

**TRANS WORLD AIRLINES FLIGHT CENTER
(now TWA Terminal A) AT NEW YORK INTERNATIONAL AIRPORT,**
John F. Kennedy International Airport, Queens.
Built 1956-62; Architects, Eero Saarinen & Associates (Eero Saarinen and Kevin Roche).

Landmark Site: Borough of Queens Tax Map Block 14260, Lot 1 in part, consisting of a site encompassed by a continuous line beginning at a point at the southernmost end of the terminal building, extending northeasterly and northerly along the outermost edge of the terminal building, easterly along the southernmost edge of the elevated walkway between the terminal building and the southern gate structure, extending around the outermost contours of the southern gate structure, westerly along the northernmost edge of the elevated walkway between the terminal building and the southern gate structure, northerly and northwesterly along the outermost edge of the terminal building between the elevated walkways, northerly along the easternmost edge of the elevated walkway between the terminal building and the northern gate structure, westerly along the line of connection between the elevated walkway and the northern gate structure, southerly along the westernmost edge of the elevated walkway between the terminal building and the northern gate structure, westerly and southwestwesterly along the outermost edges of the terminal building to its westernmost end, southerly from the western end of the terminal building to the curblineline of the service road, southeasterly along the western edge of the curblineline of the service road, southerly and easterly along a line corresponding to the outermost edge of the overhanging canopy of the terminal building, southerly along the western edge of the curblineline of the service road to a point opposite the southernmost end of the terminal building and easterly to the point of beginning.

On June 15, 1993, the Landmarks Preservation Commission held a public hearing on the proposed designation as a Landmark of the Trans World Airlines Flight Center at New York International (Idlewild) Airport (now TWA Terminal A), John F. Kennedy International Airport, and the proposed designation of the related Landmark Site (Item No. 11). Two persons testified in favor of designation and both Trans World Airlines and the Port Authority of New York and New Jersey expressed uncertainty about the proposed action. A representative of TWA requested that the hearing be continued. On September 21, 1993, the Commission continued the public hearing (Item No. 10). Both hearings had been duly advertised in accordance with provisions of law. At the continued hearing, time, similar reservations concerning designation were expressed by TWA and the Port Authority. A representative of Queens Borough President Claire Shulman expressed delight at the consideration of the TWA terminal for designation, and also expressed concern about the continued use of the facility by the airline and the airport. The Commission has received three letters in support of the proposed designation. The Commission has since met with the Port Authority to discuss its plans for the terminal.

DESCRIPTION AND ANALYSIS

Summary

The TWA Flight Center, designed by Eero Saarinen & Associates (Eero Saarinen and Kevin Roche), is among the chief works of one of the most highly-regarded architectural firms of the modern era. Saarinen's firm revolutionized air terminal design through its use of daring concrete and glass forms and technological advances, producing a distinctive and highly-acclaimed work of expressionistic architecture with the TWA Terminal (1956-62). Trans World Airlines was provided with the opportunity to erect its Flight Center by the bold decision made in 1954 by the Port of New York Authority to develop Idlewild (New York International) Airport with individual airline terminals. The Flight Center incorporates airport technology adopted at the beginning of the jet aircraft era, ranging from the very form of the terminal – the now-common "satellite" plan where aircraft gates are clustered around structures built on the runway ramp away from the main terminal – to equipment such as jetways and baggage carousels. Taking advantage of the highly-visible site assigned to TWA at the apex, or far end, of the curving service road, Saarinen designed a very distinctive and memorable building while still adhering to the master plan of the airport. The design of the building expressed Saarinen's intention "to interpret the sensation of flying" and "be experienced as a place of movement and transition." The main portion of the terminal – created by four intersecting vaults separated by narrow bands of skylights and supported on four Y-shaped piers – has an upward soaring quality. The broad expanses of window-walls create a transparent quality for the terminal, in strong contrast with the concrete structural elements. The low wings that extend from the vaulted portion of the terminal, with their concave walls which extend as cantilevered canopies to shelter passengers at curbside and curved plan, echo the forms of the main portion of the terminal and relate to the curving service road while the elevated concrete walkways leading to gate structures on the ramp, are unusual in their windowless tube form. The satellite gate structure – a form that has remained a standard in airport design – with its projections for jetway access and its remote gates, one with the airline's control tower on the roof, incorporates some of the first solutions for such facilities. The concrete structure, which required special engineering and construction methods, illustrates the collaboration necessary between the architects, engineers, and construction workers to realize this unusual and significant design.

New York City's International Airport¹

The development of New York's international airport was the result of Mayor Fiorello H. LaGuardia's interest in aviation and his long-range planning for New York City airports. Due to its remoteness from Manhattan, the city's first airport, Floyd Bennett Field on Jamaica Bay, had limited appeal both for mail delivery and passenger service. LaGuardia did not consider the Newark (N.J.) Airport, which had opened in 1928 and rapidly became the major airport on the eastern seaboard, a proper substitute. His first remedy was the construction of the New York City Municipal Airport, LaGuardia Field, commonly known as LaGuardia Airport. Commercial air service at LaGuardia soon surpassed that of Newark, and LaGuardia began planning for a much larger airport, since he was convinced that after the war the city would need another field to accommodate increased

demands for domestic and transatlantic passenger traffic and air freight service.

During the fall of 1941, Mayor LaGuardia announced plans for an additional airport to be constructed on a large area of marshlands on the south side of Long Island. The land purchased for the air field included the Idlewild golf course, an old summer hotel, and the Jamaica Sea-Airport landing strip. Although never officially a part of the name of the airport, the facility was known during its early years as Idlewild, later as New York International Airport, and since late 1963 as John F. Kennedy International Airport.² The initial planning for the large airport, undertaken by the City Department of Marine and Aviation, was based on the concept of one large terminal building and proceeded slowly because of a disagreement over the layout of the runways and the negotiation of leases with each airline. While the final layout of the airport remained

in dispute, construction began in 1942. Commercial flights began to use the airport on July 1, 1948, making use of the first terminal facilities – a small cinder block building and a control tower. Even before the construction of the present terminals began, nearly three million passengers and hundreds of millions of pounds of airmail and air cargo had passed through Idlewild airport; by 1954 the facility had the highest volume of international traffic of the world's airports.³

In 1947, the Port of New York Authority (now known as the Port Authority of New York and New Jersey) and the City of New York signed a leasehold agreement for fifty years under which the Port Authority would finance, develop, and operate the airports in New York City.⁴ The Authority began work on a new master plan for the Idlewild field because after the Second World War air travel had increased more rapidly than first projected. During the late 1940s, thirty to forty percent of all U.S. airline passengers passed through New York City in the course of their air travels, and the city had earned the position of "air capital" of the world. By 1953 it became apparent that the new airport would require more aircraft gates, and that the centralized terminal scheme had serious defects. Consequently, the use of unit terminals – separate terminals for each airline – was considered to avoid the projected two-mile-long centralized terminal, as well as to minimize passenger walking distances, reduce congestion, and provide maximum flexibility. In 1954, the decision was made to use unit terminals in order to eventually provide 140 aircraft loading gates, and in February 1955, the Port Authority and the airlines reached an agreement on a revised master plan.

