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## HISTORIC PRESERVATION REVIEW BOARD

Historic Landmark Designation Case No. 03-11

### M.J. Uline Ice Company and Arena Complex

1132, 1140 and 1146 3<sup>rd</sup> Street, NW  
(Square 748, Lots 8, 9, 10, 11, 802, 809, 810, 811 and 812)

Meeting Date: November 16, 2006  
Applicant: D.C. Preservation League  
Affected ANC: 6C  
Staff Reviewer: Tim Dennée

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After careful consideration, the staff recommends that the Board approve the designation of the M.J. Uline Ice Company and Arena Complex as a landmark in the *District of Columbia Inventory of Historic Sites* and that the Board forward the nomination to the National Register of Historic Places.

#### The M.J. Uline Ice Company building(s)

The M.J. Uline Ice Company was founded by Migiel “Mike” Uline (originally Uihlein), lately the owner of a string of ice plants in Ohio. The main block of the company’s Washington ice plant was erected in the spring of 1931, with additions in 1935-1936. The brick structure is very simple and unremarkable from an architectural point of view, but typical of a rail-side, utilitarian, brick, industrial building of the period. Built by the Consolidated Engineering Company of Baltimore, the plant’s architects of record were of the firm Kubitz & Koenig, a construction engineering firm of Baltimore. Otto Kubitz and Martin Koenig, Jr., both civil engineers, partnered in the mid 1920s, but went their separate ways in the mid 1930s, likely as a result of a severe drop in construction during the Depression.<sup>1</sup>

Uline had purchased an ice manufacturing and delivery business that was failing and managed to turn it around, apparently through a combination of hard-headed business sense, innovation, obstinacy, luck—and likely collusion. In addition to the onset of the Great Depression, a likely contributing factor to the company’s previous ill health was the fact that artificial refrigeration was increasingly affordable and available to homes and businesses, reducing demand for block ice.<sup>2</sup> The block ice market goes far back in history, as the original sources were natural and

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<sup>1</sup> Baltimore city directories indicate that Kubitz kept the office, but Koenig joined Baltimore’s City Bureau of Buildings.

<sup>2</sup> The first home refrigerators went on sale in the 1910s, and over the next four decades replaced the ice box. By 1920, there were more than 200 models available to American consumers, but they were driven by separate

local—frozen ponds, lakes and canals—with ice cut and stored in insulated ice houses and ice cellars. Because of the problems of melting, bulk storage and transportation, trade was limited despite substantial demand, particularly for food storage in the hot South. In the nineteenth century, trade in ice grew as fleets of schooners sailed north for ice in winter; in the Washington area, ships generally departed bearing Cumberland coal and returned with Kennebec River ice, which was still sold locally into the twentieth century. Not willing to stick with costly and unreliable natural ice, large industrial consumers of ice and artificial refrigeration had generally begun installing their own cooling systems in the 1880s following a spate of patents for such apparatus. Overcoming initial public skepticism about an “artificial” ice produced by machinery generally using anhydrous ammonia, ice manufacturers quickly overtook purveyors of natural ice, able to provide a consistent product year-round at a reasonable price.<sup>3</sup>

Because the Depression suppressed the market for durable goods, and World War II limited supplies of raw materials, it was not until after the war that pent-up demand for consumer goods translated into huge sales of refrigerators and freezers, sounding the death knell for the neighborhood ice man. Uline had come along at a fortunate time, presumably buying the company for a song and having a decade and a half of stable demand. Uline purportedly turned the company around in 87 days largely through technological innovation, including the use of some machinery he had patented himself. In addition to his numerous patents, “Uncle Mike” Uline was a leader in the local industry, and officer of the National Capital Ice Institute, a lobbying group—and one of several ice company owners cited by the Federal Trade Commission for price fixing in 1939.

Washington has never been known as an industrial town. Its industries tended to be focused on local consumption as opposed to the “export” of manufactured or refined goods, particularly in the post-Civil War era when transportation and mechanization increased regional and national competition by inducing manufacturers’ and wholesalers’ growth pursuing scale economies. Cities with ports, rail hubs, high urbanization, and ready access to raw materials prospered as producers. In the early twentieth century, printing was Washington’s largest private industry, appropriate to a national capital. Nonetheless, a considerable population required a considerable amount of goods. Industrial areas sprang up, more distinct from commercial and residential areas than they had been before, generally located along railways, and increasingly warehousing goods from elsewhere. The Uline ice plant was characteristic in that it stood along the rail line from Baltimore, but it was also less common for the fact that it was actually manufacturing. While certainly not the first ice manufacturer in town, it was likely the last (the building was apparently used for the purpose until 15 years ago and still retains some of its equipment), and it may be the last extant plant from the heyday of ice manufacturing. While relatively scarce to begin with, many of Washington’s industrial buildings have disappeared in recent decades, victims of neglect and redevelopment. A 1991 survey of warehouses and industrial buildings identified the plant as eligible for listing in the District of Columbia Inventory of Historic Sites and the National Register of Historic Places. The building is fairly deteriorated inside, but retains much of its original exterior appearance, with some changes to the openings and the loss of its loading dock canopy.

