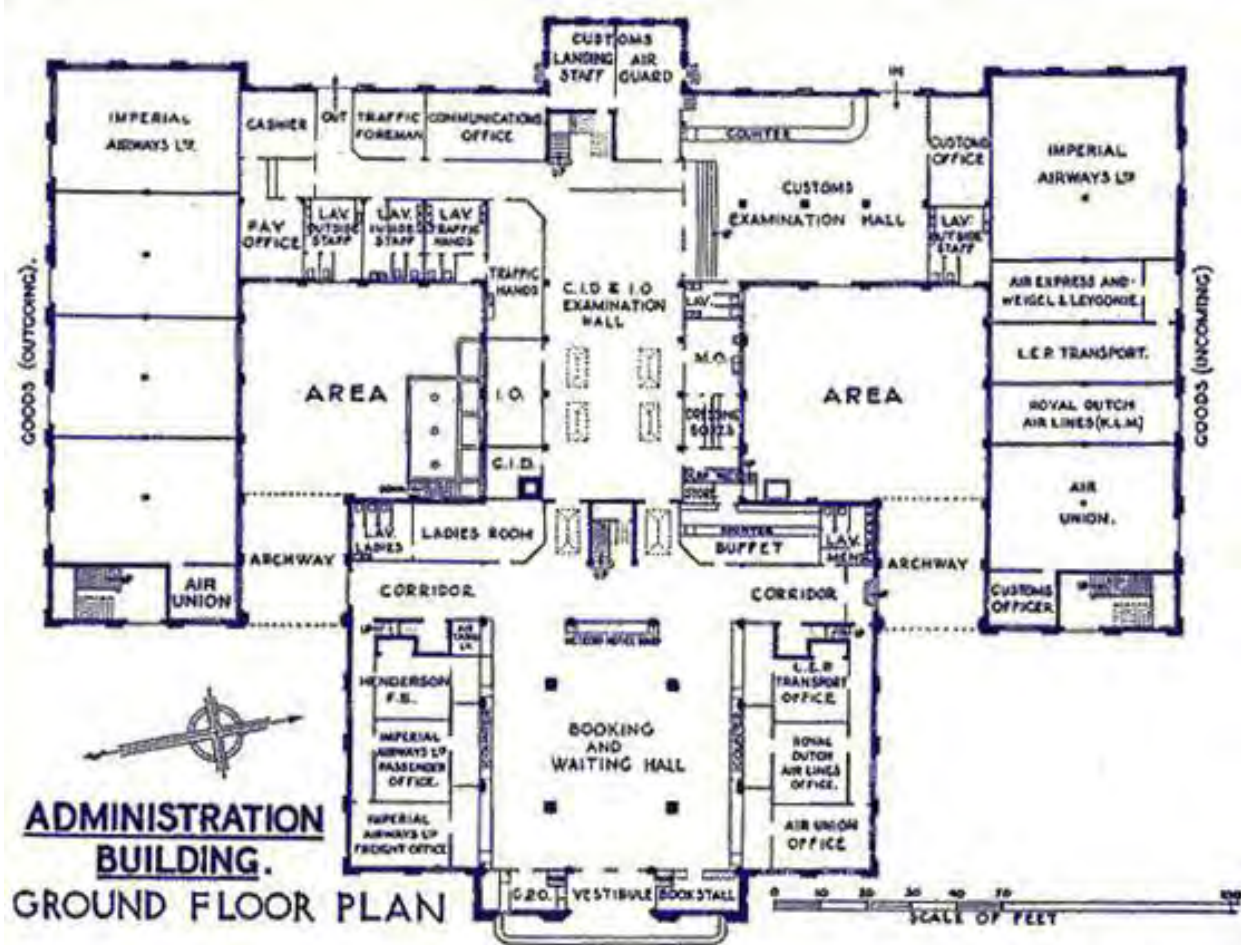


Figure 69. Original floorplan for Croydon Airport, c. 1928.<sup>64</sup>

Passenger air service was available between most of Europe's capital cities by the mid-1920s and had become a fashionable mode of transport for the wealthy. Meanwhile in the U.S., the majority of the expansion of aviation had occurred in the postal sector transporting mail, and most airports lacked a true terminal building because there was limited passenger service. When Charles Lindbergh completed his successful transatlantic solo flight in 1927, his return from Paris ushered in a new era in airport development in the U.S. His 80-city, nationwide tour spurred a feverish interest in aviation, and in the year that followed passenger totals quadrupled and airport construction boomed.<sup>65</sup> In the U.S., airport terminals initially fell into one of two general building types. Many took the form of the "depot hangar," which placed waiting rooms and offices in a portion of a large hangar. A parallel model developed based on the railroad station, in which a separate dedicated building housed a waiting area and had "gates" to permit access to

<sup>64</sup> "Terminal Building & Control Tower," *Croydon Airport*, accessed June 19, 2019, <http://www.airportofcroydon.com/Terminal%20Internal.html>.

<sup>65</sup> Gordon, *Naked Airport*, 13, 25.

and from aircraft on the adjacent apron.<sup>66</sup> Within these two general forms, architects applied a range of decorative detail that incorporated popular architectural styles or aviation-based imagery.<sup>67</sup>

Financed largely through private enterprise, the fledgling commercial airline industry in the U.S. suffered somewhat with the onset of the Great Depression. Nevertheless, federal relief programs such as the Public Works Administration and the Works Progress Administration (later renamed Work Projects Administration) soon provided a major source of funding for construction and expansion of municipal airports across the nation.<sup>68</sup> Federal efforts to standardize the design of both airports and the terminals themselves led to greater uniformity of design, if not style. The common form that emerged by the mid-1930s was not too dissimilar to the European model established at Tempelhof; municipal airports typically consisted of a low, wide building with a central control tower and windows along the airside elevation.<sup>69</sup> But while many smaller municipal airports followed this pattern, influential large-scale examples at New York's La Guardia and Washington D.C.'s National (now Reagan) airports were at the forefront of airport development during this period, serving as forerunners to the postwar model of major urban airports.<sup>70</sup>

Construction of a new Washington National Airport facility began in 1940 as a major priority of the Roosevelt administration. Architect Howard Lovewell Cheney's design of the new terminal was monumental, both in size and spirit, reminiscent of the "great departure hall" of earlier railroad architecture. Sited along the newly constructed Mount Vernon Parkway, the terminal's landside and airside facades echoed George Washington's home with its own massive colonnades, a melding of Art Deco style and Palladian reference (see Figure 70). Built into a hillside, the terminal also incorporated an innovative circulation pattern. Landside access from a curving drive brought passengers to the upper level of the terminal, where an overhanging roofline sheltered the sidewalks. The terminal's 12 gates were located on the lower level, which was at-grade on the airside. Passengers were also separated horizontally, with departures entering at the north end of the terminal and arrivals exiting at the south end.<sup>71</sup> The overall form, with a raised central portion and gently curved wings around a looped driveway, appeared at contemporary airports such as La Guardia and Dublin (Ireland, 1937) and was essentially a continuation of earlier European airport terminal design seen at the 1920s Tempelhof.<sup>72</sup> Unlike previous airports that typically moved passengers through a single level from landside to airside, the new Washington design prefigured the postwar American airport's use of vertical separation between departures and arrivals.

<sup>66</sup> John Zukowsky and Koos Bosma, *Building for Air Travel: Architecture and Design for Commercial Aviation* (Art Institute of Chicago, 1996), 68–70.

<sup>67</sup> Zukowsky and Bosma, *Building for Air Travel*, 73.

<sup>68</sup> Zukowsky and Bosma, *Building for Air Travel*, 72.

<sup>69</sup> Zukowsky and Bosma, *Building for Air Travel*, 73–74, 79; Gordon, *Naked Airport*, 101–3; Pearman, *Airports*, 57.

<sup>70</sup> Gordon, *Naked Airport*, 121.

<sup>71</sup> Zukowsky and Bosma, *Building for Air Travel*, 79–80.

<sup>72</sup> Pearman, *Airports*, 58.





Figure 70. Landside view of Washington National Airport in 1941 showing colonnade, driveway, and canopy.<sup>73</sup>

## (2) Postwar and the jet age

As commercial air travel resumed following World War II, passenger totals rose exponentially. Across the nation, smaller airport terminals were inadequate to handle thousands of passengers. New terminal designs were developed to accommodate travel on this unprecedented new scale. At the forefront of this new breed of airport, Greater Pittsburgh Airport (now Pittsburgh International Airport) embodied the future that awaited the terminal as a city unto itself. Completed in 1952, it was the largest terminal constructed in the U.S. at the time, described as a “city within a city,” and featured a nightclub, roof deck, restaurants, cinema, and retail stores.<sup>74</sup> Along with Friendship International Airport in Baltimore (opened in 1949), Pittsburgh’s terminal design incorporated the now-standard curved form, accessed from a looping drive, and a convex airside elevation. Unlike prewar airports, however, both Friendship and Pittsburgh utilized a new and notable design component, deployed in response to the increasing size of aircraft and numbers of passengers. At both airports, a massive perpendicular wing (longer than the main terminal itself) extended from the center of the terminal out onto the apron to provide enclosed access directly to aircraft gates, rather than requiring passengers to walk across the tarmac. At Pittsburgh, this boarding wing was referred as the “finger dock,” and featured a staggered massing with a rounded end (see Figure 71).<sup>75</sup>

<sup>73</sup> Jack Delano, *At the Entrance to the Municipal Airport in Washington, D.C.*, Photograph, 1941, <https://www.loc.gov/pictures/resource/fsa.8a36232>.

<sup>74</sup> Gordon, *Naked Airport*, 164, 166.

<sup>75</sup> Gordon, *Naked Airport*, 164–65.



Figure 71. Greater Pittsburgh Airport, c.1952.<sup>76</sup>

Aside from the boarding piers, the airports of the early 1950s were not altogether different from their prewar antecedents and used existing building technology. By the late 1950s, however, architects used new technologies to create ever more futuristic terminal buildings, resulting in changes to both style and layout/form. During the war, concrete arches and shells saw increasing use for hangar construction and enabled extremely large clear spans, such as at the San Diego Naval Air Station (see Figure 72).<sup>77</sup> From these more utilitarian uses, postwar designers drew both technical and aesthetic inspiration, as can be seen at Lambert Airport in St. Louis, itself an inspiration for Saarinen's TWA terminal at JFK.<sup>78</sup> Designed by Minoru Yamasaki of Hellmuth, Yamasaki and Leinweber, Lambert opened in 1956 to great acclaim. Described by architecture critic Hugh Pearman as "the best of the 1950s airports," Yamasaki's Lambert terminal served as a model for many of the architects who designed the terminals at John F. Kennedy International Airport in New York.<sup>79</sup> The terminal's thin-shell concrete design employs three cross-vaulted spaces arranged in a linear fashion, illuminated by vast expanses of glass (see Figure 73). Like earlier airports, it utilized a perpendicular boarding pier, but the arched roof and massive glazed facades were new elements that would be echoed for decades to come.

<sup>76</sup> Harold Corsini, *Aerial View of Greater Pittsburgh Airport* | *Historic Pittsburgh*, Photograph, c 1952, MSP285.B001.F03.I05, Detre Library & Archives, Heinz History Center, [https://historicpittsburgh.org/islandora/object/pitt%3AMSP285.B001.F03.I05/from\\_search/4330a4ab72217447044b1b828d36ba2c-2](https://historicpittsburgh.org/islandora/object/pitt%3AMSP285.B001.F03.I05/from_search/4330a4ab72217447044b1b828d36ba2c-2).

<sup>77</sup> Gordon, *Naked Airport*, 135.

<sup>78</sup> Antonio Roman, Antonio Román, and Eero Saarinen, *Eero Saarinen: An Architecture of Multiplicity* (New York: Princeton Architectural Press, 2003), 52; Pearman, *Airports*, 117.

<sup>79</sup> Pearman, *Airports*, 140, 142.



*Figure 72. Concrete arch hangars at the San Diego Naval Air Station.<sup>80</sup>*



*Figure 73. Concrete arches of the terminal at Lambert International Airport.<sup>81</sup>*

The 1952 master plan for the new Idlewild Airport (now JFK), approved the same year that Greater Pittsburgh opened, represented a turning point in airport design. Whereas elsewhere, multiple airlines flew in and out of a single, publicly operated terminal, the new master plan expanded on the circular-

<sup>80</sup> "As War in Europe Escalated, 1940 Naval Expansion Act Came When #PlatformsMatter-Ed Most," *Naval History and Heritage Command*, July 19, 2014, <https://usnhistory.navylive.dodlive.mil/2014/07/19/as-war-in-europe-escalated-1940-naval-expansion-act-came-when-platformsmatter-ed-most/>.

<sup>81</sup> "Lambert Field - Photograph Collection - Digital Collections," accessed June 13, 2019, <https://digital.shsmo.org/digital/collection/imc/id/13990/rec/2>.

drive-and-terminal formula and transformed it into a circle of separate terminals, each operated by a separate airline. The resulting layout, constructed from 1957 to 1962 (with a final terminal added in 1970), set the pattern later replayed at airports across the country, including at O'Hare (see Figure 74). Within this layout, individual terminal buildings at Idlewild Airport reflect the jet age of the late 1950s and 1960s, and also reflected efforts by the major American airlines such as Pan-Am, United, American, to outdo one another with creative terminal designs. The arched truss of the wartime hangar was again echoed in the central bay of J. Walter Severinghaus's design for the International Arrivals Building (IAB, 1957), and Saarinen's TWA building (1962) took the thin-shell technology used at Lambert and created an even more iconic design. Although wildly different in appearance due to architectural style, the terminals at Idlewild Airport generally follow the model introduced at Pittsburgh and Baltimore, with a main building and one or more perpendicular wings for aircraft gates. One notable exception was the Pan-Am terminal, consisting of a central disk surrounded by gates; this too would eventually be updated with additional boarding concourses extending onto the apron.

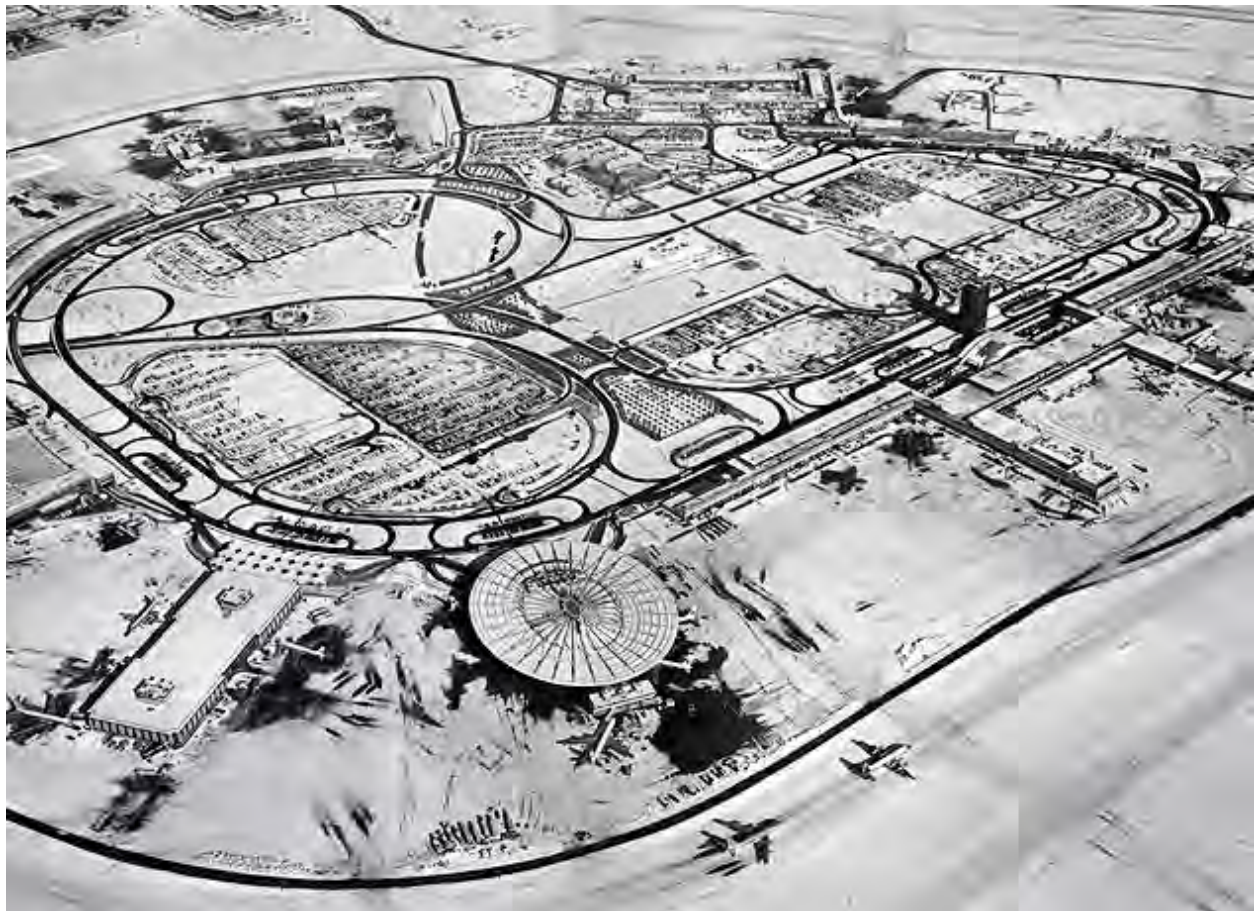


Figure 74. Aerial view of JFK Airport in 1964 showing looping roadway with various terminals, with Pan-Am in the foreground.<sup>82</sup>

<sup>82</sup> Theodore Ross, *Aerial View of JFK International Airport*, Photograph, September 17, 1964, NYJA000025, University of Texas at Austin, Harry Ransom Center, <https://norman.hrc.utexas.edu/nyjadc/ItemDetails.cfm?id=25>.



Even among the other striking buildings at JFK, Saarinen's TWA terminal is one of the most influential airport buildings of the twentieth century. With its curvilinear emphasis and flowing lines, the separation of space is distorted, as all but the aircraft gates are located beneath a single vast vault with two mezzanine sections connected by a bridge floating in the midst of the vast open space. In a new twist on the boarding pier, "flight tubes" carried passengers to two gate concourses that branched out at roughly a 90-degree angle to one another. Like these branching boarding gates, Saarinen's design introduced other features that would eventually become commonplace, particularly the baggage handling system in which passengers would check their baggage at the front of the terminal, after which it would be transported directly to the aircraft. Other elements Saarinen had envisioned, such as moving walkways between the terminal and separate boarding gate concourses, would not be installed in the TWA terminal but would be realized in later airport designs.<sup>83</sup>

Ultimately, JFK's greatest influence lay in its overall layout; critics and airport planners eschewed the wild variation among the terminals but embraced the concept of the great looping roadway ringed by terminals. This circulation plan was incorporated into the improvements at O'Hare (1961), San Francisco International (1963), and Los Angeles International Airport (LAX, 1961). At both O'Hare and LAX the individual terminals were built identical to one another; Modernist buildings that blurred the traveler's ability to orient themselves within the complex. Although built at the same time as JFK, the Modernist approach at O'Hare and LAX stood in stark contrast to the spectacle of Saarinen's concrete terminal and the architectural variety of JFK. The Theme Building at LAX and the Rotunda at O'Hare served as the only obvious visual landmarks among otherwise more uniform, rectilinear airport buildings.<sup>84</sup>

Commercial jet-engine-powered aircraft for passenger travel were first introduced in the U.S. in 1959, and rapidly altered the parameters of airport design.<sup>85</sup> The rise of the jet age, with its larger and louder aircraft, increased the need to provide separation between the main terminal and the aircraft boarding gates. Concourses lengthened or branched, and new enclosed jet-bridges such as the "aero gangplank" introduced by United Airlines at O'Hare in 1958 eliminated the need to exit the concourse to board an aircraft from the tarmac.<sup>86</sup> This increased travelling distance within the airport substantially lengthened passengers' journey from ticketing to boarding. In an effort to shorten the trek, moving sidewalks were deployed, first at Dallas's Love Field in 1957 but more sensationally at LAX in 1964, when Lucille Ball was invited to christen the new "Astroway."<sup>87</sup> Whereas Saarinen had placed his "flight tubes" above ground at JFK, the seven terminal buildings at LAX were connected to separate boarding "pods" via tunnels beneath the apron, and the "Astroways" conveyed passengers through these underground tunnels in order to reduce the effort of traveling nearly a quarter-mile between ticketing and aircraft gates.<sup>88</sup>

<sup>83</sup> Janet R. Bednarek, *Airports, Cities, and the Jet Age: US Airports Since 1945* (N.p.: Palgrave Macmillan, 2016), 129–30.

<sup>84</sup> *South Terminal Construction*, Photograph, 1962, 1997.52.051.017, SFO Museum, [https://media.flysfo.com/styles/history\\_timeline\\_slider\\_images/s3/pub\\_1997.52.051.017a.jpg](https://media.flysfo.com/styles/history_timeline_slider_images/s3/pub_1997.52.051.017a.jpg); Gordon, *Naked Airport*, 210–12.

<sup>85</sup> Bednarek, *Airports, Cities, and the Jet Age*, 130.

<sup>86</sup> "Briefings," *Flying Magazine*, June 1958, 58.

<sup>87</sup> Gordon, *Naked Airport*, 223.

<sup>88</sup> Gordon, *Naked Airport*, 223.

The early jet age incited public enthusiasm regarding air travel and the new jet-engine-powered commercial aircraft. A phenomenon of traveling to an airport not to travel, but to view the aircraft, emerged that influenced airport design of the late 1950s and 1960s. Catering to these desires, airport designers incorporated large windows and observation decks, as well as dining rooms that overlooked the airfield, and other amenities such as airport sightseeing tours.<sup>89</sup> The International Arrivals Building at Idlewild Airport (now JFK) in New York, completed in 1957, had the largest airport observation deck in the U.S., and the restaurant within the Theme Building at LAX, completed in 1961, provided passengers with a 360-degree dining experience with views toward the airfield.

Continual growth of major airports to accommodate increased air traffic ultimately led to the elimination of the “great departure hall” concept of the 1920s and 1930s, in favor of decentralized terminal buildings with modular, expandable clusters of concourses. In some cases, this decentralization was achieved through a greater physical separation between satellite boarding areas and the main terminal through an “intermodal” style that linked buildings by ground transport rather than pedestrian corridors. The concept of separating landside and airside facilities was pioneered at Tampa International, completed in 1971, which used an electric “people mover” system to ferry passengers between the landside terminal, with ticketing and baggage, and the airside boarding satellites.<sup>90</sup>

In the ultimate form of decentralization, Dallas/Fort Worth Regional Airport (completed in 1973) dispensed with even the pretense of a hub building. A series of identical semicircular terminals lined both sides of a single highway spine, allowing passengers to drive directly to the desired terminal. As at Tampa, a tramway system connected the terminals to one another as well. The semicircular design was oriented with the convex side facing the apron to provide the maximum number of aircraft gates, while the concave side enclosed a parking area. Both the layout and the buildings themselves were based on simplified, Brutalist building-block concepts: the individual terminals were constructed using precast sections, and the airport as a whole could be expanded simply by adding more terminals along the spine.<sup>91</sup>

### **(3) Deregulation: The demise and return of the “great hall”**

After the arrival of the jet, airline deregulation wrought the next major change in airport terminal design. Signed into law by President Jimmy Carter in 1978, the Airline Deregulation Act eliminated federal oversight of the ways in which airlines set fares or determined routes, letting market conditions dictate the logistics of air travel. Architecture critic Alistair Gordon cites deregulation as “the dividing line between the modern and postmodern periods of commercial aviation – between the golden days of the jet age and the transportation agonies of today.”<sup>92</sup>

As airlines overhauled their operations to maximize profits and efficiency, the “hub” concept centralized airline operations in a smaller number of major airports, which in turn served to connect secondary destinations. This increased the number of travelers making connections at larger regional and international airports, as less popular destinations were no longer accessible from direct routes. In turn,

<sup>89</sup> Zukowsky and Bosma, *Building for Air Travel*, 15.

<sup>90</sup> Gordon, *Naked Airport*, 240–41.

<sup>91</sup> Gordon, *Naked Airport*, 243–44.

<sup>92</sup> Gordon, *Naked Airport*, 245.

the airlines began using “banks” of flights, in which flights arrived and departed in staggered waves, allowing more efficient connections. This led to a drastic increase in the number of passengers in the terminals during these peak periods, many more of whom had to cross large distances in the terminal to make their connecting flights.<sup>93</sup> This represented a major shift in circulation patterns within the airport; where designers had previously focused on the movement of passengers between aircraft and ground transportation, the emphasis was now on transferring within or between the terminals themselves.<sup>94</sup> New, larger concourses offered more retail and dining options for those with layovers. Spatial relationships between concourses were designed for efficiency, both for passenger traffic as well as for the movement of jumbo jets on the aprons and taxiways.<sup>95</sup>

One of the first major airport projects constructed after deregulation, Atlanta Hartsfield International Airport's Midfield Complex exemplifies this new direction in terminal design. An earlier terminal completed in 1961 had a central building surrounded by six radiating boarding piers.<sup>96</sup> Within its first year of operation, passenger volume exceeded its capacity, and by the mid-1960s a new master plan incorporated the midfield design. Construction did not begin for more than a decade, however, and the new facility that opened in 1980 reflects the expediency of the post-deregulation era. The new layout consisted of an entrance terminal with four identical, parallel concourses separated by aprons wide enough to accommodate two jumbo jets. In order to speed transfer between airlines, the four concourses were all part of a single secure area and the single security checkpoint was located in the main terminal. The entire complex was connected by an underground “transit mall” that included pedestrian corridor, moving walkways, and a tramway system. While it solved many of the problems introduced by hubbing, the new Hartsfield did so with an almost industrial, Brutalist aesthetic largely devoid of natural light.<sup>97</sup> Gone were the vaulted rotundas in the 1961 concourses (demolished) that directly referenced Lambert and TWA; these were replaced by windowless holding areas and corridors (see *Figure 75*).

<sup>93</sup> *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook* (Washington, D.C.: Transportation Research Board, 2010), 8.

<sup>94</sup> Gordon, *Naked Airport*, 246.

<sup>95</sup> *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook*, 8.

<sup>96</sup> “History of ATL | ATL | Hartsfield-Jackson Atlanta International Airport,” accessed June 14, 2019, <https://www.atl.com/about-atl/history-of-atl/>.

<sup>97</sup> Gordon, *Naked Airport*, 246–48.



Figure 75. Image from the October 1980 issue of Delta's employee publication showing Hartsfield "before" at left and "after" at right.<sup>98</sup>

Although economic conditions and real estate constraints slowed airport construction in the U.S. in the 1980s, changes were afoot again as architects and travelers gradually rebelled against the "alienating indignities" of airports such as DFW and Hartsfield's Midfield.<sup>99</sup> Designers began to abandon the decentralized, impersonal, and industrial perspective in favor of a revival of the monumental departure hall of 1920s and 1930s terminal designs. New terminal designs were intended as bold, gestural signature pieces that would stand out in the travel experience, a sharp contrast to both the stark Modernism of the 1960s, as seen in O'Hare's Terminals 2 and 3, and the uniformity of the 1970s. Architects employed walls of glass that emphasized natural light, a return to the concepts of "view" from the late 1950s and early 1960s.

At the forefront of this trend in the U.S., Helmut Jahn's design for O'Hare's Terminal 1 was intended to "reintroduce the romance of travel" at O'Hare.<sup>100</sup> O'Hare's Terminal 1 represents a shift away from the decentralized and utilitarian terminals of the 1970s towards a return to airport buildings as grand statements, including the concept of grand halls first seen in the 1920s and 1930s and architecturally distinctive terminal buildings of the 1950s. As airports across the nation began to update their facilities to cope with ever-increasing numbers of passengers, O'Hare's Terminal 1 stood out as one "that is redefining the design standards for airports of the future."<sup>101</sup> In a design magazine from 1988, author Donna Green outlined Jahn's intentions and successes:

The United Terminal has clearly raised the standards for airport design in the future. Its vast spaces and sweeping lines of glass and steel manage to reach out to its users, offering an unexpected

<sup>98</sup> "Atlanta's 1961 Terminal Closes," *Sunshine Skies*, accessed June 14, 2019, <https://www.sunshineskies.com/atl-1961-terminal-closes.html>.

<sup>99</sup> Bednarek, *Airports, Cities, and the Jet Age*, 137; Gordon, *Naked Airport*, 250.

<sup>100</sup> O'Hare's original Terminal 1 was demolished directly before the beginning of the construction of the new Terminal 1 in 1986. Gordon, *Naked Airport*, 253.

<sup>101</sup> Donna Green, "Chicago: Terminal of the Future," *ID: Magazine of International Design* 35, no. 1 (January 1988): 46.



mixture of exuberance and reassurance. The terminal's design adapts to practical needs through more efficient ticketing facilities, more spacious waiting rooms and less complicated boarding procedures. But it also invokes images of grandeur and fantasy appropriate to—and long-missing from—air travel. "Airports are gateways to cities," concludes Jahn, "They should reflect the excitement, the spirit of that passage."<sup>102</sup>

Denver International Airport also followed the pattern set by Terminal 1's design in its concept of a monumental, memorable "great hall." This "great hall" served as the gateway to a set of parallel concourses, as at Hartsfield, and all travelers entered and exited through this dramatic space. One of the major showpiece airports of the 1990s, the Denver airport was the first completely new, major commercial airport constructed in the U.S. since 1974. Intent on creating an iconic design to serve as a city symbol, the City of Denver rejected a glass and steel roofline design, like O'Hare's Terminal 1, that referenced railroad sheds. Instead, the final design incorporated a Teflon fabric roof that instead evoked the nearby mountain skyline.<sup>103</sup>

### C. Naess & Murphy/C.F. Murphy Associates

The architectural firm of Naess & Murphy, later known as C.F. Murphy Associates, Murphy/Jahn, and JAHN, represents one of the largest and most prolific architectural firms in postwar Chicago. The firm represents a "lineage" of Chicago architects, beginning with Daniel Burnham in the nineteenth century, and emerged during a pivotal time in the history of Chicago and its urban development. The works of Naess & Murphy/C.F. Murphy marked a transition in the city from 1930s modern architecture to the International style of the Second Chicago School of Architecture, which was heavily influenced by the work of Ludwig Mies van der Rohe (commonly referred to as Mies). Co-founder Charles F. Murphy, Sr. managed the firm and hired multiple architect and designers for various commissions. In the 1950s, the firm developed a relationship with Mayor Richard Daley early in his mayoral career and worked on highly visible projects at O'Hare and the downtown Chicago Loop, intended by Daley to promote Chicago as a modern city. This context addresses the background of Charles F. Murphy, his professional relationship with Mayor Daley, and the firm's shift towards the Second Chicago School. A brief summary of the firm following its acquisition by Helmut Jahn in the 1980s is also provided for context of the firm's work at O'Hare.