The plan adopted for New York International Airport – envisioned as the largest and most efficient airport in the world, where there would be "no confusion and no congestion"⁵ – was developed under the direction of Thomas M. Sullivan, deputy director of the Aviation Department for the Port of New York Authority, and Wallace K. Harrison, who served as design consultant and coordinator. The airport's "Terminal City" would consist of the International Arrival Building with flanking Airline Wing Buildings (to be built by the Port Authority); an eleven-story control tower; seven airline terminal buildings; a network of roadways, parking lots, taxiways; and a central plaza with reflecting lagoon (now replaced by parking facilities). The allocation of sites for the airline terminals was based on carriers' traffic, seniority at the Idlewild facility, and relationship to overseas traffic. Each airline would

have the freedom to erect a terminal designed by the architect of its choice to meet individual operational needs.

The New York International Airport, strongly identified with the "Jet Age," incorporates some of the first solutions for accommodating jet aircraft and is a contemporary of facilities built in Los Angeles, San Francisco, and Chicago. Terminals built before the Second World War had been enlarged by the use of "fingers" or covered piers, which led to boarding areas on the ramp for the increasing number of aircraft; the piers – enclosed and enlarged to two-story structures – evolved into the familiar concourses of a later generation of airports. An operational change that had a great impact on airport design was the use of a "hold area" for processed passengers near the aircraft gate, which became known as the gate departure lounge. The gate lounges eliminated the need for large central waiting rooms, and prompted the relocation of passenger services nearer to aircraft gates. During the post-war airport construction boom, engineers and planners analyzed airport design and function, diagramming variations of terminal finger configurations – where aircraft were typically parked on both sides of a concourse that contained walkways, services, and gate departure lounges – and the alternative satellite form, where aircraft gates were grouped around a central waiting and service area which was connected to the main terminal by an elevated walkway. Separating routes through terminals for arriving and departing passengers, minimizing passenger walking distances, reducing congestion during peak hours of travel, and automating baggage handling were airport planning issues addressed during the period. The more widespread use of jet aircraft during the years that the Idlewild was under construction introduced yet another set of concerns: how to deal with larger sizes of aircraft, increased noise levels, and jet blasts, and how to protect passengers boarding planes at an elevated level.

Port Authority planners projected that the unit terminals at Idlewild would have finger configurations. The first group of terminals designed for the airport exhibited several solutions to providing a large number of aircraft gates. The first project to be completed was the International Arrivals Building (designed by Skidmore, Owings, & Merrill), which had long wings and perpendicular fingers. The finger plan was adopted for the American Airlines terminal (designed by Kahn & Jacobs), which had staggered lounges off a central corridor, and the United Air Lines facility (designed by Skidmore,

Owings and Merrill). The terminal of Eastern Air Lines (designed by Chester L. Churchill) was based on the concept of large, centralized waiting rooms and "loading arcades." Pan American World Airway's "umbrella" terminal (designed by Tippetts-Abbett-McCarthy-Stratton) was yet another solution: six jets could be nosed in under the roof which would protect boarding passengers from the weather. TWA was the only airline to adopt the satellite configuration for its terminal. Elevated walkways, variations on early "Jetways" introduced to commercial aviation by United Airlines at Chicago, were used at the United, Pan Am, American, and TWA terminals at Idlewild.⁶ The airline terminals also demonstrated various approaches to passenger service and technological advances in information presentation (electronic signage and closed-circuit television monitors) and baggage handling.

Trans World Airlines

Trans World Airlines⁷ has played a major role in the history of commercial aviation in the United States; the carrier was, for many years, the only airline with both domestic and transatlantic routes and the second-largest one in the country. At the time the terminal at New York International Airport was under construction, TWA linked sixty-five American cities with twenty-three points abroad. A series of mergers, involving portions of several parent airlines, including Western Air Express, Standard Air Lines, Maddux Air Lines, and Trans-Continental Air Transport produced Transcontinental & Western Air, Inc. (TWA); the name Trans World Airlines was adopted in 1950. The history of TWA is dominated by aviation advances, financial reorganizations, and the controversial role of the long-term principal stockholder Howard Hughes. The airline has a long association with aviation in New York City as one of the first carriers to contract for space at the LaGuardia airport; the airline operated the first scheduled flight into that field in 1939. TWA operated a domestic freight and passenger service prior to World War II and expanded to overseas service via southern routes to Europe and the Mid- and Far East, which was inaugurated early in 1946 with a flight from LaGuardia to Paris; weekly transatlantic air-cargo service was established in 1947. TWA competed with Pan Am, the nation's other transatlantic carrier, for passengers by introducing tourist-class transatlantic flights in 1952, switching to jet aircraft for transatlantic passenger service, and by offering an appealing and efficient new terminal at New York International Airport.

TWA was the sixth international airline to sign an agreement with the Port of New York Authority in 1949 for use of the Idlewild facility, and when the locations of the individual airline terminals at New York International Airport were announced, TWA was not especially pleased. TWA and Pan Am, as overseas carriers, were assigned positions on either side of the International Arrivals Building, but TWA would have preferred the opposite side, which was nearer to its new hanger. The carrier would be the only one to operate both foreign and domestic service from one terminal at the airport. Though the leadership of the airline underwent several changes during the course of the planning and construction of the terminal, it was during Ralph S. Damon's term as president that the TWA terminal was conceived. George Scullin reports that Damon was advised by TWA's real estate board and construction engineers to commission the firm of Eero Saarinen & Associates (which was completing the General Motors Technical Center) to design the terminal, and attributes to Damon the vision of the terminal as "a building that starts your flight with your first glimpse of it and increases your anticipation after you arrive," and the statement, "the spirit of flight, inside and out, and nothing less will do." The airline was regarded as a "client with vision and confidence."⁸

Eero Saarinen⁹

A master architect of the mid-twentieth century, Finnish-born Eero Saarinen (1910-1961) was groomed from childhood to be a successful designer by his parents, textile artist Loja Gesellius Saarinen, and highly regarded international architect (Gottlieb) Eliel Saarinen (1873-1950). Eliel's early career is best remembered for his Helsinki Railroad Station (1904-c. 1913, with Herman Gesellius) which successfully demonstrates his sympathies with the Arts and Crafts movement. The Saarinen family immigrated to the United States in 1923, yet visited Finland annually. Eliel contributed significantly to the creation of the Cranbrook School and Academy of Art, a complex of children's schools and an advanced-level art academy, located at Bloomfield Hills, north of Detroit. Cranbrook was devoted to every field of design – textiles, metalwork, architecture, and city planning. Eliel designed several buildings there, including the Cranbrook School for Boys (1924-30) and the Kingswood School for Girls (1929-30). The latter project exemplifies the Arts and Crafts ideal of collaboration between the fine and applied arts: while Eliel oversaw all aspects of design, Loja designed and

wove fabrics (in association with the Cranbrook Looms), Eero designed furniture, and his sister, Eva-Lisa, assisted with selecting wall and ceiling treatments.