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compressors, much as central air-conditioning systems are. Frigidaire offered the first self-contained unit in 1923. The home freezer followed quickly, inducing a market for frozen foods.

<sup>3</sup> Ice manufacturers advertised their product as “pure” compared to that drawn from nature.

*In representing a significant but nearly vanished industry and Washington's industrial past in general, the M.J. Uline Ice Company meets the Historic Preservation Review Board's Landmark Designation Criteria B ("History") and D ("Architecture and Urbanism") for representing "patterns of growth and change" and a distinct and specialized building type. The property thus meets the similar National Register Criteria A and C.*

### **The Uline Arena/Washington Coliseum as entertainment venue**

The juxtaposition of an ice plant and Uline's arena is at first striking, until one considers that the arena's first use was as a skating rink and hockey venue which required extensive refrigeration equipment—not to mention considerable construction financing available to a successful businessman. These factors and Uline's love for sports explain the physical and historical connection between the site's two uses.

Uline made application to erect the ice arena in August 1939. Roberts & Schaefer, a Chicago engineering firm, designed the building. Excavation of the site and the underpinning of the ice plant structures began in March of the following year, with pile driving and foundation work in June and July. Construction of the concrete, brick, and CMU walls were commenced, ultimately using nearly a million bricks and blocks. The construction of the reinforced concrete bleachers took place in September and October. The unusual reinforced concrete vault roof was poured in late autumn and early winter, completed less than three weeks before the building's opening.<sup>4</sup>

When the building did open, a *Washington Post* sportswriter referred to it as "a splendid indoor stadium that must be described as a triumph in concrete." The *Evening Star* reported that the arena had

been pronounced by architects and experts as one of the finest ever conceived....  
[T]he heated arena will feature arm-rest seats, each of which will offer a complete view of the ice surface, unhindered by post supports and beams.

The ice surface, 225 by 120 feet, will be the most spacious of any in the country...<sup>5</sup>

The building was clearly patterned after the 1936 Hershey Arena in Hershey, Pennsylvania, another ice "palace" also designed by Roberts & Schaefer.

Set up for hockey or figure skating, the arena initially had a seating capacity of 6,000. By the end of the 1960s, up to 7,000 fans could attend a hockey game. When the rink was covered for other events, the capacity rose to 8,000 to 10,000.

This type of entertainment venue is rare in Washington, D.C. Built for ice sports, it was immediately adapted for boxing and musical events and then also used for professional

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<sup>4</sup> Although its setting, curing, and the removal of the extensive formwork would have taken still longer.

<sup>5</sup> *Evening Star*, December 28, 1940.

basketball, tennis, wrestling<sup>6</sup>, and even midget auto racing. At this date, it is easy to take for granted that such venues have always existed. But unlike theaters—that were ubiquitous and changed in form relatively little even with the advent of motion pictures—places for wholly enclosed mass entertainments and sporting events awaited innovations with building systems and with construction methods to permit sufficient unobstructed space. The first indoor hockey game is reported to have been in 1875, but professional hockey surely would not have survived without being able to simultaneously heat the air for the comfort of fans and artificially cool the ice surface. Ice palaces and other indoor arenas made possible spectacles such as the Ice Capades, presumably inspired by Broadway follies and Hollywood musical extravaganzas. More popular pastimes, such as baseball and football, were still exclusively experienced out of doors, with the assistance of cantilevered stadium roofs. In the early 1930s, the premier boxing venue in the Washington area was a former brewery bottling house in Alexandria.



*The 1936 Hershey Sports Palace, Hershey, Pennsylvania.*

There have certainly been other large sports venues extant in the District—the DC Armory<sup>7</sup>, RFK Stadium, the MCI Center, for instance—but most are of more recent vintage. The open-air

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<sup>6</sup> The forerunner of the present professional wrestling associations (owned by Vince McMahon Sr.) staged events at Uline.

<sup>7</sup> Most comparable in form and age to Uline, the slightly younger District of Columbia National Guard Armory has hosted circuses, concerts, boxing and wrestling matches, as well as horse, dog, flower and antique shows. It was, very briefly, the home of a Women's Professional Basketball League team in 1979. Although constructed as an armory, its form is more like an arena; in fact, like Uline, it may have been patterned after the form, but not necessarily the construction techniques of the 1936 Hershey [Pennsylvania] Arena. Shortly after its construction, the government-owned Armory began to compete with Uline's venue to host entertainments.