Charles F. Murphy, Sr. was born in New Jersey in 1890 and moved to Chicago during his childhood. He graduated from the De La Salle Institute, a Catholic technical high school in Chicago, where he was trained as a stenographer. Murphy entered the architectural field in 1911 as secretary for the firm of Daniel Burnham, one of Chicago's leading architects. While working at D.H. Burnham and Company, Murphy became the personal assistant to Ernest Graham, an architect working at the firm. The two maintained a very close working relationship for the next 25 years, with Murphy following Graham to the firm of Graham, Anderson, Probst, and White in 1917.<sup>104</sup> Graham's new firm was one of the most prolific

<sup>102</sup> Green, "Chicago: Terminal of the Future," 51.

<sup>103</sup> Bednarek, *Airports, Cities, and the Jet Age*, 137–38.

<sup>104</sup> Kenan Heise, "Charles F. Murphy, Chicago Architect," *Chicagotribune.Com*, accessed July 22, 2019, <https://www.chicagotribune.com/news/ct-xpm-1985-05-24-8502020167-story.html>; Franz Schulze, *Oral History of Carty Manny* (Chicago, Ill.: Art Institute of Chicago, 1995), 108; Mark J. Bouman and John Zukowsky, Ed., *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 468.

in Chicago, with significant works including the Pittsfield Building (1927), the Straus Building (1923-1924), the Foreman State Bank (1928-1930), and the Field Building (1934). Murphy became a licensed architect while working with Graham, but mostly managed the inner workings of the firm and developed the managerial and administrative skills that he would employ for the remainder of his career.<sup>105</sup>

Ernest Graham passed away in 1936. The day after Graham's death, Murphy was fired from the firm along with two other architects: Sigurd Naess and Alfred Shaw. These three architects soon opened their own firm, Shaw, Naess, and Murphy. Continuing his role as an administrator, Murphy developed the strong corporate organization that would come to define the firm. Sigurd Naess had emigrated to the United States from Norway as a young man in 1902. He became known as a planning expert, and led much of the production work at Shaw, Naess, and Murphy. Alfred Shaw was a designer and painter from Boston who studied at MIT before working in Chicago. Shaw was the first of many designers that Murphy relied on over the years to build the firm's reputation. With the Great Depression followed by World War II, the 1930s and 1940s proved to be a difficult time for most architectural firms, especially one starting out. During this time, Shaw, Naess, and Murphy found work on smaller projects including a remodel of the Museum of Science and Industry in Chicago, designing and installing elevators and escalators in the Marshall Field store, and designing a munitions plant in New Jersey. The firm also gained experience in the aviation field during the war, completing work at Bunker Hill Field (currently Grissom Air Reserve Base) in Indiana and Kindley Air Force Base in Bermuda (now Bermuda International Airport). Due to personal conflicts, among other factors, Alfred Shaw left the firm in 1946 and the firm's name changed to Naess & Murphy.<sup>106</sup>

The first major project for Naess & Murphy was the Prudential Insurance Building (1952-1955), the first skyscraper built in Chicago since the Field Building in 1934. The 44-story concrete and glass building not only signaled the return of skyscraper construction to Chicago, but also signified the arrival of postwar Modernism to the urban landscape. Kenan Heise, writing for the *Chicago Tribune* in 1985, argued that the Prudential Building "hinged two eras of Chicago architecture," and that it "opened the modern, explosive era of Chicago commercial architecture."<sup>107</sup> Naess & Murphy continued to work on other commercial projects in the 1950s, including the Chicago Sun-Times Building (1957) and the Federal Reserve Addition (1957), which historian Ross Miller has described as "serviceable modernism." However, the Prudential Building proved to be the firm's most significant building of the 1950s, not only for its architectural significance, but also because it was at the dedication in 1954 that Murphy met the soon-to-be-mayor Richard J. Daley. The relationship that developed between Murphy and Daley would establish Naess & Murphy as one of the leading architectural firms in Chicago.<sup>108</sup>

<sup>105</sup> Ross Miller, "Helmut Jahn and the Line of Succession," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 305; Schulze, *Oral History of Carty Manny*, 108; Carol Willis, "Light, Height, and Site: The Skyscraper in Chicago," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis*, 1993, 131.

<sup>106</sup> Miller, "Helmut Jahn and the Line of Succession," 305; Schulze, *Oral History of Carty Manny*, 110–11, 152.

<sup>107</sup> Heise, "Charles F. Murphy, Chicago Architect."

<sup>108</sup> Miller, "Helmut Jahn and the Line of Succession," 303, 305.

After their first meeting, Mayor Daley and Murphy slowly developed a professional relationship that extended through the 1960s. Daley had a vision to rebuild the downtown Chicago Loop as a modern American city, and Murphy's firm became an integral partner in bringing that vision to reality. Murphy and Daley shared an Irish-Catholic connection, and they had both attended the De La Salle Institute, although Daley graduated from the school decades after Murphy. According to Miller, Daley was impressed with Murphy because he "did not strike Daley as a fancy-pants architect."<sup>109</sup> Daley soon turned to Murphy to help him prevent a lawsuit from residents along the South Shore attempting to stop the construction of a new water filtration plant. Naess & Murphy worked to make the plant more attractive by designing a civic park as part of the facility and saved the new mayor from the impending lawsuit. Daley then turned to Naess & Murphy to help him with another difficult situation with the city's new airport at O'Hare Field.<sup>110</sup>

When Daley took office, funding for O'Hare had been a point of contention between the City and the airlines for nearly a decade. However, the new mayor was committed to building a modern airport for Chicago and he soon began direct negotiations with the airlines to reach a mutual agreement in 1956. With funding secured, he commissioned Naess & Murphy to review the plans drafted by Ralph Burke, and construction began in earnest in 1959. Between 1960 and the mid-1970s, the firm (including its successors) was responsible, along with multiple partner firms, for the design and construction of O'Hare, including Terminals 2 and 3, the Rotunda, the Heating & Refrigeration Plant, the O'Hare Telephone Building, and the O'Hare Hilton Hotel. The firm was also involved in designing the overall layout of the airport, including the runways, roadways, parking structures, and various other utilitarian buildings and systems.<sup>111</sup> C.F. Murphy Associates was honored in 1963 by the Chicago Association of Consulting Engineers for the design of the terminal buildings and the Rotunda.<sup>112</sup> An August 1963 issue of *Progressive Architecture* outlined the design of the new O'Hare plan, stating that it "lacks the brilliance and originality of Dulles" but shows strength in details such as "the meticulous care with which the individual buildings were designed; in the expert integration of structural and mechanical services; in the orderly and craftsman-like execution of the interiors, which have visual harmony in spite of the diverse requirements of 13 different airlines; and in the well-designed adjunct service structures, such as the fire station, the heating and refrigeration plant, and the central telephone exchange..."<sup>113</sup>

Sigurd Naess retired in 1959 and Murphy subsequently changed the name of the firm to C.F. Murphy Associates (C.F. Murphy) in 1960. Murphy's son, Charles F. Murphy, Jr., became more involved in the firm. Murphy, Jr. was an admirer of Mies and began hiring designers and architects, many of whom are now associated with the Second Chicago School of Architecture, who had either been trained by Mies or were committed to following his philosophies embodied in the International Style. The first of these new architects was Stanislaw Gladych, previously employed by SOM, who was hired as the firm's lead

<sup>109</sup> Miller, "Helmut Jahn and the Line of Succession," 303.

<sup>110</sup> Schulze, *Oral History of Carty Manny*, 152.

<sup>111</sup> Carl W. Condit, *Chicago: 1930-70: Building, Planning, and Urban Technology* (Chicago and London: The University of Chicago Press, 1974), 259; Richard P. Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)* (Muncie, Ind.: Ball State University, 1970), 166, 193, 196; C.F. Murphy Associates, *C.F. Murphy Associates* (Chicago: C.F. Murphy Associates, 1975).

<sup>112</sup> City of Chicago, Department of Aviation, *Annual Report 1963*, 6.

<sup>113</sup> "Our Two Largest Airports," 103.

designer. Gladych was one of the leading architects at O'Hare along with Carty Manny, Jr., Gertrude Lempp Kerbis, and John Novack, all of whom were strongly influenced by Mies. Other notable architects employed by C.F. Murphy throughout the 1960s included Otto Stark, Jacque Brownson, and James Ferris. C.F. Murphy's turn toward International-style design also fit perfectly into Mayor Daley's vision to modernize Chicago. According to Ross Miller, "The radically modern architecture demonstrated that the mayor of Chicago was not simply defending old arrangements, but was doing nothing less than recasting the aging American downtown."<sup>114</sup> Connecting Chicago to the world with a modern airport facility at O'Hare was an early priority for Daley and his vision to rebuild the city, but it was not the last. In the 1960s, the mayor planned a major redevelopment of the Dearborn Avenue corridor. C.F. Murphy participated in partnerships on three buildings that redefined this corridor of downtown Chicago, including the Richard J. Daley Center (1965), the Chicago Federal Center (1974), and the First National Bank of Chicago (1969). The firm would continue to complete numerous civic commissions for the City of Chicago, employing the Miesian International style to recast the city's image in the postwar era.<sup>115</sup> C.F. Murphy did not complete this task alone, however. Throughout the 1960s and 1970s, the majority of the firm's projects were the products of multiple architects and designers collaborating within the firm, as well as partnerships with other reputable firms such as SOM and Mies's private firm.

In 1967 Mayor Daley commissioned C.F. Murphy to design a new exhibition hall at McCormick Place. To assist with the project, the firm hired Eugene Summers, who brought his assistant Helmut Jahn to the firm as well. As a student of Mies, Summers was devoted to the modernist principles of the Second Chicago School of Architecture. Jahn, on the other hand, gained a reputation for being more flexible in his designs. By 1973, Jahn was promoted to Executive Vice President and Director of Planning and Design within C.F. Murphy and spent the remainder of the decade expanding the firm's stylistic range on multiple projects around the United States, but particularly in Chicago. As Ross Miller argued, "Within the framework of C.F. Murphy's bread-and-butter civic commission of the 1970s, Jahn methodically renewed the firm and established his own reputation."<sup>116</sup> In 1982, Jahn gained a controlling interest in C.F. Murphy and changed the firm's name to Murphy/Jahn, while significantly reducing the size of the firm. Charles Murphy, Sr. passed away in 1985.<sup>117</sup> Following his takeover of the firm, Jahn designed multiple postmodern and late-modern buildings across the United States and internationally, including airports in Cologne, Munich, Bangkok, and Chicago.

Jahn also continued C.F. Murphy's work at O'Hare. In 1982 the CDA launched the ODP, which included rebuilding Terminal 1, expanding Terminals 2 and 3, building a new international terminal (Terminal 5), and a "people mover" to transport travelers to more distant parking areas. Murphy/Jahn led O'Hare Associates, a joint venture of multiple firms, to complete the ODP. Helmut Jahn is credited with the overall

<sup>114</sup> Ross Miller, "City Hall and the Architecture of Power," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 253.

<sup>115</sup> Miller, "Helmut Jahn and the Line of Succession," 305; Miller, "City Hall and the Architecture of Power," 249–57; C.F. Murphy Associates, *C.F. Murphy Associates*.

<sup>116</sup> Miller, "Helmut Jahn and the Line of Succession," 307.

<sup>117</sup> Heise, "Charles F. Murphy, Chicago Architect."



design of the new Terminal 1 (1988), and the facade improvements to Terminals 2 and 3 (2006).<sup>118</sup> In 2012 Jahn renamed the firm to JAHN.<sup>119</sup> The firm continues to work internationally while maintaining its main offices in Chicago.

## D. Stanislaw Z. Gladych

Stanislaw Gladych was the chief designer for the O'Hare expansion that began in the late 1950s and continued through the early 1960s. A brief biography of Stanislaw is provided as context for understanding the design of O'Hare as it fits within the context of Gladych's influences and role in Chicago modern architecture in the mid-twentieth century.

Gladych was born in Poland in 1921. During World War II, he worked in the underground resistance, and was captured by the Russian army and sent to Siberia.<sup>120</sup> Once released, he was sent to Britain and then served in the Polish Air Force, and was shot down more than once.<sup>121</sup> After the war, Gladych remained in England, attending the architecture school at the University of Liverpool.

Upon graduating in 1950, Gladych immigrated to the United States and was hired by SOM at the firm's New York office.<sup>122</sup> He was sent to Okinawa, Japan, to assist in designing United States military facilities, and then transferred to SOM's Chicago office, where he was selected as the lead designer for the Air Force Academy at Colorado Springs, Colorado.

When the Air Force Academy project came to a close in 1956, Gladych left SOM to join Naess & Murphy (renamed C.F. Murphy in 1960).<sup>123</sup> That same year, Gladych became a partner at the firm and was selected as the designer for the Central Water Filtration Plant in Chicago.<sup>124</sup> This became the world's largest water filtration plan, and its Miesian design was honored with an award by *Progressive Architecture* magazine.<sup>125</sup> Although never a student of Mies, Gladych was intrigued by Mies's design philosophy, and utilized these Second Chicago School of Architecture principles in much of his important works.<sup>126</sup>

<sup>118</sup> "Transportation," *JAHN*, accessed August 20, 2019, <https://www.jahn-us.com/transportation>; O'Hare Associates, *Chicago O'Hare International Airport O'Hare Development Program* (Prepared for the City of Chicago, December 1982); Gapp, Paul, "O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?"

<sup>119</sup> Nory Miller, *Helmut Jahn* (New York: Rizzoli, 1986), 7; "Transportation"; Melissa Harris, "Name Change, New Design Leadership at Murphy/Jahn," *Chicago Tribune*, accessed August 20, 2019, <https://www.chicagotribune.com/business/ct-xpm-2012-10-26-chi-name-change-new-design-leadership-at-murphyjahn-20121026-story.html>.

<sup>120</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>121</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>122</sup> Schulze, *Oral History of Carty Manny*, 154.

<sup>123</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>124</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>125</sup> Schulze, *Oral History of Carty Manny*, 177.

<sup>126</sup> Schulze, *Oral History of Carty Manny*, 178.

Gladych was selected to work as chief designer for the O'Hare project under project manager Carter Manny, Jr. Beginning in 1956, this project required a rework of Burke's existing plan to expand the airport, which culminated into the 1958 master plan. Gladych was responsible for applying Miesian design principles to the terminal buildings and the Heating & Refrigeration Plant. During the design process he was assisted by other key figures on the O'Hare project, including Carter Manny, Jr., Walter Metschke, Otto Stark, and Gertrude Lempp Kerbis.

Manny credits Gladych with the implementation of the modular system at O'Hare, which was utilized in the concourse design. This scheme allowed for future growth at the concourses by designing the projecting contact gates with uniform dimensions to accommodate infill of the nose pocket space in between. Other design elements developed by Gladych did not come together as planned; specifically, the executed design of the curtain walls at the main terminal buildings, which could not be manufactured as originally designed due to issues related to the large size of each glazed panel.

In 1964 C.F. Murphy Associates and Perkins & Will were selected to design the First National Plaza Building in Chicago, and Gladych was assigned as the designer. Completed in 1969, the First National Plaza Building was a 60-story skyscraper that had a distinctive curvilinear shape defined by its slightly flared base. Also completed in 1968 was the extant building at Mercy Hospital in Chicago, which was designed by C.F. Murphy Associates, with Gladych as lead designer.

The J. Edgar Hoover FBI Building in Washington, D.C., was one of Gladych's largest commissions during his time at C.F. Murphy Associates. Designed in several phases beginning in 1967 and ending in 1977, the building exhibits a strong sense of Brutalism in its form and extensive use of concrete, and stirred controversy over the appropriateness of such a design and scale within the nation's capital. Original concepts by Gladych exhibited a more Miesian character, which eventually was dropped in favor of a Brutalist design that Gladych described as "expressing the 'precise, integrated form of the FBI.'"<sup>127</sup> However, the design was nearly universally panned by architecture critics and was not seen favorably by the public.<sup>128</sup>

In 1972 Gladych left C.F. Murphy Associates to join an engineering consulting firm, Howard, Needles, Tammen and Bergendoff (HNTB), where he served as president for one year.<sup>129</sup> By 1973 Gladych left HNTB to work on his own, starting a firm called S.Z. Gladych Design & Planning Consultant, before retiring shortly afterward.<sup>130</sup>

<sup>127</sup> Aarons, Leroy F., "Group Hails Design for FBI Offices," *The Washington Post*, October 2, 1964, sec. B.

<sup>128</sup> Eckardt, Wolf Von, "Rating Washington's Architecture," *The Washington Post*, January 6, 1974.

<sup>129</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>130</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

## E. Ludwig Mies van der Rohe, Miesian Architecture, and the Second Chicago School of Architecture

The background on Ludwig Mies van der Rohe and the Second Chicago School of Architecture is provided to understand how Terminal 2 fits into the context of Miesian architecture, which was an influential style from its introduction in the United States in 1940 until the 1960s.

Mies is best known for promoting a particularly streamlined version of Modern architecture that came to define the American city in the years after World War II. As the head of the architecture department at the Illinois Institute of Technology (IIT), he trained a generation of architects to follow his philosophy of architecture based on reducing buildings to their most essential elements. Mies developed much of his philosophy as a young architect in Germany, where he became associated with the International Style of architecture. The architects of the International Style believed that modern society had become “impersonal and collective” and that new architecture should reflect that view. Mies embraced the “impersonal nature of modern technology itself,” and dedicated himself to the perfection of artistry through the use of modern materials and methods.<sup>131</sup> Rejecting all sense of subjectivity, he aspired to objectivity in architecture by reducing buildings to their most basic elements. The goal of his stylistic reductionism was a focus on the creation of space, both exterior and interior. The combination of intentionally reductive architecture establishing defined, yet open and connected, space through the precise expression of modern materials embodies Mies’s philosophy. This was well summarized by architect Werner Blaser:

Space is primary and the position of the walls is determined by it. Interior and exterior form a whole. In this spatial freedom the static principle of slab, beam and column, i.e. of load and support, can be expressed. As the logical sequel to these lucid requirements we have the articulation of proportions in surface and space.<sup>132</sup>

Mies brought this philosophy to the United States in 1938, when he accepted an invitation to develop a new curriculum for the architecture department at the Armour Institute in 1938, which became IIT in 1940. Under Mies, the architecture department of IIT grew from a relatively unknown technical school to one of the most influential programs in the country.”<sup>133</sup> The Armour Institute was founded in 1890, during the rise of the First Chicago School of Architecture. The architects of the First Chicago School, such as Louis Sullivan, Daniel Burnham, and John Wellborn Root, among others, developed a new system of architecture that “emphasized structure and function over ornamentation.”<sup>134</sup> Mies advanced Sullivan’s famous slogan “form follows function” towards the design of a form so basic that it could suit any function. The architects trained under and influenced by Mies’s curriculum became known as the Second Chicago School of Architecture, in part because they extended the ideals of those earlier architects to new levels of austerity and functionality.

<sup>131</sup> Richard Pommer, “Mies van Der Rohe and the Political Ideology of the Modern Movement in Architecture,” in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 133.

<sup>132</sup> Werner Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, Second edition (Basel, Boston, Stuttgart: Birkhauser Verlag, 1981), 7.

<sup>133</sup> Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, 30.

<sup>134</sup> “Mies: The Man, The Legacy,” *Mies Van Der Rohe Society*, accessed August 16, 2019, <http://miessociety.org/mies/>.

Mies preferred the term *Baukunst*, or “building art,” over “architecture” and developed a meticulous curriculum based on five principles of architecture, summarized as a focus on structure, space, proportion, materials, and the fine arts in relation to architecture. Instead of direct instruction, Mies encouraged his students to examine each of these principles objectively through various exercises during the first four years of study; only in the fifth and final year did students apply their methods on tangible projects. Mies intended for his students to embrace a purely rational method of design and reject any subjectivity. The outcome of this curriculum was a generation of architects who absorbed everything the master teacher shared with them, but also developed an inflexibility of style. As James Ingo Freed, a student of Mies and later the Dean of Architecture at IIT, recalled, the four years of exercises “eliminated all other options...by the time you got to the fifth year you didn’t know what to do except what you had already done.”<sup>135</sup> Comparing education to training, Freed argued, “Education implies free will; and there was little of that there.”<sup>136</sup>

Over the following decades, the architects of the Second Chicago School built a multitude of efficient steel, glass, and concrete rectangular towers that came to define the American metropolis. The primary features of the Miesian style include rectilinear forms, a lack of ornamentation beyond accentuating the building materials, use of modern materials such as glass and steel, and open internal and external spaces framed by the building. This form was, for a time, ideally suited to the postwar American economy, which was steadily shifting away from manufacturing towards companies that necessitated more and more centralized office spaces. The Miesian model also matched the goals of civic leaders such as Richard Daley of Chicago, who not only saw it as efficient, but as an emblematic symbol of modernity. The Second Chicago School provided the rational order that American business and civic leaders desired to reshape the country in an age of unprecedented prosperity.

While teaching at IIT, Mies continued to work as a professional architect and produced three of his most iconic and influential buildings in the 1950s. The first of these are the apartments at 860 and 880 Lake Shore Drive (1948-1951) in Chicago, which have been described as one of the “most influential designs for high-rise structures of the twentieth century.”<sup>137</sup> With the Lake Shore Apartments, he aspired toward transparency of the structural design and building materials. Because fire codes required the steel skeleton to be encased in concrete, Mies chose to weld non-structural I-beams to the facade to give emphasis to the structure and materials beneath. In addition, the positioning of the buildings on an irregular lot create a clear and defined exterior space, with orientation directed simultaneously to the street and the lake. Secondly, Crown Hall (1950-1956), in the center of the campus designed by Mies at IIT, defined Mies’s desire to merge interior and exterior space. The structure of the building is entirely transparent, with the ceiling clearly suspended from the exterior superstructure, creating an entirely free and open interior space. That space is also surrounded by a continuous curtain wall that completely opens interior workspace to the exterior space of the campus. The designs of these two buildings were brought together in the Seagram Building in New York City. The appearance of the Lake Shore

<sup>135</sup> James Ingo Freed and Franz Schulze, “Mies in America: An Interview with James Ingo Freed Conducted by Franz Schulze,” in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 186.

<sup>136</sup> Freed and Schulze, “Mies in America: An Interview with James Ingo Freed Conducted by Franz Schulze,” 186.

<sup>137</sup> Franz Schulze, *Mies van Der Rohe: A Critical Biography* (Chicago and London: The University of Chicago Press, 1985), 241.



apartments is replicated on a taller and grander scale, with bronze I-beams ascending the facade of the building. The building is set back from the street to create a plaza, representing a large public space in the urban fabric of the city. Although the continuous curtain wall of Crown Hall is missing, the structure of the Seagram Building allows for large, flexible, open spaces on each floor.<sup>138</sup>

The influence of these three iconic buildings on the Second Chicago School architects can be seen in two high-profile buildings in downtown Chicago. The Continental Center (1962) was designed by Jacques Brownson and James Ferris of C.F. Murphy Associates. Both of these architects studied under Mies at IIT in the 1940s and 1950s, and Brownson even continued as an instructor. The Continental Center has an unadorned rectangular massing with exposed steel framing. The interior features open, column-free floorplans completely surrounded by floor-to-ceiling glass walls, reminiscent of the Crown Hall interior. The architects employed modern materials and engineering to design a minimal structure supported by only 20 columns with three 42-foot-wide bays on the facade. In addition, the first floor is recessed in the same manner as the Lake Shore Apartments and the Seagram Building.<sup>139</sup> A second building of note is the Chicago Civic Center (Richard J. Daley Center, 1965). Brownson is credited as the architect of record, but the entire project was a joint venture between the Chicago-based firms C.F. Murphy Associates; SOM; and Loeb, Schlossman, and Bennett. The Civic Center appears to very similar to the Continental Center on a larger scale, with three 87-foot bays across the facade supported by 12 exterior columns and continuous curtain walls encircling each story. However, the Civic Center is surrounded by an enormous plaza that occupies 65 percent of the building's site, repeating the plaza of the Seagram Building and echoing Mies's focus on exterior space.<sup>140</sup> The two prominent buildings showcase the designs and philosophy of the Second Chicago School architects as they worked to rebuild the nation's cities in the postwar period.

The Second Chicago School style is also apparent among the buildings constructed at O'Hare in the 1960s and 1970s. Gladych was not trained by Mies but was greatly influenced by Mies's philosophies. As Carter Manny described Gladych, he was "more Miesian than Mies."<sup>141</sup> With the terminal buildings, Gladych employed extensive curtain walls that create a sense of openness between the interior of the buildings and the surrounding airport design. The interior spaces themselves are vast and open, accommodating the large crowds of passengers and establishing a freedom of movement within the terminals. These design elements are also present in the Heating & Refrigeration Building, where the exterior curtain walls permit visibility of the machinery within. The terminal buildings were constrained by other design requirements of the airport, and do not reflect Mies's interest in creating a defined exterior space. However, this element is present in the design of the O'Hare Hilton Hotel. The curved facade of

<sup>138</sup> "Mies van Der Rohe Biography, Life & Quotes | TheArtStory," accessed August 16, 2019, [https://www.theartstory.org/artist/mies-van-der-rohe-ludwig/life-and-legacy/#biography\\_header](https://www.theartstory.org/artist/mies-van-der-rohe-ludwig/life-and-legacy/#biography_header); Schulze, *Mies van Der Rohe: A Critical Biography*, 275.

<sup>139</sup> *Continental Center: Landmark Designation Report* (Prepared for Commission on Chicago Landmarks, July 7, 2011), 6, 9, 12–13.

<sup>140</sup> Miller, "City Hall and the Architecture of Power," 255; Jan C. Rowan, ed., "Civic Center: Dignity and Continuity," *Progressive Architecture* 47, no. 10 (October 1966): 247; "Richard Daley Center," *The Architecture Week Great Buildings Collection*, accessed August 22, 2019, [http://www.greatbuildings.com/buildings/Richard\\_Daley\\_Center.html](http://www.greatbuildings.com/buildings/Richard_Daley_Center.html).

<sup>141</sup> Schulze, *Oral History of Carty Manny*, 155.

the hotel is not strictly Miesian; however, it is balanced with the terminal roadway to create an exterior plaza, with the control tower as its central feature, that is reminiscent of the Mies's Lake Shore Apartments and the Seagram Building.<sup>142</sup>

The reinforced steel and concrete exterior frame of the Terminal 2 and Terminal 3 were designed with Miesian principles of Modern architecture, with half-inch rolled tinted glass curtain walls with extruded aluminum mullions. This particular curtain wall system was developed by Gladych, Botho Schneider—also from Naess & Murphy—and Flower City Ornamental Iron Company in Minneapolis. Gladych utilized a similar Miesian curtain wall design for the Heating & Refrigeration Plant that was constructed northwest of the Terminal Core as part of the same master plan. With both designs, Gladych attempted to apply the architectural principles of Crown Hall at the Illinois Institute of Technology.<sup>143</sup>

Gladych preferred taller glazing between each mullion, without the smaller, upper light that was constructed, but the curtain wall system that was chosen could not allow for this size of uninterrupted glass. The neoprene gasket system that was used for this curtain wall had been developed by the automobile industry for use in windshields, then first implemented in architecture by Eero Saarinen for the General Motors Technical Center, and explained by Manny:

It's a very nifty glazing scheme, where this gasket grabs the metal on one side, the mullion that supports the unit, and it grabs the glass on the other side. Then you take a little tool and you push this zipper thing together that closes the thing, just like they do on automobile windshields. It was a technology developed by the auto industry that Eero picked up and used, and we used it and many others followed suit.<sup>144</sup>

More so than the smaller, SOM-designed original Terminal 1, the glass and steel designs of Naess & Murphy's O'Hare Terminal 2 and 3 buildings clearly reflected the Miesian philosophy of Modern architecture in their original designs, characterized by streamlined rectilinear designs and honest use of building materials.

<sup>142</sup> Schulze, *Oral History of Carty Manny*, 234, 288–89.

<sup>143</sup> Schulze, *Oral History of Carty Manny*, 210.

<sup>144</sup> Schulze, *Oral History of Carty Manny*, 201–4.

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### 3. Recommendations

#### A. Significance

Terminal 2 was evaluated for National Register of Historic Places (National Register) eligibility under *Criteria A, B, C, and D*. Evaluation under each of the National Register Criteria and discussion of period and level of significance and historic integrity is provided below.

##### (1) *Criterion A*

Under *Criterion A*, "Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history."

Terminal 2 was completed in 1961 and opened in 1962 during a period of major growth at O'Hare. At this time Terminals 2 and 3, the Rotunda, and support facilities were constructed based on the 1958 O'Hare master plan to support airport expansion, satisfy passenger demand and changes within the aviation industry, and provide new facilities and services for passengers and airport staff. The introduction of jet-engine-powered aircraft to commercial air travel in the late 1950s precipitated substantial changes to airport design and operations, pressuring City officials to expand O'Hare to serve this increase in air travel and secure Chicago's standing as a connecting hub for air transportation. As one of the major components of this construction program, Terminal 2 exemplifies the 1961-63 expansion of O'Hare to serve an important transportation need. Following its early 1960s expansion, O'Hare quickly ranked as one of the busiest airports in the nation and is representative of jet age transportation in the United States.<sup>145</sup> For these reasons, Terminal 2 possesses significance for the National Register under *Criterion A* in the area of Transportation.

In response to deregulation and increases in air traffic, continuous improvements to O'Hare have been made since the 1960s. The 1978 Airline Deregulation Act dramatically changed the nature of air travel in the U.S. By consolidating flights into regional hubs, airlines were able to significantly increase the number of flights they were able to operate. This in turn created the need for a change in airport design to accommodate the increase of both aircraft and passengers at the country's major airports. Atlanta's Hartsfield-Jackson Airport was one of the first to address these issues by completely redesigning the airport around a mid-field complex of satellite concourses. This new layout allowed aircraft to move more freely and provided travelers with expanded amenities. Atlanta's design represented a comprehensive re-imagining of the flow and functionality of that airport. City officials at O'Hare responded to these aviation industry changes by planning for and then executing the O'Hare Development Program (ODP) in the 1980s and 1990s and the Facade and Circulation Enhancements (FACE) project in 2006, both of which included significant terminal modifications. Under the ODP, Terminal 2 was expanded to the south to better serve increased passenger traffic in areas near security screening. Additionally, Concourse F was expanded to accommodate additional contact gates and hold rooms. In 2006 the front facade of the main terminal building was replaced to allow for more passenger circulation within the ticketing area. This resulted in a terminal that reflects these later eras of construction as much as it displays the initial

<sup>145</sup> "Chicago O'Hare International Airport, Crossroads of the World," *Chicago Tribune*, April 7, 1963, sec. 7A: Your Chicago Today.



construction from 1961. Terminal 2, as it had evolved by 2006 does not represent an exceptionally significant example of later aviation trends, and therefore does not meet *Criteria Consideration G: Properties That Have Achieved Significance Within the Past Fifty Years*. Changes to Terminal 3 after construction do not appropriately reflect significant trends in airport design, specifically with respect to changes brought about by airline deregulation. Other airports such as those at Atlanta, Denver, and many others constructed entirely new airport buildings as a response to airline deregulation, which better represents the design trends brought about by this significant event. Therefore, its period of significance under *Criterion A* is limited to 1961-63, the date of initial construction to the commemoration ceremony of the O'Hare expansion in 1963.