During the early 1930s Eero studied sculpture at the Parisian Académie de la Grand Chaumière, completed a Bachelor of Fine Arts in the Beaux-Arts-oriented architecture program at Yale University, toured Europe and Egypt on a travel fellowship, during which time he was influenced by the architecture of Erich Mendelsohn and Alvar Aalto – before joining his father's firm in 1936. Together, the Saarinens produced the much-praised Crow Island School (1939-40, with Perkins, Wheeler & Will) in Winnetka, Illinois. Eero entered many design competitions, and won several prizes. He collaborated with designer Charles O. Eames on the scheme for a molded plywood chair which won the Organic Design in Home Furnishings competition (1940-41), sponsored by the Museum of Modern Art. Recognized from that point on as an important furniture designer, Saarinen produced many designs for the Knoll furniture company, best represented by his Womb chair (1946-48) and Nos. 71 and 72 chair series (c.1956).

Saarinen has been credited with developing the innovative "systems approach" to design; he carefully analyzed each problem, and usually relied on modern technology, in order to find a unique form and structure to express a concept architecturally. As a result, each of his designs has a certain wholeness about it; he claimed to be concerned with the "esthetics of the whole organism" and sought an "expressive architecture, an antiassembly-line architecture," stating "each building should be as distinctive as each person should."¹⁰ The commission which firmly established his architectural career was the General Motors Technical Center (1945-56, with Smith, Hinchman & Grylls) in Warren, Michigan. Though its initial designs were begun in association with his father, the final scheme was largely due to Eero. The complex is ruled by its strictly modular design (structure, partitions, and mechanical systems are fully integrated) and features such technological innovations as neoprene window gaskets and walls of thin insulated panels sheathed in porcelainized sheet metal; yet the architect also added brightly colored brick surfaces and his signature element, a reflecting pool. During the GM project, the elder Saarinen died and Eero formed a successor firm, Eero Saarinen & Associates. An intensely devoted and methodical worker – he worked 365 days a year, according to his chief of design, Kevin Roche – Eero produced a

number of buildings which have become American landmarks. These include his Jefferson National Expansion Memorial (designed 1948, completed 1964), the famous parabolic arch in St. Louis, Missouri; the Kresge Auditorium and Chapel (1953-56, with Anderson & Beckwith), geometrically-derived enclosures highlighting different materials, at the Massachusetts Institute of Technology in Cambridge; the David S. Ingalls Hockey Rink (1956-59), the undulating concrete roof of which expresses the exhilaration of a hockey game, at Yale University in New Haven; and two soaring reinforced concrete masterpieces associated with flight: the Trans World Airlines Flight Center (1956-62) at New York (now J.F.K.) International Airport – probably his most renowned design – and Dulles Airport (1958-62, with Ammann & Whitney) in Chantilly, Virginia. The last three commissions were completed after Saarinen's death in 1961 as was his other prominent New York project, the somber granite-clad Columbia Broadcasting System (CBS) Headquarters (1960-64) on Sixth Avenue between West 52nd and 53rd streets.

Saarinen's buildings received extensive publicity in the press, and he was given several prestigious awards. Though many architects and architectural writers sympathetic to the International style criticized Saarinen's work as lacking consistency (a necessary by-product of his design method), his *oeuvre* has withstood the test of time: by 1993 six of his designs had received the American Institute of Architects' 25-Year Award for "exemplif[ying] design of enduring significance." These include the Crow Island School, GM Technical Center, and Dulles Airport.¹¹ Saarinen's successor firm, Kevin Roche and John Dinkeloo, founded by his colleagues, has been a significant force in American architecture during the second half of this century. Other architects influenced by his design philosophy are Cesar Pelli, Gunnar Birkerts, and Robert Venturi.

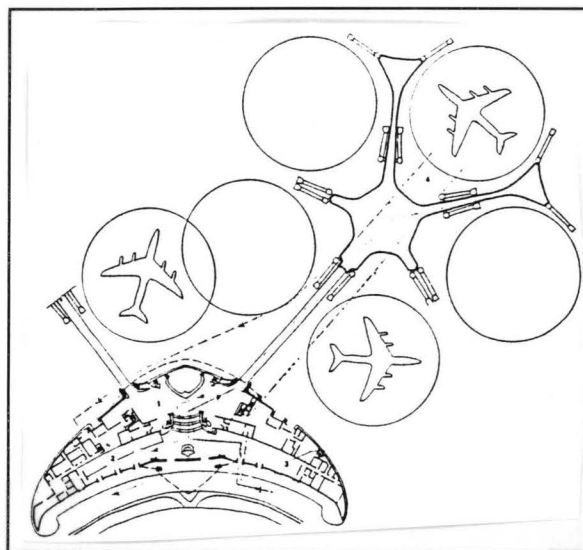
Design and Construction

TWA provided the architectural firm with a catalogue of needs, and its projection of passenger traffic in 1970: 1000 people within the building at peak hours, and a turnover in arriving and departing passengers at the rate of 2000 per hour. Aline Saarinen described her husband as an ardent and incessant air traveler who had deplored the ugliness, shoddiness, and inconvenience of most air terminals.¹² In accordance with his firm's usual approach to a design problem, the staff made a programmatic analysis of airport functions, collected

data on planes and passengers, and toured existing terminals. The architects took advantage of the less convenient terminal site assigned to TWA by capitalizing on its high visibility at the apex, or far end, of the curving service road, and designed a distinctive and memorable building while still adhering to the master plan of the airport. The architects were determined that the building would relate to the tight, wedge-shaped site and it does so with the configuration of the main terminal, walkways extending at angles, and gate structures; the low side wings of the terminal conform to curve of the service road.