Griffith [baseball] Stadium is long gone, as is the little Capitol (aka Turner) Arena at 14<sup>th</sup> and W NW (essentially a large television studio where wrestling and the “Town and Country Jamboree” were broadcast in the 1950s). Like the District of Columbia’s dozen landmark theaters, the Uline Arena is important to the city’s social history as a major recreation venue for half a century. But with a seating capacity of 6,000 to 12,000, depending on the use, the Uline Arena, later known as the Washington Coliseum, was something of a combination DC Armory, Constitution Hall, MCI Center, and Kalorama Roller Rink. And unlike many of the District’s landmark movie houses, the arena provided principally live entertainment, hosting many celebrities and professional sports teams and figures.

The Uline Arena was home court for three professional basketball teams, including the Washington Capitols during the period 1946-1951 (the Capitols organization failed in 1952). The first three of those years, the team was led by the legendary but then first-time coach Red Auerbach. In 1950, a year after a league merger created the National Basketball Association, newly drafted Capitol Earl Lloyd became the first African American to play in the league.

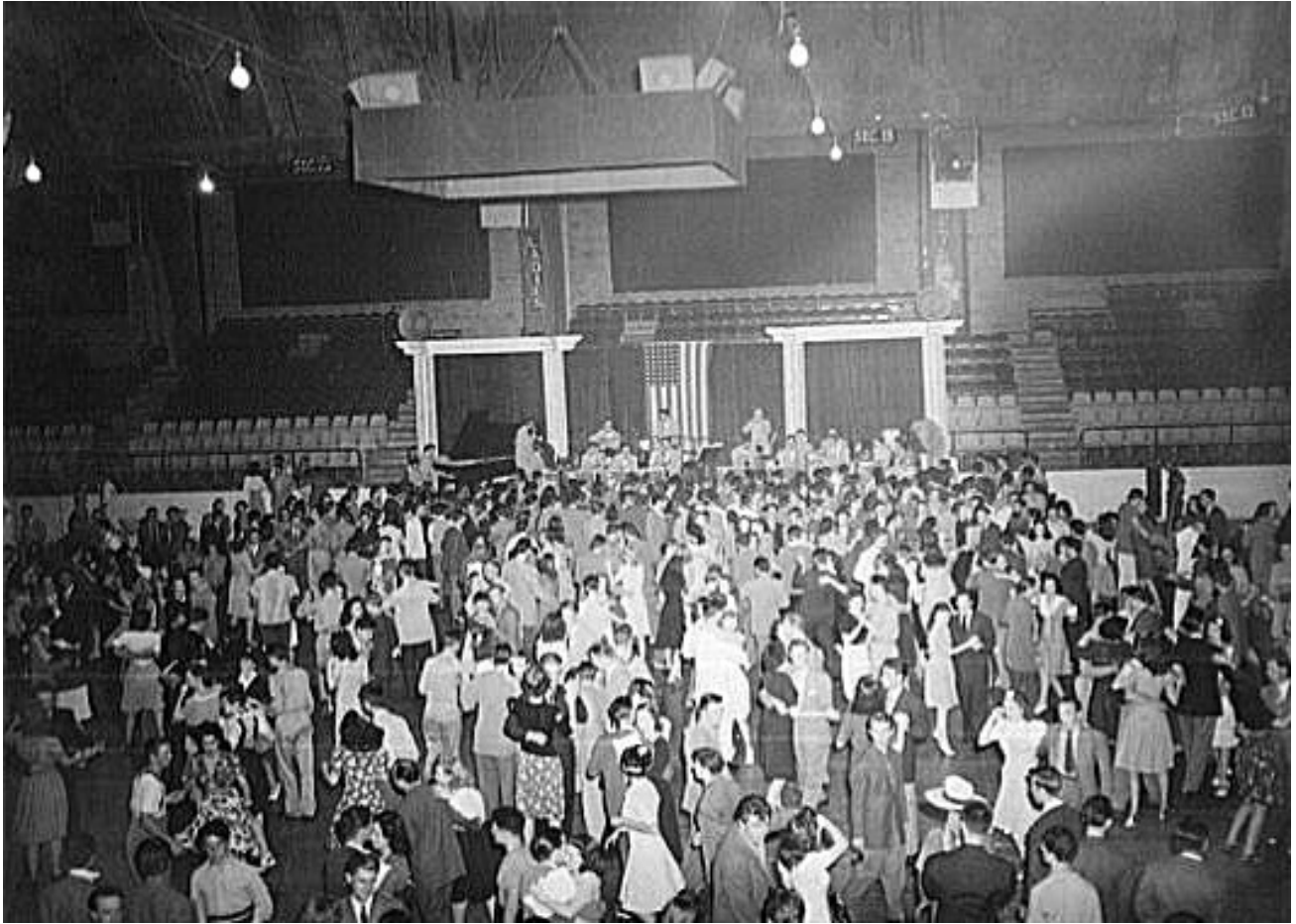
The Arena was home ice for amateur and professional hockey teams from 1941 to 1960. The teams always struggled to attract fans and were found not to be very profitable. Uline cast about for other events to fill the calendar, so until the mid 1960s, the arena hosted the annual Ice Capades. During World War II, with fewer organized sporting events because of the conflict, the building served as a place for patriotic rallies, swing dances, and even served as temporary barracks for servicemen stopping over in Washington in transit or for “R and R.”<sup>8</sup>