## **(2) Criterion B**

Under *Criterion B*, "Properties may be eligible for the National Register if they are associated with the lives of persons significant in our past."

Terminal 2 is not associated with any persons of historical significance outside of its architects, engineers, and designers, which are addressed under *Criterion C*. As such, it is recommended not eligible for listing in the National Register under *Criterion B*.

## **(3) Criterion C**

Under *Criterion C*, "Properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."

Terminal 2 embodies significant characteristics of an airport terminal of the jet age, representing this distinctive property type. The jet age had an influential impact on airport terminal design, as airports evolved to accommodate both a dramatic increase in air traffic after World War II and the larger jet-engine-powered passenger aircraft of the late 1950s. The introduction of jet aircraft prompted City officials to design new terminals for existing airports or redesign existing terminals to accommodate the larger size of the new aircraft. This pattern of development spread across many major metropolitan regions of the country, influencing airport design changes at airports such as Idlewild Airport (now JFK) in New York and Lambert Field in St. Louis. The development of O'Hare according to the 1958 master plan by Naess & Murphy was a direct response to these influences.

Terminal 2's main building and associated Concourse E & F reflect general trends in airport designs of the jet age, such as ticketing area and baggage claim serving two levels fronting the landside roadway, a single-level path of travel from ticketing to the aircraft, and a concourse extending into the airfield to serve contact gates and hold rooms without requiring passengers to walk across the tarmac. Additionally, O'Hare's use of the circular-drive-and-terminal plan allowed for ease of access for vehicular traffic to Terminal 2, with the dual-level roadway providing separation of arriving and departing passengers, which was an efficiency-based design originating in the jet age era. As such, Terminal 2 is representative of this jet age airport terminal design with distinctive characteristics, including a vertical separation of arrivals and departures, focus on the automobile through a bi-level roadway, and enclosed concourses with

circulation corridors leading to contact gates. Therefore, Terminal 2 possesses National Register significance under *Criterion C* for airport design of this period in the area of Architecture.

The original design of Terminal 2 was an example of Miesian architecture, which developed in Chicago and was chiefly driven by Mies van der Rohe. Also referred to as the Second Chicago School of Architecture, Miesian design principles infiltrated Modern architecture, with distinctive elements such as tinted plate glass curtain walls with glazing separated by aluminum extruded mullions. However, Terminal 2 cannot be appropriately evaluated for significance as an example of Miesian architecture as the primary facade of Terminal 2 that displayed this style was removed and replaced with an entirely new facade and canopy. This new facade and a south elevation addition, constructed in 2006 and 1984 respectively, both introduced different architectural character to the terminal.

Stanislaw Gladych served as the lead designer for Terminal 2, assisted by several other members of the Naess & Murphy team, including project manager Carter Manny, Jr. and with contributions by Landrum & Brown. According to first-hand accounts from designers on the project, Terminal 2 and other O'Hare buildings associated with the 1958 master plan were designed with substantial input and detailed development by other members of the design team and hired consultants, and was not the sole creative work of Gladych. As such, Terminal 2 does not represent the creative product of any single individual and does not reflect the work of any particular "master" architect, artisan, or craftsperson. Similarly, the design and planning of Terminal 2 does not appropriately reflect the works of Naess & Murphy in any manner that would be a significant association with the architectural firm.

Major alterations to Terminal 2 occurred as a result of the 1980s modernization of O'Hare, as outlined in the ODP and the 2006 FACE project. The post-1961 changes to Terminal 2 occurred in a piece-meal fashion that neither focused on intentionally retaining the original design nor clearly introduced new design principles to reflect the 1980s era of terminal design. As such, Terminal 2 does not represent an exceptionally significant example of an airport terminal of the 1980s.

#### **(4) Criterion D**

Under *Criterion D*, "Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history."

The design, construction, and alterations of Terminal 2 have been well documented, and it is unlikely that the building has potential to yield important information that is not otherwise accessible. As such, Terminal 2 is recommended not eligible for listing in the National Register under *Criterion D*.

#### **(5) Period of significance**

The period of significance for Terminal 2 was determined to coincide with the date of completion through the date of commemoration of the O'Hare expansion: 1961-63.

#### **(6) Level of significance**

Terminal 2 was evaluated for significance for representing changes to aviation during the jet age at the national level under *Criterion A: Transportation*, and for representing distinctive characteristics of an

airport terminal property type constructed during the jet age at the national level under *Criterion C: Architecture*.

## B. Integrity

To be eligible for inclusion in the National Register, a property must exhibit sufficient historic integrity to convey its significance, in addition to being associated with one or more of the National Register Criteria listed above. Terminal 2 was evaluated based on the seven aspects of integrity below: location, design, setting, materials, workmanship, feeling, and association. The evaluation of integrity for Terminal 2 was assessed to a period of significance of 1961-63.

- **Location** – Terminal 2 remains in its original location and therefore retains integrity of location.
- **Design** – Terminal 2 retains some of its original design in the general layout, structure, and features of the primary public spaces, but has undergone substantial alterations that have affected the terminal's design as it relates to its jet age-era style and plan during the period of significance. Alterations to the terminal building that affect integrity of design include the 2006 facade replacement and new canopy at the primary north elevation, as well as the 1984 south elevation addition, which have both substantially altered the original Miesian composition and materials of the building's original design. This primary facade offered the first view of the terminal as the passenger was approaching the ticketing area. This critical north elevation has been removed and replaced with a new facade. Additionally, alterations to Concourse E & F over time, including infill of the nose pockets and extension of the Concourse F branch, have changed the original design by introducing contemporary design elements to principal public areas of the terminal. As such, Terminal 2 does not retain integrity of design to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture* during its period of significance.
- **Setting** – Terminal 2 retains its integrity of setting within the larger O'Hare complex. Despite the construction of the adjacent FAA office building and associated FAA Main Control Tower, Terminal 2 continues to retain its general orientation and setting within O'Hare from its period of significance.
- **Materials** – Terminal 2 has experienced changes to materials in its principal public spaces since its jet age construction, including expansion of the main terminal building to the south in the 1980s and the 2006 facade replacement, interior material changes within the main terminal building, and interior renovations to Concourse E & F. The additions to Terminal 2 have introduced modern materials that have altered the integrity of the exterior facade. New interior materials of the main terminal building include the introduction of phenolic interior wall panels, metal grating ceiling, and chevron-striped terrazzo flooring. Concourse E & F has also experienced changes to original jet age materials, including interior renovations that introduced contemporary materials including acoustic tile ceilings, phenolic wall panels, terrazzo floor design, and other finishes. As such, Terminal 2 does not retain integrity of materials to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture* during its period of significance.

- **Workmanship** – Terminal 2 does not convey integrity of workmanship due to the substantial loss of original material caused by alterations to the main terminal building and concourses over time. As such, Terminal 2 does not retain sufficient workmanship from the jet age period of its original construction to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture*.
- **Feeling** – While Terminal 2 retains its continued use as an airport terminal, the principal public spaces and primary facade facing the roadway have been altered with the introduction of contemporary materials, which has diminished Terminal 2's feeling as an airport terminal designed and constructed during the jet age. It is highly unlikely that a historic contemporary would recognize Terminal 2 when approaching the building's primary facade from the roadway. As such, Terminal 2 does not retain integrity of feeling to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture* during its period of significance.
- **Association** – Terminal 2 retains association with the expansion project that occurred at O'Hare in response to increased air travel and other influences of the jet age, as it retains its use as an airport terminal and continues to exhibit its orientation and plan as a main terminal building with extending concourses.

### C. Eligibility

Terminal 2 possesses significance under National Register *Criterion A: Transportation* and *Criterion C: Architecture*; however, it does not retain sufficient integrity with relation to design, materials, workmanship, or feeling to convey significance under either criterion during its period of significance. Therefore, Terminal 2 is recommended not eligible for listing in the National Register.



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### **G-2.6. Terminal 3**



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Great Lakes Region  
Illinois, Indiana, Michigan,  
Minnesota, North Dakota,  
Ohio, South Dakota,  
Wisconsin

Chicago Airports District Office  
2300 East Devon Avenue  
Des Plaines, Illinois 60018

November 4, 2019

Mr. Anthony Rubano  
Acting Cultural Resources Coordinator  
State Historic Preservation Office  
IDNR – One Natural Resources Way  
Springfield, IL 62702-1271

Mr. Rubano:

Enclosed you will find a copy of a document entitled, *Determination of Eligibility: Terminal 3, Chicago O'Hare International Airport*. We request that you review the Federal Aviation Administration document to determine if you concur that Terminal 3, including Concourses H, K and L, is not eligible for listing on the National Register of Historic Places.

If you have any questions, please feel free to call me at (847) 294-7354.

Sincerely,

A handwritten signature in black ink that reads "Amy B. Hanson". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Amy B. Hanson  
Environmental Protection Specialist  
Chicago Airports District Office  
Federal Aviation Administration

Cc: Aaron Frame, City of Chicago Department of Aviation  
Jamie Rhee, City of Chicago Department of Aviation



## Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271

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Mailing Address: 1 Old State Capitol Plaza, Springfield, IL 62701

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Cook County

Chicago

National Register Eligibility, Terminal 3 and Concourses H, K and L at O'Hare International Airport

10000 W. O'Hare Ave.

SHPO Log #015120219

December 18, 2019

Amy Hanson

U.S. Department of Transportation

Federal Aviation Administration

Chicago Airports District Office

2300 E. Devon Ave., Suite 201

Des Plaines, IL 60018

Dear Ms. Hanson:

We have reviewed the information you have provided concerning the referenced project.

We concur with your finding that these structures lack sufficient significance for listing on the National Register of Historic Places.

This letter does not constitute a State Historic Preservation "Sign-off" on the project for the purposes of Section 106 of the National Historic Preservation Act of 1966, as amended.

If you have any further questions, please call 217/782-4836.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert F. Appleman".

Robert F. Appleman

Deputy State Historic

Preservation Officer

c: Aaron Frame, Deputy Commissioner, Chicago Department of Aviation

Jamie Rhee, Commissioner, Chicago Department of Aviation

# **Determination of Eligibility: Terminal 3**

## **Chicago O'Hare International Airport**

Prepared for the  
**Federal Aviation Administration**

Prepared by



[www.meadhunt.com](http://www.meadhunt.com)

November 2019



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## Executive Summary

The historical evaluation of Terminal 3 at O'Hare International Airport (O'Hare, or "the airport") supports Federal Aviation Administration (FAA) requirements for compliance with the National Environmental Policy Act (NEPA) and Section 106 regulations issued pursuant to the National Historic Preservation Act (NHPA), as amended (36 CFR Part 800). As part of its review of the City of Chicago's proposed Airport Layout Plan (ALP) modification, FAA is conducting a NEPA process for the proposed Terminal Area Plan (TAP) and other ALP modifications. In April 2019 FAA engaged Mead & Hunt, Inc. (Mead & Hunt), through a third-party contract, to complete a National Register of Historic Places (National Register) evaluation of Terminal 3.

Terminal 3 consists of a main terminal building and three distinct concourses that project from the main terminal building: Concourse H & K, Concourse L, and the Concourse L "Stinger." Designed by Naess & Murphy and completed in 1962, the main terminal building is Miesian in its original character, with its exterior dominated by tinted glass and aluminum curtain walls. A curtain wall addition was constructed on the northern facade in 2006. Concourse H & K (also completed in 1962) and Concourse L (completed in 1985) share similar exterior design cues with each other, while the appearance of the Concourse L Stinger (completed in May 2018) departs from this Miesian character with a more contemporary design. Terminal 3 exhibits modifications carried out at various times that include several additions to its original plan, as well as changes to some exterior and interior finishes. It currently houses the operations of American Airlines and its subsidiary airlines, as well as JetBlue Airways and Spirit Airlines.

Terminal 3 was evaluated for National Register eligibility under *Criterion A: History*, *Criterion B: Significant Person(s)*, *Criterion C: Architecture*, or *Criterion D: Information Potential*. Terminal 3 possesses significance under *Criterion A* in the area of Transportation as it exemplifies the 1961-63 expansion of O'Hare to serve an important transportation need. Terminal 3 also possesses significance under *Criterion C* for airport design of this period as it embodies significant characteristics of an airport terminal of the "jet" age, which heralded the introduction of jet-engine-powered aircraft into commercial transportation in the late 1950s, and represents this distinctive property type. However, it does not retain sufficient integrity with relation to design, materials, workmanship, or feeling to convey National Register significance. Therefore, Terminal 3 is recommended not eligible for listing in the National Register.

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# 1. Description

## A. Overall setting and context

Located in northeastern Illinois, Chicago O'Hare International Airport (ORD, also referred to as "O'Hare" or "the airport") occupies an approximately 8,200-acre site that straddles the Cook/DuPage County line to include areas within the city limits of Chicago, Des Plaines, Schiller Park, and Rosemont. The airport is sited approximately 17 miles northwest of Chicago's Central Business District and a variety of light industrial, commercial, residential, and public land uses surround the airport property. The airport itself consists of a central group of terminals (Terminals 1, 2, 3, and 5) encircled by taxiways and surrounded by runways (see Figure 1). Cargo facilities are located at southeast, southwest, and northeast portions of the airport. The general aviation facility is in the northeast corner of the airport, and fuel storage facilities are located at the northwest corner. Public surface parking areas are located along the central and northeast portions of the airport. The Federal Aviation Administration (FAA) North Control Tower is in the northwest corner of the property, while the FAA South Control Tower is located in the cargo facilities area on the southwest side of the airport. Other support facilities in the areas on the south, northwest, and northeast portions of the property include those for airline support and maintenance, aircraft rescue and firefighting, a post office, and Transportation Security Administration (TSA).

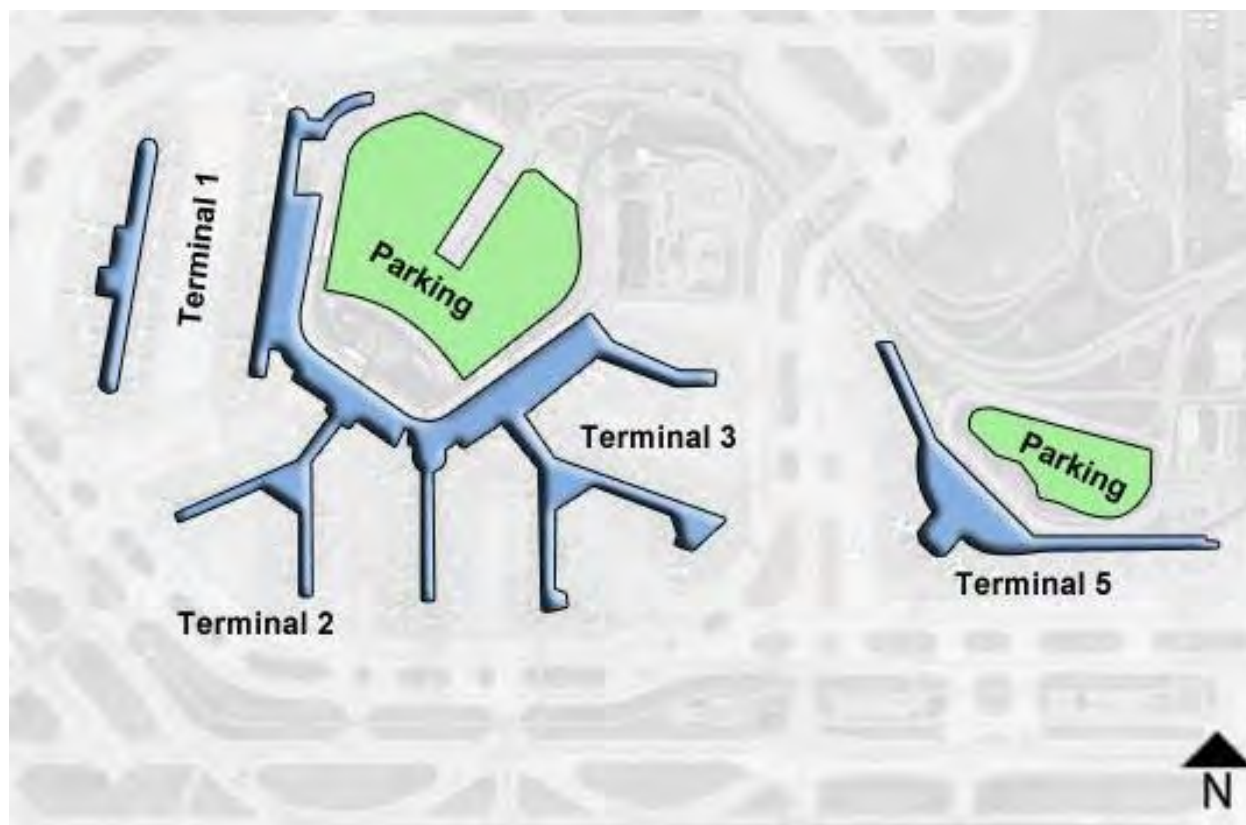


Figure 1. Map of terminals and parking areas at O'Hare.<sup>1</sup>

<sup>1</sup> "Chicago Ohare (ORD) Airport Terminal Map," *IFly.Com*, accessed June 5, 2019, <https://www.ifly.com/chicago-ohare-international-airport/terminal-map>.

At the center of the property, Terminals 1, 2, and 3 form the Terminal Core Area, arranged in a U-shaped plan that opens to the northeast. The interior of the U is occupied by two large parking lots, bisected by a central roadway that provides access to the Elevated Parking Building. Terminal 1 forms the west side of the U-plan. The O'Hare Hilton Hotel is located between the Elevated Parking Building and Terminal 2 (the base of the U), and the City of Chicago Department of Aviation (CDA) control tower (formerly a FAA control tower) is centered on a grassy plaza that separates the hotel from Terminal 2. The Rotunda is located at the juncture of Terminal 2, Terminal 3, and Concourse G. Glass-enclosed, concourse-level walkways link the Rotunda to Terminals 2 and 3. Immediately adjacent to the north perimeter wall of the circular Rotunda is a three-story FAA office building, which was designed to match the curve of the building but does not touch the building, and the 1995 FAA Main Control Tower. Concourse G is attached to the southern perimeter of the Rotunda and connects directly into the Rotunda (unlike Terminal 2 and 3). The southern exterior of the Rotunda faces airside taxiways, airline gates, and aircraft service area.

The outside of the U formed by Terminals 1 to 3 is occupied by a total of 168 contact gates and 15 remote hardstands.<sup>2</sup> Terminals 2 and 3 have concourses that extend onto the aprons in a perpendicular or Y shape, while Terminal 1 has a concourse (Concourse B) with gates along the west side of the main terminal building and a separate, parallel concourse (Concourse C) accessed via an underground tunnel.

Interstate Highway 190 (I-190) and the Chicago Transit Authority (CTA) O'Hare Rapid Transit Blue Line Rail Service enter the airport from the east. The Blue Line follows the central roadway to the parking area, where the O'Hare CTA Station is located below ground. The Airport Transit System (ATS, or "people mover") links the three domestic terminals, the international terminal, and the long-term parking area to the northeast by rail; the ATS is accessible via a transfer station from the Metra commuter rail service. Within the Terminal Core Area, the ATS tracks and a two-level vehicular circulation roadway separate the parking lot, garage, hotel, and CDA control tower from the terminals. The upper roadway level provides access to the ticketing area for departing passengers while the lower roadway level provides access to the baggage claim and transportation for arriving passengers. ATS stations are located opposite each of the three terminals (as well as at Terminal 5) and are linked via covered pedestrian walkways across the roadway.

## **B. Overview of Terminal 3**

Terminal 3 is located at the southeastern end of the Terminal Core, which consists of Terminal 1, Terminal 2, and Terminal 3 and their associated concourses arranged around the pentagon-shaped looping roadway. Terminal 3 faces landside to the north and is connected to the Rotunda at the west.

Terminal 3 consists of a main terminal building and three distinct concourses that project from the main terminal building: Concourse H & K, Concourse L, and the Concourse L "Stinger" (see Figure 2 and Figure 3).<sup>3</sup> Designed by Naess & Murphy and completed in 1962, the main terminal building is Miesian in its original character, with its exterior dominated by tinted glass and aluminum curtain walls, and a curtain wall addition constructed in 2006. Concourse H & K (also completed in 1962) and Concourse L

<sup>2</sup> Aircraft parked at remote hardstand positions are accessed via shuttle bus rather than jet bridge.

<sup>3</sup> Terminal 3 is comprised of CDA Building numbers 300 (main terminal building), 305 (Concourse H & K stem and apex), 310 (Concourse H branch), 315 (Concourse K branch), 320 (Concourse L), and 330 (Concourse L Stinger).

(completed in 1985) share similar exterior design cues, while the appearance of the Concourse L Stinger (completed in May 2018) departs from this Miesian character with a more contemporary design. Terminal 3 exhibits modifications carried out at various times that include several additions to its original plan, as well as changes to some exterior and interior finishes. It currently houses the operations of American Airlines and its subsidiary airlines, as well as JetBlue Airways and Spirit Airlines.



Figure 2. Location of main Terminal 3 building and Concourse E & F.





*Figure 3. Overview of Terminal 3 from the CDA control tower, with the main terminal building at center, the Concourse L “Stinger” at far left, Concourse L at left, and Concourse H & K at right. The parking garage and Hilton Hotel are visible in the foreground.*

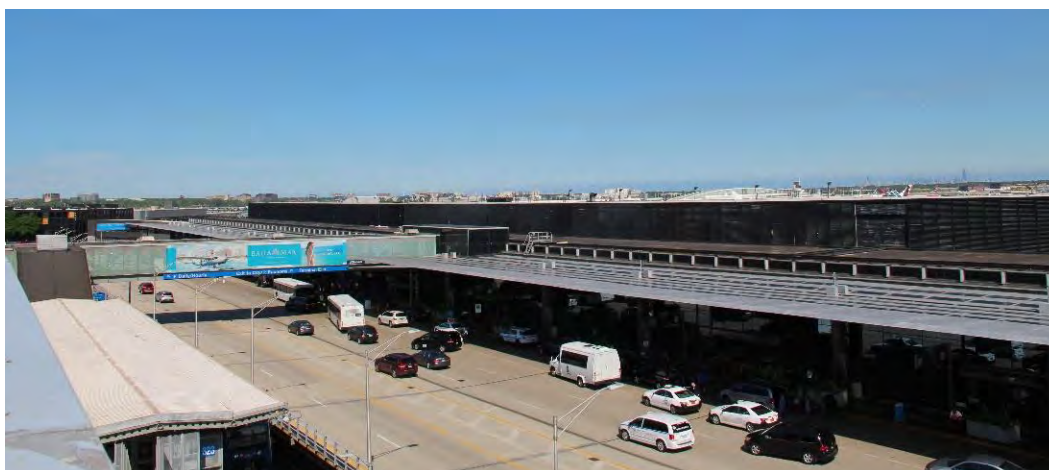
The main terminal building and Concourse H & K were designed in tandem and completed in 1962, with Concourse L completed in 1985, and the Concourse L Stinger completed in 2018. The main terminal building consists of ticketing and baggage claim areas, a secure concourse, back-of-the-house services related to baggage handling, and various spaces for administrative use by the airlines. The main terminal building consists of three floors, including a lower (apron) level, a first (concourse) level, and a second (mezzanine) level, as well as a basement (tunnel) level below grade. A mechanical penthouse projects above the roofline along the central east-west spine of the building. The north (landside) elevation of the main terminal building fronts the roadway and includes ticketing and baggage areas. The south (airside) elevation of the main terminal building includes airline contact gates and associated jet bridges, and airside ramp space for aircraft parking.

Concourse H & K, Concourse L, and the Concourse L Stinger generally project southeast from the main terminal building, with contact gates lining most elevations, and taxilanes between each of the concourses and their respective projecting wings. The three concourses have been constructed and modified individually over time and exhibit differences with respect to design, form, and interior feeling. Despite these differences, the concourses have similar functional elements and spaces, including main circulation spines at the first (concourse) level flanked by concession areas, hold rooms, contact gates, service areas, and preferred customer lounges. The apron and tunnel levels of the concourses are primarily utilitarian and provide back-of-the-house support spaces and airline administrative offices.

## C. Main terminal building

### (1) Overview

The main terminal building is a rectilinear building and has a flat roof with mechanical penthouse that projects above the roofline (see Figure 4 and Figure 5). It consists of the ticketing and baggage claim areas, TSA security screening, a secure concourse with concessions, administrative offices, and back-of-the-house support. The apron level holds the baggage claim area, as well as back-of-the-house support that is mainly operated by individual airlines. The concourse level consists of ticketing, TSA security screening, and some administrative offices, with additional administrative offices at the mezzanine level. The basement (tunnel) level holds mechanical equipment, janitorial and other offices, as well as a branch of the utility tunnel.<sup>4</sup> The ticketing and baggage areas are aligned with the stacked, double roadway system that loops around the Terminal Core, with the ticketing area located on the roadway's upper departure level and the baggage claim located on the lower arrivals level. An elevated pedestrian bridge, completed in 1992, provides access from the main terminal building to the parking garage and ATS located opposite the roadway.<sup>5</sup>



*Figure 4. North elevation of the main terminal building from the roof of the main parking garage, view facing southeast.*

<sup>4</sup> The utility tunnel refers to the utility tunnel that distributes and returns various resources from the Heating & Refrigeration Plant through the airport terminals and concourses, including lines for hot water, chilled water, domestic water, and fire protection.

<sup>5</sup> Carol Ross Barney Architects, Inc., "Plans for the Automated Guideway Transit System Central Core Stations," June 1964, Available in the Chicago Department of Aviation files, Chicago.





*Figure 5. North and west elevations of the main terminal building, view facing east.*

The original dimensions of the main terminal building were approximately 750 feet in length and 140 feet in width prior to any additions. A 1984 addition enlarged the main terminal building with an additional 320 feet to the east, expanding the floor area by approximately 50 percent (see Figure 6). This expansion was conducted by Delta Air Lines and utilized a nearly identical design as the existing main terminal building in materials, massing, form, and design details. During these alterations, an addition to the south elevation was constructed to increase interior space to accommodate enlarged security screening areas. Later alterations in 2006 introduced a curtain wall to the north elevation of the main terminal building as part of a larger facade enhancement project known as the Facade and Circulation Enhancements (FACE) renovation project, which also introduced a canopy extending across the roadway-facing elevations of all three terminal buildings at the Terminal Core. These 2006 alterations also expanded the interior space of the ticketing and baggage areas. Taken together, all additions have enlarged the main terminal building's width by approximately 60 feet from its original plan. Currently, the main terminal building is approximately 1,180 feet long, and varies from approximately 140 feet (the original plan width) to approximately 200 feet wide.



*Figure 6. East elevation of the 1984 addition to the main terminal building at center, view facing southwest. Passageway to Concourse L Stinger visible at left.*

The concourse-level interior is defined by double-height public spaces within both the secure and non-secure areas. Three, two-story blocks of administrative offices span the east-west central spine of the building and separate the non-secure ticketing area along the northern end of the building from the secure concourse area along the southern end of the building (see Figure 7). TSA security screening areas and secure exits are located within the intervening spaces, providing access points to the secure area of the terminal.



*Figure 7. Interior of the ticketing area of the main terminal building with the end of a mezzanine level block visible at left.*

## **(2) Exterior**

The exterior of the main terminal building is a union of the original Miesian design and materials and contemporary elements added to the building over time. The 1984 eastward expansion of the main terminal building retained the existing style and materials of the building's original design. An addition to the south elevation in 1984 and an addition to the north elevation in 2006 introduced more contemporary design elements and materials to the building's exterior.

The north elevation mainly consists of a curtain-wall addition (north elevation addition) constructed in 2006, as part of the FACE renovation project, located along the upper and lower roadway levels, and expands the building's original footprint approximately 15 feet (see Figure 8). The north elevation addition was designed by JAHN—the successor to Murphy/Jahn—and is contemporary in its design and construction, consisting of a curtain wall system with glass panels at butt joints secured by clips and a steel cable primary structure, with side elevations of the addition consisting of glass panels secured to a vertical steel reinforcement structure. The design is integrated into the structure of the canopy that extends across the curbside elevations of the Terminal Core buildings (see Figure 9). The canopy was also designed by JAHN and completed in 2006 as part of the FACE renovation project. The canopy is an uneven-V fin shape with slotted glass skylights, and sits upon large, round, metal columns spaced every 30 feet. It serves as a roof for the north elevation addition and shelters the sidewalk and nearest lane of traffic (see Figure 10).





*Figure 8. North elevation of the main terminal building showing the contemporary curtain wall addition, view facing southeast.*



*Figure 9. East elevation of the main terminal building showing a detail of the canopy at center, the contemporary curtain wall addition at left, and the 1984 eastern expansion of the main terminal building visible at far left, view facing west.*



*Figure 10. Contemporary canopy that spans the Terminal Core at curbside, with original north elevation visible at far right and curtain wall addition visible at center, view facing east.*

The north elevation addition features a series of entry vestibules and curbside check-in/baggage collection rooms (see Figure 11). The entry vestibules at both levels consist of double-door, bi-parting, aluminum, automatic entry systems. Some of the entry vestibules are wider, consisting of two adjacent automatic entry doors rather than one (see Figure 12). Both the entry vestibules and curbside check-in/baggage collection rooms are rectangular rooms delineated by open metal framing. These rooms are clad in glass panels facing the interior ticketing area and have operable partition doors; they are fitted with vertical bi-fold metal doors for enclosing and securing the space facing the sidewalk (see Figure 13). At the concourse level, the sidewalk extends to the entrance edges of the vestibules and curbside check-in rooms. Between these entrances are open area wells down to the lower level, which is bordered at the concourse level by a guardrail system with horizontal cables passing through thin aluminum fins (see Figure 14).