According to co-designer Kevin Roche, the first design for the terminal was an oval shell resting on four points with an edge beam, a form that Saarinen found awkward.¹³ A series of clay models, and then larger cardboard forms were used in the three-dimensional design process, especially to refine the forms of the shell and the ridges which emphasize their separation. The complex forms of the supporting piers were first shaped in wire to form the area needed for concrete and steel reinforcing; then a skin of light cardboard converted the shape to a solid volume. The forms that enclose the terminal appear to some as eccentric shells, and to others as intersecting barrel vaults; a recent analysis suggests that the forms are four lobes, or segmental domes, each of which stands alone, resting on two buttress supports. The architects took shell design into a more free-form arena, and made expressive innovations rather than technological ones.¹⁴

When Saarinen's design for the terminal was presented to the public in November 1957, the shape of the structure was described as bold and futuristic. Edward Hudson, aviation columnist for the *New York Times*, assuming that the airline had some misgivings about spending a projected \$12 million on such an unusual plan, thought that TWA was counting on winning public acceptance for the terminal.¹⁵ Attention was focused on the functional aspects of the terminal, both when the design was presented and upon its completion. It would be the airline's solution to three problems of air travel: quick and efficient service at check-in; up-to-the-minute information on arrivals and departures; and rapid baggage delivery. The placement of the long ticketing counter and the baggage claim area in the two low wings, at street level opposite curb areas protected by the projecting roof, was an attempt to increase passenger convenience. Recent advances in technology were employed in the electronically-controlled doors at the drop-off and pick-up points, large electronic signs –



Plan of Terminal

huge Solari (the Swiss watch manufacturer) Datavision boards where flight information could be kept up-to-date – and the transfer of that information throughout the terminal via closed-circuit television monitors. Originally, it was thought that passengers would have to walk to aircraft parked around a one-story structure on the ramp, the "Flight Wing." The use of "Jetways" was under study by late 1957, and the delay in the beginning of construction of the terminal allowed for the evaluation and adoption of this newly-available equipment. The use of jetways raised the height of the ramp structure to two stories, and determined its final form – a more compact "star-shaped" variation of the violin-shaped structure that appears in early images of the design. The projections from the main volume of the building are connections for the jetways, one at the front and one near the rear of each aircraft (for the segregation of first class and coach passengers).¹⁶ The structure has two remote gate lounges in order to accommodate seven aircraft; perched on the roof of the gate near the center of TWA's ramp area is the carrier's control tower, from which personnel direct ground traffic and control the flight information system. The use of baggage carousels in the main terminal area was an addition to the original plan for baggage-handling automation.¹⁷

The unusual form of the terminal required innovative approaches to structural design, engineering, and construction, and it was considered a monument to concrete as a building material and the architects, engineers, and construction workers who created it.¹⁸ Kenneth P. Morris, as project

engineer for contractors Grove Shepherd Wilson & Kruge; and Ralph Yeakel, Saarinen's second in command and resident architect for the project; a staff of fourteen engineers; and 150 craftsmen were responsible for the construction of the terminal.¹⁹ The architects supplied numerous architectural and structural drawings, many of which were of a new type that provided dimensional information; for example, contour lines that indicated the progressive shape of the buttress at one-foot intervals were added to section drawings. Grove Shepherd Wilson & Kruge produced working drawings and developed the techniques by which the structure could be built. For the concrete formwork, steel-pipe scaffolding was erected on a grid, with each vertical accurately placed to support the underside of the form at the proper elevation and position.²⁰ Specialists designed concrete mixes to meet the unusual conditions of the building; a fairly standard concrete was used for the piers and then blended with a lightweight mix for the roof shells.²¹ The pouring of the concrete structure, which is one monolithic form without control joints above the ground, was a carefully-orchestrated event. Once all the forms were removed, the *New York Times* could report: "TWA's Terminal Standing on Own."²² Nearly a year later, the one-quarter-inch-thick tinted glass window walls were installed. Construction, which began in June 1959, was complete enough in May 1962 to allow the terminal to be officially opened as the TWA Flight Center at New York International Airport.²³

A Terminal To Catch the Excitement of the Trip²⁴

Saarinen's design for the TWA Flight Center is the exemplar of expressionistic architectural trends of the late 1950s and 1960s. Saarinen and his like-minded peers expressed their dissatisfaction with the restrictive minimalism of the International Style, as it had been interpreted in America, through attempts to imbue modern architecture with a monumentalism appropriate to public structures.

To paraphrase Saarinen, the design intent of the Trans World Airlines terminal was to create, within the complex of terminals that makes up Idlewild, a building for TWA which would be distinctive and memorable, in which the architecture itself would express the drama, specialness, and excitement of travel, and which would be experienced as a place of movement and of transition. From the time the design was presented, the similarity between the form of a building and a bird was often remarked upon, with critics stating that the "structure is symbolically designed to appear like some huge bird with wings

spread in flight." Saarinen played down that analogy:

*The fact that to some people it looked like a bird in flight was really coincidental. That was the last thing we ever thought about. Now, that doesn't mean that one doesn't have the right to see it that way, or to explain it to laymen in those terms, especially because laymen are usually more literally than visually inclined.*²⁵

Saarinen interpreted the role airport terminal design played in satisfying emotional needs associated with jet travel – security and drama – with a baroque-like use of symbolic forms. The extent to which the terminal was successful in combining the functional realities of the jet age with the aesthetic drama of flight would be its real test in the public's mind. Saarinen's phrase "To Express the Excitement of Travel" appeared in the carrier's print ads in 1962, which noted that "the soaring roof and sweep of glass enclosed a hundred new ideas to speed departure and arrival."²⁶

Saarinen was emphatic that architecture had to be of its own time, and sought to interpret his era in a dynamic, expressive manner. Saarinen's approach to design and his reluctance to embrace fully any one theoretical camp left him free to explore the flowing, irregular forms that were appearing in art, furniture design, and in buildings. Saarinen took the shell, a form much in favor during the 1950s, and made it uniquely his own by exploring new shapes rather than devoting attention to shell dynamics; in a similar manner, he used large expanses of glazed walls, characteristic of airport terminal design, in an unusual manner.

The design of the terminal engendered much interest, and was not without its critics.²⁷ One contemporary writer noted that the building had been received with a great amount of skepticism, but was widely accepted as appropriate architecture for the jet age.²⁸ The *New York Times'* architectural critic, Ada Louise Huxtable, noted that the most dubious idea for a terminal, paradoxically, had produced by far the best building – Eero Saarinen's magnificently detailed and executed *tour de force* for TWA. Her admiration for the TWA terminal was underscored by her disappointment with the airport in general.²⁹ The project was presented in architectural periodicals in England, France, Germany, and Mexico; in 1963 the TWA terminal received an Award of Merit from the American Institute of Architects.³⁰

Description*

The exterior of the TWA terminal is composed of remarkably few elements, and its simplicity is furthered by the two building materials: concrete buttresses and roof, and green-tinted glass walls. The wing-like roof of the central portion rises above low wings that extend on the east and west, and follow the curve of the airport service road. Extending from the main terminal are two raised walkways that connect with gate structures on the aircraft ramp; the two-story eastern gate structure has a pair of remote gate lounges (the western gate structure, built later, is not included in this designation). The exterior concrete areas of terminal are painted in a range of cream shades.