The Uline Arena is perhaps best known as the site of the first personal appearance of the Beatles in the United States. It is well remembered that the band’s American debut was on the televised Ed Sullivan Show in New York on February 9, 1964. Two days later, they played their first concert at what was now known as the Washington Coliseum. The next day the Beatles returned to New York for a date at Carnegie Hall. After a remote appearance on Sullivan’s show from Miami on the 16<sup>th</sup>, the band returned to England. It was not until the end of the summer of 1964 that the band returned to North America for a proper one-month tour of 24 U.S. and Canadian cities, this time excluding Washington.<sup>9</sup> The Beatles show ushered in a period of high-profile rock-and-roll acts at the Coliseum, including appearances of the Rolling Stones (1965 and 1966), the Yardbirds (1966), Bob Dylan (1967), and reportedly the Dave Clark Five, the Beach Boys, and Chuck Berry.

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<sup>8</sup> The War Hospitality Committee provided 572 beds for servicemen in September 1944.

<sup>9</sup> With more than 8,000 in attendance, the Beatles took the stage at the Coliseum after three other acts, the Caravelles, Tommy Roe, and the Chiffons. The Beatles performed ten songs on a rather make-shift stage and set up their own instruments—and moved them periodically, as they were playing in the round and tried to face each side. The concert was filmed by CBS for a special closed circuit presentation to be screened at movie theaters around the country in March. The rebroadcast, packaged with concerts by the Beach Boys and Leslie Gore, was also shown at the Coliseum on March 15. There were also bootleg film and audio recordings of the Beatles performance which have survived.



*Woody Herman's "First Herd" entertains soldiers, zoot-suited Lindy-hoppers, and their dates at Uline Arena, June 1942. Office of War Information photo, Library of Congress.*

At about the same time, the arena unexpectedly became a venue for high culture as well, given a dearth of suitable performing arts theaters in the city.

No event better demonstrated the plight of the arts than the May 1965 debut appearances of Rudolf Nureyev and Margot Fonteyn with the Royal Ballet. Without the Capitol Theater, Patrick Hayes and New York impresario Sol Hurok turned in desperation to the Washington Coliseum.... Known mainly as a forum for ice hockey, the cavernous building was to become the only available venue for presentations such as the Leningrad Ballet, the Moiseyev Dance Company, and the Royal Ballet. On a makeshift stage built at one end of the arena, Nureyev and Fonteyn wove their magic to patrons sitting on folding chairs. In all likelihood, few in the audience had ever been to this depressed area of the city. On opening night, in stifling heat, I sat with Attorney General Robert Kennedy on the upper steps leading down into the arena. Thinking back, it is my guess that the planning for the new John F. Kennedy Center for the Performing Arts received an

unexpected boost that evening as Kennedy and other cabinet members experienced high art in a setting that was far from luxurious.<sup>10</sup>

The affectionate nickname “Uncle Mike” belied the darker aspects of Migiel Uline’s character. Likely set in his ways and certainly opinionated by age 67, when he built the arena, Uline demonstrated at least what might be characterized as an obstinate streak. He carried on a protracted feud with the District of Columbia Armory which, perhaps understandably, he considered government-subsidized competition with his venue. More troubling was the fact that, like many other public accommodations in Washington at the time, the arena’s events were generally racially segregated, except for matches at which black boxers contended. African Americans could not attend “white’s-only” shows but could watch the Harlem Globetrotters or



*A District of Columbia public schools fitness assembly and demonstration at the Uline Arena in 1943. The local chapter of the NAACP encouraged a boycott of this program, as African Americans were generally not permitted to attend events at the Arena. Library of Congress photo.*

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<sup>10</sup> Douglas H. Wheeler, “The Impresarios on G Street,” 2001, the Cosmos Club website, <http://www.cosmos-club.org/journals/2001/wheeler.html>.

participate in events for the black public schools. During World War II, local chapters of the NAACP encouraged a boycott of the arena and took issue with Uline's renting the space for one of these school events.<sup>11</sup> Uline merely dug in his heels, only relenting on his rule in 1948. Uline perversely claimed that he had intended to desegregate but would not be forced to do so; once he felt the heat was off, he went ahead. Uline passed away in 1958, and the arena, renamed the Washington Coliseum, passed into new ownership.