*Figure 11. Entry vestibule (center-left) and closed curbside check-in/baggage collection room (right) at first-floor curbside at the north elevation of the main terminal building.*



*Figure 12. Entry vestibule with two sets of doors at the lower level curbside at the north elevation of the main terminal building.*



*Figure 13. Curbside check-in/baggage collection room at first-floor curbside at the north elevation of the main terminal building.*



*Figure 14. Open well between the entry vestibules at the north elevation.*



The elevated enclosed pedestrian bridge is located near the center of the north elevation and consists of a Warren truss with vertical supports atop two exposed I-beams (see Figure 15). The bridge is clad in laminated glass with a striped acid-etch pattern, similar to finishes in Terminal 1. At the end nearest the main terminal building, the bridge is supported by steel supports that exhibit lateral steel bracing in the form of I-beams with round punched holes (see Figure 16). A glass-enclosed penthouse adjacent to the bridge projects above the canopy, which provides a sheltered landing for the stairs and elevator that lead to the bridge.



*Figure 15. Elevated bridge from the main terminal building to the parking garage and ATS.*



*Figure 16. Steel supports at the elevated bridge from the main terminal building to the parking garage and ATS.*

The original exterior composition of the building was dominated by a series of tinted plate glass windows separated by vertical I-beam mullions, which has been maintained at the east and west elevations. This composition is also visible at the exterior north and south elevations adjacent to the 2006 curtain wall addition at the north elevation and the 1984 addition at the south elevation (see Figure 17). This 1984 south elevation addition was constructed to create additional space within the secure concourse to accommodate increased security screening. A continuous curtain wall/arched roof skylight system consisting of tinted glass serves as the primary exterior enclosure of this addition (see Figure 18). At the lower level, the original exterior composition consists of high-aggregate, precast concrete panels topped by a band of clerestory windows, most of which appear unaltered.



*Figure 17. East and north elevations of the main terminal building showing the original exterior design applied to the 1984 eastward addition to the main terminal building, view facing southwest.*



*Figure 18. 1984 south elevation addition to the main terminal building, view facing northwest.*



### (3) Concourse-level interior

#### (a) Ticketing area

The ticketing area encompasses most of the northern section of the building's concourse level and is accessible from the roadway's departure level via a series of entry vestibules. The entry vestibules are recessed within the 2006 addition, and consist of one-story spaces framed by metal I-beams with flat glass ceilings, interior aluminum storefront windows, and white terrazzo floors (see Figure 19). The ticketing area is an expansive, two-story space framed by square columns with a flat metal grating ceiling, and terrazzo flooring that features a chevron stripe pattern of dark grey and white. There are open area wells down to the lower level interior between the entry vestibules, baggage collection rooms, and elevators. These wells are bordered by tubular metal and glass panel guardrails at the concourse level. Six escalators are located within these wells—two of which are located adjacent to stairs—that provide access to the baggage claim at the apron level. These escalators were constructed as part of the 2006 FACE renovation project and replaced previous escalators located within the former perimeter of the main terminal building.



*Figure 19. Interior of entry vestibule at the concourse level, with a curbside check-in/baggage collection room visible beyond partition wall.*



*Figure 20. Interior of ticketing area.*

The primary space consists of a central circulation space with ticketing services along the building's two-story central spine. At the front of the ticketing area are walk-up airline self-check-in kiosks and movable queue rope barriers (Figure 21). Baggage collection desks and associated conveyor belts are located behind the kiosks and line most of the interior walls along the central spine's first-floor offices. They sit behind a steel structure dropped soffit and are adorned with a plethora of electronic screens serving as signage. Most of the physical signs throughout the space are hung from the ceiling by similar thin metal posts.



*Figure 21. Ticketing area showing the ticketing agent desks and mezzanine.*

Five TSA screening areas are located between the blocks of first- and mezzanine-level offices along the building's central spine and lead from the ticketing area to the concourse. Some screening areas are marked by one or two contemporary, cantilevered, metal blade canopies that have sporadically placed light diodes at the underside (see Figure 22). A secure exit between the concourse and the ticketing area separates the two spaces with a glazed partition wall and two metal revolving doors (see Figure 23). Above these doors is signage informing of the "exit-only" nature of the access point, as well as a neon-illuminated sign with an American Airlines logo.





Figure 22. Ticketing area with TSA security screening area visible at left.



Figure 23. Secure exit between the concourse and the ticketing area.

The central ticketing/TSA security areas have experienced changes over time. The passenger check-in process is now partially driven by self-service kiosks and baggage hand-off, offering time savings over the original configuration of conventional check-in counters lining the space to manage the check-in process. The TSA screening checkpoint space requirements have also increased with changes in security needs.

**(b) Concourse area**

The concourse is located along the south side of the main terminal building and has similar design elements and finishes as the ticketing area along the building's north side. Like the ticketing area, the two-story space is framed by square columns with wall finishes that mainly consist of phenolic interior wall panels and gypsum board, flooring that consists of a chevron stripe pattern of dark grey and white terrazzo, and a ceiling that consists of flat metal grating (see Figure 24).<sup>6</sup> A circulation corridor runs the length of the concourse, flanked by concessions, two hold rooms, and three contact gates.



*Figure 24. Concourse of the main terminal building with glazed partition walls associated with the TSA security screening area visible at right.*

Security screening locations and secure exits serve as secure access between the non-secure ticketing area and the concourse area. Access between ticketing and the concourse was originally unrestricted in the areas around and between the building's center spine, as shown in as-built plans from 1964. These previously open areas are currently used for TSA security screening, which provide multiple controlled access points to the secured areas of the terminal. Full-height and partial-height partition walls around the TSA security screening areas appear to be removable.

Some concessions extend into the circulation space with partition walls to accommodate additional seating for dining (see Figure 25). Doors to offices and other spaces located along the central spine of the building can also be accessed from the concourse. A pair of escalators provides access from the concourse to the baggage claim at the lower level, and is located near the connection of the main

<sup>6</sup> Phenolic wall panels refer to the contemporary, composite building material that consists of a cellulose fiber core and is often finished with a laminate or resin coat.



terminal building with Concourse H & K (see Figure 25). These escalators are marked by a double-wide, metal-frame gate and surrounded by a semi-circular glass guardrail topped by a red metal tube railing.



*Figure 25. Pair of escalators leading from the concourse to the lower level baggage claim, with concession areas extending into the circulation area visible at right.*

An addition along the south elevation of the main concourse was constructed in 1984 to accommodate additional space in the concourse area for increased security screening (see Figure 26). The design of this addition consists of a continuous curtain wall/semi-arched roof skylight system with an exposed, interior, steel, semi-arched structure that serves as the primary exterior enclosure (see Figure 27). Each semi-arch steel truss is perforated with punched ovular holes, which reflects similar design cues to Terminal 1. The side elevations of the addition are infilled with glass in metal frames that display a semi-fanlight design following the semi-arch steel trusses.



Figure 26. South elevation addition visible at left and main circulation of the concourse visible at right.



Figure 27. Detail of the exposed, interior, steel, semi-arch structure of the south elevation addition to the main terminal building.



There are two projecting areas of the concourse that serve three contact gates and associated holding rooms (gates H1, H2, and K1) (see Figure 28). At the locations where the concourse transitions to Concourse H & K, the flooring changes to a diamond pattern of white, light grey, and dark grey terrazzo, and the ceiling changes to slatted metallic panels interspersed with fluorescent tube lighting (see Figure 29).



*Figure 28. Portion of the south elevation addition at the location of a contact gate.*



*Figure 29. Connection between the concourse of the main terminal building and Concourse H & K, showing transition in ceiling and floor design between the two areas.*

At the eastern end of the concourse level is an American Airlines Admirals Club lounge, which is a preferred customer lounge operated by American Airlines (see Figure 30). Originally constructed as the Delta Air Lines Crown Room lounge in 1984, Delta Air Lines vacated the space circa 2000 and it was remodeled in 2001 for the American Airlines Admirals Club lounge.<sup>7</sup> Various circumstances delayed the lounge's completion until 2017, and the space served ancillary needs for various airport functions in the meantime, including use by the United Services Organization, Inc. (USO). The lounge is accessible via the secured area of the main concourse and is separated from the ticketing area by an interior glass curtain wall system, with modern finishes that date to 2017 (Figure 31).



*Figure 30. Entry to American Airlines Admirals Club lounge located at the eastern end of the main terminal building.*

<sup>7</sup> Information regarding the modifications of this American Airlines Admirals Club lounge was obtained during in-person conversations on June 19, 2019 with Tyrone Hamilton, an employee of American Airlines.





*Figure 31. Interior of the American Airlines Admirals Club lounge located within the 1984 addition at the eastern end of the main terminal building.*

#### **(4) Mezzanine level**

The second-floor mezzanine level is located in three blocks along the central east-west spine of the main concourse, and includes administrative offices and conference rooms located above similar-use spaces at the concourse level (see Figure 32). The mezzanine has a wraparound, single-loaded corridor (rooms accessed from one side only) that is enclosed on the exterior by aluminum interior storefront windows with both opaque and transparent glazing; it is accessed by stairs and elevators located at the ends of each block (see Figure 33). Where they occur, the transparent glazing provides views to the ticketing area and the concourse area. The walls along the interior of the mezzanine mainly consist of full-length plate glass windows and doors with transoms, with some areas clad in drywall or square tiling. The ceiling consists of open metal grating to diffuse the light and provide separation of the mechanical units from the space below. The flooring along the corridors consists of white terrazzo. The interior finishes at these administrative offices are modern throughout, and mainly consist of carpeting, drywall, and T-bar ceilings (see Figure 34).



*Figure 32. View of the mezzanine level from the concourse area.*



*Figure 33. View down single-loaded corridor at the mezzanine, with the ticketing area visible through the transparent glazing of the interior aluminum storefront windows at right and the offices and conference rooms lining the corridor at left.*



*Figure 34. Typical interior office space at the mezzanine in the main terminal building.*

**(5) Lower-level interior**

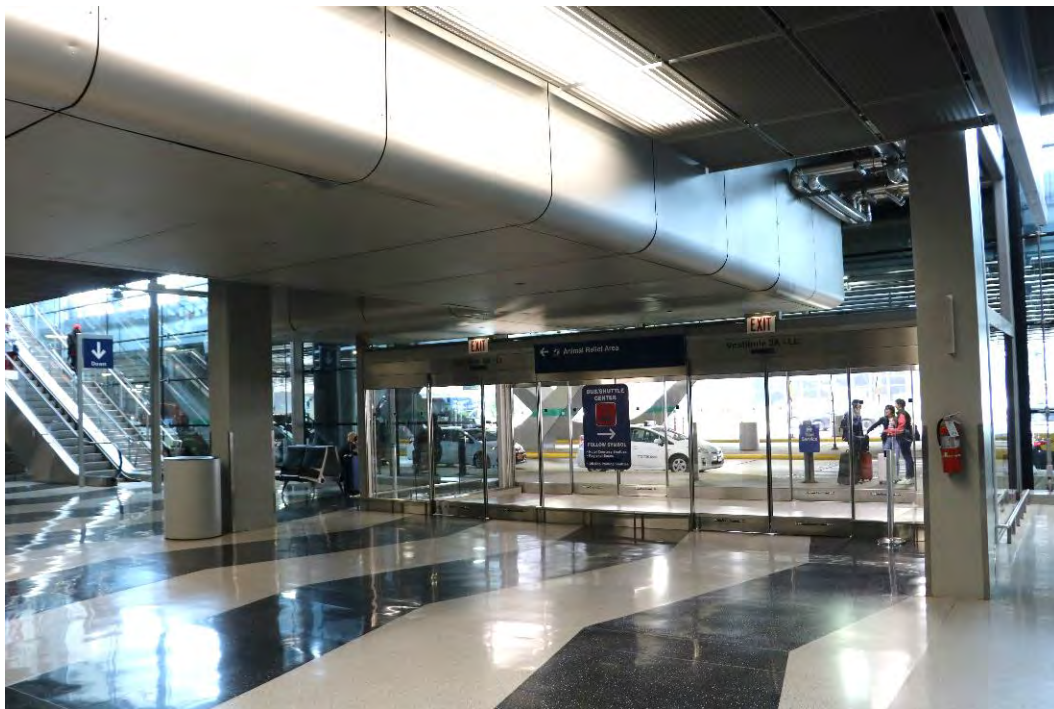
**(a) Baggage claim**

The lower level mainly serves as baggage claim, with two primary areas that consist of a circulation corridor at the north side of the building and baggage claim conveyor belts and associated spaces at the south side of the building (see Figure 35). The north side of the building fronts the lower, arrivals level of the roadway, with entry/exit vestibules located within the 2006 addition at the north elevation (see Figure 36). Areas within the circulation corridor include check-in kiosks and information desks. An open metal pipe guardrail system, typically lined with seating and benches, separates the two primary areas. Seating closer to the north elevation consists of contemporary versions of the Eames tandem-sling seating chairs originally designed for use throughout O'Hare's Terminal 2 and Terminal 3. Secondary areas located along the southern and eastern ends of the space include toilet rooms and baggage customer service offices. Concession and retail kiosks have also been added to the circulation areas over time. Throughout the circulation spaces, ceiling-mounted signage and electronic information boards dominate overhead, along with soffits that contain conveyor belts between the curbside check-in/baggage collection rooms to the baggage handling areas.





*Figure 35. Baggage claim area showing the conveyor belts.*

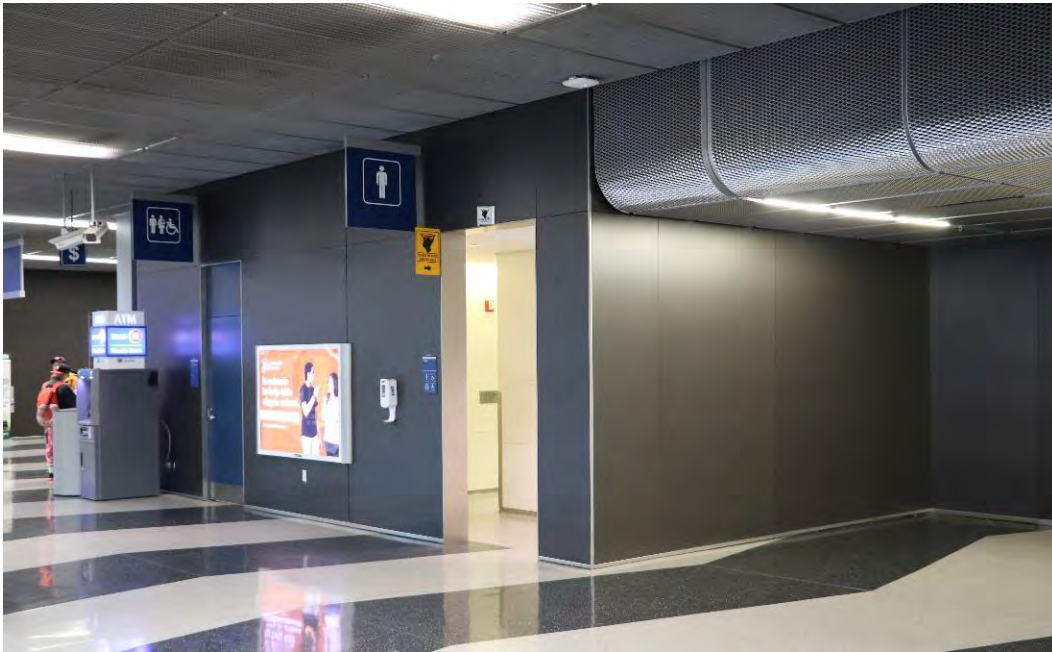


*Figure 36. Entry vestibule at interior of the apron level. The soffit visible at top accommodates a conveyor belt for transporting baggage between the curbside check-in/baggage collection rooms and the baggage handling area.*

The rear walls are generally clad with white textured fiber reinforced polymer (FRP) interior wall panels or dark gray phenolic interior wall panels (see Figure 37). These apron-level interior areas also contain the



same chevron pattern dark grey and white terrazzo floor as the primary spaces on the concourse level. The ceilings are composed of a variety of metal tiles, including scalloped texture tiles, smooth finish tiles, and open metal grating. Ceiling tiles have rounded edges where the ceiling transitions to different heights or around soffits. Flanking each side of the elevators are pairs of escalators and stairs that lead from the baggage claim area to pedestrian tunnels that lead to the parking garage and the CTA Station (see Figure 38). Escalators located parallel to the building's north elevation lead to ticketing at the concourse level.

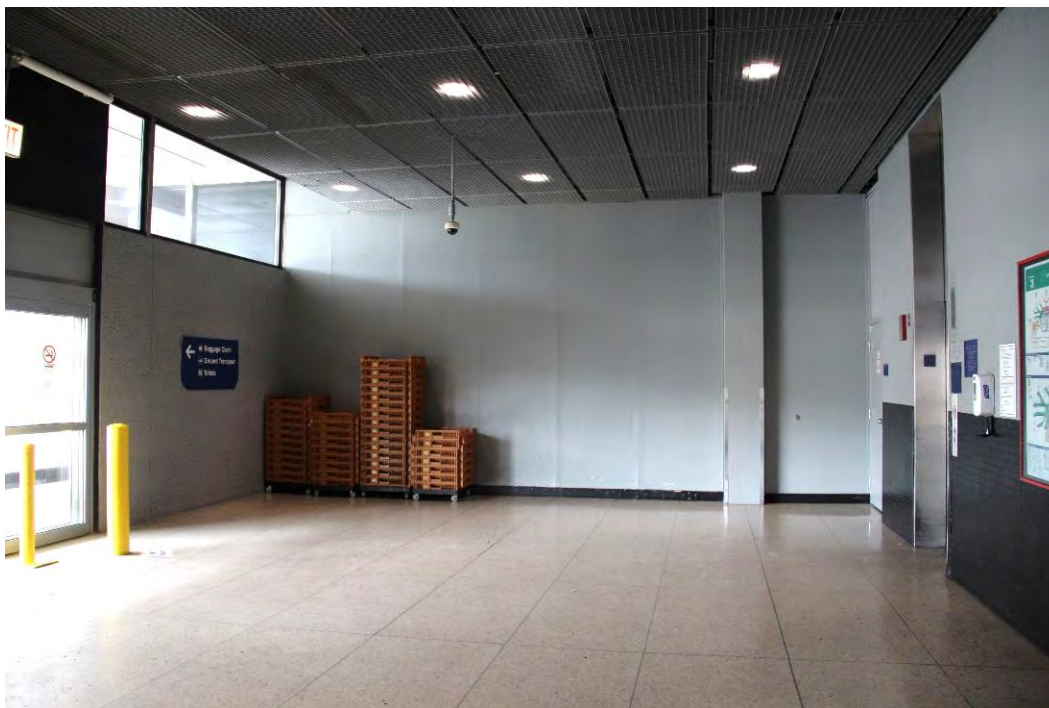


*Figure 37. Phenolic interior wall panels and other interior finishes at apron-level baggage claim area.*



*Figure 38. Interior of lower level showing escalators to tunnel level toward the parking garage and CTA Station, and elevators to both the tunnel level and concourse level.*

A vestibule located at the eastern end of the apron level provides access to elevators, as well as an exit to a non-secure exterior area. In this vestibule, the interior finishes mainly consist of gypsum board interior wall panels and square tiling, terrazzo flooring, and metal grating ceiling (see Figure 39). Bollards are in front of the automatic sliding glass doors at the interior near the exit.



*Figure 39. Vestibule at the eastern end of the apron level with exit to non-secure exterior area at left and elevators at right.*

#### **(6) Tunnel-level interior**

The tunnel level is located below grade and includes both public spaces and secure, back-of-the-house spaces. The public spaces at the tunnel level are accessible through three access points, which consist of stairs, escalators, and elevators that connect the baggage claim area to tunnels that lead to parking and the CTA station (see Figure 40).<sup>8</sup> These access points are spaced equally, and are generally located near the midpoint and either end of the baggage claim area. These three spaces all share the same interior finishes and elements, including escalators, stairs, and elevators leading from baggage claim, chevron-pattern terrazzo flooring, metal grating ceiling with diffused lighting, and phenolic wall panels. The ceiling directly above the mid-landing at the stairs appears to be cast-concrete and has a dimpled design (see Figure 41).

<sup>8</sup> These three tunnels are referred to as 3A, 3B, and 3C. Tunnels 3A and 3B that connect Terminal 3 to the parking garage and CTA station via the underground pedestrian concourse are part of a separate pedestrian tunnel system that was planned in 1971. Tunnel 3C leads directly to the parking garage and was constructed during the 1985 alterations to the main terminal building, and completed in 1987. C.F. Murphy Associates, "Plans for Pedestrian Tunnels, Chicago O'Hare International Airport," 1971, Available in the Chicago Department of Aviation files, Chicago. HARZA Engineering Company, Globetrotters Engineering Corporation, and Rubinos & Mesia Engineers, Inc., "Plans for Pedestrian Tunnel 3C and Pedestrian Tunnel 7," May 1, 1987, Available in the Chicago Department of Aviation files, Chicago.





Figure 40. Pedestrian concourse at the tunnel level of Terminal 3 leading from the escalators, stairs, and elevators to the baggage claim at the apron level of the main terminal building.



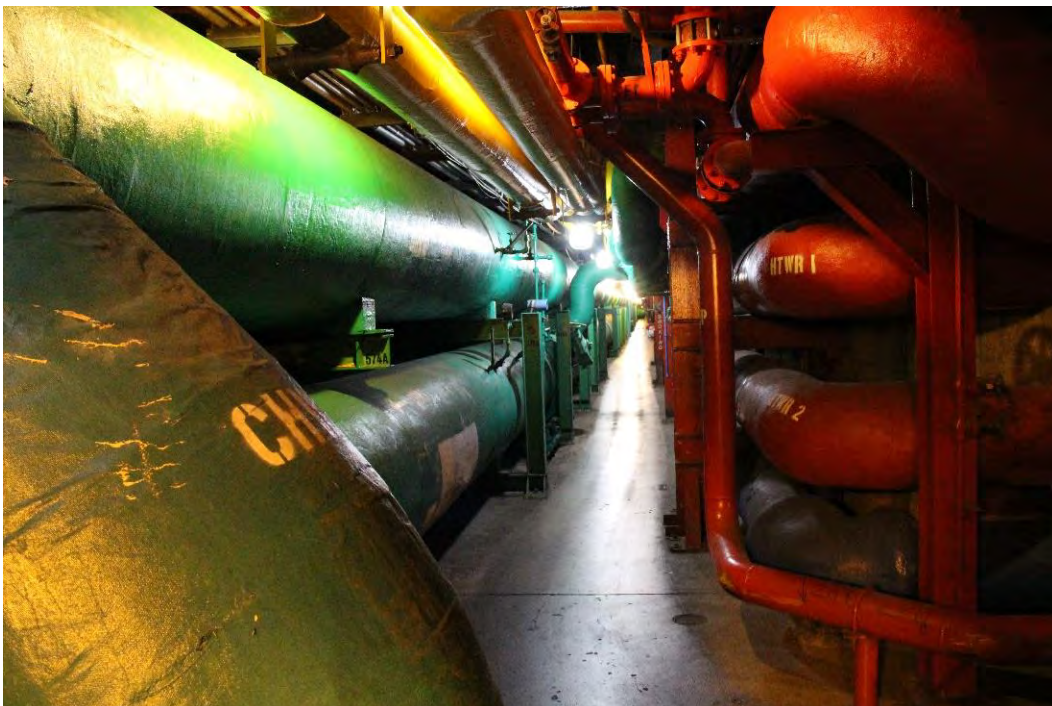
Figure 41. Detail of the dimpled concrete ceiling above the mid-landing of the stairs that lead from the apron-level baggage claim to the pedestrian concourses toward the parking garage and CTA station.

The secure, back-of-the-house spaces at the tunnel level of Terminal 3 include a single-loaded corridor extending the length of the main terminal building, with adjacent mechanical rooms, custodial offices, and other utilitarian rooms along the north side (see Figure 42). The airport utility tunnel is accessible from this

corridor (see Figure 43). The utility tunnel has a tunnel branch that extends into the main terminal building of Terminal 3 and continues through the tunnel level of the concourses. These utility tunnel branches are utilitarian in design and construction, and consist of long circulation corridors flanked by large, color-coded utility pipes that line the tunnel walls.



*Figure 42. Corridor at the tunnel level of the main terminal building at Terminal 3.*



*Figure 43. Utility tunnel branch located below the main terminal building of Terminal 3.*



## D. Concourse H & K

### (1) Overview

Concourse H & K extends to the east from the main terminal building at Terminal 3. It has a Y-shape plan defined by four main segments: the stem, which projects from the main terminal building; the concourse apex (hereafter referred to as “apex”), where the stem meets the two concourse branches; and, the two concourse branches that diverge from the apex and serve the H gates and K gates, respectively referred to as Concourse H and Concourse K (see Figure 44).<sup>9</sup> The concourse varies in height among these segments, but all share a continuous basement (tunnel) level that consists of a branch of the utility tunnel to accommodate utility delivery and return, as well as a lower (apron) level associated with ground crew operations and offices for airline administration.

The stem has a basement (tunnel) level and apron level that consists of baggage handling areas. The concourse level serves as the stem's principal public area, with a central circulation corridor mainly flanked by contact gates, toilet rooms, and concessions. The penthouse (second) level consists of mechanical operations.

The apex is four stories in height including the apron level, with the concourse level mainly consisting of a food court and other concessions located between the corridors of the concourse branches, and a reception room associated with the American Airlines Admirals Club lounge and Flagship Lounge. The second floor and third floors of the apex consist of the American Airlines Flagship Lounge and American Airlines Admirals Club lounge, respectively, as well as airline administrative offices. A ramp tower projects two stories above the third-floor roofline and serves ground traffic control operations.

The concourse branches, Concourse H and Concourse K, share a similar plan consisting of a central circulation corridor flanked by contact gates, toilet rooms, and concessions, with minor differences in spatial arrangements at each cap addition. The penthouse level houses mechanical equipment.

Concourse H & K has undergone several modifications over time with most of the existing finishes dating to 1990. Some of the major changes include the infill of nose pockets at contact gates during multiple periods between 1966 and 1989, the expansion of Concourse H and Concourse K branches with the 1990 construction of additions at each respective end of the concourse branches (cap additions), the 1990 construction of an arch skylight across the concourse stem, and the 1990 construction of barrel-arch ceilings in the Concourse H and Concourse K branches.<sup>10</sup>

<sup>9</sup> Some materials reference the “stem” area as the “throat.”

<sup>10</sup> Nose pockets refer to recesses in the concourse footprint to accommodate the close parking of an aircraft to the gate.



*Figure 44. Birds-eye view of Concourse H & K from the CDA control tower.*



*Figure 45. View in between the Y-branches of Concourse H & K, with Concourse H at left, the concourse apex at center, and Concourse K partially visible at right.*



*Figure 46. East elevation of Concourse K, with the third floor of the concourse apex and ramp tower visible in the background.*

## **(2) Exterior**

Despite several additions over time, some of the exterior design elements of Concourse H & K continue to resemble those at Concourse E & F at Terminal 2. Concourse H & K continues to convey elements of its original Miesian design with the grid pattern exterior at the first through third levels. The apron-level exterior mainly consists of concrete masonry units and has various garage openings and access doors to both the interior of the apron level and to interior stairs to the concourse level. The first-floor exterior is generally defined by grid blocks of vertical window panels or high-aggregate, precast concrete panels separated by concrete gridlines. The mechanical penthouses at the second floor are clad in vertical standing-seam metal sheets, and display metal louver vents. The third floor of the concourse apex projects above the rooflines of the adjacent concourse segments and the walls share the general exterior grid-block design of the concourse level. The two-story ramp tower extends above the roofline at the apex and consists of a base clad in vertical standing-seam metal siding with the cab located above. The cab has a nearly identical design to other ramp towers throughout the airport, with wraparound tinted windows angled downward and separated by metal mullions.

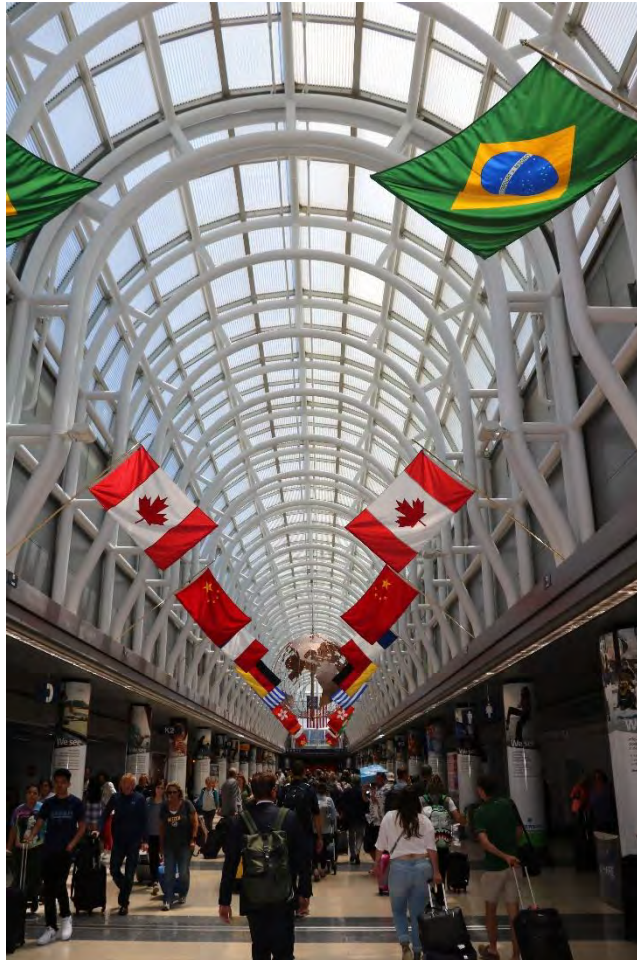
## **(3) Interior**

The concourse interior is generally organized into primary public spaces that include circulation corridors, hold rooms, food courts, toilet rooms, and concession spaces, and secondary non-public and semi-private spaces that include American Airlines Admirals Club lounges, administrative spaces, and the ramp tower, as discussed below.

### **(a) Circulation corridors**

A central circulation corridor dominates the interior of the concourse stem, illuminated with natural light by a multi-story skylight that was added in 1990 (see Figure 47). This skylight consists of a vaulted steel tube truss system attached to a continuous curtain wall arch with insulating laminated glazing. Apses create rounded caps for the skylight at either end of the stem corridor. Flags of various nations are hung from

poles extending outward above the circulation area.<sup>11</sup> A copper-colored spherical metal representation of Earth suspended from the skylight arch trusses exhibits several light diodes placed sporadically around the exterior of the sphere.



*Figure 47. Central circulation corridor in the stem of Concourse H & K, showing the arch ceiling truss.*

Concessions, contact gates, and back-of-the-house service rooms are located on either side of the stem's central circulation corridor. Round columns that line either side of the circulation corridor are wrapped in contemporary advertisement banners. The flooring consists of light beige terrazzo alternating with stripes of dark grey terrazzo and was installed in 1990 to match the terrazzo flooring pattern that had existed previously.<sup>12</sup> Ceilings on either side of the central circulation corridor are composed of slatted metallic ceiling panels interspersed with fluorescent tube lighting.