Four complexly-massed piers support the roof over the central portion of the terminal. The four segments of the roof, separated by narrow skylights, meet at the central roof plate. The outward-canting side walls, and smaller front and ramp-facing walls have fixed sash held in an aluminum framework. The piers on the ramp side of the terminal, through which the concrete tube walkways extend, frame a large oval window above a concrete bulkhead. The letters "TWA" are mounted on the edge of the roof. The two front piers support the projecting front roof shell that extends to shelter the main entrances and terminates in a spoon-like scupper. The imprint of the formwork boards that remain visible as the concrete finish on the front piers and on the underside of the overhanging shell express the structural quality of raw concrete. Two glazed vestibules project from the central wall area, flanking an iron bowl-like light fixture attached to the window framing. Several canister spotlights hang at the upper edge of the wall and two spherical spotlights are mounted in front of the windows in the piers.

The curved walls of the flat-roofed side wings rise from a low curb and extend as a roof overhanging the sidewalk; the ends of these wings are terminated with taller, modeled parapet-like forms. There are two rows of recessed spotlights in the soffit

of the overhang. The original door openings are framed by rib-like projections. On the east wing, two of the openings have been converted to floor-to-ceiling windows and glazed vestibules project from the other two openings. On the west wing, the five openings have two projecting glazed vestibules, two pairs of recessed glazed doors, and a pair of flush glazed doors.³¹ The west end of the wing is obscured by a low, one-story enclosed walkway. The sidewalk has been widened, although the original curb line is visible. The aircraft ramp side of the wings is shielded from view by an addition north of the east wing and by baggage-handling equipment on the west wing.

The enclosed concrete walkways, painted white, are tubes with an oval cross-section, modeled on the exterior with curved forms near the main terminal ends. They rise in the center portion in a shallow arc and are supported by battered piers at several points.

The three main sections of the east gate structure have concrete ground stories (painted a light neutral color and coved at the upper edge), and fully-glazed second stories. The main structure is star-shaped with rectangular projections (onto which jetways are attached); it is extended by two glass-enclosed walkways, supported by a solid base and battered piers, to remote triangular gate lounges (Gates 39 and 42). The glazed windows of the operational control tower rise above the roof of Gate 39. The structures have nearly flat concrete roofs.

Subsequent History

In 1972, the west satellite gate structure was built. TWA, which also uses the adjacent terminal to the west, currently shares the Flight Center with America West. Alterations to the exterior of the terminal are limited to signage, the addition of the temporary enclosed walkway to Terminal B, and the placement of baggage-handling equipment on the ramp side.

Report prepared by Betsy Bradley,
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Research Department

*For the sake of convenience, north is used in the description rather than northeast, and so on.

NOTES

1. This section is based on George Scullin, *International Airport* (Boston & Toronto: Little, Brown & Co., 1968); Thomas M. Sullivan, "Planning Airport Terminal buildings," *Civil Engineering* 29 (May 1959), 334-38; Dudley Hunt, Jr., "How Idlewild Was Planned for the Jet Age," *Architectural Record* 130 (Sept. 1961), 152-154 and Arnold W. Thompson, "Evolution and Future of Airport Passenger Terminals," *Journal of the Aero-Space Transport Division, Proceedings of the American Society of Civil Engineers*, 90 (Oct. 1964), 127-134.
2. In 1943 the airfield was named Major General Alexander E. Anderson Airport, in honor of a decorated veteran of two world wars. In March 1948, the City Council changed the name of the facility to New York International Airport, Anderson Field. In December 1963, during the month following the president's assassination, the airport was named the John F. Kennedy International Airport.
3. Edward Hudson, "New Structures Rise at Idlewild," *NYT*, Dec. 6, 1955, p. 39.
4. All structures at the airport are on property that belongs to the City of New York, which was leased to the Port of New York Authority for fifty years; the Authority subleases terminal sites to various occupants. The construction bills for the terminals and other structures were largely the responsibility of the Port Authority which has been repaid through the subleases.
5. Howard S. Cullman, "Tomorrow's Airport -- A World Fair," *NYT*, June 8, 1947, VI, p. 12.
6. United Airlines tested an "Aero-Gangplank" during the summer of 1958; by 1959 United had ordered "Jetways" for use at its terminals at New York International, LaGuardia, and several other major airports. "Jetway" appears to have been a proprietary name that has become a generic term. *Airports and Airport Engineering* 12 (July-August, 1958), 75 and 13 (May-June 1959), 42-43.
7. Information on TWA was compiled from Geoffrey Arend, *Air World's Great Airports, LaGuardia* (New York: Air Cargo News, Inc., 1979), 84-91; Arch Whitehouse, *The Sky's the Limit* (New York: Macmillan Co., 1971); and Robert J. Serling, *Howard Hughes' Airline: an informal history of TWA* (New York: St. Martin's Press, 1983).
8. Scullin, 154. Ralph S. Damon, the airline's long-term leader during the post-war rebuilding period for the carrier, assumed the presidency of TWA in 1949 and remained in that position until his death in January 1956. Damon was succeeded as president by Carter L. Burgess, who served a brief term of only eleven months. Charles S. Thomas' two-year term as president, from July 1958 to July 1960, preceded that of Charles C. Tillinghast, Jr., who assumed the position in March 1961, presided at the opening of the TWA Flight Center, and continued to lead the airline for a number of years. Edgar Kaufmann, Jr., noted in "Inside Eero Saarinen's TWA Building," *Interiors* 121 (July 1962), 87 the vision and confidence of the airline as a client and the turnover of responsible officials at TWA after 1956; he cited George Clay (an attorney from Missouri who held several positions at TWA prior to becoming a Vice-President for Administration in 1954 and a Director in 1956) and later Byron Rathbun (about whom little is known) as two men played leading roles in the terminal project. Donald Keogh was the TWA project engineer at the time the terminal was nearing completion, according to the *NYT*, April 22, 1962, p. 14.
9. This section is based on: Alan Temko, *Eero Saarinen* (New York: George Braziller, 1962); Walter McQuade, "Eero Saarinen, A Complete Architect," *Architectural Forum* 116 (April 1962), 102-107; Rupert Spade, introduction to *Eero Saarinen*, Library of Contemporary Architects (New York: Simon & Schuster, 1971); "Slouching towards Barcelona," *Progressive Architecture* 56 (Feb. 1975), 78-85; Andrea O. Dean, "Eero Saarinen in Perspective," *A.I.A. Journal* 70 (Nov. 1981), 36-[51]; R. Craig Miller, "Saarinen, Eliel, and Saarinen, Eero," *Macmillan Encyclopedia of Architects* (New York: Macmillan-The Free Press, 1982), vol. 3, 625-633; *Design in America. The Cranbrook Vision, 1925-1950* (New York: Harry N. Abrams, 1983); "Eero Saarinen," *Architecture and Urbanism* extra edition (1984); and Peter Papademetriou, "Coming of Age. Eero Saarinen and Modern American Architecture," *Perspecta* 21 (1984), 116-141.