One irony is that the arena did become an important venue for African-American cultural and political events. Shortly after it opened, a Paul Robeson benefit for the Committee on Aid to China and the National Negro Congress was shifted from the Daughters of the American Revolution Hall.<sup>12</sup> Nation of Islam Founder Elijah Muhammad spoke in 1959. And in the 1980s, it was most notable as home to performances of Washington's indigenous Go-Go music.

The coliseum was in a downward slide in the 1970s and 1980s. Despite being a popular concert hall, masses of young rock and Go-Go fans could be troublesome for the immediate neighborhood. Concerts spilled out into street melees in 1967, 1973 and in the early 1980s. The coliseum also became a holding facility for most of the 12,000 individuals arrested over three days of anti-war protests in 1971. A conversion of the arena to a church was unsuccessful in the mid 1980s, and less than a decade later, the industrial-zoned site was a private garbage-transfer station. The nadir came in 2003, when the building's demolition was proposed. The D.C. Preservation League had already placed the property on its Most Endangered List and submitted the present nomination.

*For its unique contributions to sports entertainment and popular culture in Washington and for its place in the Civil Rights struggle, Uline Arena meets National Register Criterion A ("associated with events that have made a significant contribution to the broad patterns of our history") and HPRB designation Criteria A and B, as a site of "events that contributed significantly to the heritage, culture or development of the District of Columbia or the nation" and "associated with social movements, groups" that did the same.*

### **The Uline Arena as architecture**

Hailed as "a triumph in concrete" when complete, the Uline Arena was the first thin-shell concrete building erected in Washington. The vaulted roof, supporting its own weight, allowed for an unobstructed, approximately 140- by 270-foot interior space that, in turn, accommodated the largest indoor hockey rink in the country.

The architect of record was Joe Harry Lapish, an obscure Washington architect of the 1920s, 1930s and 1940s.<sup>13</sup> But the design really emanated from the Chicago offices of Roberts & Schaefer, the engineers for the Hershey Sports Palace. The firm had exclusive U.S. patent rights to an innovative German system of reinforced concrete roof constructed and superintended and

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<sup>11</sup> The rallying cry was "Don't Enforce Bigotry! Don't Go to the Uline!" *Washington Tribune* May 8, 1943.

<sup>12</sup> *Washington Daily News* April 26, 1941. Possible shades of the famous 1939 Marian Anderson incident?

<sup>13</sup> Lapish competed unsuccessfully for the commission to design Fuld Hall at Princeton University in 1938.



tested the construction from its Eastern Branch Office. The contractor was the White Construction Company of New York.

The idea of creating a thin, light concrete roof supported by its own structure and not by trusses or columns was conceived by Walther Bauersfeld, chief designer for the Carl Zeiss optical works of Jena, Germany. At the time, Zeiss was constructing the world's first permanent and purpose-built planetarium and needed to create a hemispherical dome with a smooth, unobstructed interior upon which to project celestial images.<sup>14</sup> Bauersfeld's proposed solution consisted of a geodesic dome system of welded steel-bar mesh encased in a thin shell of concrete. Zeiss partnered with Dyckerhoff & Widmann Aktiengesellschaft, a Hamburg engineering and construction firm specializing in pre-stressed concrete, to make Bauersfeld's idea a reality. Dyckerhoff & Widmann's Franz Dischinger and Ulrich Finsterwalder solved the engineering and construction difficulties during the 1924-1926 project. Because its roof was domed and relatively small, the loads at any particular spot atop the Jena planetarium were small enough that the concrete shell could be as little as six centimeters thick.



Poured in place in a thin layer over extensive formwork, the concrete in such shells was not compacted in the way thick concrete members typically are. While such shell roofs took advantage of the compressive strength of concrete, their strength came mainly from their shape and the ability to distribute and dissipate loads. The steel, of course, added tensile strength, counteracting wracking or shearing forces, impacts, and uneven live loads. One of the strengths

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<sup>14</sup> Zeiss had patented the planetarium projector in 1922 and temporarily installed one at the new German Museum at Munich in 1923.

of such construction, both as engineering and architecture, is that the result was a seamless or “monolithic” roof.

