

Die Spiele

Volume 2

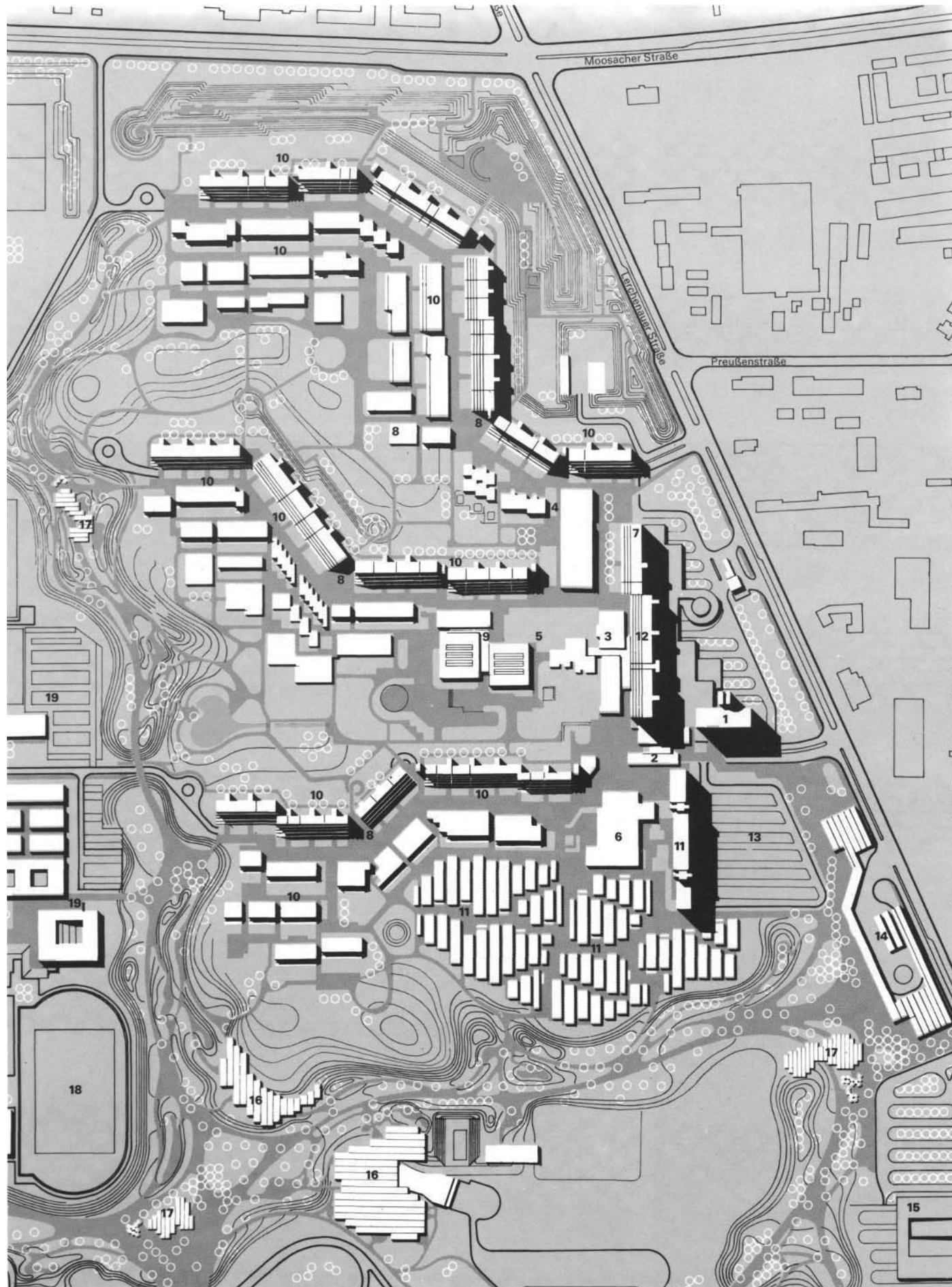
The constructions

Olympic Village

Architects:
Heinle, Wischer and Associates,
Stuttgart/Munich
(Total Planning)
Ludwig, Wiegand, Zuleger, Munich

(Men's Olympic Village)
Eckert, and Wirsing, Munich
(Women's Olympic Village)
Heinle, Wischer and Associates

(Olympic Village Center, the School
and the Childrens' Day Care)
Christ and Karg, Munich
(Church and Community Center)
(Outdoor Facilities)
Miller and Luz, Stuttgart