<sup>11</sup> These international flags are replaced with American flags annually to commemorate various American holidays including Memorial Day and Independence Day.

<sup>12</sup> This change is shown in drawings by Welton Becket Associates dated 1987 for modifications to the concourse that were carried out in 1990.



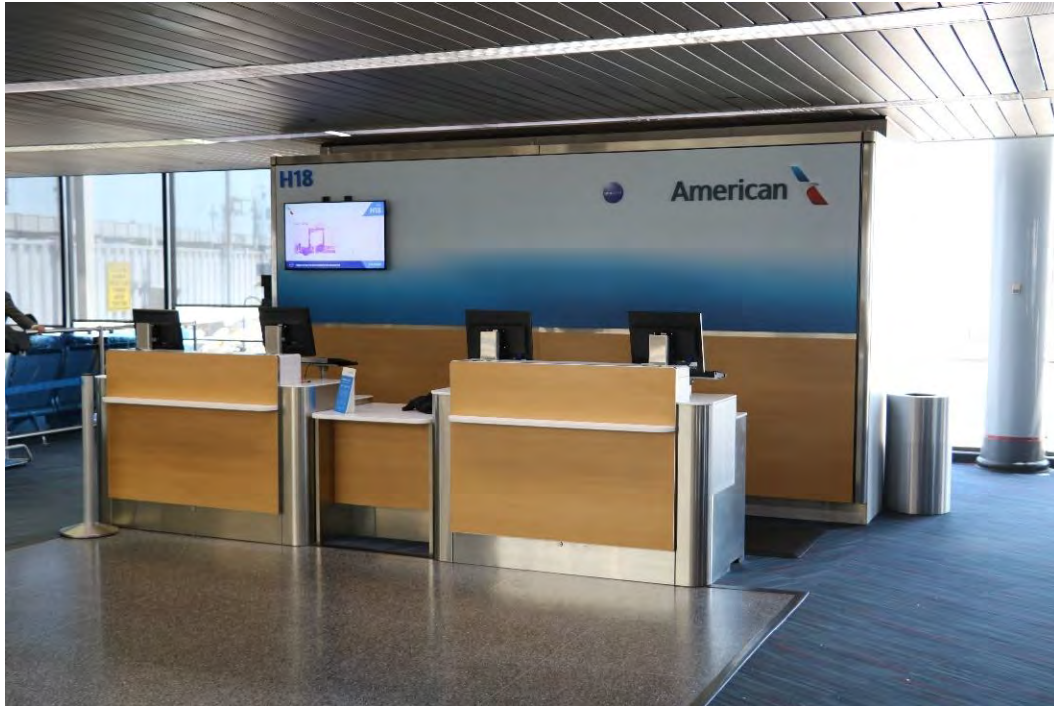
**(b) Concourse hold rooms**

Directly adjacent to the central corridors are the hold rooms (see Figure 48). Large phenolic panel soffits at the transition from the corridor to the hold rooms conceal building mechanical equipment. This is also where the hold rooms transition from terrazzo to carpet floor finishes. Low, one-story areas beyond these transitions line the exterior wall, where tinted windows provide views out to the airfield. Window panels are arranged in groupings of four, sporadically interrupted by groupings of four, high-aggregate, precast concrete panels.



*Figure 48. Typical hold room transition from the main circulation area.*

The hold rooms have contemporary gate agent desks and seating composed of a modern version of the Eames tandem-sling seating originally designed for use throughout O'Hare's Terminal 2 and Terminal 3. The gate agent desks and signage backdrops vary slightly in appearance but all appear to be made from plastic laminate, with some exhibiting metal panel trim (see Figure 49).



*Figure 49. Typical contemporary gate agent desks and backdrops.*

**(c) Concourse apex**

The concourse apex occurs where the stem connects with the Concourse H and Concourse K branches (see Figure 50). The apex has the largest vertical massing of Concourse H & K and holds a food court at the concourse level with the remainder serving secondary functions including administrative offices, preferred customer lounges, and the ramp tower.



*Figure 50. South elevation of the concourse apex showing the apron level through third floor, with the ramp tower visible in the background.*

At the transition point between the stem and the concourse branches and apex (see Figure 51), the barrel-arch ceilings of both concourse branches curve to connect in a union of skylights, exposed metal

tube trusses, and opaque grey square panels (see Figure 52). The concourse apex is dominated by a food court at the concourse level, which spans both concourse branches (see Figure 53). This food court exhibits modern finishes and layout dating to its 2002 remodel. This area is roughly triangular in plan, consisting of rows of concessions with one large area of tables and counters for seating. The flooring at the food court continues the general composition of the main circulation area, with the terrazzo laid in a horizontal curve through the food court that links the flooring stripes of Concourse H with Concourse K. The round columns continue through this space with some columns exposed to their metallic finish, while others are wrapped in advertisement banners. The ceiling at the food court mainly consists of panels set within a T-bar structure, with accents of contemporary wood soffits that provide space for recessed can lighting and mounted concession signage.



*Figure 51. Concourse H & K apex at center, with Concourse K at left and Concourse H at right, view from concourse stem.*





*Figure 52. Arched ceiling at concourse apex.*



*Figure 53. Food court at concourse apex, view from Concourse K.*



A circulation corridor is behind the food court. Referred to on plans as the “cross over,” this corridor connects the Concourse H and Concourse K branches (see Figure 54). This corridor appears to be part of an addition to the concourse apex area, which was expanded outward during work related to 1990 changes to Concourse H & K.



*Figure 54. View down the “cross over” at the concourse apex from Concourse H branch toward Concourse K branch.*

A substantial portion of the concourse apex consists of spaces associated with the American Airlines preferred customer lounges, including a reception room at the concourse level, the American Airlines Flagship Lounge at the second level, and the American Airlines Admirals Club lounge at the third level (see Figure 55 and Figure 56). All areas associated with these preferred customer lounges display modern finishes, as they were remodeled to their current configurations in 2017. American Airlines administrative offices occupy the space at the third floor adjacent to the American Airlines Admirals Club lounge. The interior offices feature minimal architectural detail, with modern finishes that consist of drywall, T-bar ceiling, and flooring that is a mixture of carpet and composition flooring with a hardwood-appearance (see Figure 57). A stairwell within these offices provides access to the ramp tower.



*Figure 55. Interior of the American Airlines Flagship Lounge on the second floor.*



*Figure 56. Interior of American Airlines Admirals Club lounge on the third floor.*





*Figure 57. Interior of a third-floor office.*

The ground traffic control room for operations on apron areas around Concourse H & K is located at the ramp tower, directly above the offices occupied by airline administration. The interior of the tower generally consists of carpet flooring and a T-bar ceiling, with perimeter walls consisting of the downward-angled windows for ground traffic observation (see Figure 58). Closely grouped workstations occupy the open floorplan.



*Figure 58. Ramp tower interior.*

#### (4) Concourse H and Concourse K branches

The concourse stem splits at the apex to become two concourse branches that serve H gates and K gates, referred to as Concourse H and Concourse K. Both concourses exhibit nearly identical interior appearances and finishes at the concourse level and are defined by a central circulation corridor flanked on either side by hold rooms, concessions, toilet rooms, and back-of-the-house service rooms. The circulation corridors of both concourses are dominated by a barrel-arch ceiling that was added in 1990, and consists of opaque, light grey, square panels that exhibit “cutouts” to expose backlit, translucent square panels ranging in colors, including shades of green, blue, and orange depending on location throughout the concourse branches (see Figure 59). Contemporary advertisement banners are suspended from the arch ceiling throughout the corridors. The concourse branch flooring remains unchanged from the stem, exhibiting the same striped pattern of terrazzo installed in 1990. Typical wall finishes within these concourse branches consist of phenolic wall panels with a color palette consisting of light grey, dark grey, and red, reflecting American Airlines branding (see Figure 60).



Figure 59. Main circulation corridor in the Concourse H branch, showing barrel-arch ceiling.





*Figure 60. Typical interior wall finishes within the concourse branches.*

#### **(5) Concourse H and Concourse K extensions**

The Concourse H and Concourse K extensions both consist of extensions constructed in 1990 that include a concourse level and apron level. The two additions were constructed in tandem and share some design similarities, but exhibit variations in interior spatial arrangement and uses.

The Concourse H extension, constructed in 1990, has a central open space defined by a large radial dome, consisting of steel trusses with a single polygonal ring and glazing with a stripe acid-etch pattern (see Figure 61). The flooring directly below the dome consists of blue terrazzo in the shape of the American Airlines eagle, set within white and dark grey terrazzo.



*Figure 61. Radial dome at Concourse H extension.*

The Concourse K extension, constructed in 1990, is larger than the Concourse H extension and consists of a central food court surrounded by hold rooms, as well as a preferred customer lounge that is not currently in use and was previously a public passageway (see Figure 62). The central food court is defined by a similar radial dome to that at Concourse H and consists of steel trusses with two polygonal rings and glazing with a stripe acid-etch pattern (see Figure 63). The flooring directly below the dome displays blue terrazzo airline branding set in a spiral pattern among white terrazzo. This central food court has concessions lining the interior walls with seating in the center, below the dome, along with storage rooms and toilet rooms flanking three outer corners of the food court.



Figure 62. Entrance to the closed preferred customer lounge located in the Concourse K extension.

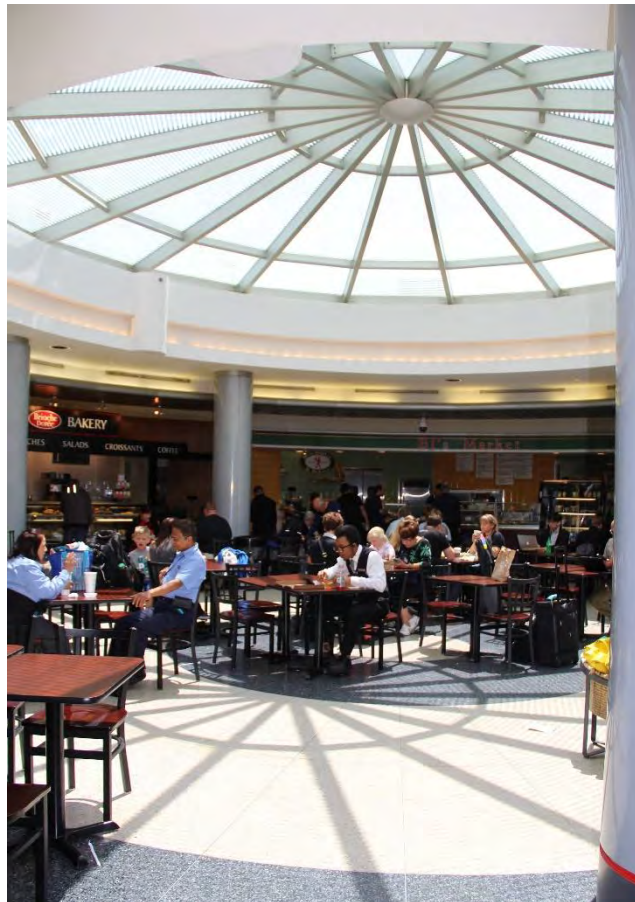


Figure 63. Central food court within the Concourse K extension.



**(6) Apron-level interior**

The apron level of the concourse consists entirely of back-of-the-house functions and does not include any public areas. These spaces include baggage handling areas, mechanical areas, TSA checked baggage screening areas, and airline administrative offices, as well as ground crew offices and break rooms or “ready rooms.”

**(a) Baggage handling area**

The baggage handling area refers to the location where checked baggage is sorted and loaded onto carts for transporting to aircraft. At Concourse H & K, this area is a double-height space that partially occupies both the apron and tunnel levels near the connection of the concourse with the main terminal building. This expansive space is dominated by conveyor belts and metal chutes arranged in rows at the tunnel level, separated by aisles for access by motorized carts, with circulation lanes that traverse the space (see Figure 64 through Figure 66). Conveyor belts and other equipment run above the working floor, aligned with the apron level. The space's utilitarian function is reflected in its features and finishes, which include square concrete columns, poured concrete floor, and various metal pipes and other metal features such as bollards and guardrails.



*Figure 64. Rows of conveyor belts and metal chutes at the baggage handling area at the tunnel level. Carts can be seen in some aisles.*





*Figure 65. Aisles between rows of conveyor belts and metal chutes at the baggage handling area at the tunnel level.*



*Figure 66. Lanes traversing the tunnel level.*

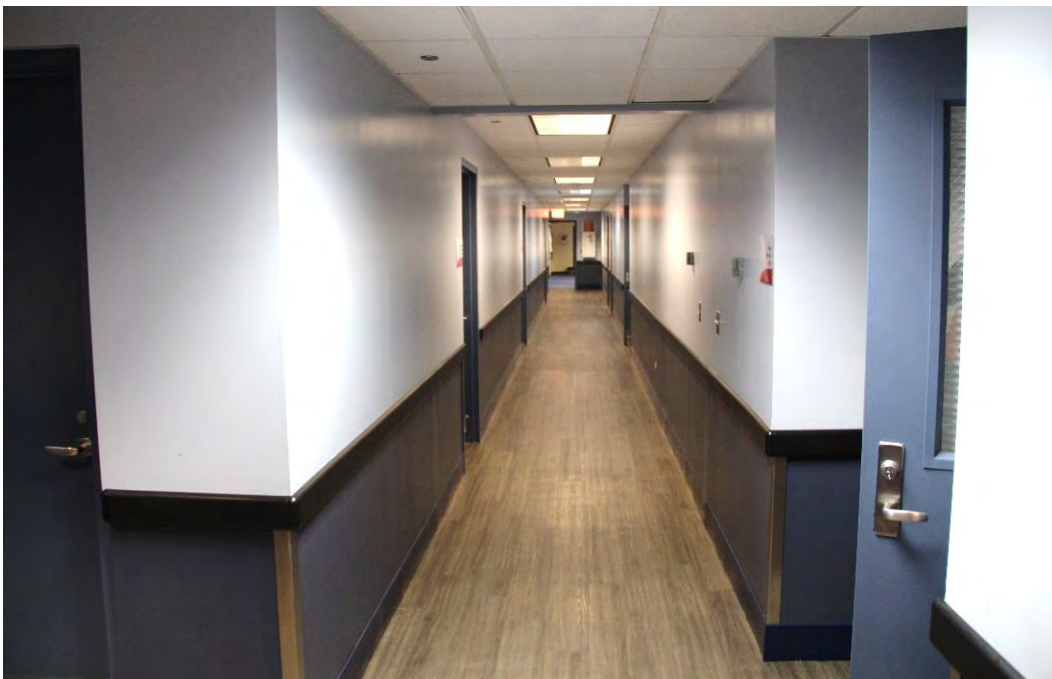
**(b) Offices and “ready rooms”**

Most apron-level spaces are highly compartmentalized and serve administrative offices, a “Central Control” baggage handling control room, ground crew break rooms or “ready rooms,” and mechanic

workshop (see Figure 67 through Figure 71). Some rooms are accessible from the exterior of the apron level and others are accessible via interior stairs from the concourse level and via interior corridors. Most of these rooms display simple finishes that include drywall or painted concrete masonry units, with T-bar ceilings and flooring that consists of various materials including poured concrete, carpet, composition flooring with a hardwood appearance, and what appears to be linoleum tiling and sheets.



*Figure 67. "Central Control" room operated by American Airlines, which controls the baggage handling process.*



*Figure 68. Corridor at apron level with administrative office spaces flanking either side of the corridor.*





*Figure 69. Administrative area at apron level.*



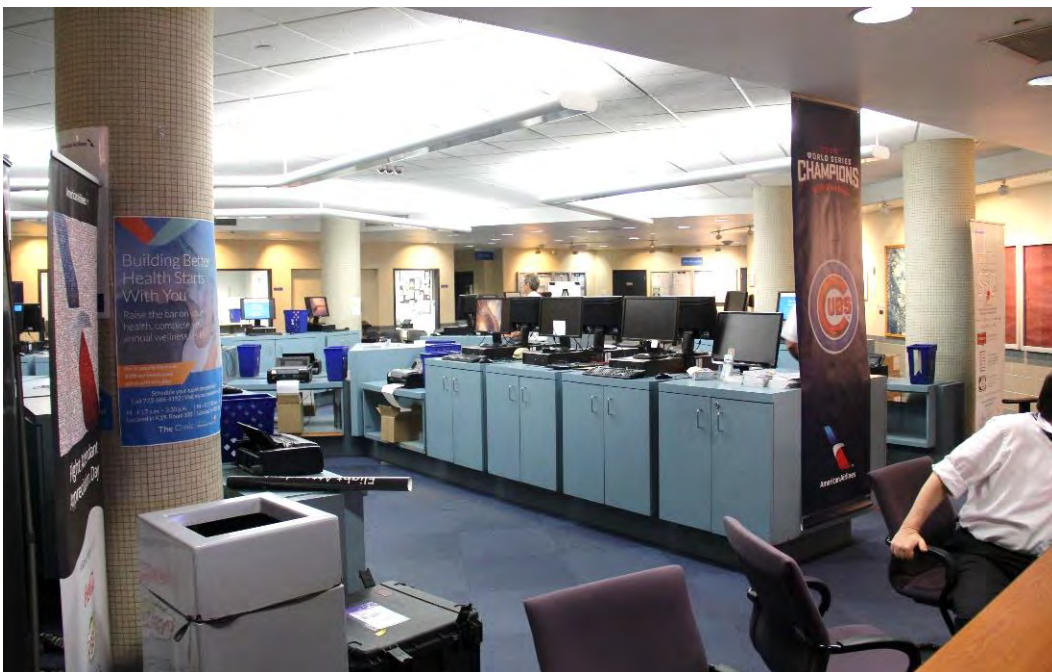
*Figure 70. Break room, or "ready room," for ground crew at apron level.*



*Figure 71. Mechanic workshop at apron level.*

**(7) Tunnel-level interior**

The administrative offices at the tunnel level (see Figure 72) appear to serve as an extension of the administrative offices at the apron level as they are accessible via an interior stairwell between administrative areas at both levels. Typical interior finishes in these administrative spaces do not vary from offices at the apron level.



*Figure 72. Typical administrative offices at the tunnel level.*



## E. Concourse L addition

The Concourse L addition was designed by Perkins & Will in association with Milton Pate & Associates, and was completed in 1985 as part of the modernization of O'Hare in the 1980s.<sup>13</sup> The concourse extends southeast from the eastern end of the main terminal building and is rectilinear in plan with an end that is slightly askew. The exterior of Concourse L appears very similar in design and composition to that of Concourse H & K, with Miesian design cues such as the grid blocks of window panels and high-aggregate, precast concrete panels (see Figure 73). Blocks of mechanical penthouses project above the roofline and are clad in louvered metal panels. The ramp tower is two stories in height, with a base clad in vertical standing-seam metal and a cab that exhibits a nearly identical design to other ramp towers throughout the airport, with wraparound tinted windows angled downward and separated by metal mullions (see Figure 74). Flood lights affixed to tall metal poles are located along the roof edge of the concourse that illuminate the ramp area. These existing light poles replaced shorter light poles in 1989.<sup>14</sup>



*Figure 73. South and east elevations of Concourse L, view facing northwest.*

<sup>13</sup> Gapp, Paul, "O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?," *Chicago Tribune*, August 19, 1984, sec. 13.

<sup>14</sup> Bechtel Civil, Inc., Welton Becket Associates, Chris P. Stefanos Assoc., Bevins Consultants, Inc., and Environmental Systems Des., "Plans for O'Hare Terminal Expansion [Concourse H & K]," December 29, 1989, Available in the Chicago Department of Aviation files, Chicago.



*Figure 74. South and east elevations of the ramp tower at Concourse L, view facing northwest. Mechanical penthouses visible in foreground.*

The concourse interior consists of a central circulation spine with hold rooms, contact gates, concession areas, and back-of-the-house services at the concourse level. Interior finishes are dominated by the curved, polished metal ceiling that includes strip fluorescent lighting and neon accent tubing characteristic of their 1980s construction (see Figure 75 and Figure 76).



*Figure 75. Central circulation corridor at Concourse L.*





Figure 76. Typical hold room at interior of Concourse L, with central circulation corridor visible at right.

## F. Concourse L Stinger

The Concourse L Stinger (hereafter referred to as the “Stinger”) is a concourse designed by F.H. Paschen, an architecture and contracting firm, and completed in 2018. The Stinger extends east and southeast from the main terminal building, connecting via an elevated passageway that zigzags to the irregular-shaped concourse. Given its recent construction, the Stinger exhibits a contemporary exterior design that is distinct from the rest of Terminal 3 and other concourses at O’Hare (see Figure 77). The exterior exhibits a plan and massing defined by intersecting rectangular forms. Exterior materials range from phenolic wall panels that exhibit a metallic appearance to walls of vertical tinted window panels (see Figure 78 and Figure 79). The Stinger interior exhibits modern finishes throughout and has hold rooms and concession spaces (see Figure 80).



Figure 77. South and east elevation of the Concourse L Stinger, view facing northwest.



*Figure 78. East and north elevations of the Concourse L Stinger, view facing southwest.*



*Figure 79. Elevated passageway from Concourse L to the Concourse L Stinger.*





*Figure 80. Circulation corridor at the interior of the Concourse L Stinger.*

## **G. Summary of alterations**

A summary of the alterations to Terminal 3 are presented below by area and in chronological order.

### **(1) Main terminal building**

- 1971: New canopy design for curbside of main terminal building of Terminal 3, which was ultimately replaced by the FACE canopy completed in 2006 (see below).
- 1984: East addition to main terminal building to accommodate Delta Air Line's expansion in Terminal 3, designed by Murphy/Jahn; constructed in conjunction with construction of Concourse L.<sup>15</sup>
- 1984: Addition to south elevation of main terminal building, designed by Murphy/Jahn.
- 1987: Relocation of security screening from base of concourse stems to areas between ticketing and secure concourse areas of main terminal building.
- 2001: Remodeling of the Delta Air Lines Crown Room lounge for new use as the American Airlines Admirals Club (the lounge did not open for use until 2017).
- 2006: Facade enhancement, known as the FACE renovations, designed by JAHN, that included construction of current curtain wall addition to the north elevation of the main terminal building and the continuous exterior canopy, with interior finishes within the north elevation curtain wall that included new terrazzo flooring.

<sup>15</sup> Gapp, Paul, "O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?"

- Continuous: Modifications to retail food/concession areas.
- Continuous: Modifications/modernization of administrative spaces at concourse, apron, and mezzanine levels

## **(2) Concourse H & K**

- 1966-1989: Infill of nose pockets completed over time; concourse shown in original configuration in 1966, then subsequent drawing sets show nose pockets infilled incrementally until 1989, when concourse is shown in current configuration.
- 1989: Replacement of exterior light poles with taller light poles.
- 1990: Construction of Concourse H branch extension and Concourse K branch extension, designed by Welton Beckett Associates.
- 1990: Infill of remaining nose pockets at Concourse H & K, replacement of some glass window walls (four panels) with precast concrete panels, construction of new penthouses for mechanical and electrical, reconstruction of existing penthouses, construction of arched skylight at stem of Concourse H & K, and arched ceilings at concourse branches.
- 2002: Concourse H & K apex food court remodeled, designed by Teng & Associates, Inc.
- Continuous: Modifications to retail food/concession areas.
- Continuous: Modifications/modernization of lower/apron level support spaces.
- Continuous: Modifications/modernization of administrative spaces.

## **(3) Concourse L**

- 1985: Concourse L completed with design by Perkins & Will and Milton Pate & Associates; constructed in conjunction with expansion of the main terminal building.
- Continuous: Modifications to retail food/concession areas.
- Continuous: Modifications/modernization of apron-level support spaces.
- Continuous: Modifications/modernization of administrative spaces.

## **(4) Concourse L stinger**

- 2018: Concourse L Stinger constructed, with design by Corgan.

## 2. Statement of Significance

### A. History of Terminal 3

#### (1) Burke's master plan for O'Hare

In the early 1940s, increased traffic at Midway Airport on the south side of Chicago prompted the City of Chicago (City) to study how to improve Chicago's ability to accommodate the nation's general trend of growing air travel. The City determined that Midway Airport was not a candidate for expansion, given the substantial existing residential neighborhoods that surrounded the airport on all sides. The City selected planner and civil engineer Ralph Burke to lead the study on how the City should grapple with this problem, and in 1944 Burke outlined his findings in the *Report of Commercial Airport Requirements for Chicago*. This report identified the existing Douglas manufacturing plant and associated airfield northwest of downtown Chicago as a potential site to develop as the City's second commercial airport, which eventually became the site of O'Hare (see Figure 81).<sup>16</sup> Burke believed the future of Chicago as a world-class city depended on a well-planned strategy to secure its position as a travel center, as air travel was envisioned as taking over rail travel—a mode of transportation for which Chicago had been the nation's leading center since the early twentieth century.<sup>17</sup>

Burke quickly drafted plans to develop O'Hare into a major international airport that could support the increasing demand at Midway and in the region and allow Chicago to remain a central city for transportation. O'Hare's first master plan in 1948 envisioned a "tangential scheme" design with multiple "split-finger" terminals extending from a central grand concourse.<sup>18</sup> This plan devised several runways radiating from the terminal building at incremental angles like a pinwheel, with a single roadway leading to parking areas fronting the central concourse (see Figure 82).<sup>19</sup> Burke's plan took a few years to materialize and his complete design was never fully constructed. By the time of his death in 1956 only one terminal (the original Terminal 1) had been completed, which was designed by Bill Priestley of Skidmore, Owings and Merrill (SOM).<sup>20</sup>

<sup>16</sup> David Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 75.

<sup>17</sup> Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 75.

<sup>18</sup> Franz Schulze, *Oral History of Carty Manny* (Chicago: Art Institute of Chicago, 1995), 184.

<sup>19</sup> Schulze, *Oral History of Carty Manny*, 184.

<sup>20</sup> Schulze, *Oral History of Carty Manny*, 181; Brodherson, "All Airplanes Lead to Chicago: Airport Planning and Design in a Midwest Metropolis," 262.





Figure 81. Overview of the locations and relative size of Midway Airport (Chicago Municipal Airport) and the proposed O'Hare (Orchard Place/Douglas Field) facilities in relation to the city of Chicago, 1948.<sup>21</sup>

<sup>21</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for the City of Chicago, January 1948), 21, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.





*Figure 82. 1948 drawing of Ralph Burke's proposed design for O'Hare featuring a central roadway approaching the grand concourse with split-finger terminals extending into the airfield. Note that Burke's terminology contrasts with modern airport terminology, in which the central structures are referred to as terminals leading to the concourses where aircraft arrive.<sup>22</sup>*

Following the construction of the first terminal, the new commercial jet aircraft revealed the shortcomings of Burke's initial plan. The Boeing 707 and Douglas DC-8 not only carried twice as many passengers as earlier commercial aircraft but required longer runways and more space at the terminal gates to accommodate wider wingspans. The deliveries of these new jet-engine-powered aircraft to the main airlines was set to begin in 1958 and increase in 1959, which put pressure on Chicago to hasten the planning process and to ensure these aircraft could be accommodated through upgrades at O'Hare.<sup>23</sup>

There were a few additional issues with Burke's plan. The radiating runway design of Burke's "tangential scheme" presented risk related to potential aircraft collisions, due to the convergence of multiple

<sup>22</sup> Ralph H. Burke, *Master Plan of Chicago Orchard (Douglas) Airport* (Prepared for City of Chicago, January 1948), 22, available in Transportation Library Digital Collections: Chicago O'Hare International Airport, <https://archive.org/details/masterplanofchic00burk>, Northwestern University Transportation Library.

<sup>23</sup> Naess & Murphy, Landrum & Brown, and James P. O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program* (Prepared for the City of Chicago, 1958), 3, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/chicagoohareinte00odon>, Northwestern University Transportation Library.

runways.<sup>24</sup> Burke's plan had also underestimated the role of the automobile in air travel. By 1960 a new highway was completed between the Chicago Loop and O'Hare with space in the median for a future commuter train line.

In 1955 Mayor Richard Daley commissioned the architectural firm Naess & Murphy to review Burke's original plan and build upon it with larger terminals and greater automobile access. Naess & Murphy selected Stanislaw Z. Gladych as the chief designer for the O'Hare project alongside Carter Manny, Jr.<sup>25</sup> The design and planning team partnered with the Cincinnati-based airport consulting firm Landrum & Brown to complete the new airport design and to work with existing airlines at O'Hare to accommodate individual needs, and assess the airline's statistics for anticipated future air traffic. In assisting with the design, Landrum & Brown focused on the concepts of "concentration, consolidation, and connections."<sup>26</sup> By this time, the expansion of O'Hare had become the largest public project in the history of Chicago.<sup>27</sup>

## **(2) Naess & Murphy master plan design**

By 1958 Naess & Murphy had redesigned Burke's 1948 plan to eliminate the grand, single terminal building for a more favorable, widened, U-shape terminal arrangement. This plan was selected for reasons of economy and efficiency, including the assurance that this U-shape design would allow for "more maneuvering and parking room for planes" and would enhance ground transportation around the terminals for efficient curbside passenger loading and unloading in the growing automobile age.<sup>28</sup> Additionally, this plan could better accommodate any potential future airport expansion projects than could Burke's single terminal design. Under Naess & Murphy's plan, two additional terminals were proposed to operate alongside the original terminal building, which was to undergo some alterations to serve as O'Hare's new international terminal. This scheme maintained some of Burke's "split-finger" Y-shaped concourses, and alternated with simpler, linear concourses (see Figure 83). A central circular restaurant building was proposed to be constructed between the two new terminals, and an area to the northeast of the three terminal buildings was proposed as a utilitarian area with a Heating and Air Conditioning Plant (later referred to as the Heating & Refrigeration Plant) and other support buildings.<sup>29</sup>

<sup>24</sup> Schulze, *Oral History of Carty Manny*, 188.

<sup>25</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals," *Chicago Tribune*, January 4, 1982.

<sup>26</sup> American Institute of Architects et al., *AIA Guide to Chicago* (San Diego, New York and London: Harcourt Brace, 1993), 262.

<sup>27</sup> American Institute of Architects et al., *AIA Guide to Chicago*, 275.

<sup>28</sup> Thomis, Wayne, "Newest O'Hare Plan Results in More Room," *Chicago Daily Tribune*, March 5, 1958, sec. 1.

<sup>29</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 9.



*Figure 83. Image of the proposed new terminal buildings (and the existing original Terminal 1) and plan for O'Hare based on the 1958 master plan.<sup>30</sup>*

Landrum & Brown encouraged extensive use of concession spaces to maintain traveler comfort and focused on a centralized location for principal concessions. This concept developed into the proposal for two, multi-story, circular buildings to be located between the terminals that would house a restaurant and other concessions.<sup>31</sup> The proposal to design a circular building between the western new terminal and the existing terminal building was abandoned, and the Rotunda was the only circular building retained in the final design.