With the success of the first planetarium, Zeiss and Dyckerhoff & Widmann struck a partnership principally to satisfy a sudden craze for planetaria, but they soon patented the “Zeiss-Dywidag” (or “Z-D”) system for use in other types of buildings with wide-span roofs. By the end of 1928, Dyckerhoff & Widmann had undertaken 38 commissions in Germany, including series of narrow vaults over the Great Market Halls of Frankfurt (1926-1928) and Leipzig (1928-1929). In the early 1930s, the company collaborated on the erection of a large wind tunnel at the German Laboratory for Aviation at Berlin, and during World War II “Dywidag” (**Dyckerhoff & Widman AG**) built several U-boat shelters on the North Sea.<sup>15</sup>

In 1930 the Z-D system was purportedly employed for the first time in America for Chicago’s Adler Planetarium, the first planetarium in the western hemisphere.<sup>16</sup> An experimental barrel-vault roof using the system appeared on a temporary dairy barn at the Chicago World’s Fair in 1933. By this time, the Z-D system had been patented in the United States, and it was exclusively licensed to Roberts & Schaefer Company. Dyckerhoff & Widmann sent Austrian engineer Anton Tedesko (1903-1994) to Chicago to superintend new projects and to instruct the staff on the technical requirements.<sup>17</sup> Tedesko was thus *the* master of thin-shell concrete in the United States until at least the end of World War II; he appears to have been responsible for all of Roberts & Schaefer’s major projects along those lines.<sup>18</sup> The next of these was probably the dome of New York’s Hayden Planetarium, completed in 1935 (and demolished in the 1990s, despite opposition from many preservationists<sup>19</sup>).

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<sup>15</sup> In the meantime, Spanish engineer Eduardo Torroja constructed a domed thin-shell roof over the market at Algeciras in 1930. Five years later, Torroja designed a thin-shell roof for the Zarzuela Hippodrome near Madrid “formed by segments of hyperboloids of revolution.” The roof was as thin as two inches at the edges and five and a half inches where it connected to the structural supports.

<sup>16</sup> There does not seem to be universal agreement or acknowledgement that the Adler was constructed with the Z-D system, perhaps because the system had not yet been patented in the United States.

<sup>17</sup> The Z-D system was patented in the U.S. by Dyckerhoff & Widmann engineer Franz Dischinger in 1933, although the patent application was dated 1932. In the latter year, Anton Tedesko was sent to begin work with Roberts & Schaefer, and he was undoubtedly the engineer for the temporary for the 1933 Century of Progress Exposition barn. In 1931, Dyckerhoff & Widmann sent Hubert Rusch sent to Buenos Aires to begin projects there. Rusch had worked with Dischinger and Finsterwalder on several of their *Grossmarkthallen* commissions.

<sup>18</sup> Tedesko earned a civil engineering degree from the Technical University of Virginia in the 1920s. He worked for Roberts & Schaeffer until 1967. He published articles on the Hershey arena and on various other engineering subjects. His works, in turn, have been discussed in a number journal articles. In 1966 Tedesko received a Civil Engineering Achievement Award, and the following year was elected to the National Academy of Engineering. The Zurich-based International Association for Bridge and Structural Engineering Foundation for the Advancement of Structural Engineering awards its “Anton Tedesko Medal” medal each year to a prominent structural engineer.

<sup>19</sup> “Interestingly, none of the building’s champions cited its significance as the first example of the Z-D system in America. While the importance of Hayden Planetarium’s dome structure had been widely publicized in the contemporary engineering, and even popular, press, this issue never appears to have surfaced in the 1990s preservation debate. This highlights the difficulty of raising public and professional awareness of landmarks in engineering and, hence, the heightened danger that these aging buildings face.” Dr. Thomas E. Boothby, ed., “Historic Preservation of Thin-Shelled Concrete Structures,” Pennsylvania State University, Department of Architectural Engineering, 2003, [http://www.arche.psu.edu/thinshells/module%20I/case\\_studies.htm](http://www.arche.psu.edu/thinshells/module%20I/case_studies.htm)



*Photographs from a 1928-1929 scrapbook of Dyckerhoff & Widman projects. This appears to be the Frankfurt Grossmarkthalle under construction. Private collection.*

Even with dramatic increases in government spending, large-scale construction jobs were difficult to land during the Depression, and the use of such a new and still experimental technology was limited. The programmatic demand for very broad, uninterrupted new spaces

was also limited; most of the examples of the Z-D system in the U.S. prior to World War II were recreation venues. Roberts & Schaefer erected the Hershey Sports Palace (aka Hershey Arena) in 1936; a new Philadelphia Skating Club rink at Ardmore, Pennsylvania in 1937; the Edward Hatch Memorial [Band] Shell in Boston, Massachusetts in 1940, and aircraft hangars for North Island Naval Air Station, San Diego, California in 1941. All of these structures are still in use, and all but the quarter-sphere Boston bandshell have in common the form of a large, single barrel vault as the principal roof.

Construction of Migiel Uline's arena commenced in the summer of 1940 and ultimately consumed nearly a million bricks and blocks for the base and ends of the building. The construction of the reinforced concrete bleachers took place in September and October. The first section of the roof was poured November 11, with each section requiring a few days to cure—and be tested—before a rib and the next section could be done. By that time of year, the engineers and laborers were working in 40- to 50-degree temperatures, and the last roof section was not poured until January 9, less than three weeks before the building's opening. Each section was tested by the Washington Testing Laboratory.