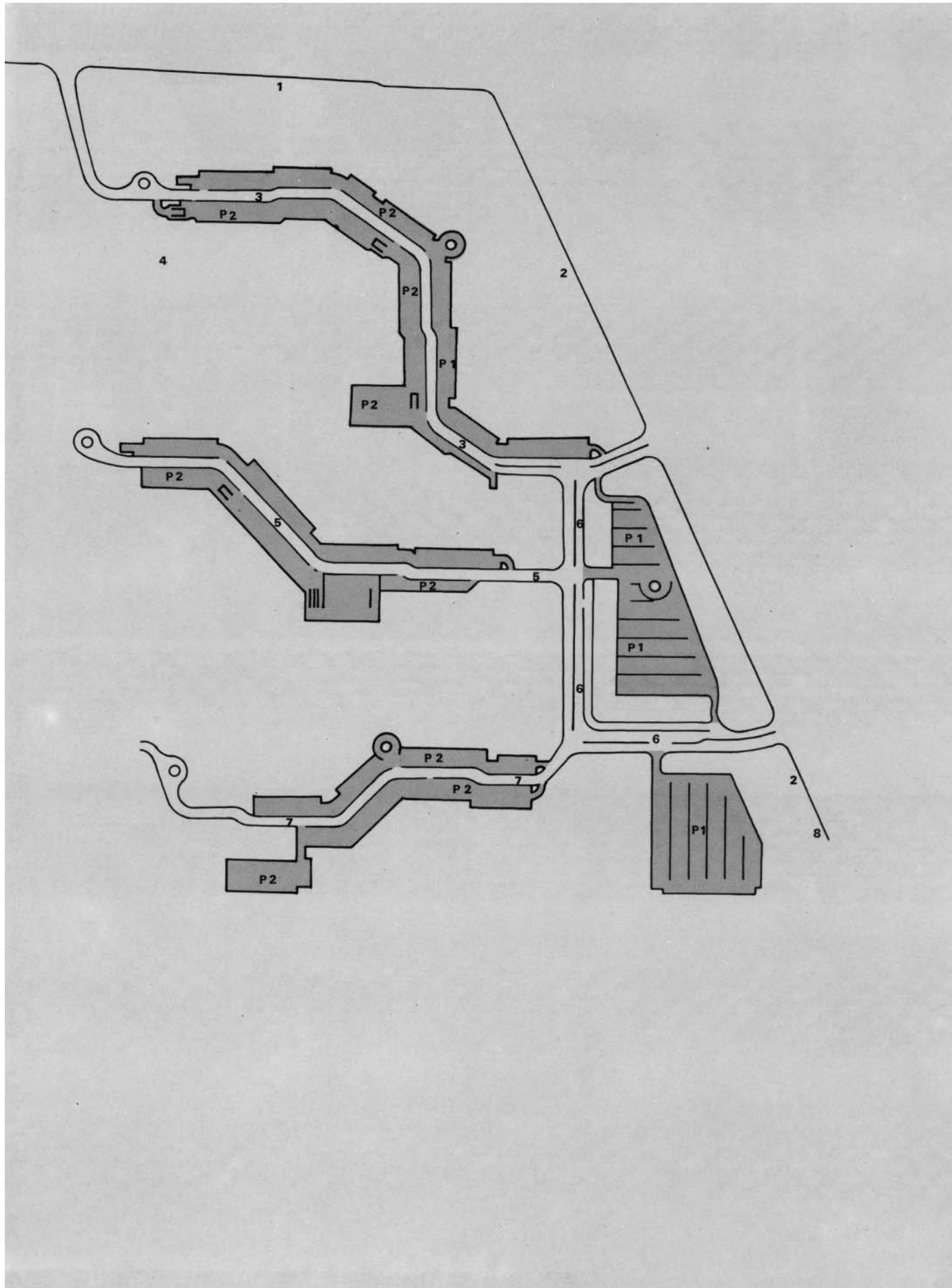
Layout diagram

- 1 Administration Building
- 2 Contact Zone
- 3 Shopping Center
- 4 Church Center
- 5 Amusement Center
- 6 Cafeteria
- 7 Medical Center
- 8 Swimming pool and Sauna
- 9 Post Office
- 10 Men's Village
- 11 Women's Village
- 12 Hotel
- 13 Bus Station
- 14 Subway Station
- 15 BMW Parking Garage and Parking Lot
- 16 Restaurant
- 17 Kiosks
- 18 Athletics Training Camp
- 19 German Olympic Center (DOZ)

Street level

- 1 Moosacher Strasse
- 2 Lerchenauer Strasse
- 3 Strassberger Strasse
- 4 Thouwi Weg
- 5 Nadi Strasse
- 6 Helene-Mayer-Ring
- 7 Connollystrasse
- 8 Subway and bus station

- P1 Open air parking lot
- P2 Roofed-over parking places





Munich used an important argument in its application for the 1972 Olympic Games, namely, the advantage of having the athletes' and assistants' quarters in direct proximity to the contest sites. The Olympic Village had to offer accommodations for 7,000 persons on eighty hectares of land. It was to include the facilities necessary for its temporary function and to be a residential area in a convenient location after the Games were over.

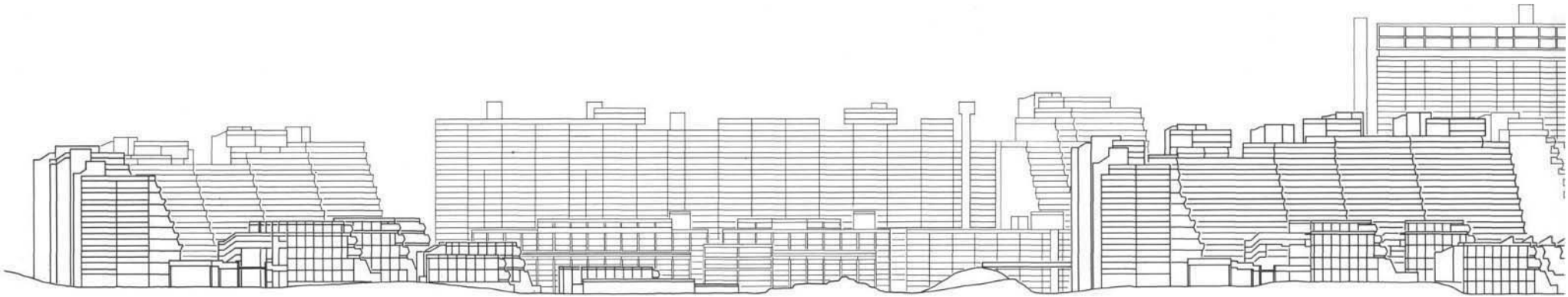
Although during the primary planning stages approximately 10,000 athletes (1,800 women and 8,200 men) were expected, it turned out that actually 12,000 athletes, trainers, and assistants stayed in the settlement near the Olympic Park.

In March, 1968, the Olympic Construction Company, following a decision of the supervisory board, awarded the contract for the entire Oberwiesefeld to the winner of the third prize. The designing of a section of the Village was entrusted to Eckert and Wirsing. These architects had contracts to design student apartments at Oberwiesefeld even before Munich applied for the Olympics. This section was the Women's Village during the Games.

The concept of architects Behnisch and Associates was the basis of the designs for the Olympic buildings at Oberwiesefeld. The final area and building program envisioned 5,000 apartments to house 10,000 persons after the Olympics. This apartment building program was supplemented by infrastructure measures because of the wide differences in pre- and post-Olympic requirements. This demanded thorough consideration during the important design stage.