10. Quoted in McQuade, 107.
11. "Saarinen's GM Technical Center Receives AIA's 25-Year Award," *Architecture: the AIA Journal* 74 (Apr. 1985), 11, 15; "Eero Saarinen's Dulles Airport Wins AIA 25-Year Award," *Architecture: the AIA Journal* 77 (May 1988), 38, 43; "Deere HQ Wins Saarinen a Sixth 25-Year Award," *Progressive Architecture* 74 (Feb. 1993), 18.
12. "Dream of Eero Saarinen a Tribute to His Memory," *Aviation News* 4 (May 25, 1962), 2.
13. Roche's description appeared in "TWA's Graceful New Terminal," *Architectural Forum* 108 (Jan. 1958), 79-83. The descriptions of the TWA terminal design process include graphic scenes such as Saarinen taking a knife to a grapefruit half and pushing on the end to create the bulges in the shell forms, as well as Roche sawing a model in half to make an intermediate design conform to the curve in the service road.
14. The shell forms are discussed in Christopher Hart Leubkeman, "Form Swallows Function," *Progressive Architecture* 73 (May 1992), 106-108. The *Engineering News-Record* reported that the key to the stability of the structure was a center plate which is the only structural connection between the four shells separated by three-foot-wide skylights. The plate receives tensile stress from the outward-leaning field and two side shells, and compressive stress from the forward-tilting front shell; the plate was not designed to resist vertical forces, which are transferred through interior edge beams to the piers. Supplementing the piles in resisting the horizontal component of thrusts of the piers are three subgrade post-tensioned ties (concrete-encased high-strength bars) and one at the main waiting-room level.
15. *NYT*, Edward Hudson, "Aviation: Unusual Terminal for Idlewild," Nov. 17, 1957, p. 37. The *NYT*, Oct., 11, 1958, p. 45, reported that engineers were reworking the plans for the terminal because it was too costly to build as originally designed; what changes were made as a result of this study are undetermined.
16. Several airlines at Idlewild used two jetways to access aircraft parked parallel to terminal structures, but the use of the nose-in parking position and one jetway became favored for economic reasons. According to Glenn Garrison, "TWA Picks Futuristic Terminal Design," *Aviation Week* 67 (Nov. 18, 1957), 40-41, the traveler would have a choice of using a moving sidewalk or walking through the long passageway linking the main terminal with the ramp gate structures. The design of these walkways changed from glass-enclosed structures with moving sidewalks to the enclosed tunnels and the use of the moving sidewalks was abandoned. The functional aspects of the TWA terminal were described in "TWA: Wing-Like Roof, Theater-Type Lounge," *Airlift* (Sept. 1959), New York City Airports Clipping file, Municipal Reference Library and "Newest Terminal Spreads its Wing," *Aviation News* 4 (May 25, 1962), 2.
17. According to Bruno H. Hake, "Baggage Handling: Passenger and Baggage Processing at Air Terminals," in *Journal of the Aero-Space Transport Division, Proceedings of the American Society of Civil Engineers* 39 (Oct. 1963), 42, baggage carousels had been in operation for some time at terminals in Montreal and San Francisco. TWA may have been the first airline to install carousels at New York International Airport; they were located in the ground level of the west wing, not in their present location (neither space is included in this designation).
18. "Architect's Dream Makes Contractor's Nightmare," *Public Works* 92 (Sept. 1961), 204-206; "TWA's Concrete, Wing-roofed Terminal Ready for Flight," *Engineering News-Record* 168 (May 31, 1962), 48-50; "Shaping a two-acre sculpture," *Architectural Forum* 113 (August 1960), 118-123; and Scullin related the construction of the terminal.
19. The firm of Ammann & Whitney were the engineers for the project.
20. The contractor engaged Computer Usage Company of New York City to calculate 400 key elevation points.