Large, thin-shell vaults were quite new, as the earliest Z-D projects involved domes for planetaria and smaller vaults for market buildings. The vault shape required some re-engineering because, unlike the dome, loads were not distributed equally around the base. The engineers innovated by introducing external arched “ribs” to stiffen the vault.

The fundamental load-resisting mechanism is the development of membrane stresses that are carried into the arch ribs, to be resisted by axial compression in the arch. Unbalanced loads, such as unbalanced snow loads and wind, produce small transverse bending moments in the shell and much larger bending moments in the arch rib. The tension that results from the action of these bending moments is resisted by the reinforcing steel. Additional stresses that result from the restraint of the shell at the supports is resisted by the placement of diagonal reinforcement. All of these are features of the “Zeiss-Dywidag” System, identified on the title block of the structural drawings and visible in the patent drawings of Dischinger and Finsterwalder.<sup>20</sup>

Of the thin-shell vaulted structures in America, the Hershey Arena is perhaps the best known. Like Uline, it was erected as ice facility for hockey and skating, but it also became a concert hall hosting nationally and internationally known acts as early as 1937. The Hershey Arena vault was faced with limestone, and it was surrounded by a two-story limestone Art Deco structure which contained the entrance lobby, mechanical equipment and support functions. The Uline Arena was consciously modeled on the Hershey Arena, but without the Deco frippery.<sup>21</sup> The Uline Arena was constructed with unadorned brick walls enclosing only the single great space, its mechanical equipment largely accommodated in the existing ice plant and, of course, beneath the floor.

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<sup>20</sup> Boothby.

<sup>21</sup> *Washington Post* December 28, 1940.

The plainness of the Washington arena surely had much more to do with Uline's concern for the bottom line than with any aesthetic considerations, but the result is one of the first Modern buildings in Washington—new “industrial” technology in the service of pure structure, pure form, pure function. The building embodies the trans-Atlantic give-and-take of modern architecture. Those utilitarian pieces of American engineering so admired by the first European Modernists and proto-Modernists—silos, grain elevators, bridges, and turn-of-the-century factories—influenced their work and helped shape their ideas with regard to form, decoration, the expression of structure, and the “industrial production” of architecture. In turn, the advances made by the Germans in structural engineering and the straightforward expression of structure obviously made possible the Uline Arena; the building is similar to German work of the period work which prefigures later Modernist works. The projection of the prominent ribs of the vaulted roofs create a similar effect to that of the exterior steel truss systems later used by Ludwig Mies van der Rohe for the rectilinear Crown Hall at the Illinois Institute of Technology (1950-1956) and the unrealized National Theater project for Mannheim, Germany (1953). And the thin-shell reinforced concrete technology itself led to even more creative forms, making possible the artistic hyperbolic paraboloids of the Mexican engineer Felix Candela and the Italian Pier Nervi, Eero Saarinen's eighth-of-a-sphere Kresge Auditorium at M.I.T. (1953-1955) and “winged” TWA Terminal at JFK Airport (1962). On a local level, the smaller, repeating vaults of the I.M. Pei-designed house in Cleveland Park (1962) or the pavilion-type garden and parking structures in the Capitol Park section of the Southwest Redevelopment Area (*circa* 1962) harken back to the Dyckerhoff & Widmann market halls of the late 1920s—as well as to Le Corbusier's mid-1930s design of a weekend house at Vaucresson, France and assuredly other, intervening projects.