In order to carry out their urban planning and architectural concepts, the planners decided to apply the "process of optimization", a method frequently used in engineering to find the best possible solution of a given task. This was the first time for this procedure to be used in architecture in the contest of a project of such magnitude.

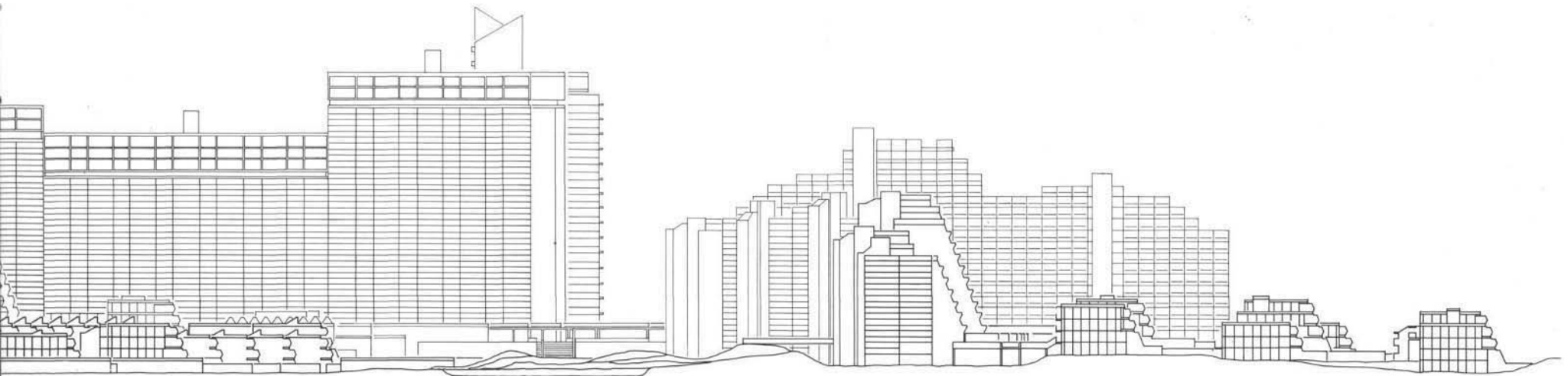
Sharing in this part of the work were Gordon Ludwig, Franz Raab, Gert Wiegand, and Wolf Zuleger of Munich as independent architects of equal rank and winners of one of the four fourth prizes in the

"Oberwiesefeld Architectural Competition".

Either alone or in groups, 22 architects were competing in the first stages of the "optimization process". They designed fifty-seven architectural proposals in a scale of 1:500. By eliminating the less suitable designs in three successive steps the final design concept was developed with the cooperation of the participants and seventeen special advisors. The fifty-seven proposals were reduced to twenty, then to

seven, and then to three well thought-out concepts which finally resulted in the solution. This final concept stood up to the criticism of the expert advisors in regard to living quality, room layout, daylight, hygiene, sound conditioning as well as in relation to sociological conditions, building codes, ecology, green zones, traffic patterns, urban planning and general considerations of landscaping.





A central area with highrises as tall as twenty stories is located on Lerchenauer Strasse, the eastern boundary of Oberwiesenfeld. Two lengthy buildings are placed parallel to each other on a north-south axis, and are complemented by an administration building placed perpendicularly to this axis. Three tracts of terraced houses with seven to fourteen stories each extend out of this center on an east-west axis toward the south. In front of these there are terraced houses of three to five stories' height and in front of these there are semi-detached houses of one to three stories. In