The two terminal buildings were originally referred to as Terminal C and Terminal D; however, by the time of completion the terminals were labeled Terminal 2 and Terminal 3, respectively.<sup>32</sup> In his design for the concourses, Gladych devised a modular system based on 5-foot intervals, where all spaces had dimensions in multiples of 5 feet. This modular system ensured uniformity among use by multiple airlines and ease of potential future concourse expansion. In this scheme, the concourse corridors were designed

<sup>30</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 9.

<sup>31</sup> Schulze, *Oral History of Carty Manny*, 228.

<sup>32</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 30.

to be 20 feet in width, and projecting hold rooms to be 15 feet in length.<sup>33</sup> According to Manny, Gladych had implemented this system with the assumption that the spaces between these projecting hold rooms would be infilled over time to accommodate increased aircraft parking.<sup>34</sup> While this standardization allowed the design to be consistent throughout, particular airlines continued to operate with their own preferred methods, including differences in aircraft parking and enplaning procedures. The center split Y concourses were designed to have additional space above the rooflines to serve as public observation decks, to provide viewing space for passengers.<sup>35</sup> This amenity reflected the character of the jet age, with public enthusiasm for the new jet-engine-powered aircraft and an increased interest in air travel.

Similar to other major airports that had been operating at the time, the master plan implemented the dual-level roadway system to separate departure passengers from arrival passengers for efficiency.<sup>36</sup> One of the earliest examples of this separation was at the Washington National Airport (now Ronald Reagan Washington National Airport); however, in this case, it was not a dual-level roadway. Instead, the terminal building was constructed on a slope, with the separation built into the interior plan only. For O'Hare, this design not only allowed for the interior levels to be tailored to functions related to inbound and outbound passengers, but also prevented unnecessary transferring between levels for outbound passengers entering from the roadway through ticketing, then from the concourse to the aircraft. Features designed for passenger comfort included the development of canopies to provide passengers with shelter while enplaning and deplaning in inclement weather, where airlines did not desire to utilize telescoping or swinging jet bridges.<sup>37</sup>

The interior of the new terminal buildings included a first floor with mezzanine level, where the mezzanine would provide "airline offices, rental offices, airline clubs, and airport administrative offices," with baggage claim at the lower level.<sup>38</sup> The design and dimensions of the interiors were influenced by minimum size requirements for ticket counters and circulation space determined by Landrum & Brown, as well as the interior design vision of Harvey Stubsjoen from Naess & Murphy.<sup>39</sup> Stubsjoen designed the signage, ticket counters, areas for public seating, and established design standards with Hayward Blake, a graphics consultant, to retain consistency and uniformity among the varied branding elements of individual airlines.<sup>40</sup> Stubsjoen commissioned Charles Eames to design chairs in the waiting areas of the terminal,

<sup>33</sup> Schulze, *Oral History of Carty Manny*, 212.

<sup>34</sup> Schulze, *Oral History of Carty Manny*, 212.

<sup>35</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 34–35.

<sup>36</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 30.

<sup>37</sup> City of Chicago, Department of Aviation, "Annual Report 1961," 1961, 12–13, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/annualreport1961chic>, Northwestern University Transportation Library; "Our Two Largest Airports," *Progressive Architecture* XLIV, no. 8 (August 1963): 102.

<sup>38</sup> Naess & Murphy, Landrum & Brown, and O'Donnell, *Chicago O'Hare International Airport Engineering Report: First Stage Development Program*, 31.

<sup>39</sup> Schulze, *Oral History of Carty Manny*, 211.

<sup>40</sup> Schulze, *Oral History of Carty Manny*, 211–13.



which developed into the tandem-sling chairs that were used throughout O'Hare.<sup>41</sup> These chairs were manufactured through Herman Miller and influenced seating design in other airports, including Dulles International Airport.

Terminal 2 and Terminal 3 were both completed in 1961 and opened to passenger travel on January 15, 1962, ahead of schedule (see Figure 84 and Figure 85). At this time, the Rotunda was in the beginning stages of its construction, due to its supporting role in the overall function of the airport, and would not be completed until 1963. As Concourse G had been completed and opened at the same time as the new terminals, a temporary walkway was constructed around the Rotunda for through-access.



Figure 84. View of Terminal 2 at night showcasing Naess & Murphy's minimal Modernist design, 1962.<sup>42</sup>

<sup>41</sup> Schulze, *Oral History of Carty Manny*, 223.

<sup>42</sup> Kori Rumore, "From Farmland to 'Global Terminal': A Visual History of O'Hare International Airport," *Chicago Tribune*, March 27, 2019, <https://www.chicagotribune.com/news/ct-ohare-international-airport-development-history-timeline-htlmstory.html>.



Figure 85. Interior, southern concourse portion of the main terminal building at Terminal 3.<sup>43</sup>

### (3) Opening and critical reception

O'Hare's new terminal buildings opened on January 15, 1962, and O'Hare's expansion was formally dedicated in March 1963, upon completion of the Rotunda. The opening was heralded with a ceremony that included President John F. Kennedy, Chicago Mayor Richard J. Daley, the design team for the new terminals, and other prominent civic leaders. By this time, Naess & Murphy had been renamed C.F. Murphy Associates after the retirement of partner Sigmund Naess in 1959.

C.F. Murphy Associates was honored in 1963 by the Chicago Association of Consulting Engineers for the design of the terminal buildings and Rotunda.<sup>44</sup> An August 1963 issue of *Progressive Architecture* outlined the design of the new O'Hare plan, stating that it "lacks the brilliance and originality of Dulles" but

<sup>43</sup> "Our Two Largest Airports," 108.

<sup>44</sup> City of Chicago, Department of Aviation, "Annual Report 1963," December 31, 1963, 6, Available in Transportation Library Digital Collection: Chicago O'Hare International Airport Available in Transportation Library Digital Collection: Chicago O'Hare International Airport <https://archive.org/details/annualreport1963chic>, Northwestern University Transportation Library.

with strength in details such as “the meticulous care with which the individual buildings were designed; in the expert integration of structural and mechanical services; in the orderly and craftsman-like execution of the interiors, which have visual harmony in spite of the diverse requirements of 13 different airlines; and in the well-designed adjunct service structures, such as the fire station, the heating and refrigeration plant, and the central telephone exchange...”<sup>45</sup>

In 1962, following the completion of Terminals 2 and 3, operations at Midway Airport were transferred to O'Hare, which soon became, and has remained, one of the busiest airports in the United States.<sup>46</sup> Every major American city could be reached from Chicago on relatively short flights, which established O'Hare as a primary location for connecting flights across the country. The fact that O'Hare had been specifically designed to accommodate the jet liners of the 1950s and 1960s added to its importance as a major airport.

#### **(4) Later alterations**

Through the latter years of the 1960s, the nose pockets that were originally designed at the concourses began to be infilled by various airlines due to increased passenger traffic that necessitated creation of additional hold room space. This infilling continued through the 1980s, along with further improvements to O'Hare that included the construction of a new control tower in 1970. This control tower, based on a standardized design developed for the FAA by I.M. Pei in the early 1960s, was constructed in front of the terminals.<sup>47</sup> It was also around this time that ramp towers were constructed at the apex of the Y-shape concourses of Terminals 2 and 3 to monitor and control ground traffic around the concourses. A new hotel and parking garage, both designed by C.F. Murphy, were completed in 1972 and 1973, respectively. At the time of construction, the parking garage at O'Hare was the largest in the world.<sup>48</sup> Part of this project included the construction of multiple pedestrian tunnels linking the parking garage and hotel with each of the three terminal buildings.<sup>49</sup>

In 1975 the consulting group O'Hare Associates began exploring a \$1 billion upgrade plan for O'Hare, which was later influenced by the Airline Deregulation Act of 1978, as well as design-related goals and operational-related goals.<sup>50</sup> Passenger and airfield traffic was expected to increase through the 1980s and 1990s, and the increased use of wide-body “jumbo jet” aircraft such as the Boeing 747, the McDonnell Douglas DC-10, and the Lockheed L-1011 TriStar influenced the need to expand existing

<sup>45</sup> “Our Two Largest Airports,” 103.

<sup>46</sup> The transfer of operations from Midway was temporary as flights returned to Midway in 1964. “Chicago Department of Aviation | O'Hare and Midway International Airports,” *Midway History*, accessed July 31, 2019, <https://www.flychicago.com/business/CDA/Pages/Midway.aspx>.

<sup>47</sup> Philip Jodido and Janet Adams Strong, *I.M. Pei: Complete Works* (New York: Rizzoli, 2008), 93–95.

<sup>48</sup> American Institute of Architects et al., *AIA Guide to Chicago*, 265–67; David Brodherson, “An Airport in Every City: The History of American Airport Design,” in *Building for Air Travel: Architecture and Design for Commercial Aviation* (Munich and New York: Prestel and The Art Institute of Chicago, 1996), 84.

<sup>49</sup> C.F. Murphy Associates, “Elevated Parking Structure,” September 15, 1968, Available in the Chicago Department of Aviation files, Chicago.

<sup>50</sup> O'Hare Associates was a joint venture led by Murphy/Jahn (previously C.F. Murphy & Associates). Allen L. Pomerance, “O'Hare's Showstopper Terminal,” *Civil Engineering (New York)* 57, no. 11 (1987): 40–43.



concourses at Terminal 2 and Terminal 3.<sup>51</sup> Additionally, increased security needs and individual airlines' desires for more modern appearances initiated interior design changes to Terminal 2, Terminal 3, and their associated concourses. In 1980 the O'Hare Development Program (ODP) evolved to include a proposal for the expansion of Terminal 3 and construction of a new associated concourse, additional pedestrian tunnel to the parking garage, construction of a new Terminal 1, relocation of flight kitchen and maintenance facilities, and further infill of nose pockets at individual concourses (see Figure 86).<sup>52</sup> This plan also included plans for a new Terminal 1 to replace the existing international terminal, completed in 1988 by Murphy/Jahn.<sup>53</sup>

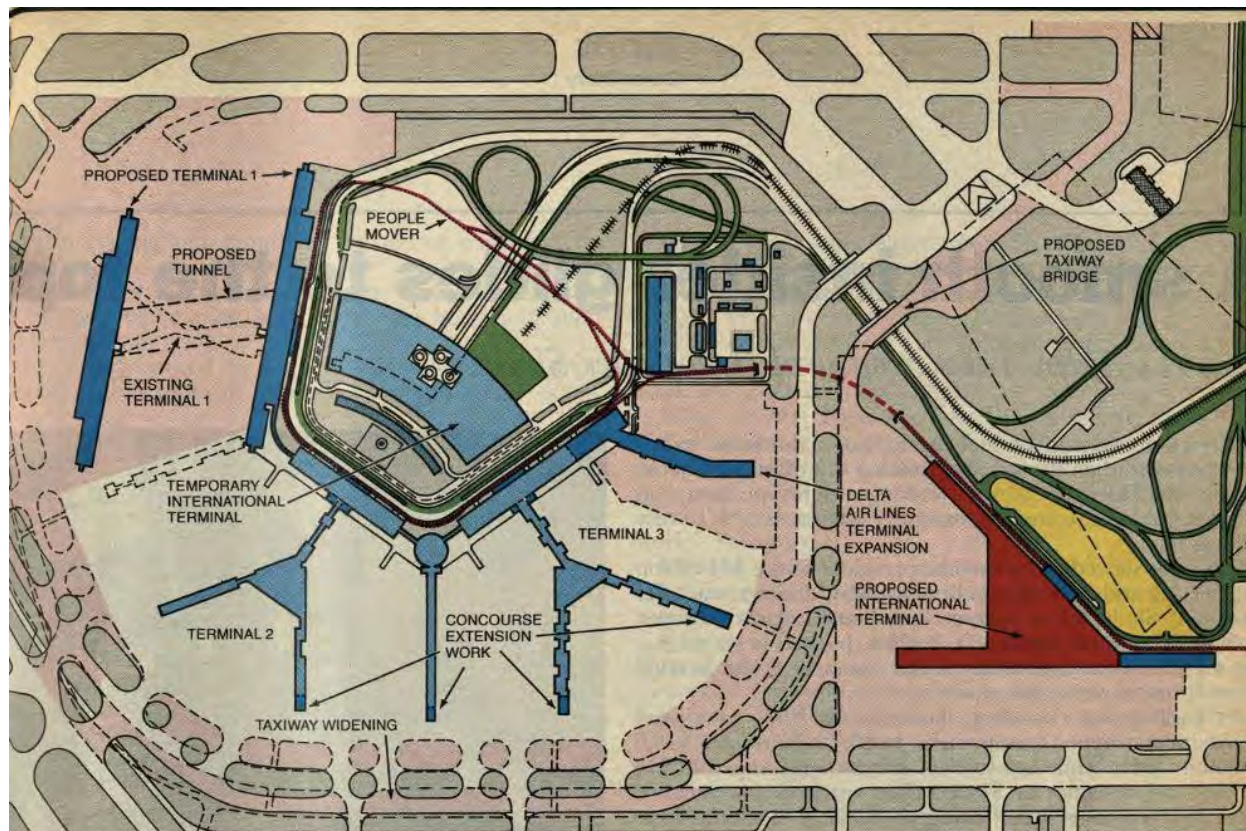


Figure 86. Overview of the O'Hare Development Program, 1984.<sup>54</sup>

Proposed changes to Terminal 3 were outlined in a 1981 document outlining the potential projects, which were later detailed in a 1982 ODP document. This preliminary document originally proposed construction of a new Terminal 4 building to be located adjacent to the existing Terminal 3 and connected via an upper level pedestrian bridge. This plan evolved into the expansion of Terminal 3 rather than an entirely new building, and by 1982 Delta Air Lines began working with O'Hare Associates to develop plans for this new Delta-specific area of the airport. Under this plan, the main terminal building at Terminal 3 was proposed

<sup>51</sup> Young, David, "FAA Gives OK to Start Rehabilitation of O'Hare," *Chicago Tribune*, July 23, 1982, sec. 2.

<sup>52</sup> Young, David, "FAA Gives OK to Start Rehabilitation of O'Hare"; O'Hare Associates, *O'Hare... Tomorrow... Today: The Chicago O'Hare International Airport Development Program*, October 1983, 4.

<sup>53</sup> Young, David, "FAA Gives OK to Start Rehabilitation of O'Hare."

<sup>54</sup> "O'Hare Airport Expansion Takes Off," *Engineering News-Record* 212, no. 19 (May 10, 1984): 27.



to be expanded eastward with a 320-foot addition, with nearly identical design elements and dimensions as the original design of the main terminal building, as well as new baggage claim areas, and the extended roadway and curb front. While the terminal expansion generally reflected the existing terminal design, it exhibited a steel frame rather than the existing reinforced-concrete frame, allowing for fewer interior columns in the baggage claim space at the lower level.<sup>55</sup>

Proposed to align with this new addition at the south elevation was the construction of a new Delta-specific concourse at Terminal 3, labeled as Concourse L, designed by Perkins & Will and Milton Pate & Associates. The transition to the new Concourse L was similar in design to the south addition at the main terminal building at Terminal 3, which provided additional interior space to accommodate increased security screening. Completed in 1984, this south addition was designed by Murphy/Jahn and preceded the similar design cues used for Terminal 1, completed in 1988. Murphy/Jahn served as the architects on staff with O'Hare Associates and utilized curved steel trusses that exhibit punched holes and support glazed curtain walls in other areas around the Terminal Core, including the new atrium at the old FAA tower (now CDA tower), completed in 1995.

Concourse H & K was also expanded and modified as part of the ODP, with each concourse branches extended south supporting more gate frontage as well as additional building space for hold rooms and concessions.

In 2006 the FACE renovation project was completed and consisted of a new north elevation curtain wall addition located along the upper and lower roadway levels, and expanding the building's original footprint approximately 15 feet. The north elevation addition was designed by JAHN—the successor to Murphy/Jahn—and is contemporary in its design and construction, consisting of a curtain wall system with glass panels at butt joints secured by clips and a steel cable primary structure, with side elevations of the addition consisting of glass panels secured to a vertical steel reinforcement structure. The design is integrated into the structure of the canopy that extends across the curbside elevations of the Terminal Core buildings. Also designed by JAHN and completed as part of the FACE project, the canopy is an uneven-V fin shape with slotted glass skylights supported by regularly spaced, large, round, metal columns. The canopy serves as a roof for the north elevation addition and shelters the sidewalk and nearest lane of traffic.

In 2018 the Concourse L “Stinger” was constructed to the northeast Terminal 3, with an elevated pedestrian tunnel connecting the concourse level of the main terminal building with this new concourse.

## **B. Airport design**

The design of airport terminals has evolved over time as the function of the terminal itself has changed. Early terminals were essentially a sheltered waiting area for passengers, and as they became more sophisticated designers considered the spatial needs inherent in moving people through a single building that acted as a bridge between air and ground transportation. In the post-World War II (postwar) period terminals began to sprawl, offering new retail and entertainment amenities and spawning purpose-specific wings (the boarding pier, later the concourse) to provide access to boarding gates. The “jet age” heralded

<sup>55</sup> Gapp, Paul, “O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?”

the introduction of jet-engine-powered aircraft into commercial transportation in the late 1950s, and architects responded with new and modified terminals that eventually developed to include multiple, distinct concourses.

The following section discusses the development and evolution of airport terminals as a property type, including layout changes that shaped new terminal design. The era in which a terminal is built is reflected in its design; thus, to establish potential for significance of Terminal 3 and its associated concourses, it needs to be placed within an appropriate historic context of airport design of the era in which it was built, as well as being considered with a contextual understanding of any prior periods that influenced its design. This historic context provides the background within which to understand how the design of Terminal 3 and its associated concourses represent a shift from the minimal terminals of the propeller aircraft age to larger terminals of the jet age. New and expanded terminals and concourses accommodated the increase in passenger travel associated with the introduction of larger jet-engine-powered aircraft such as the Boeing 707 and McDonnell Douglas DC-8. Additionally, historic context for later periods of airport layout and terminal designs provides an understanding of events, such as airline deregulation, that precipitated later alterations and additions to Terminal 3 and its concourses.

### **(1) Pre-World War II beginnings**

The period between World War I and World War II saw the birth of both commercial passenger aviation and the airport terminal as a distinct architectural property type.<sup>56</sup> Prior to that time airfields were either purely utilitarian (a landing field, perhaps with storage facilities) or designed as sporting venues similar to horse racing tracks, where spectators could watch air contests and demonstrations.<sup>57</sup> World War I served as an impetus for the rapid advances in both aircraft and airfield development, and at the war's conclusion Europe's aviation infrastructure was far more developed than that of the United States.<sup>58</sup> The 1910s and 1920s saw the conversion of European military airfields for civilian use, and through much of the interwar period Europe dominated the forefront of airport design and development.<sup>59</sup> Major interwar examples included Paris's Le Bourget, Berlin's Tempelhof, and the Hendon, Croydon, and Hounslow airports outside London.<sup>60</sup>

Early terminal buildings at these airports varied widely; aesthetically, many employed architectural styles popular at the time, while others were designed to evoke existing, familiar architecture precedents. At Le Bourget, the first design included a group of small buildings, each of which housed different functions, rather than a single terminal; the buildings were arranged around a central plaza reminiscent of an urban city square. The first "integrated terminal" design was constructed in 1922 at the Königsburg airport in East Prussia (now Kaliningrad, Russia). The facility combined passenger and administrative spaces in a single building, located at the corner of the airfield and flanked by hangars. The Königsburg concept was employed in Berlin on a far grander scale with the landmark construction of the first terminal at Tempelhof

<sup>56</sup> Hugh Pearman, *Airports: A Century of Architecture* (Laurence King Publishing, 2004), 42; Alastair Gordon, *Naked Airport: A Cultural History of the World's Most Revolutionary Structure* (Henry Holt and Company, 2014), 10–13.

<sup>57</sup> Gordon, *Naked Airport*, 10–13.

<sup>58</sup> Pearman, *Airports*, 41.

<sup>59</sup> Gordon, *Naked Airport*, 10–13.

<sup>60</sup> Pearman, *Airports*, 42.

in 1926 (see Figure 87). At Tempelhof, the airport facilities included a central control tower, hangars, and a two-story terminal building. The terminal itself featured a Modernist design with a long, linear form and bands of windows. Notably, its designers anticipated future expansion and expected that additions would extend at either end to accommodate larger numbers of passengers.<sup>61</sup>



Figure 87. Photograph of the 1926 Tempelhof terminal building, shown in 1928.<sup>62</sup>

London's Croydon, constructed in 1928, serves as another milestone in airport design. In this case, an imposing building reminiscent of a country estate included a four-story, crenellated control tower at the center of the facade and the interior layout provided what author Alastair Gordon describes as “the conceptual beginnings of airport circulation” (see Figure 88).<sup>63</sup> The symmetrical floorplan divided both cargo and passengers into arrivals and departures, and even included separate lavatory facilities for landside and airside staff.<sup>64</sup>

<sup>61</sup> Pearman, *Airports*, 53.

<sup>62</sup> SPIEGEL ONLINE, “Fotostrecke - Bild 2 - Abschied von Tempelhof,” *SPIEGEL ONLINE*, October 29, 2008, <https://www.spiegel.de/fotostrecke/abschied-von-tempelhof-fotostrecke-107840-2.html>.

<sup>63</sup> Gordon, *Naked Airport*, 16.

<sup>64</sup> Gordon, *Naked Airport*, 15.

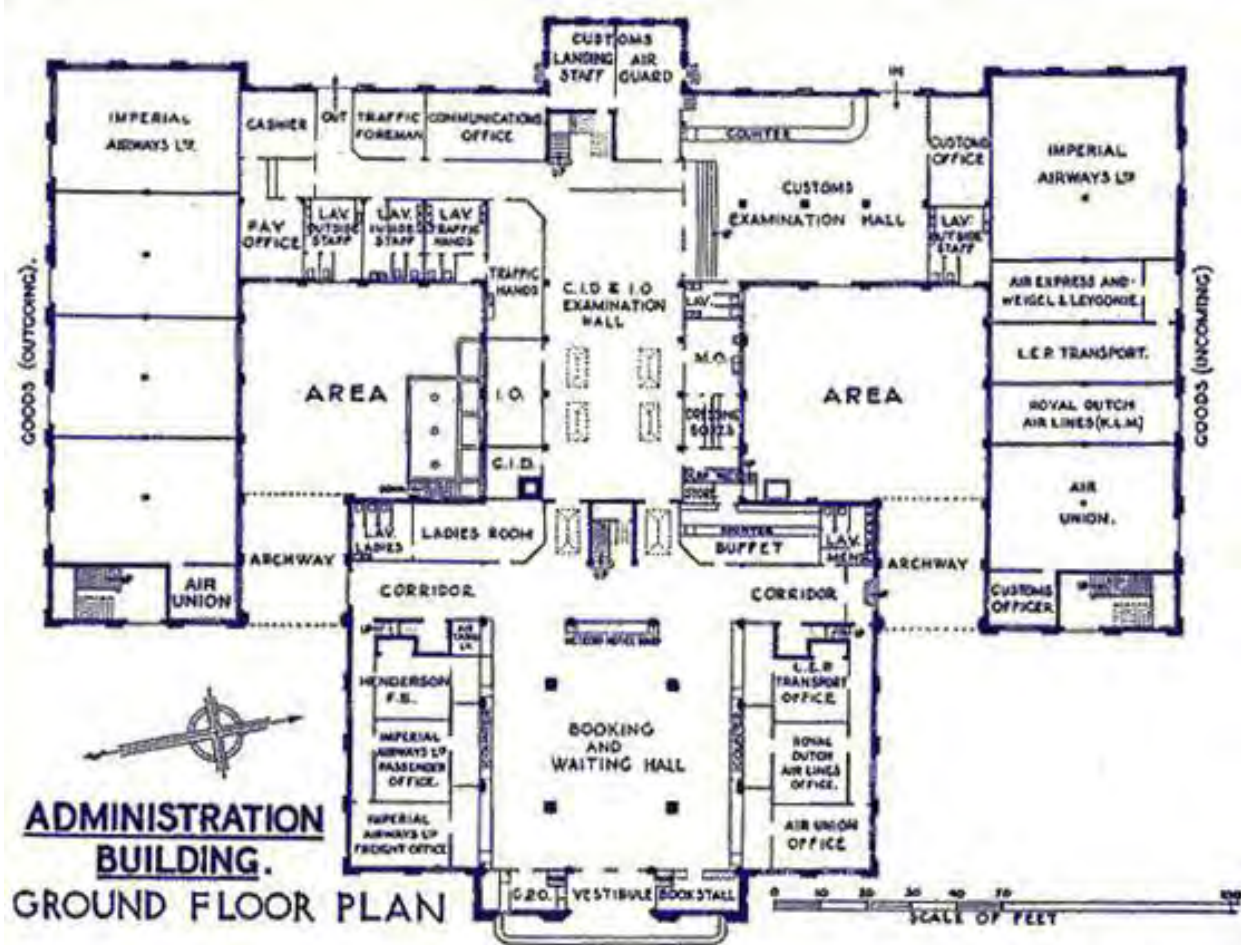


Figure 88. Original floorplan for Croydon Airport, c. 1928.<sup>65</sup>

Passenger air service was available between most of Europe's capital cities by the mid-1920s and had become a fashionable mode of transport for the wealthy. Meanwhile in the U.S., the majority of the expansion of aviation had occurred in the postal sector transporting mail, and most airports lacked a true terminal building because there was limited passenger service. When Charles Lindbergh completed his successful transatlantic solo flight in 1927, his return from Paris ushered in a new era in airport development in the U.S. His 80-city, nationwide tour spurred a feverish interest in aviation, and in the year that followed passenger totals quadrupled and airport construction boomed.<sup>66</sup> In the U.S., airport terminals initially fell into one of two general building types. Many took the form of the "depot hangar," which placed waiting rooms and offices in a portion of a large hangar. A parallel model developed based on the railroad station, in which a separate dedicated building housed a waiting area and had "gates" to permit access to

<sup>65</sup> "Terminal Building & Control Tower," *Croydon Airport*, accessed June 19, 2019, <http://www.airportofcroydon.com/Terminal%20Internal.html>.

<sup>66</sup> Gordon, *Naked Airport*, 13, 25.



and from aircraft on the adjacent apron.<sup>67</sup> Within these two general forms, architects applied a range of decorative detail that incorporated popular architectural styles or aviation-based imagery.<sup>68</sup>

Financed largely through private enterprise, the fledgling commercial airline industry in the U.S. suffered somewhat with the onset of the Great Depression. Nevertheless, federal relief programs such as the Public Works Administration and the Works Progress Administration (later renamed Work Projects Administration) soon provided a major source of funding for construction and expansion of municipal airports across the nation.<sup>69</sup> Federal efforts to standardize the design of both airports and the terminals themselves led to greater uniformity of design, if not style. The common form that emerged by the mid-1930s was not too dissimilar to the European model established at Tempelhof; municipal airports typically consisted of a low, wide building with a central control tower and windows along the airside elevation.<sup>70</sup> But while many smaller municipal airports followed this pattern, influential large-scale examples at New York's La Guardia and Washington D.C.'s National (now Reagan) airports were at the forefront of airport development during this period, serving as forerunners to the postwar model of major urban airports.<sup>71</sup>

Construction of a new Washington National Airport facility began in 1940 as a major priority of the Roosevelt administration. Architect Howard Lovewell Cheney's design of the new terminal was monumental, both in size and spirit, reminiscent of the "great departure hall" of earlier railroad architecture. Sited along the newly constructed Mount Vernon Parkway, the terminal's landside and airside facades echoed George Washington's home with its own massive colonnades, a melding of Art Deco style and Palladian reference (see Figure 89). Built into a hillside, the terminal also incorporated an innovative circulation pattern. Landside access from a curving drive brought passengers to the upper level of the terminal, where an overhanging roofline sheltered the sidewalks. The terminal's 12 gates were located on the lower level, which was at-grade on the airside. Passengers were also separated horizontally, with departures entering at the north end of the terminal and arrivals exiting at the south end.<sup>72</sup> The overall form, with a raised central portion and gently curved wings around a looped driveway, appeared at contemporary airports such as La Guardia and Dublin (Ireland, 1937) and was essentially a continuation of earlier European airport terminal design seen at the 1920s Tempelhof.<sup>73</sup> Unlike previous airports that typically moved passengers through a single level from landside to airside, the new Washington design prefigured the postwar American airport's use of vertical separation between departures and arrivals.

<sup>67</sup> John Zukowsky and Koos Bosma, *Building for Air Travel: Architecture and Design for Commercial Aviation* (Art Institute of Chicago, 1996), 68–70.

<sup>68</sup> Zukowsky and Bosma, *Building for Air Travel*, 73.

<sup>69</sup> Zukowsky and Bosma, *Building for Air Travel*, 72.

<sup>70</sup> Zukowsky and Bosma, *Building for Air Travel*, 73–74, 79; Gordon, *Naked Airport*, 101–3; Pearman, *Airports*, 57.

<sup>71</sup> Gordon, *Naked Airport*, 121.

<sup>72</sup> Zukowsky and Bosma, *Building for Air Travel*, 79–80.

<sup>73</sup> Pearman, *Airports*, 58.



Figure 89. Landside view of Washington National Airport in 1941 showing colonnade, driveway, and canopy.<sup>74</sup>

## (2) Postwar and the jet age

As commercial air travel resumed following World War II, passenger totals rose exponentially. Across the nation, smaller airport terminals were inadequate to handle thousands of passengers. New terminal designs were developed to accommodate travel on this unprecedented new scale. At the forefront of this new breed of airport, Greater Pittsburgh Airport (now Pittsburgh International Airport) embodied the future that awaited the terminal as a city unto itself. Completed in 1952, it was the largest terminal constructed in the U.S. at the time, described as a “city within a city,” and featured a nightclub, roof deck, restaurants, cinema, and retail stores.<sup>75</sup> Along with Friendship International Airport in Baltimore (opened in 1949), Pittsburgh’s terminal design incorporated the now-standard curved form, accessed from a looping drive, and a convex airside elevation. Unlike prewar airports, however, both Friendship and Pittsburgh utilized a new and notable design component, deployed in response to the increasing size of aircraft and numbers of passengers. At both airports, a massive perpendicular wing (longer than the main terminal itself) extended from the center of the terminal out onto the apron to provide enclosed access directly to aircraft gates, rather than requiring passengers to walk across the tarmac. At Pittsburgh, this boarding wing was referred as the “finger dock,” and featured a staggered massing with a rounded end (see Figure 90).<sup>76</sup>

<sup>74</sup> Jack Delano, *At the Entrance to the Municipal Airport in Washington, D.C.*, Photograph, 1941, <https://www.loc.gov/pictures/resource/fsa.8a36232>.

<sup>75</sup> Gordon, *Naked Airport*, 164, 166.