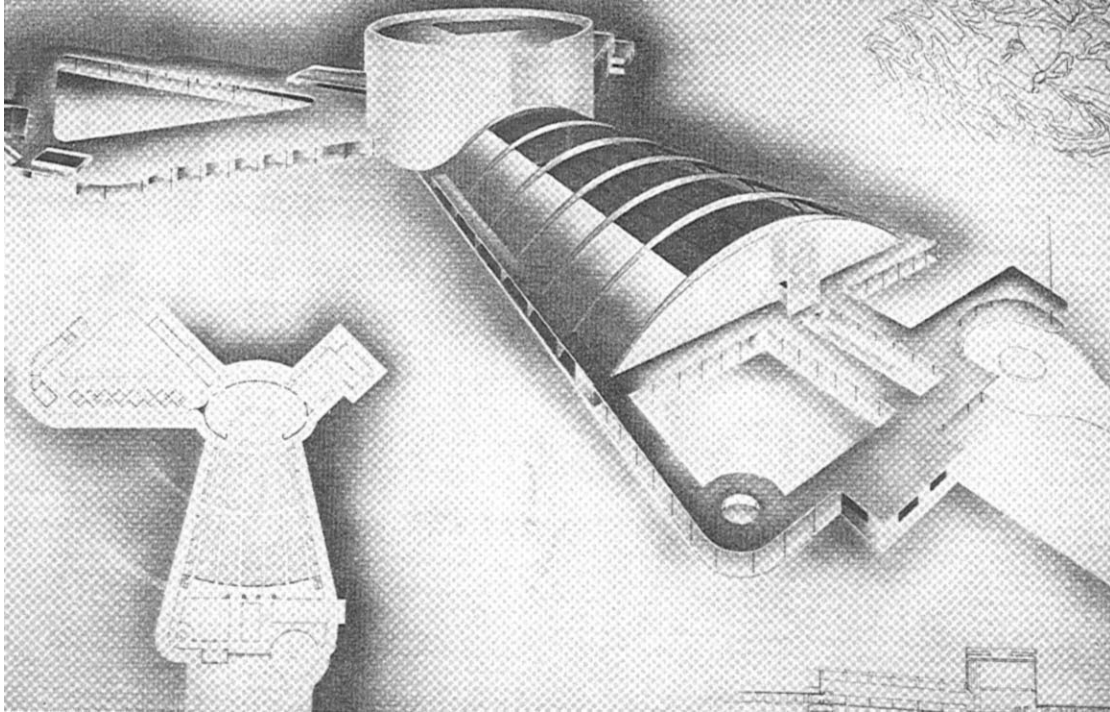
In the introduction to the Museum of Modern Art's catalog of the seminal “Modern Architecture, International Exhibition,”<sup>22</sup> curated by Philip Johnson and Henry-Russell Hitchcock, Alfred Barr, the museum's director, portrayed the characteristics of the new Modernist architecture in a way that neatly describes the design of the Uline Arena.

Slender posts and beams, and concrete reinforced by steel have made possible structures of skeleton-like strength and lightness.

...the modern architect working in the new style conceives of his building...as a skeleton enclosed by a thin light shell. He thinks in terms of *volume*—of space enclosed by planes or surfaces—as opposed to mass and solidity. This principle of volume leads him to make his walls seem thin flat surfaces by eliminating moldings and by making his windows and doors flush with the surface.

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<sup>22</sup> The show was the museum's first exhibit of architecture, and it presented works by Mies and Le Corbusier, as well as Frank Lloyd Wright. Its title was responsible for popularizing the term “International Style” as applied to the works of the Modernist movement.



*A rendering of a large, unexecuted theater project employing a ribbed vault roof over the auditorium. From the 1941 second-edition textbook *Architectural Design* by Ernest Pickering.*

Looking at the Uline Arena more than sixty years later and in light of an explosion of thin-shell construction for all types of buildings during the 1950s and 1960s, it would be easy to overlook how revolutionary the technology and form of the building were at the time. Even seventeen years after the arena's completion, one observer could still write:

Thin-shell construction...is reaching a critical stage of development in the U.S. It is not only finally accepted and thriving, but increasingly fashionable, a dangerous stage for any new engineering or art form. The quip is that h.p. no longer stands for horsepower but for hyperbolic paraboloid.... The shell has arrived.<sup>23</sup>

Although superficially similar in roof form to the Uline Arena, contemporary Washington structures such as the District of Columbia National Guard Armory (1942) and Hangars 1 and 2 at Bolling Air Force Base (1941-1942) were actually erected in a more traditional and conventional manner; those concrete roofs are carried by steel bowstring trusses. It was not until 1947 that the Roberts & Schaefer Company designed another example of a wide-span thin-shell concrete roof in Washington, this time over the new Kalorama Roller Rink at 1631 Kalorama Road.<sup>24</sup>

<sup>23</sup> Lawrence Lessing, "The Rise of Shells," *Architectural Forum*, July 1958.

<sup>24</sup> In that same year, Anton Tedesco superintended the construction of a Z-D-roofed B-36 hangar at Loring Air Force Base in Maine. The structure covers nearly two and a half acres and represented a shift in the military's standards for hangars from the earlier truss-supported type represented by those at Bolling. The use of thin-shell

Thin-shell concrete structures fell out of favor for two principal reasons. First, while the materials were relatively cheap, labor and the extensive formwork and scaffolding required were quite costly. The technology was best suited for the Depression and World War II eras, when labor was cheap or steel scarce. In the 1950s and 1960s, however, artistic considerations often overrode ones of cost, but the difficulty of adding to or modifying the unique concrete forms became an impediment. New thin-shell structures are quite rare, thus limiting the universe of existing thin-shell concrete buildings to those produced and extant from an approximately 40-year period.

*The Uline Arena meets HPRB Landmark Designation Criterion D, as it embodies “the distinguishing characteristics” of early indoor arenas and is an expression of the Modern aesthetic and engineering innovation in twentieth century. The property thus also meets National Register Criterion C.*

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concrete for airplane hangars apparently originated with the Italian architect-engineer Pier Nervi, who designed such a building for the Italian Air Force in 1935.