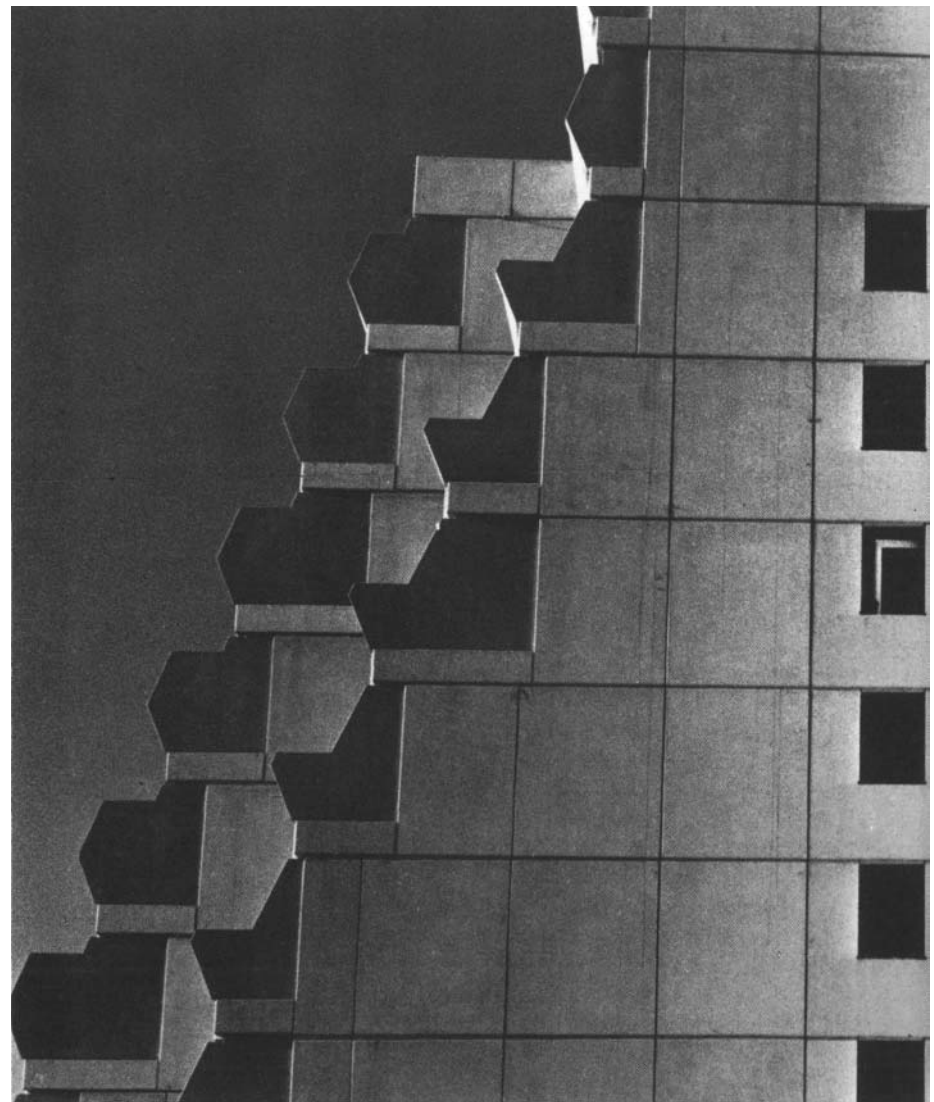
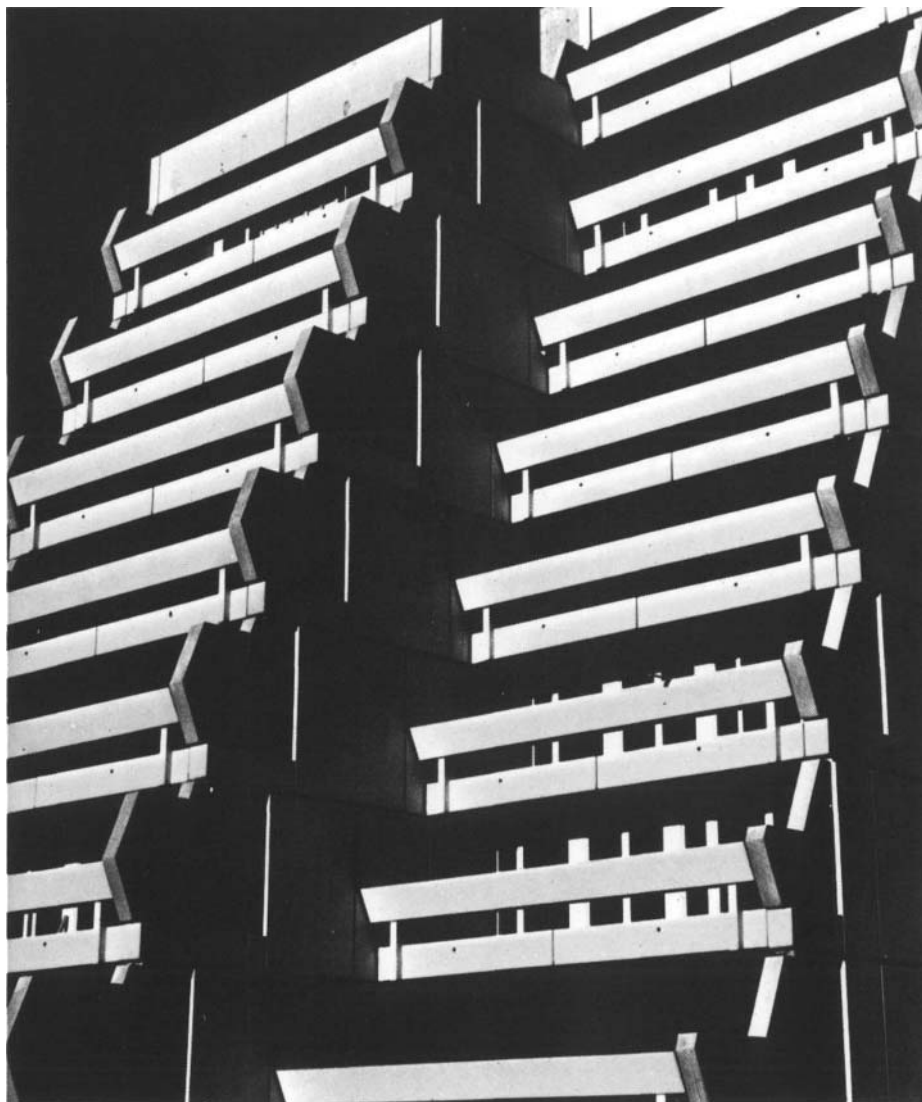
the south this village ends in rows of two-storied bungalows (ground floor with set-back upper level). Pedestrian and vehicular traffic are separated on two levels. The green zones stretch from Olympic Park through the free area between the three tracts all the way to the center.

The three tracts with their terraced houses served as the Men's Olympic Village. The women athletes were housed in the terraced highrise to the south and in the bungalows. The northern highrise offered apartments, a hotel, a row of stores, and a medical center.

apartments ranging from one to six rooms in size. Each apartment also has a balcony with flower boxes.

Indoor swimming-pools, some of them complemented by saunas on the upper story, are located in the middle of each tract.

One of the difficulties in allocating the various apartments was the diversity in the size of the various competing teams. Since the apartments were conceived to be used after the Olympics, the athletes and their coaches had to be satisfactorily housed in





A great variety of follow-up structures is necessary for such a city unit that includes 4,728 apartments for 12,000 sportsmen from 122 nations. It was only in this way that such a city of this size could be filled with life during the Olympic Games.

The administration building was located at the main entrance, in the immediate vicinity of the subway and bus stations. The mayor of the Village and his staff worked here during the Games.