<sup>76</sup> Gordon, *Naked Airport*, 164–65.



Figure 90. Greater Pittsburgh Airport, c. 1952.<sup>77</sup>

Aside from the boarding piers, the airports of the early 1950s were not altogether different from their prewar antecedents and used existing building technology. By the late 1950s, however, architects used new technologies to create ever more futuristic terminal buildings, resulting in changes to both style and layout/form. During the war, concrete arches and shells saw increasing use for hangar construction and enabled extremely large clear spans, such as at the San Diego Naval Air Station (see Figure 91).<sup>78</sup> From these more utilitarian uses, postwar designers drew both technical and aesthetic inspiration, as can be seen at Lambert Airport in St. Louis, itself an inspiration for Saarinen's TWA terminal at JFK.<sup>79</sup> Designed by Minoru Yamasaki of Hellmuth, Yamasaki and Leinweber, Lambert opened in 1956 to great acclaim. Described by architecture critic Hugh Pearman as "the best of the 1950s airports," Yamasaki's Lambert terminal served as a model for many of the architects who designed the terminals at John F. Kennedy International Airport in New York.<sup>80</sup> The terminal's thin-shell concrete design employs three cross-vaulted spaces arranged in a linear fashion, illuminated by vast expanses of glass (see Figure 92). Like earlier airports, it utilized a perpendicular boarding pier, but the arched roof and massive glazed facades were new elements that would be echoed for decades to come.

<sup>77</sup> Harold Corsini, *Aerial View of Greater Pittsburgh Airport* | *Historic Pittsburgh*, Photograph, c 1952, MSP285.B001.F03.I05, Detre Library & Archives, Heinz History Center, [https://historicpittsburgh.org/islandora/object/pitt%3AMSP285.B001.F03.I05/from\\_search/4330a4ab72217447044b1b828d36ba2c-2](https://historicpittsburgh.org/islandora/object/pitt%3AMSP285.B001.F03.I05/from_search/4330a4ab72217447044b1b828d36ba2c-2).

<sup>78</sup> Gordon, *Naked Airport*, 135.

<sup>79</sup> Antonio Roman, Antonio Román, and Eero Saarinen, *Eero Saarinen: An Architecture of Multiplicity* (New York: Princeton Architectural Press, 2003), 52; Pearman, *Airports*, 117.

<sup>80</sup> Pearman, *Airports*, 140, 142.



*Figure 91. Concrete arch hangars at the San Diego Naval Air Station.<sup>81</sup>*



*Figure 92. Concrete arches of the terminal at Lambert International Airport.<sup>82</sup>*

The 1952 master plan for the new Idlewild Airport (now JFK), approved the same year that Greater Pittsburgh opened, represented a turning point in airport design. Whereas elsewhere, multiple airlines

<sup>81</sup> "As War in Europe Escalated, 1940 Naval Expansion Act Came When #PlatformsMatter-Ed Most," *Naval History and Heritage Command*, July 19, 2014, <https://usnhistory.navylive.dodlive.mil/2014/07/19/as-war-in-europe-escalated-1940-naval-expansion-act-came-when-platformsmatter-ed-most/>.

<sup>82</sup> "Lambert Field - Photograph Collection - Digital Collections," accessed June 13, 2019, <https://digital.shsmo.org/digital/collection/imc/id/13990/rec/2>.



flew in and out of a single, publicly operated terminal, the new master plan expanded on the circular-drive-and-terminal formula and transformed it into a circle of separate terminals, each operated by a separate airline. The resulting layout, constructed from 1957 to 1962 (with a final terminal added in 1970), set the pattern later replayed at airports across the country, including at O'Hare (see Figure 93). Within this layout, individual terminal buildings at Idlewild Airport reflect the jet age of the late 1950s and 1960s, and also reflected efforts by the major American airlines such as Pan-Am, United, American, to outdo one another with creative terminal designs. The arched truss of the wartime hangar was again echoed in the central bay of J. Walter Severinghaus's design for the International Arrivals Building (IAB, 1957), and Saarinen's TWA building (1962) took the thin-shell technology used at Lambert and created an even more iconic design. Although wildly different in appearance due to architectural style, the terminals at Idlewild Airport generally follow the model introduced at Pittsburgh and Baltimore, with a main building and one or more perpendicular wings for aircraft gates. One notable exception was the Pan-Am terminal, consisting of a central disk surrounded by gates; this too would eventually be updated with additional boarding concourses extending onto the apron.

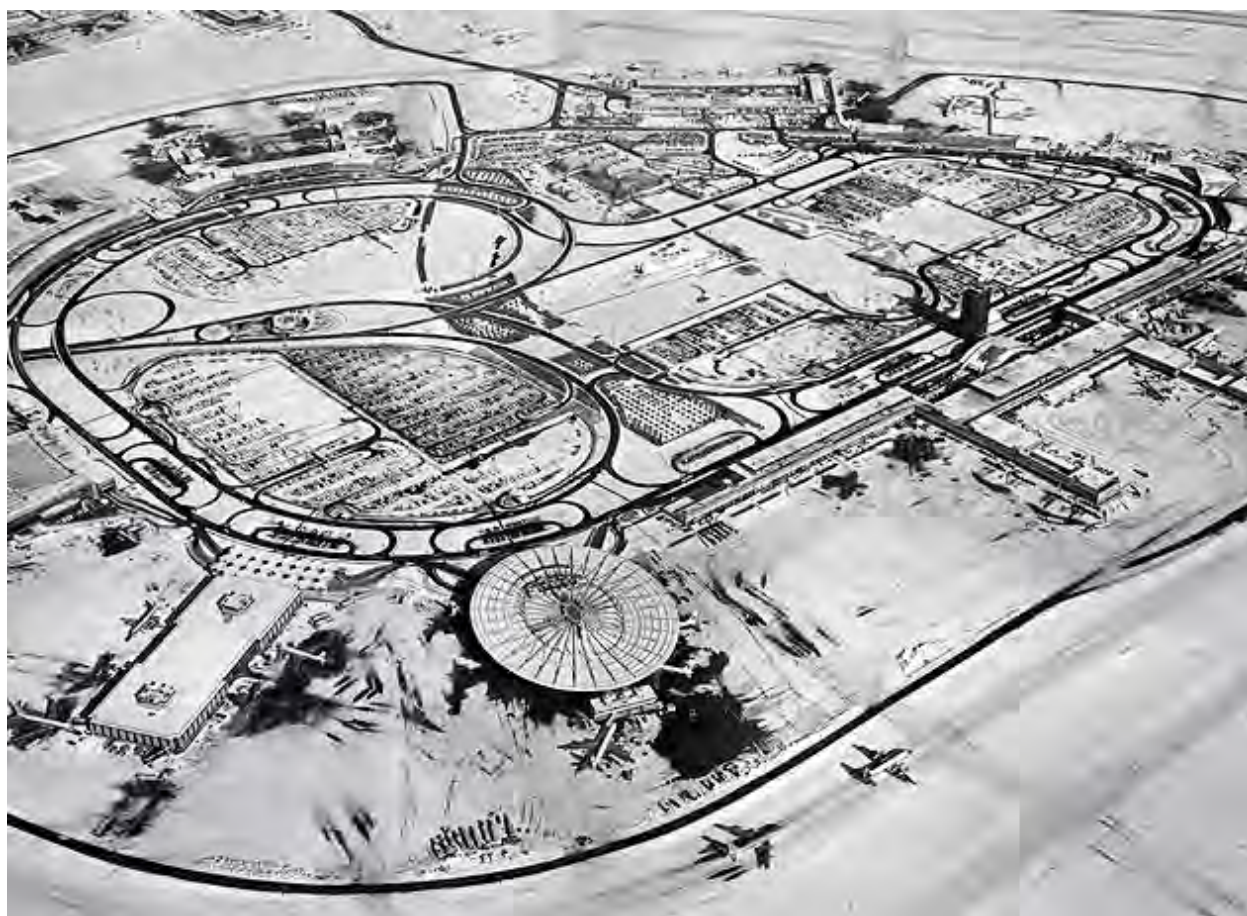


Figure 93. Aerial view of JFK Airport in 1964 showing looping roadway with various terminals, with Pan-Am in the foreground.<sup>83</sup>

<sup>83</sup> Theodore Ross, *Aerial View of JFK International Airport*, Photograph, September 17, 1964, NYJA000025, University of Texas at Austin, Harry Ransom Center, <https://norman.hrc.utexas.edu/nyjadc/ItemDetails.cfm?id=25>.

Even among the other striking buildings at JFK, Saarinen's TWA terminal is one of the most influential airport buildings of the twentieth century. With its curvilinear emphasis and flowing lines, the separation of space is distorted, as all but the aircraft gates are located beneath a single vast vault with two mezzanine sections connected by a bridge floating in the midst of the vast open space. In a new twist on the boarding pier, "flight tubes" carried passengers to two gate concourses that branched out at roughly a 90-degree angle to one another. Like these branching boarding gates, Saarinen's design introduced other features that would eventually become commonplace, particularly the baggage handling system in which passengers would check their baggage at the front of the terminal, after which it would be transported directly to the aircraft. Other elements Saarinen had envisioned, such as moving walkways between the terminal and separate boarding gate concourses, would not be installed in the TWA terminal but would be realized in later airport designs.<sup>84</sup>

Ultimately, JFK's greatest influence lay in its overall layout; critics and airport planners eschewed the wild variation among the terminals but embraced the concept of the great looping roadway ringed by terminals. This circulation plan was incorporated into the improvements at O'Hare (1961), San Francisco International (1963), and Los Angeles International Airport (LAX, 1961). At both O'Hare and LAX the individual terminals were built identical to one another; Modernist buildings that blurred the traveler's ability to orient themselves within the complex. Although built at the same time as JFK, the Modernist approach at O'Hare and LAX stood in stark contrast to the spectacle of Saarinen's concrete terminal and the architectural variety of JFK. The Theme Building at LAX and the Rotunda at O'Hare served as the only obvious visual landmarks among otherwise more uniform, rectilinear airport buildings.<sup>85</sup>

Commercial jet-engine-powered aircraft for passenger travel were first introduced in the U.S. in 1959, and rapidly altered the parameters of airport design.<sup>86</sup> The rise of the jet age, with its larger and louder aircraft, increased the need to provide separation between the main terminal and the aircraft boarding gates. Concourses lengthened or branched, and new enclosed jet-bridges such as the "aero gangplank" introduced by United Airlines at O'Hare in 1958 eliminated the need to exit the concourse to board an aircraft from the tarmac.<sup>87</sup> This increased travelling distance within the airport substantially lengthened passengers' journey from ticketing to boarding. In an effort to shorten the trek, moving sidewalks were deployed, first at Dallas's Love Field in 1957 but more sensationally at LAX in 1964, when Lucille Ball was invited to christen the new "Astroway."<sup>88</sup> Whereas Saarinen had placed his "flight tubes" above ground at JFK, the seven terminal buildings at LAX were connected to separate boarding "pods" via tunnels beneath the apron, and the "Astroways" conveyed passengers through these underground tunnels in order to reduce the effort of traveling nearly a quarter-mile between ticketing and aircraft gates.<sup>89</sup>

<sup>84</sup> Janet R. Bednarek, *Airports, Cities, and the Jet Age: US Airports Since 1945* (N.p.: Palgrave Macmillan, 2016), 129–30.

<sup>85</sup> *South Terminal Construction*, Photograph, 1962, 1997.52.051.017, SFO Museum, [https://media.flysfo.com/styles/history\\_timeline\\_slider\\_images/s3/pub\\_1997.52.051.017a.jpg](https://media.flysfo.com/styles/history_timeline_slider_images/s3/pub_1997.52.051.017a.jpg); Gordon, *Naked Airport*, 210–12.

<sup>86</sup> Bednarek, *Airports, Cities, and the Jet Age*, 130.

<sup>87</sup> "Briefings," *Flying Magazine*, June 1958, 58.

<sup>88</sup> Gordon, *Naked Airport*, 223.

<sup>89</sup> Gordon, *Naked Airport*, 223.

The early jet age incited public enthusiasm regarding air travel and the new jet-engine-powered commercial aircraft. A phenomenon of traveling to an airport not to travel, but to view the aircraft, emerged that influenced airport design of the late 1950s and 1960s. Catering to these desires, airport designers incorporated large windows and observation decks, as well as dining rooms that overlooked the airfield, and other amenities such as airport sightseeing tours.<sup>90</sup> The International Arrivals Building at Idlewild Airport (now JFK) in New York, completed in 1957, had the largest airport observation deck in the U.S., and the restaurant within the Theme Building at LAX, completed in 1961, provided passengers with a 360-degree dining experience with views toward the airfield.

Continual growth of major airports to accommodate increased air traffic ultimately led to the elimination of the “great departure hall” concept of the 1920s and 1930s, in favor of decentralized terminal buildings with modular, expandable clusters of concourses. In some cases, this decentralization was achieved through a greater physical separation between satellite boarding areas and the main terminal through an “intermodal” style that linked buildings by ground transport rather than pedestrian corridors. The concept of separating landside and airside facilities was pioneered at Tampa International, completed in 1971, which used an electric “people mover” system to ferry passengers between the landside terminal, with ticketing and baggage, and the airside boarding satellites.<sup>91</sup>

In the ultimate form of decentralization, Dallas/Fort Worth Regional Airport (completed in 1973) dispensed with even the pretense of a hub building. A series of identical semicircular terminals lined both sides of a single highway spine, allowing passengers to drive directly to the desired terminal. As at Tampa, a tramway system connected the terminals to one another as well. The semicircular design was oriented with the convex side facing the apron to provide the maximum number of aircraft gates, while the concave side enclosed a parking area. Both the layout and the buildings themselves were based on simplified, Brutalist building-block concepts: the individual terminals were constructed using precast sections, and the airport as a whole could be expanded simply by adding more terminals along the spine.<sup>92</sup>

### **(3) Deregulation: The demise and return of the “great hall”**

After the arrival of the jet, airline deregulation wrought the next major change in airport terminal design. Signed into law by President Jimmy Carter in 1978, the Airline Deregulation Act eliminated federal oversight of the ways in which airlines set fares or determined routes, letting market conditions dictate the logistics of air travel. Architecture critic Alistair Gordon cites deregulation as “the dividing line between the modern and postmodern periods of commercial aviation – between the golden days of the jet age and the transportation agonies of today.”<sup>93</sup>

As airlines overhauled their operations to maximize profits and efficiency, the “hub” concept centralized airline operations in a smaller number of major airports, which in turn served to connect secondary destinations. This increased the number of travelers making connections at larger regional and international airports, as less popular destinations were no longer accessible from direct routes. In turn,

<sup>90</sup> Zukowsky and Bosma, *Building for Air Travel*, 15.

<sup>91</sup> Gordon, *Naked Airport*, 240–41.

<sup>92</sup> Gordon, *Naked Airport*, 243–44.

<sup>93</sup> Gordon, *Naked Airport*, 245.

the airlines began using “banks” of flights, in which flights arrived and departed in staggered waves, allowing more efficient connections. This led to a drastic increase in the number of passengers in the terminals during these peak periods, many more of whom had to cross large distances in the terminal to make their connecting flights.<sup>94</sup> This represented a major shift in circulation patterns within the airport; where designers had previously focused on the movement of passengers between aircraft and ground transportation, the emphasis was now on transferring within or between the terminals themselves.<sup>95</sup> New, larger concourses offered more retail and dining options for those with layovers. Spatial relationships between concourses were designed for efficiency, both for passenger traffic as well as for the movement of jumbo jets on the aprons and taxiways.<sup>96</sup>

One of the first major airport projects constructed after deregulation, Atlanta Hartsfield International Airport's Midfield Complex exemplifies this new direction in terminal design. An earlier terminal completed in 1961 had a central building surrounded by six radiating boarding piers.<sup>97</sup> Within its first year of operation, passenger volume exceeded its capacity, and by the mid-1960s a new master plan incorporated the midfield design. Construction did not begin for more than a decade, however, and the new facility that opened in 1980 reflects the expediency of the post-deregulation era. The new layout consisted of an entrance terminal with four identical, parallel concourses separated by aprons wide enough to accommodate two jumbo jets. In order to speed transfer between airlines, the four concourses were all part of a single secure area and the single security checkpoint was located in the main terminal. The entire complex was connected by an underground “transit mall” that included pedestrian corridor, moving walkways, and a tramway system. While it solved many of the problems introduced by hubbing, the new Hartsfield did so with an almost industrial, Brutalist aesthetic largely devoid of natural light.<sup>98</sup> Gone were the vaulted rotundas in the 1961 concourses (demolished) that directly referenced Lambert and TWA; these were replaced by windowless holding areas and corridors (see Figure 94).

<sup>94</sup> *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook* (Washington, D.C.: Transportation Research Board, 2010), 8.

<sup>95</sup> Gordon, *Naked Airport*, 246.

<sup>96</sup> *Airport Cooperative Research Program Report 25, Airport Passenger Terminal Planning and Design, Volume 1: Guidebook*, 8.

<sup>97</sup> “History of ATL | ATL | Hartsfield-Jackson Atlanta International Airport,” accessed June 14, 2019, <https://www.atl.com/about-atl/history-of-atl/>.

<sup>98</sup> Gordon, *Naked Airport*, 246–48.





Figure 94. Image from the October 1980 issue of Delta's employee publication showing Hartsfield "before" at left and "after" at right.<sup>99</sup>

Although economic conditions and real estate constraints slowed airport construction in the U.S. in the 1980s, changes were afoot again as architects and travelers gradually rebelled against the "alienating indignities" of airports such as DFW and Hartsfield's Midfield.<sup>100</sup> Designers began to abandon the decentralized, impersonal, and industrial perspective in favor of a revival of the monumental departure hall of 1920s and 1930s terminal designs. New terminal designs were intended as bold, gestural signature pieces that would stand out in the travel experience, a sharp contrast to both the stark Modernism of the 1960s, as seen in O'Hare's Terminals 2 and 3, and the uniformity of the 1970s. Architects employed walls of glass that emphasized natural light, a return to the concepts of "view" from the late 1950s and early 1960s.

At the forefront of this trend in the U.S., Helmut Jahn's design for O'Hare's Terminal 1 was intended to "reintroduce the romance of travel" at O'Hare.<sup>101</sup> O'Hare's Terminal 1 represents a shift away from the decentralized and utilitarian terminals of the 1970s towards a return to airport buildings as grand statements, including the concept of grand halls first seen in the 1920s and 1930s and architecturally distinctive terminal buildings of the 1950s. As airports across the nation began to update their facilities to cope with ever-increasing numbers of passengers, O'Hare's Terminal 1 stood out as one "that is redefining the design standards for airports of the future."<sup>102</sup> In a design magazine from 1988, author Donna Green outlined Jahn's intentions and successes:

The United Terminal has clearly raised the standards for airport design in the future. Its vast spaces and sweeping lines of glass and steel manage to reach out to its users, offering an unexpected

<sup>99</sup> "Atlanta's 1961 Terminal Closes," *Sunshine Skies*, accessed June 14, 2019, <https://www.sunshineskies.com/atl-1961-terminal-closes.html>.

<sup>100</sup> Bednarek, *Airports, Cities, and the Jet Age*, 137; Gordon, *Naked Airport*, 250.

<sup>101</sup> O'Hare's original Terminal 1 was demolished directly before the beginning of the construction of the new Terminal 1 in 1986. Gordon, *Naked Airport*, 253.

<sup>102</sup> Donna Green, "Chicago: Terminal of the Future," *ID: Magazine of International Design* 35, no. 1 (January 1988): 46.

mixture of exuberance and reassurance. The terminal's design adapts to practical needs through more efficient ticketing facilities, more spacious waiting rooms and less complicated boarding procedures. But it also invokes images of grandeur and fantasy appropriate to—and long-missing from—air travel. "Airports are gateways to cities," concludes Jahn, "They should reflect the excitement, the spirit of that passage."<sup>103</sup>

Denver International Airport also followed the pattern set by Terminal 1's design in its concept of a monumental, memorable "great hall." This "great hall" served as the gateway to a set of parallel concourses, as at Hartsfield, and all travelers entered and exited through this dramatic space. One of the major showpiece airports of the 1990s, the Denver airport was the first completely new, major commercial airport constructed in the U.S. since 1974. Intent on creating an iconic design to serve as a city symbol, the City of Denver rejected a glass and steel roofline design, like O'Hare's Terminal 1, that referenced railroad sheds. Instead, the final design incorporated a Teflon fabric roof that instead evoked the nearby mountain skyline.<sup>104</sup>

### C. Naess & Murphy/C.F. Murphy Associates

The architectural firm of Naess & Murphy, later known as C.F. Murphy Associates, Murphy/Jahn, and JAHN, represents one of the largest and most prolific architectural firms in postwar Chicago. The firm represents a "lineage" of Chicago architects, beginning with Daniel Burnham in the nineteenth century, and emerged during a pivotal time in the history of Chicago and its urban development. The works of Naess & Murphy/C.F. Murphy marked a transition in the city from 1930s modern architecture to the International style of the Second Chicago School of Architecture, which was heavily influenced by the work of Ludwig Mies van der Rohe (commonly referred to as Mies). Co-founder Charles F. Murphy, Sr. managed the firm and hired multiple architect and designers for various commissions. In the 1950s, the firm developed a relationship with Mayor Richard Daley early in his mayoral career and worked on highly visible projects at O'Hare and the downtown Chicago Loop, intended by Daley to promote Chicago as a modern city. This context addresses the background of Charles F. Murphy, his professional relationship with Mayor Daley, and the firm's shift towards the Second Chicago School. A brief summary of the firm following its acquisition by Helmut Jahn in the 1980s is also provided for context of the firm's work at O'Hare.

Charles F. Murphy, Sr. was born in New Jersey in 1890 and moved to Chicago during his childhood. He graduated from the De La Salle Institute, a Catholic technical high school in Chicago, where he was trained as a stenographer. Murphy entered the architectural field in 1911 as secretary for the firm of Daniel Burnham, one of Chicago's leading architects. While working at D.H. Burnham and Company, Murphy became the personal assistant to Ernest Graham, an architect working at the firm. The two maintained a very close working relationship for the next 25 years, with Murphy following Graham to the firm of Graham, Anderson, Probst, and White in 1917.<sup>105</sup> Graham's new firm was one of the most prolific

<sup>103</sup> Green, "Chicago: Terminal of the Future," 51.

<sup>104</sup> Bednarek, *Airports, Cities, and the Jet Age*, 137–38.

<sup>105</sup> Kenan Heise, "Charles F. Murphy, Chicago Architect," *Chicagotribune.Com*, accessed July 22, 2019, <https://www.chicagotribune.com/news/ct-xpm-1985-05-24-8502020167-story.html>; Franz Schulze, *Oral History of Carty Manny* (Chicago, Ill.: Art Institute of Chicago, 1995), 108; Mark J. Bouman and John Zukowsky, Ed., *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 468.

in Chicago, with significant works including the Pittsfield Building (1927), the Straus Building (1923-1924), the Foreman State Bank (1928-1930), and the Field Building (1934). Murphy became a licensed architect while working with Graham, but mostly managed the inner workings of the firm and developed the managerial and administrative skills that he would employ for the remainder of his career.<sup>106</sup>

Ernest Graham passed away in 1936. The day after Graham's death, Murphy was fired from the firm along with two other architects: Sigurd Naess and Alfred Shaw. These three architects soon opened their own firm, Shaw, Naess, and Murphy. Continuing his role as an administrator, Murphy developed the strong corporate organization that would come to define the firm. Sigurd Naess had emigrated to the United States from Norway as a young man in 1902. He became known as a planning expert, and led much of the production work at Shaw, Naess, and Murphy. Alfred Shaw was a designer and painter from Boston who studied at MIT before working in Chicago. Shaw was the first of many designers that Murphy relied on over the years to build the firm's reputation. With the Great Depression followed by World War II, the 1930s and 1940s proved to be a difficult time for most architectural firms, especially one starting out. During this time, Shaw, Naess, and Murphy found work on smaller projects including a remodel of the Museum of Science and Industry in Chicago, designing and installing elevators and escalators in the Marshall Field store, and designing a munitions plant in New Jersey. The firm also gained experience in the aviation field during the war, completing work at Bunker Hill Field (currently Grissom Air Reserve Base) in Indiana and Kindley Air Force Base in Bermuda (now Bermuda International Airport). Due to personal conflicts, among other factors, Alfred Shaw left the firm in 1946 and the firm's name changed to Naess & Murphy.<sup>107</sup>

The first major project for Naess & Murphy was the Prudential Insurance Building (1952-1955), the first skyscraper built in Chicago since the Field Building in 1934. The 44-story concrete and glass building not only signaled the return of skyscraper construction to Chicago, but also signified the arrival of postwar Modernism to the urban landscape. Kenan Heise, writing for the *Chicago Tribune* in 1985, argued that the Prudential Building "hinged two eras of Chicago architecture," and that it "opened the modern, explosive era of Chicago commercial architecture."<sup>108</sup> Naess & Murphy continued to work on other commercial projects in the 1950s, including the Chicago Sun-Times Building (1957) and the Federal Reserve Addition (1957), which historian Ross Miller has described as "serviceable modernism." However, the Prudential Building proved to be the firm's most significant building of the 1950s, not only for its architectural significance, but also because it was at the dedication in 1954 that Murphy met the soon-to-be-mayor Richard J. Daley. The relationship that developed between Murphy and Daley would establish Naess & Murphy as one of the leading architectural firms in Chicago.<sup>109</sup>

<sup>106</sup> Ross Miller, "Helmut Jahn and the Line of Succession," in *Chicago Architecture and Design 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: The Art Institute of Chicago and Perstel-Verlog, 1993), 305; Schulze, *Oral History of Carty Manny*, 108; Carol Willis, "Light, Height, and Site: The Skyscraper in Chicago," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis*, 1993, 131.

<sup>107</sup> Miller, "Helmut Jahn and the Line of Succession," 305; Schulze, *Oral History of Carty Manny*, 110-11, 152.

<sup>108</sup> Heise, "Charles F. Murphy, Chicago Architect."

<sup>109</sup> Miller, "Helmut Jahn and the Line of Succession," 303, 305.

After their first meeting, Mayor Daley and Murphy slowly developed a professional relationship that extended through the 1960s. Daley had a vision to rebuild the downtown Chicago Loop as a modern American city, and Murphy's firm became an integral partner in bringing that vision to reality. Murphy and Daley shared an Irish-Catholic connection, and they had both attended the De La Salle Institute, although Daley graduated from the school decades after Murphy. According to Miller, Daley was impressed with Murphy because he "did not strike Daley as a fancy-pants architect."<sup>110</sup> Daley soon turned to Murphy to help him prevent a lawsuit from residents along the South Shore attempting to stop the construction of a new water filtration plant. Naess & Murphy worked to make the plant more attractive by designing a civic park as part of the facility and saved the new mayor from the impending lawsuit. Daley then turned to Naess & Murphy to help him with another difficult situation with the city's new airport at O'Hare Field.<sup>111</sup>

When Daley took office, funding for O'Hare had been a point of contention between the City and the airlines for nearly a decade. However, the new mayor was committed to building a modern airport for Chicago and he soon began direct negotiations with the airlines to reach a mutual agreement in 1956. With funding secured, he commissioned Naess & Murphy to review the plans drafted by Ralph Burke, and construction began in earnest in 1959. Between 1960 and the mid-1970s, the firm (including its successors) was responsible, along with multiple partner firms, for the design and construction of O'Hare, including Terminals 2 and 3, the Rotunda, the Heating & Refrigeration Plant, the O'Hare Telephone Building, and the O'Hare Hilton Hotel. The firm was also involved in designing the overall layout of the airport, including the runways, roadways, parking structures, and various other utilitarian buildings and systems.<sup>112</sup> C.F. Murphy Associates was honored in 1963 by the Chicago Association of Consulting Engineers for the design of the terminal buildings and the Rotunda.<sup>113</sup> An August 1963 issue of *Progressive Architecture* outlined the design of the new O'Hare plan, stating that it "lacks the brilliance and originality of Dulles" but shows strength in details such as "the meticulous care with which the individual buildings were designed; in the expert integration of structural and mechanical services; in the orderly and craftsman-like execution of the interiors, which have visual harmony in spite of the diverse requirements of 13 different airlines; and in the well-designed adjunct service structures, such as the fire station, the heating and refrigeration plant, and the central telephone exchange..."<sup>114</sup>

Sigurd Naess retired in 1959 and Murphy subsequently changed the name of the firm to C.F. Murphy Associates (C.F. Murphy) in 1960. Murphy's son, Charles F. Murphy, Jr., became more involved in the firm. Murphy, Jr. was an admirer of Mies and began hiring designers and architects, many of whom are now associated with the Second Chicago School of Architecture, who had either been trained by Mies or were committed to following his philosophies embodied in the International Style. The first of these new architects was Stanislaw Gladych, previously employed by SOM, who was hired as the firm's lead

<sup>110</sup> Miller, "Helmut Jahn and the Line of Succession," 303.

<sup>111</sup> Schulze, *Oral History of Carty Manny*, 152.

<sup>112</sup> Carl W. Condit, *Chicago: 1930-70: Building, Planning, and Urban Technology* (Chicago and London: The University of Chicago Press, 1974), 259; Richard P. Doherty, *The Origin and Development of Chicago-O'Hare International Airport (Dissertation)* (Muncie, Ind.: Ball State University, 1970), 166, 193, 196; C.F. Murphy Associates, *C.F. Murphy Associates* (Chicago: C.F. Murphy Associates, 1975).

<sup>113</sup> City of Chicago, Department of Aviation, *Annual Report 1963*, 6.

<sup>114</sup> "Our Two Largest Airports," 103.



designer. Gladych was one of the leading architects at O'Hare along with Carty Manny, Jr., Gertrude Lempp Kerbis, and John Novack, all of whom were strongly influenced by Mies. Other notable architects employed by C.F. Murphy throughout the 1960s included Otto Stark, Jacque Brownson, and James Ferris. C.F. Murphy's turn toward International-style design also fit perfectly into Mayor Daley's vision to modernize Chicago. According to Ross Miller, "The radically modern architecture demonstrated that the mayor of Chicago was not simply defending old arrangements, but was doing nothing less than recasting the aging American downtown."<sup>115</sup> Connecting Chicago to the world with a modern airport facility at O'Hare was an early priority for Daley and his vision to rebuild the city, but it was not the last. In the 1960s, the mayor planned a major redevelopment of the Dearborn Avenue corridor. C.F. Murphy participated in partnerships on three buildings that redefined this corridor of downtown Chicago, including the Richard J. Daley Center (1965), the Chicago Federal Center (1974), and the First National Bank of Chicago (1969). The firm would continue to complete numerous civic commissions for the City of Chicago, employing the Miesian International style to recast the city's image in the postwar era.<sup>116</sup> C.F. Murphy did not complete this task alone, however. Throughout the 1960s and 1970s, the majority of the firm's projects were the products of multiple architects and designers collaborating within the firm, as well as partnerships with other reputable firms such as SOM and Mies's private firm.