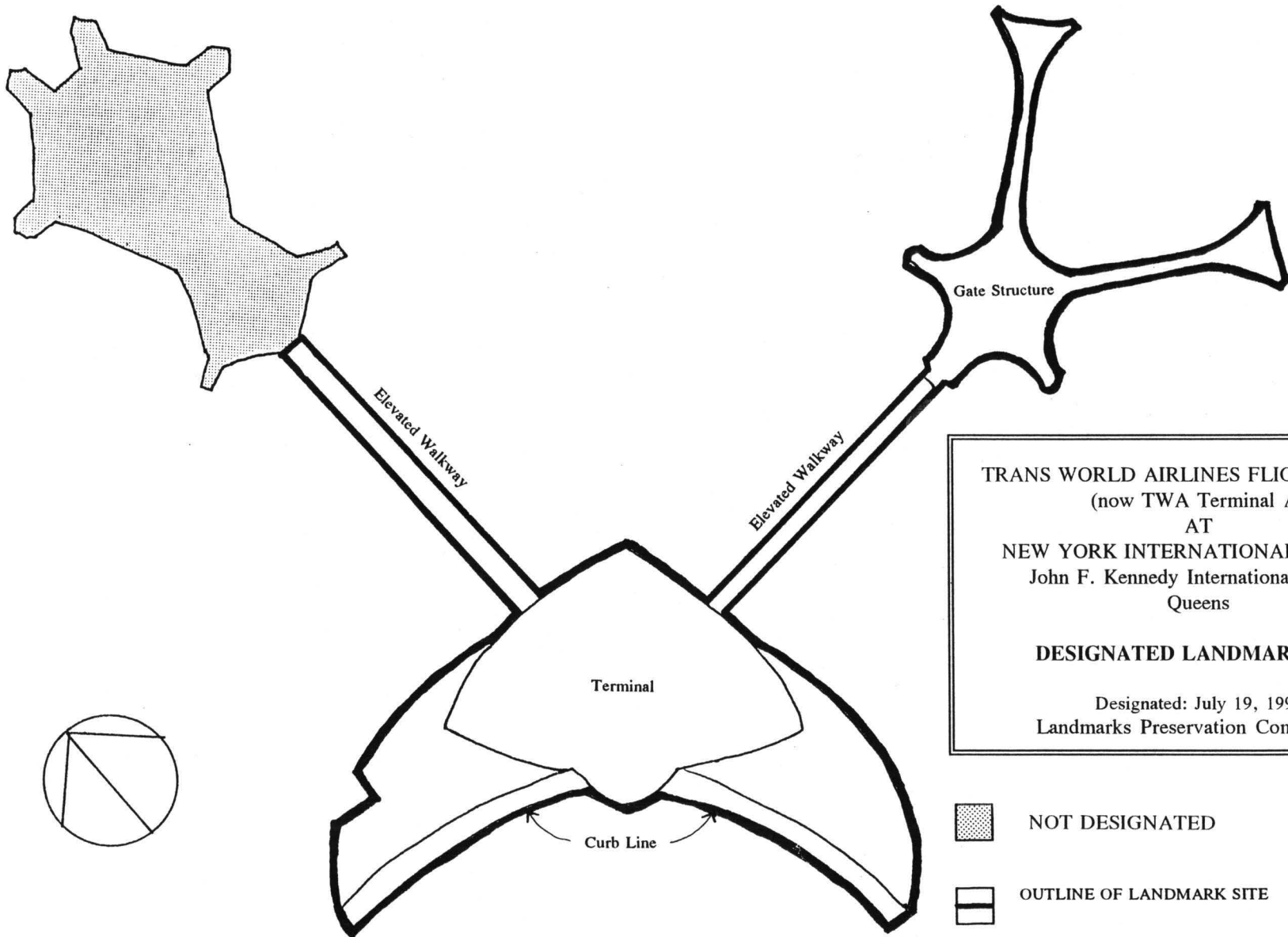
21. Pozzolith and other additives were used as water-reducing and plasticizing agents and to control the setting time of the mixes which were purposely varied in order to allow the removal of the upper forms and finishing of the surface of the concrete. Two types of aggregate of the same color – a coarse stone for the normal weight concrete used for the piers and a lightweight shale aggregate for the shells – were used to produce an overall uniform appearance. Three truck cranes with 180-foot booms lifted one-cubic-yard buckets to the deck for the pours; each bucket was coded for its exact placement. The pour, which began on August 31, 1960, took 120 hours in all and was interrupted by Hurricane Diane. The center plate of the concrete dome was poured first, followed by the ramp-facing and front shells, and finally the larger side shells. The roof of the terminal was left with a wood-float finish while the piers, edge beams, and other members with formed surfaces received a rubbed finish (*Public Works* suggested that some areas were bush-hammered to produce a surface texture desired by the architect).
22. *NYT*, Dec. 8, 1960, p. 70.
23. The opening of the terminal was reported in the *NYT*, May 18, 1962, p. 33, and May 29, 1962, p. 61; and in *Aviation News* 4 (May 25, 1962), 2.
24. This section draws upon criticism of the TWA terminal in Peter Papademetriou, "TWA's Influence," *Progressive Architecture* 73 (May 1962), 102-104; *Eero Saarinen on His Work*, ed. Aline B. Saarinen (New Haven & London: Yale University Press, 1962); "TWA's Graceful New Terminal," *Architectural Forum* 108 (Jan. 1958), 78-85; Michael Brawne, "Airport Passenger Buildings," *Architectural Review* 132 (Nov. 1962), 341-348; Ken Macrorie, "Arriving and Departing," *The Reporter* 27 (Sept. 13, 1962), 52-55; "Recent Work of Eero Saarinen," *Zodiac* 4 (1959), 54-57; Bill Ballantine, "Idlewild Gateway to the World," *Cosmopolitan* (May 1960), "Trans World Airlines," *Architectural Record* 130 (Sept. 1961), 162-162; "TWA Flight Center, Idlewild," *Architectural Record* 132 (July 1962), 129-130; "I Want to Catch the Excitement of the Trip," *Architectural Forum* 117 (July 1962), 72-75; and other sources individually cited.
25. *Eero Saarinen on His Work*, 60 (from a *Horizon* interview, June 19, 1959).
26. For instance, an advertisement in *Aviation Week and Space Technology*, June 11, 1962, p. 46.
27. Gillo Dorfles in "Eero Saarinen: The TWA Terminal, and the Embassy," *Zodiac* 8 (1962), 85-89 wondered if the symbolic quality of the design "rather smack[ed] of an enormous publicity stunt."
28. James Baker, "Architecture," *The New International Year Book 1962* (New York: Funk & Wagnalls Co., 1963) 32.
29. Ada Louise Huxtable, "Idlewild: Distressing Monument to Air Age," *NYT*, Nov. 25, 1962, II, p. 25.
30. *American Institute of Architects Journal*, 39 (May, 1963), 40-41.
31. As-built plans of the terminal indicate of the four openings on the east (ticket counter) wing, the two west ones contained pairs of doors, and the eastern ones contained fixed glass; on the western (baggage claim) wing, the openings contained alternately doors and fixed glass, with a door located in the opening closest to the main portion of the terminal. Currently, three open box-awning-like signs, black with red and white lettering, hang from the overhanging ceiling on the west wing.

FINDINGS

On the basis of a careful consideration of the history, the architecture, and other features of this building, the Landmarks Preservation Commission finds that the Trans World Airlines Flight Center (now TWA Terminal A) at New York International Airport has a special character, special historical and aesthetic interest and value as part of the development, heritage and cultural characteristics of New York City.

The Commission further finds that, among its important qualities, the TWA Flight Center, designed by Eero Saarinen & Associates (Eero Saarinen and Kevin Roche), is among the chief works of one of the most highly-regarded architectural firms of the modern era; that Saarinen's firm revolutionized air terminal design through its use of daring concrete and glass forms and technological advances, producing a distinctive and highly-acclaimed work of expressionistic architecture with the TWA Terminal (1956-62); that Trans World Airlines was provided with the opportunity to erect its Flight Center by the bold decision made in 1954 by the Port of New York Authority to develop Idlewild (New York International) Airport with individual airline terminals; that the TWA terminal incorporates airport technology adopted at the beginning of the jet aircraft era, ranging from the very form of the terminal – the now-common "satellite" plan where aircraft gates are clustered around structures built on the runway ramps away from the main terminal – to equipment such as jetways and baggage carousels; that, taking advantage of the highly-visible site assigned to TWA at the apex, or far end, of the curving service road, Saarinen designed a very distinctive and memorable building while still adhering to the master plan of the airport; that the design of the building expressed Saarinen's intention "to interpret the sensation of flying" and "be experienced as a place of movement and transition;" that the main portion of the terminal – created by four intersecting vaults separated by narrow bands of skylights and supported on four Y-shaped piers – has an upward soaring quality; that the broad expanses of window-walls create a transparent quality for the terminal, in strong contrast with the concrete structural elements; that the low wings that extend from the vaulted portion of the terminal, with their concave walls which extend as cantilevered canopies to shelter passengers at curbside and curved plan, echo the forms of the main portion of the terminal and relate to the curving service road; that the elevated concrete walkways leading to gate structures on the ramp, are unusual in their windowless tube form; that the satellite gate structure – a form that has remained a standard in airport design – with its projections for jetway access and its remote gates, one with the airline's control tower on the roof, incorporates some of the first solutions for such structures to service jet aircraft; that the concrete structure, which required special engineering and construction methods, illustrates the collaboration between the architects, engineers, and construction workers to realize this unusual and significant design.