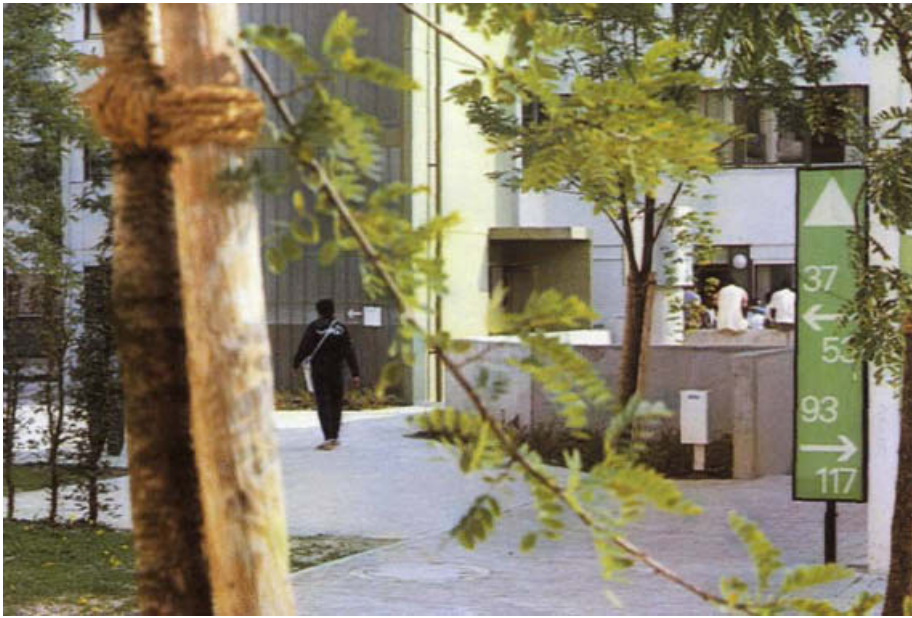
Immediately upon entering the very heart of the Village the buildings open out onto a plaza.

While the cafeteria was located south of the plaza the row of stores started to the right of the foot of the extensive highrise. When the Village was occupied by athletes, it seemed like an oriental bazaar. If one could speak of any place of contact, it was here.

Roughly half-way down the shopping mall a covered walkway branches off, leading to the adjacent entertainment center. The versatility of this center becomes obvious from the following list: grouped around a wide hall for idling and walking were TV rooms, a reading room, a room for playing checkers and other games, a discotheque, the post office of the Olympic Village, a record bar, a sound tape studio for classic music, a billiard room, a ping-pong hall, a hall with coin-operated games, a theater auditorium seating 350 and a movie theater seating 200 spectators. Some of these installations extend through two stories. The variety of available rooms was matched by a rich program which ran the whole gamut from music and theater performances of high artistic value to light entertainment. Films from twenty-four countries were shown in the Village movie theater.

The center was converted into an elementary school and a children's day care center after the Games. The auditorium of the theater hall, for example, now serves as a gymnastics hall and the stage area is used as a calisthenics hall.

At its end the shopping mall opens onto another plaza — the second place for meetings and communication. This is the location of the church center which unites the two big Christian denominations as well as — in adjoining worship halls — the Jewish and Islamic faiths under one roof. In the open area around the Village center the athletes were able to spend their leisure time in the yards of the future school where they could play ping-pong, mini-golf, garden chess, the mill and checkers. The total installation was complemented by playgrounds, fashioned in accordance with modern design concepts, and by water pools, lawns and zones of rest. All of the facilities were supposed to promote human contact among all athletes according to the ideals of the founders of the Olympic Games. Those who experienced the Olympic Village during the Games will testify that the facilities built were in harmony with this ideal.