In 1967 Mayor Daley commissioned C.F. Murphy to design a new exhibition hall at McCormick Place. To assist with the project, the firm hired Eugene Summers, who brought his assistant Helmut Jahn to the firm as well. As a student of Mies, Summers was devoted to the modernist principles of the Second Chicago School of Architecture. Jahn, on the other hand, gained a reputation for being more flexible in his designs. By 1973, Jahn was promoted to Executive Vice President and Director of Planning and Design within C.F. Murphy and spent the remainder of the decade expanding the firm's stylistic range on multiple projects around the United States, but particularly in Chicago. As Ross Miller argued, "Within the framework of C.F. Murphy's bread-and-butter civic commission of the 1970s, Jahn methodically renewed the firm and established his own reputation."<sup>117</sup> In 1982, Jahn gained a controlling interest in C.F. Murphy and changed the firm's name to Murphy/Jahn, while significantly reducing the size of the firm. Charles Murphy, Sr. passed away in 1985.<sup>118</sup> Following his takeover of the firm, Jahn designed multiple postmodern and late-modern buildings across the United States and internationally, including airports in Cologne, Munich, Bangkok, and Chicago.

Jahn also continued C.F. Murphy's work at O'Hare. In 1982 the CDA launched the ODP, which included rebuilding Terminal 1, expanding Terminals 2 and 3, building a new international terminal (Terminal 5), and a "people mover" to transport travelers to more distant parking areas. Murphy/Jahn led O'Hare Associates, a joint venture of multiple firms, to complete the ODP. Helmut Jahn is credited with the overall

<sup>115</sup> Ross Miller, "City Hall and the Architecture of Power," in *Chicago Architecture and Design, 1923-1993: Reconfiguration of an American Metropolis* (Chicago and Munich: Prestel and The Art Institute of Chicago, 1993), 253.

<sup>116</sup> Miller, "Helmut Jahn and the Line of Succession," 305; Miller, "City Hall and the Architecture of Power," 249–57; C.F. Murphy Associates, *C.F. Murphy Associates*.

<sup>117</sup> Miller, "Helmut Jahn and the Line of Succession," 307.

<sup>118</sup> Heise, "Charles F. Murphy, Chicago Architect."

design of the new Terminal 1 (1988) and the facade improvements to Terminals 2 and 3 (2006).<sup>119</sup> In 2012 Jahn renamed the firm to JAHN.<sup>120</sup> The firm continues to work internationally while maintaining its main offices in Chicago.

## D. Stanislaw Z. Gladych

Stanislaw Gladych was the chief designer for the O'Hare expansion that began in the late 1950s and continued through the early 1960s. A brief biography of Stanislaw is provided as context for understanding the design of O'Hare fits within the context Gladych's influences and role in Chicago modern architecture in the mid-twentieth century.

Gladych was born in Poland in 1921. During World War II, he worked in the underground resistance, and was captured by the Russian army and sent to Siberia.<sup>121</sup> Once released, he was sent to Britain and then served in the Polish Air Force, and was shot down more than once.<sup>122</sup> After the war, Gladych remained in England, attending the architecture school at the University of Liverpool.

Upon graduating in 1950, Gladych immigrated to the United States and was hired by SOM at the firm's New York office.<sup>123</sup> He was sent to Okinawa, Japan, to assist in designing United States military facilities, and then transferred to SOM's Chicago office, where he was selected as the lead designer for the Air Force Academy at Colorado Springs, Colorado.

When the Air Force Academy project came to a close in 1956, Gladych left SOM to join Naess & Murphy (renamed C.F. Murphy in 1960).<sup>124</sup> That same year, Gladych became a partner at the firm and was selected as the designer for the Central Water Filtration Plant in Chicago.<sup>125</sup> This became the world's largest water filtration plan, and its Miesian design was honored with an award by *Progressive Architecture* magazine.<sup>126</sup> Although never a student of Mies, Gladych was intrigued by Mies's design philosophy, and utilized these Second Chicago School of Architecture principles in much of his important works.<sup>127</sup>

<sup>119</sup> "Transportation," *JAHN*, accessed August 20, 2019, <https://www.jahn-us.com/transportation>; O'Hare Associates, *Chicago O'Hare International Airport O'Hare Development Program* (Prepared for the City of Chicago, December 1982); Gapp, Paul, "O'Hare at the Turning Point: Is Delta's Sparkle the New Direction?"

<sup>120</sup> Nory Miller, *Helmut Jahn* (New York: Rizzoli, 1986), 7; "Transportation"; Melissa Harris, "Name Change, New Design Leadership at Murphy/Jahn," *Chicago Tribune*, accessed August 20, 2019, <https://www.chicagotribune.com/business/ct-xpm-2012-10-26-chi-name-change-new-design-leadership-at-murphyjahn-20121026-story.html>.

<sup>121</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>122</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>123</sup> Schulze, *Oral History of Carty Manny*, 154.

<sup>124</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>125</sup> Schulze, *Oral History of Carty Manny*, 153.

<sup>126</sup> Schulze, *Oral History of Carty Manny*, 177.

<sup>127</sup> Schulze, *Oral History of Carty Manny*, 178.

Gladych was selected to work as chief designer for the O'Hare project under project manager Carter Manny, Jr. Beginning in 1956, this project required a rework of Burke's existing plan to expand the airport, which culminated into the 1958 master plan. Gladych was responsible for applying Miesian design principles to the terminal buildings and the Heating & Refrigeration Plant. During the design process he was assisted by other key figures on the O'Hare project, including Carter Manny, Jr., Walter Metschke, Otto Stark, and Gertrude Lempp Kerbis.

Manny credits Gladych with the implementation of the modular system at O'Hare, which was utilized in the concourse design. This scheme allowed for future growth at the concourses by designing the projecting contact gates with uniform dimensions to accommodate infill of the nose pocket space in between. Other design elements developed by Gladych did not come together as planned; specifically, the executed design of the curtain walls at the main terminal buildings, which could not be manufactured as originally designed due to issues related to the large size of each glazed panel.

In 1964 C.F. Murphy Associates and Perkins & Will were selected to design the First National Plaza Building in Chicago, and Gladych was assigned as the designer. Completed in 1969, the First National Plaza Building was a 60-story skyscraper that had a distinctive curvilinear shape defined by its slightly flared base. Also completed in 1968 was the extant building at Mercy Hospital in Chicago, which was designed by C.F. Murphy Associates, with Gladych as lead designer.

The J. Edgar Hoover FBI Building in Washington, D.C., was one of Gladych's largest commissions during his time at C.F. Murphy Associates. Designed in several phases beginning in 1967 and ending in 1977, the building exhibits a strong sense of Brutalism in its form and extensive use of concrete, and stirred controversy over the appropriateness of such a design and scale within the nation's capital. Original concepts by Gladych exhibited a more Miesian character, which eventually was dropped in favor of a Brutalist design that Gladych described as "expressing the 'precise, integrated form of the FBI.'"<sup>128</sup> However, the design was nearly universally panned by architecture critics and was not seen favorably by the public.<sup>129</sup>

In 1972 Gladych left C.F. Murphy Associates to join an engineering consulting firm, Howard, Needles, Tammen and Bergendoff (HNTB), where he served as president for one year.<sup>130</sup> By 1973 Gladych left HNTB to work on his own, starting a firm called S.Z. Gladych Design & Planning Consultant, before retiring shortly afterward.<sup>131</sup>

<sup>128</sup> Aarons, Leroy F., "Group Hails Design for FBI Offices," *The Washington Post*, October 2, 1964, sec. B.

<sup>129</sup> Eckardt, Wolf Von, "Rating Washington's Architecture," *The Washington Post*, January 6, 1974.

<sup>130</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

<sup>131</sup> "Stanislaw Z. Gladych Dies; Designed O'Hare Terminals."

## **E. Ludwig Mies van der Rohe, Miesian Architecture, and the Second Chicago School of Architecture**

The background on Ludwig Mies van der Rohe and the Second Chicago School of Architecture is provided to understand how Terminal 3 fits into the context of Miesian architecture, which was an influential style from its introduction in the United States in 1940 until the 1960s.

Mies is best known for promoting a particularly streamlined version of Modern architecture that came to define the American city in the years after World War II. As the head of the architecture department at the Illinois Institute of Technology (IIT), he trained a generation of architects to follow his philosophy of architecture based on reducing buildings to their most essential elements. Mies developed much of his philosophy as a young architect in Germany, where he became associated with the International Style of architecture. The architects of the International Style believed that modern society had become “impersonal and collective” and that new architecture should reflect that view. Mies embraced the “impersonal nature of modern technology itself,” and dedicated himself to the perfection of artistry through the use of modern materials and methods.<sup>132</sup> Rejecting all sense of subjectivity, he aspired to objectivity in architecture by reducing buildings to their most basic elements. The goal of his stylistic reductionism was a focus on the creation of space, both exterior and interior. The combination of intentionally reductive architecture establishing defined, yet open and connected, space through the precise expression of modern materials embodies Mies’s philosophy. This was well summarized by architect Werner Blaser:

Space is primary and the position of the walls is determined by it. Interior and exterior form a whole. In this spatial freedom the static principle of slab, beam and column, i.e. of load and support, can be expressed. As the logical sequel to these lucid requirements we have the articulation of proportions in surface and space.<sup>133</sup>

Mies brought this philosophy to the United States in 1938, when he accepted an invitation to develop a new curriculum for the architecture department at the Armour Institute in 1938, which became IIT in 1940. Under Mies, the architecture department of IIT grew from a relatively unknown technical school to one of the most influential programs in the country.<sup>134</sup> The Armour Institute was founded in 1890, during the rise of the First Chicago School of Architecture. The architects of the First Chicago School, such as Louis Sullivan, Daniel Burnham, and John Wellborn Root, among others, developed a new system of architecture that “emphasized structure and function over ornamentation.”<sup>135</sup> Mies advanced Sullivan’s famous slogan “form follows function” towards the design of a form so basic that it could suit any function. The architects trained under and influenced by Mies’s curriculum became known as the Second Chicago School of Architecture, in part because they extended the ideals of those earlier architects to new levels of austerity and functionality.

<sup>132</sup> Richard Pommer, “Mies van Der Rohe and the Political Ideology of the Modern Movement in Architecture,” in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 133.

<sup>133</sup> Werner Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, Second edition (Basel, Boston, Stuttgart: Birkhauser Verlag, 1981), 7.

<sup>134</sup> Blaser, *Mies van Der Rohe: Continuing the Chicago School of Architecture*, 30.

<sup>135</sup> “Mies: The Man, The Legacy,” *Mies Van Der Rohe Society*, accessed August 16, 2019, <http://miessociety.org/mies/>.



Mies preferred the term *Baukunst*, or “building art,” over “architecture” and developed a meticulous curriculum based on five principles of architecture, summarized as a focus on structure, space, proportion, materials, and the fine arts in relation to architecture. Instead of direct instruction, Mies encouraged his students to examine each of these principles objectively through various exercises during the first four years of study; only in the fifth and final year did students apply their methods on tangible projects. Mies intended for his students to embrace a purely rational method of design and reject any subjectivity. The outcome of this curriculum was a generation of architects who absorbed everything the master teacher shared with them, but also developed an inflexibility of style. As James Ingo Freed, a student of Mies and later the Dean of Architecture at IIT, recalled, the four years of exercises “eliminated all other options...by the time you got to the fifth year you didn’t know what to do except what you had already done.”<sup>136</sup> Comparing education to training, Freed argued, “Education implies free will; and there was little of that there.”<sup>137</sup>

Over the following decades, the architects of the Second Chicago School built a multitude of efficient steel, glass, and concrete rectangular towers that came to define the American metropolis. The primary features of the Miesian style include rectilinear forms, a lack of ornamentation beyond accentuating the building materials, use of modern materials such as glass and steel, and open internal and external spaces framed by the building. This form was, for a time, ideally suited to the postwar American economy, which was steadily shifting away from manufacturing towards companies that necessitated more and more centralized office spaces. The Miesian model also matched the goals of civic leaders such as Richard Daley of Chicago, who not only saw it as efficient, but as an emblematic symbol of modernity. The Second Chicago School provided the rational order that American business and civic leaders desired to reshape the country in an age of unprecedented prosperity.

While teaching at IIT, Mies continued to work as a professional architect and produced three of his most iconic and influential buildings in the 1950s. The first of these are the apartments at 860 and 880 Lake Shore Drive (1948-1951) in Chicago, which have been described as one of the “most influential designs for high-rise structures of the twentieth century.”<sup>138</sup> With the Lake Shore Apartments, he aspired toward transparency of the structural design and building materials. Because fire codes required the steel skeleton to be encased in concrete, Mies chose to weld non-structural I-beams to the facade to give emphasis to the structure and materials beneath. In addition, the positioning of the buildings on an irregular lot create a clear and defined exterior space, with orientation directed simultaneously to the street and the lake. Secondly, Crown Hall (1950-1956), in the center of the campus designed by Mies at IIT, defined Mies’s desire to merge interior and exterior space. The structure of the building is entirely transparent, with the ceiling clearly suspended from the exterior superstructure, creating an entirely free and open interior space. That space is also surrounded by a continuous curtain wall that completely opens interior workspace to the exterior space of the campus. The designs of these two buildings were brought together in the Seagram Building in New York City. The appearance of the Lake Shore

<sup>136</sup> James Ingo Freed and Franz Schulze, “Mies in America: An Interview with James Ingo Freed Conducted by Franz Schulze,” in *Mies van Der Rohe: Critical Essays* (Cambridge, Mass.: MIT Press, 1989), 186.

<sup>137</sup> Freed and Schulze, “Mies in America: An Interview with James Ingo Freed Conducted by Franz Schulze,” 186.

<sup>138</sup> Franz Schulze, *Mies van Der Rohe: A Critical Biography* (Chicago and London: The University of Chicago Press, 1985), 241.

apartments is replicated on a taller and grander scale, with bronze I-beams ascending the facade of the building. The building is set back from the street to create a plaza, representing a large public space in the urban fabric of the city. Although the continuous curtain wall of Crown Hall is missing, the structure of the Seagram Building allows for large, flexible, open spaces on each floor.<sup>139</sup>

The influence of these three iconic buildings on the Second Chicago School architects can be seen in two high-profile buildings in downtown Chicago. The Continental Center (1962) was designed by Jacques Brownson and James Ferris of C.F. Murphy Associates. Both of these architects studied under Mies at IIT in the 1940s and 1950s, and Brownson even continued as an instructor. The Continental Center has an unadorned rectangular massing with exposed steel framing. The interior features open, column-free floorplans completely surrounded by floor-to-ceiling glass walls, reminiscent of the Crown Hall interior. The architects employed modern materials and engineering to design a minimal structure supported by only 20 columns with three 42-foot-wide bays on the facade. In addition, the first floor is recessed in the same manner as the Lake Shore Apartments and the Seagram Building.<sup>140</sup> A second building of note is the Chicago Civic Center (Richard J. Daley Center, 1965). Brownson is credited as the architect of record, but the entire project was a joint venture between the Chicago-based firms C.F. Murphy Associates; SOM; and Loeb, Schlossman, and Bennett. The Civic Center appears to very similar to the Continental Center on a larger scale, with three 87-foot bays across the facade supported by 12 exterior columns and continuous curtain walls encircling each story. However, the Civic Center is surrounded by an enormous plaza that occupies 65 percent of the building's site, repeating the plaza of the Seagram Building and echoing Mies's focus on exterior space.<sup>141</sup> The two prominent buildings showcase the designs and philosophy of the Second Chicago School architects as they worked to rebuild the nation's cities in the postwar period.

The Second Chicago School style is also apparent among the buildings constructed at O'Hare in the 1960s and 1970s. Gladych was not trained by Mies but was greatly influenced by Mies's philosophies. As Carter Manny described Gladych, he was "more Miesian than Mies."<sup>142</sup> With the terminal buildings, Gladych employed extensive curtain walls that create a sense of openness between the interior of the buildings and the surrounding airport design. The interior spaces themselves are vast and open, accommodating the large crowds of passengers and establishing a freedom of movement within the terminals. These design elements are also present in the Heating & Refrigeration Building, where the exterior curtain walls permit visibility of the machinery within. The terminal buildings were constrained by other design requirements of the airport, and do not reflect Mies's interest in creating a defined exterior space. However, this element is present in the design of the O'Hare Hilton Hotel. The curved facade of

<sup>139</sup> "Mies van Der Rohe Biography, Life & Quotes | TheArtStory," accessed August 16, 2019, [https://www.theartstory.org/artist/mies-van-der-rohe-ludwig/life-and-legacy/#biography\\_header](https://www.theartstory.org/artist/mies-van-der-rohe-ludwig/life-and-legacy/#biography_header); Schulze, *Mies van Der Rohe: A Critical Biography*, 275.

<sup>140</sup> *Continental Center: Landmark Designation Report* (Prepared for Commission on Chicago Landmarks, July 7, 2011), 6, 9, 12–13.

<sup>141</sup> Miller, "City Hall and the Architecture of Power," 255; Jan C. Rowan, ed., "Civic Center: Dignity and Continuity," *Progressive Architecture* 47, no. 10 (October 1966): 247; "Richard Daley Center," *The Architecture Week Great Buildings Collection*, accessed August 22, 2019, [http://www.greatbuildings.com/buildings/Richard\\_Daley\\_Center.html](http://www.greatbuildings.com/buildings/Richard_Daley_Center.html).

<sup>142</sup> Schulze, *Oral History of Carty Manny*, 155.

the hotel is not strictly Miesian; however, it is balanced with the terminal roadway to create an exterior plaza, with the control tower as its central feature, that is reminiscent of the Mies's Lake Shore Apartments and the Seagram Building.<sup>143</sup>

The reinforced steel and concrete exterior frame of the Terminal 2 and Terminal 3 were designed with Miesian principles of Modern architecture, with half-inch rolled tinted glass curtain walls with extruded aluminum mullions. This particular curtain wall system was developed by Gladych, Botho Schneider—also from Naess & Murphy—and Flower City Ornamental Iron Company in Minneapolis. Gladych utilized a similar Miesian curtain wall design for the Heating & Refrigeration Plant that was constructed northwest of the Terminal Core as part of the same master plan. With both designs, Gladych attempted to apply the architectural principles of Crown Hall at the Illinois Institute of Technology.<sup>144</sup>

Gladych preferred taller glazing between each mullion, without the smaller, upper light that was constructed, but the curtain wall system that was chosen could not allow for this size of uninterrupted glass. The neoprene gasket system that was used for this curtain wall had been developed by the automobile industry for use in windshields, then first implemented in architecture by Eero Saarinen for the General Motors Technical Center, and explained by Manny:

It's a very nifty glazing scheme, where this gasket grabs the metal on one side, the mullion that supports the unit, and it grabs the glass on the other side. Then you take a little tool and you push this zipper thing together that closes the thing, just like they do on automobile windshields. It was a technology developed by the auto industry that Eero picked up and used, and we used it and many others followed suit.<sup>145</sup>

More so than the smaller, SOM-designed original Terminal 1, the glass and steel designs of Naess & Murphy's O'Hare Terminal 2 and 3 buildings clearly reflected the Miesian philosophy of Modern architecture in their original designs, characterized by streamlined rectilinear designs and honest use of building materials.

<sup>143</sup> Schulze, *Oral History of Carty Manny*, 234, 288–89.

<sup>144</sup> Schulze, *Oral History of Carty Manny*, 210.

<sup>145</sup> Schulze, *Oral History of Carty Manny*, 201–4.

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### 3. Recommendations

#### A. Significance

Terminal 3 was evaluated for National Register of Historic Places (National Register) eligibility under *Criteria A, B, C, and D*. Evaluation under each of the National Register Criteria and discussion of period and level of significance and historic integrity is provided below.

##### (1) *Criterion A*

Under *Criterion A*, "Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history."

Terminal 3 was completed in 1961 and opened in 1962 during a period of major growth at O'Hare. At this time Terminals 2 and 3, the Rotunda, and support facilities were constructed based on the 1958 O'Hare master plan to support airport expansion, satisfy passenger demand and changes within the aviation industry, and provide new facilities and services for passengers and airport staff. The introduction of jet-engine-powered aircraft to commercial air travel in the late 1950s precipitated substantial changes to airport design and operations, pressuring City officials to expand O'Hare to serve this increase in air travel and secure Chicago's standing as a connecting hub for air transportation. As one of the major components of this construction program, Terminal 3 exemplifies the 1961-63 expansion of O'Hare to serve an important transportation need. Following its early 1960s expansion, O'Hare quickly ranked as one of the busiest airports in the nation and is representative of jet age transportation in the United States.<sup>146</sup> For these reasons, Terminal 3 possesses significance for the National Register under *Criterion A* in the area of Transportation.

In response to deregulation and increases in air traffic, continuous improvements to O'Hare have been made since the 1960s. The 1978 Airline Deregulation Act dramatically changed the nature of air travel in the U.S. By consolidating flights into regional hubs, airlines were able to significantly increase the number of flights they were able to operate. This in turn created the need for a change in airport design to accommodate the increase of both aircraft and passengers at the country's major airports. Atlanta's Hartsfield-Jackson Airport was one of the first to address these issues by completely redesigning the airport around a mid-field complex of satellite concourses. This new layout allowed aircraft to move more freely and provided travelers with expanded amenities. Atlanta's design represented a comprehensive re-imagining of the flow and functionality of that airport.

As the aviation industry evolved, City officials at O'Hare responded by planning for and then executing the O'Hare Development Program (ODP) in the 1980s and 1990s and the Facade and Circulation Enhancements (FACE) project in 2006, both of which included significant terminal modifications. Under the ODP, Terminal 3 was expanded 50 percent from its original dimensions, and a new concourse added. In 2006 the front facade was replaced to allow for more passenger circulation within the ticketing area. This resulted in a terminal that reflects these later eras of construction as much as it displays the initial

<sup>146</sup> "Chicago O'Hare International Airport, Crossroads of the World," *Chicago Tribune*, April 7, 1963, sec. 7A: Your Chicago Today.

construction from 1961. Terminal 3, as it had evolved by 2006 does not represent an exceptionally significant example of later aviation trends, and therefore does not meet *Criteria Consideration G: Properties That Have Achieved Significance Within the Past Fifty Years*. Changes to Terminal 3 after construction do not appropriately reflect significant trends in airport design, specifically with respect to changes brought about by airline deregulation. Other airports such as those at Atlanta, Denver, and many others constructed entirely new airport buildings as a response to airline deregulation, which better represents the design trends brought about by this significant event. Therefore, its period of significance under *Criterion A* is limited to 1961-63, the date of initial construction to the commemoration ceremony of the O'Hare expansion in 1963.

## **(2) Criterion B**

Under *Criterion B*, "Properties may be eligible for the National Register if they are associated with the lives of persons significant in our past."

Terminal 3 is not associated with any persons of historical significance outside of its architects, engineers, and designers, which are addressed under *Criterion C*. As such, it is recommended not eligible for listing in the National Register under *Criterion B*.

## **(3) Criterion C**

Under *Criterion C*, "Properties may be eligible for the National Register if they embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction."

Terminal 3 embodies significant characteristics of an airport terminal of the jet age, representing this distinctive property type. The jet age had an influential impact on airport terminal design, as airports evolved to accommodate both a dramatic increase in air traffic after World War II and the larger jet-engine-powered passenger aircraft of the late 1950s. The introduction of jet aircraft prompted City officials to design new terminals for existing airports or redesign existing terminals to accommodate the larger size of the new aircraft. This pattern of development spread across many major metropolitan regions of the country, influencing airport design changes at airports such as Idlewild Airport (now JFK) in New York and Lambert Field in St. Louis. The development of O'Hare according to the 1958 master plan by Naess & Murphy was a direct response to these influences.

Terminal 3's main building and associated Concourse H & K reflect general trends in airport designs of the jet age, such as ticketing area and baggage claim serving two levels fronting the landside roadway, a single-level path of travel from ticketing to the aircraft, and a concourse extending into the airfield to serve contact gates and hold rooms without requiring passengers to walk across the tarmac. Additionally, O'Hare's use of the circular-drive-and-terminal plan allowed for ease of access for vehicular traffic to Terminal 3, with the dual-level roadway providing separation of arriving and departing passengers, which was an efficiency-based design originating in the jet age era. As such, Terminal 3 is representative of this jet age airport terminal design with distinctive characteristics, including a vertical separation of arrivals and departures, focus on the automobile through a bi-level roadway, and enclosed concourses with

circulation corridors leading to contact gates. Therefore, Terminal 3 possesses National Register significance under *Criterion C* for airport design of this period in the area of Architecture.

The original design of Terminal 3 was an example of Miesian architecture, which developed in Chicago and was chiefly driven by Ludwig Mies van der Rohe. Also referred to as the Second Chicago School of Architecture, Miesian design principles infiltrated Modern architecture, with distinctive elements such as tinted plate glass curtain walls with glazing separated by aluminum extruded mullions. However, Terminal 3 cannot be appropriately evaluated for significance as an example of Miesian architecture as the primary facade of Terminal 3 that displayed this style was removed and replaced with an entirely new face and canopy. This new facade and a south elevation addition, constructed in 2006 and 1984, respectively, both introduced different architectural character to the terminal.

Stanislaw Gladych served as the lead designer for Terminal 3, assisted by several other members of the Naess & Murphy team, including project manager Carter Manny, Jr. and with contributions by Landrum & Brown. According to first-hand accounts from designers on the project, Terminal 3 and other O'Hare buildings associated with the 1958 master plan were designed with substantial input and detailed development by other members of the design team and hired consultants, and was not the sole creative work of Gladych. As such, Terminal 3 does not represent the creative product of any single individual and does not reflect the work of any particular "master" architect, artisan, or craftsperson. Similarly, the design and planning of Terminal 3 does not appropriately reflect the works of Naess & Murphy in any manner that would be a significant association with the architectural firm.

Major alterations to Terminal 3 occurred as a result of the 1980s modernization of O'Hare, as outlined in the ODP and the 2006 FACE project. The post-1961 changes to Terminal 3 occurred in a piece-meal fashion that neither focused on intentionally retaining the original design nor clearly introduced new design principles to reflect the 1980s era of terminal design. As such, Terminal 3 does not represent an exceptionally significant example of an airport terminal of the 1980s.

#### **(4) Criterion D**

Under *Criterion D*, "Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history."

The design, construction, and alterations of Terminal 3 have been well documented, and it is unlikely that the building has potential to yield important information that is not otherwise accessible. As such, Terminal 3 is recommended not eligible for listing in the National Register under *Criterion D*.

#### **(5) Period of significance**

The period of significance for Terminal 3 was determined to coincide with the date of completion through the date of commemoration of the O'Hare expansion: 1961-63.

#### **(6) Level of significance**

Terminal 3 was evaluated for significance for representing changes to aviation during the jet age at the national level under *Criterion A: Transportation*, and for representing distinctive characteristics of an

airport terminal property type constructed during the jet age at the national level under *Criterion C: Architecture*.

## B. Integrity

To be eligible for inclusion in the National Register, a property must exhibit sufficient historic integrity to convey its significance, in addition to being associated with one or more of the National Register Criteria listed above. Terminal 3 was evaluated based on the seven aspects of integrity below: location, design, setting, materials, workmanship, feeling, and association. The evaluation of integrity for Terminal 3 was assessed to a period of significance of 1961-63.

- **Location** – Terminal 3 remains in its original location and therefore retains integrity of location.
- **Design** – Terminal 3 retains some of its original design in the general layout, structure, and features of the primary public spaces, but has undergone substantial alterations that have affected the terminal's design as it relates to its jet age-era style and plan during the period of significance. Alterations to the terminal building that affect integrity of design include the 2006 facade replacement and new canopy at the primary north elevation, as well as the 1984 south elevation addition, which have both substantially altered the original Miesian composition and materials of the building's original design. This primary facade offered the first view of the terminal as the passenger was approaching the ticketing area. This critical north elevation has been removed and replaced with a new facade. Additionally, alterations carried out as part of the 1980s modernization include a 50-percent expansion of the terminal building to the east, expansion of the terminal building to the south, the addition of Concourse L and the Concourse L "Stinger," and alterations to Concourse H & K. These change the original design by introducing contemporary design elements to principal public areas of the terminal. As such, Terminal 3 does not retain integrity of design to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture* during its period of significance.
- **Setting** – Terminal 3 retains its integrity of setting within the larger O'Hare complex. Despite the construction of the adjacent FAA office building and associated FAA Main Control Tower, Terminal 3 continues to retain its general orientation and setting within O'Hare from its period of significance.
- **Materials** – Terminal 3 has experienced changes to materials in its principal public spaces since its jet age construction, including expansion of the main terminal building to the south in the 1980s and the 2006 facade replacement, construction of new concourses in 1985 and 2018, interior material changes within the main terminal building, and interior renovations to Concourse H & K. The additions to Terminal 3 have introduced modern materials that have altered the integrity of the exterior facade. New interior materials of the main terminal building include the introduction of phenolic interior wall panels, metal grating ceiling, and chevron-striped terrazzo flooring. The concourses have also experienced changes to original jet age materials, including the introduction of barrel-arch skylights and translucent panel ceilings, phenolic wall panels, and other contemporary material finishes. As such, Terminal 3 does not retain integrity of materials to



convey significance under *Criterion A: Transportation* or *Criterion C: Architecture* during its period of significance.

- **Workmanship** – Terminal 3 does not convey integrity of workmanship due to the substantial loss of original material caused by alterations to the main terminal building and concourses over time. As such, Terminal 3 does not retain sufficient workmanship from the jet age period of its original construction to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture*.
- **Feeling** – While Terminal 3 retains its continued use as an airport terminal, the principal public spaces and primary facade facing the roadway have been altered with the introduction of contemporary materials, which has diminished Terminal 3's feeling as an airport terminal designed and constructed during the jet age. It is highly unlikely that a historic contemporary would recognize Terminal 3 when approaching the building's primary facade from the roadway. As such, Terminal 3 does not retain integrity of feeling to convey significance under *Criterion A: Transportation* or *Criterion C: Architecture* during its period of significance.
- **Association** – Terminal 3 retains association with the expansion project that occurred at O'Hare in response to increased air travel and other influences of the jet age, as it retains its use as an airport terminal and continues to exhibit its orientation and plan as a main terminal building with extending concourses.

### C. Eligibility

Terminal 3 possesses significance under National Register *Criterion A: Transportation* and *Criterion C: Architecture*; however, it does not retain sufficient integrity with relation to design, materials, workmanship, or feeling to convey significance under either criterion during its period of significance. Therefore, Terminal 3 is recommended not eligible for listing in the National Register.

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