Accordingly, pursuant to the provisions of Chapter 74, Section 3020 of the Charter of the City of New York and Chapter 3 of Title 25 of the Administrative Code of the City of New York, the Landmarks Preservation Commission designates as a Landmark the Trans World Airlines Flight Center (now TWA Terminal A) at New York International Airport, John F. Kennedy International Airport, Queens and designates Borough of Queens, Tax Map Block 14260, Lot 1 in part, consisting of a site encompassed by a continuous line beginning at a point at the southernmost end of the terminal building, extending northeasterly and northerly along the outermost edge of the terminal building, easterly along the southernmost edge of the elevated walkway between the terminal building and the southern gate structure, extending around the outermost contours of the southern gate structure, westerly along the northernmost edge of the elevated walkway between the terminal building and the southern gate structure, northerly and northwesterly along the outermost edge of the terminal building between the elevated walkways, northerly along the easternmost edge of the elevated walkway between the terminal building and the northern gate structure, westerly along the line of connection between the elevated walkway and the northern gate structure, southerly along the westernmost edge of the elevated walkway between the terminal building and the northern gate structure, westerly and southwestwesterly along the outermost edges of the terminal building to its westernmost end, southerly from the western end of the terminal building to the curblineline of the service road, southeasterly along the western edge of the curblineline of the service road, southerly and easterly along a line corresponding to the outermost edge of the overhanging canopy of the terminal building, southerly along the western edge of the curblineline of the service road to a point opposite the southernmost end of the terminal building and easterly to the point of beginning, as its Landmark Site.



TRANS WORLD AIRLINES FLIGHT CENTER
 (now TWA Terminal A)
 AT
 NEW YORK INTERNATIONAL AIRPORT
 John F. Kennedy International Airport
 Queens

DESIGNATED LANDMARK SITE

 Designated: July 19, 1994
 Landmarks Preservation Commission

-  NOT DESIGNATED
-  OUTLINE OF LANDMARK SITE

NOTE: THIS DRAWING IS NOT TO SCALE



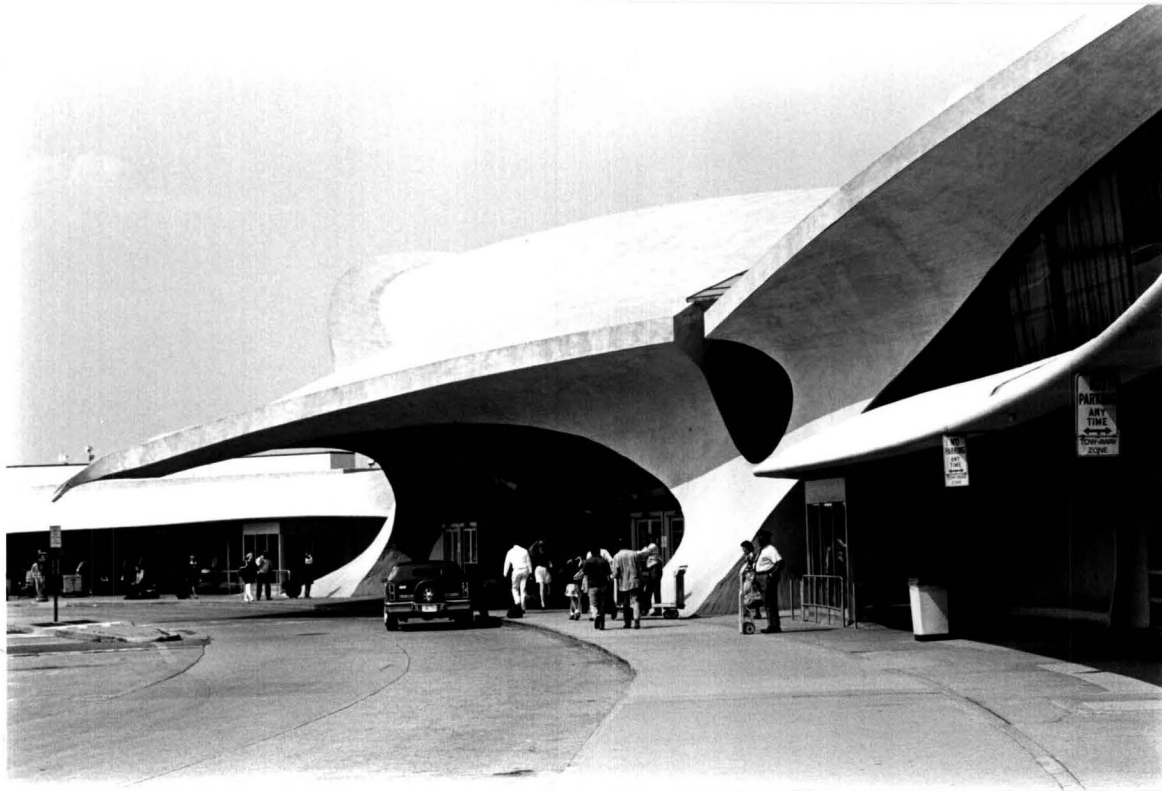
Trans World Airlines Flight Center at New York International Airport.
John F. Kennedy International Airport, Queens.
Main facade.

Photo credit: Carl Forster



Trans World Airlines Flight Center at New York International Airport.
John F. Kennedy International Airport, Queens.
Main facade.

Photo credit: Carl Forster



Trans World Airlines Flight Center at New York International Airport.
John F. Kennedy International Airport, Queens.
Two views of the main entrance.

Photo credit: Carl Forster



Trans World Airlines Flight Center at New York International Airport.
John F. Kennedy International Airport, Queens.
Walkways to gate structures.

Photo credit: Carl Forster



Trans World Airlines Flight Center at New York International Airport.
John F. Kennedy International Airport, Queens.
East gate structure and Gate 39.

Photo credit: Carl Forster



Trans World Airlines Flight Center at New York International Airport.
John F. Kennedy International Airport, Queens.
Gate 42, east gate structure.

Photo credit: Carl Forster