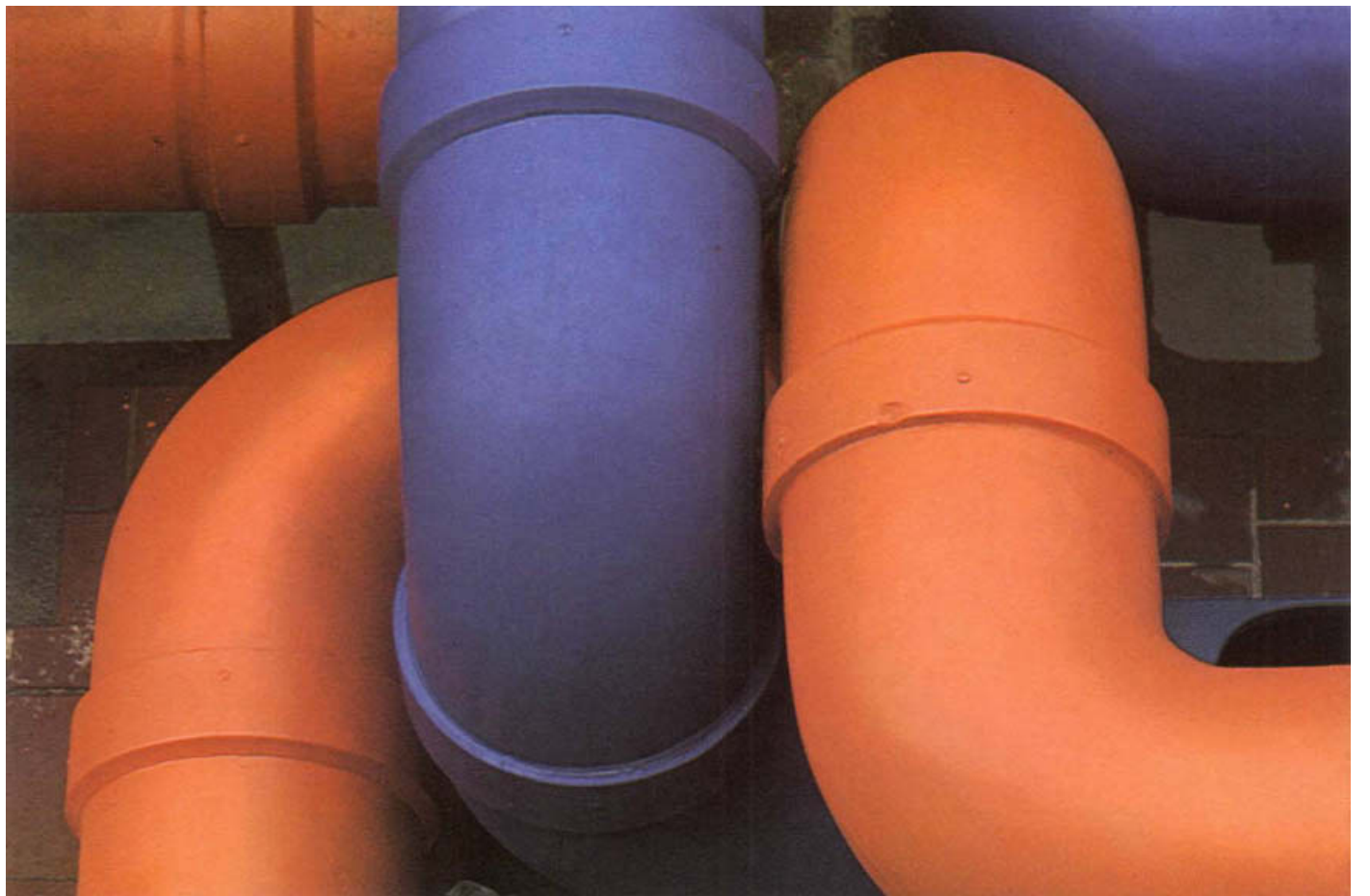
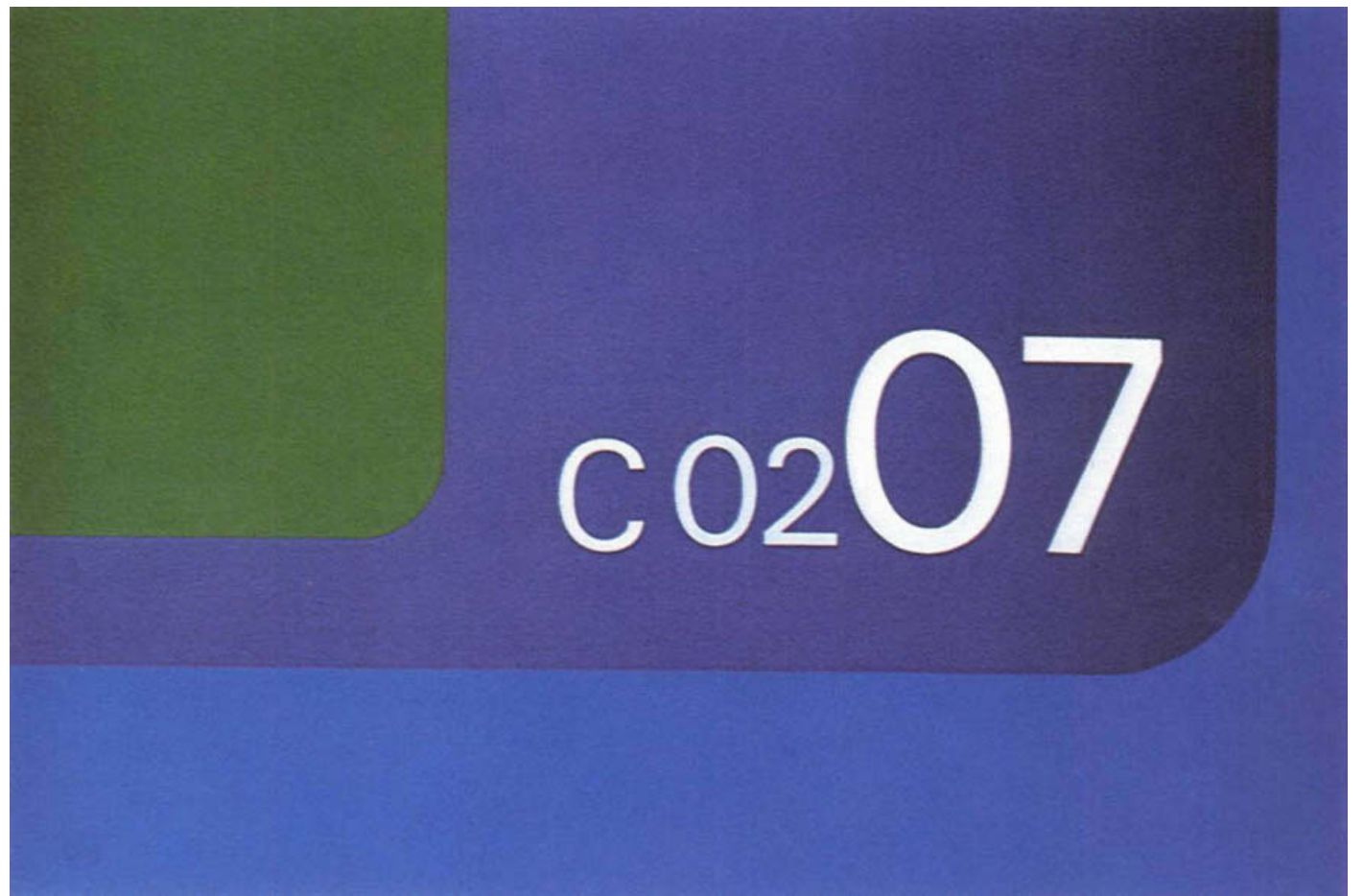


The Olympic Village is advantageously situated in relation to Munich's streets and traffic patterns. At two places, individual traffic flows in and out of Lerchenauer Strasse at the same level. Visitors and residents reach the parking spaces nearest their apartments by this drive-in system. In addition, a three-story parking house has been erected east of the highrise tract of the Village center.

By stairs or elevators residents reach the traffic-free pedestrian level and the apartments situated on the upper stories of the terraced houses. A service drive and an emergency access are located at Moosacher Strasse. Within the Village, motor roads extend underneath the shopping mall and under each tract so that there are practically a connecting street parallel to Lerchenauer Strasse and three branch streets with U-turn loops at the western boundary of the Olympic Village.

The same system is used one level higher in the pedestrian area. Sidewalks extend from the shopping mall between the terraced houses and the green area. The connection to the public paths in Olympic Park will be made over the Kusoczinskidamm which runs north and south. An inside passage, which is also usable as a street, extends from the Village through an underpass in the Kusoczinskidamm directly into the Central University Sports fields. During the Olympics this way was reserved for Village residents. The contest and training areas which were located outside of Oberwiesefeld were served from an internal bus station which was temporarily situated at the main entrance. Public transportation, i.e. the bus and subway stations at Lerchenauer Strasse and the rapid transit system at the western outskirts of Olympic Park, can be reached conveniently on foot. For post-Olympic use, subway and buses are the most important means of public transportation.



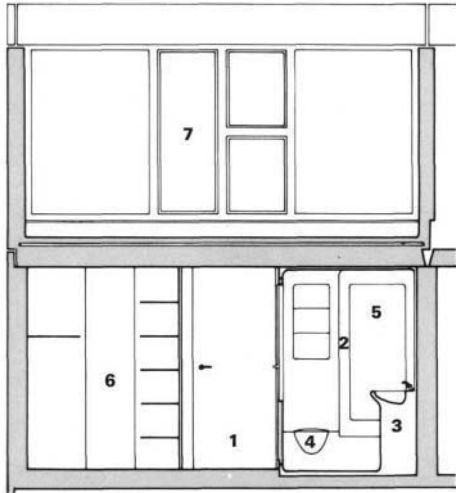


The median guidelines created by Hans Hollein of Vienna improved orientation in the pedestrian zone. These guidelines consisted of lengths of tubing on supports, which branched out to the different living areas. An easily remembered color from the Olympic spectrum was chosen for each tract. Simultaneously, these tubes served as conduits for lighting and public address systems and were so set up that bulletin boards and display panels could be hung upon them wherever needed. Plazas and streets were named in memory of deceased Olympic champions. The same street names and color symbols were used also at the motor traffic level below the pedestrian zone.



Section/direct view

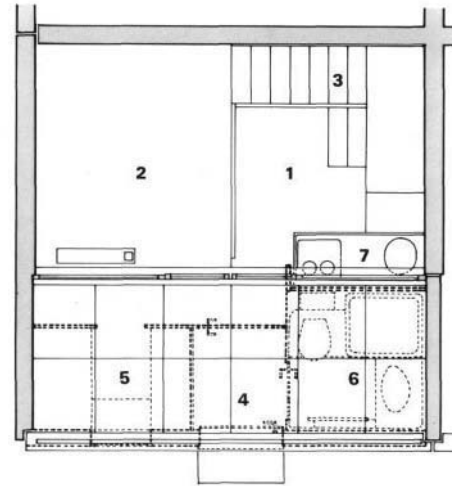
- 1 Entrance, vestibule
- 2 "Wet cell"
- 3 Wash basin
- 4 Toilet
- 5 Shower
- 6 Closet and book case
- 7 Terrace, facade, sleeping and study area, upper level



Rooms in the Women's Village, Level Area Floor Plan/View from Above

- 1 Part of the living area on the ground floor
- 2 Sleeping and study area on the upper level
- 3 Free steps
- 4 Entrance, vestibule
- 5 Closet and book case

- 6 Prefab "wet cell" with wash basin, shower and toilet
- 7 Kitchenette with electric stove, refrigerator, sink and cabinet



The Women's Olympic Village to the south consists of a nineteen-story highrise with 800 apartments, a bungalow area with 800 more apartments, 118 apartments for married students and employees, and a student cafeteria. The apartments in the highrise had between nineteen and twenty-four square meters of living space, the bungalow approximately twenty-four square meters on two floors. 1,800 women athletes lived here during the games.

A double row maisonette-apartment type was chosen for the bungalows. Each unit consists of a ground floor living area of approximately sixteen square meters, a gallery with a studio approximately five square meters, and a roof-terrace of approximately six square meters. In this way a building plan for students was developed in accord with their desire to live independently.

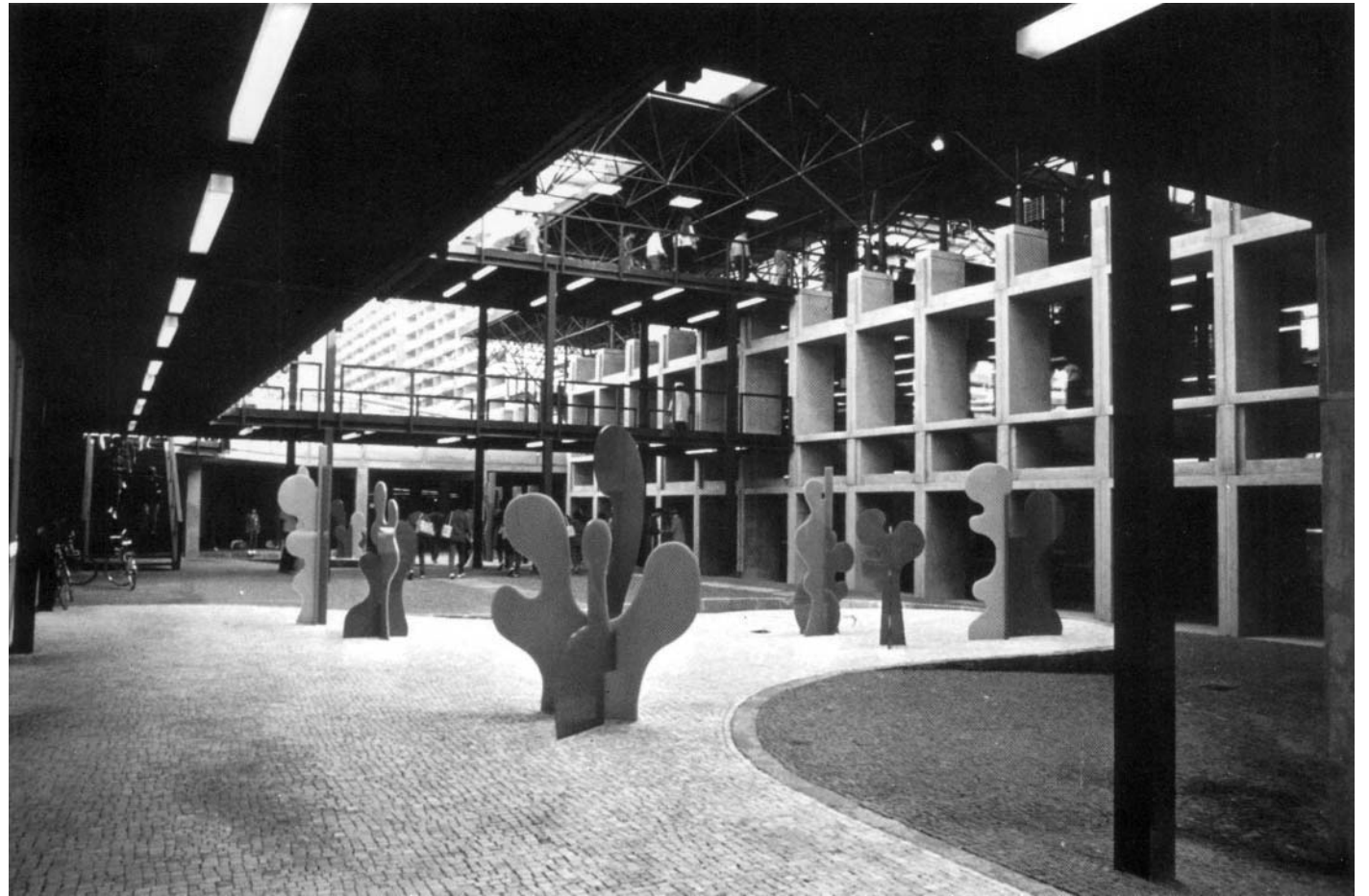
The addition of up to 800 units of this type resulted in structures with independent character, which were divided only by alleys, paths and plazas. The narrow alleys, the light-colored flat houses with their closed facades, and the high-lying balconies gave the impression of a Moorish settlement.

The highrise and the bungalows were built of prefabricated concrete components. Completely prefabricated bathrooms with shower, toilet and wash basin were set into each apartment. On the side of the acrylic glass segments facing the apartment, connections were available for a kitchenette with sink and refrigerator.

Orientation within the Women's Olympic Village was facilitated for residents by designating the block alphabetically and by painting the doors in distinctive colors. The letters A and B were assigned to the highrise. The doors of the flat buildings bore the row and house number in addition to the block-color and letter (starting with C).

The Women's Olympic Village was not directly connected to the motor traffic system. The bus terminal for internal and outside traffic was in the immediate vicinity.

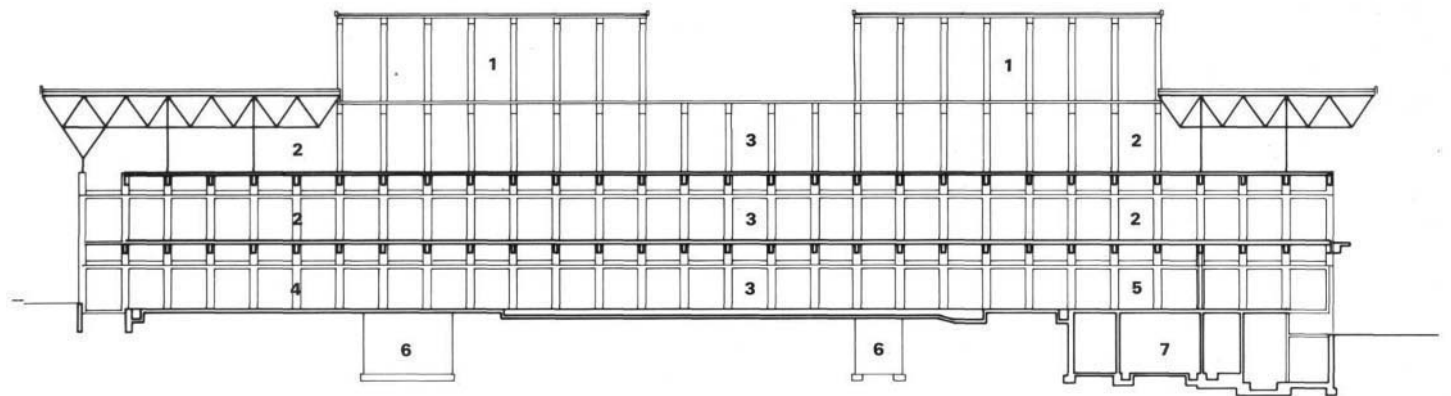




The students' cafeteria, located between the Men's and the Women's Villages, was enlarged with the help of a steel pipe frame construction in such a way that at dinner time 12,000 meals could be served within two hours.

The large number of meals which had to be served in a short time demanded a kitchen and distribution operation planned to the very last detail. A self-service system on all three floors was seen to be the most promising solution.

There were three large kitchens with five food distribution counters and three dining rooms.



**Cafeteria
Cross Section**

- 1 Ventilation center
(this part of the building
was removed after the
Olympics.)
- 2 Dining hall
- 3 Kitchen and food
distribution
- 4 Business area
- 5 Special restaurant
- 6 Elevator
- 7 Technical area

**Visitors' Conveniences,
Restaurants, Beer Gardens and
Kiosks in Olympic Park**

Architects:

*Behnisch and Associates, Munich/
Stuttgart with Domenig and Huth, Graz
(Dining Center North)*

*Peter Lanz, Munich (Restaurant South)
Leyck and Hugle, Munich (Beer Garden on
the Lake)*

*Ray Lardschneider, Munich (Kiosk Stands)
3h design-hübner and huster, Stuttgart
(room-cells)*



It was necessary at times to reckon with gatherings of far more than 100,000 people simultaneously because so many different facilities for competitive sports were concentrated in the Olympic Park. This was quite a contrast to sports centers elsewhere which usually had only one sports event at any one time. On the one hand visitors came as spectators for events in the stadium, in the gymnasium, in the halls for swimming, boxing and volleyball, at the bicycle stadium and at the hockey field. On the other hand, many people who were interested in the happenings at the Games but could get no tickets, wanted to participate in this big celebration at least by a stroll through the Olympic Park.

At the Regatta course at Oberschleissheim, at the riding arena at Riem or in the basketball gymnasium, the spectators could be easily supplied with food and drink at kiosks or in beer tents, as well as on the fair grounds where all the necessary facilities are continually maintained in their original use. The problem of determining the extent of the facilities needed to provide

for the visitors to the Olympic Park itself had to be faced by the Organizing Committee from the earliest planning stages.

The size of the permanent restaurants in the sports facilities could only be determined by taking into consideration their general usage after the Olympics. During the Olympic Games, their capacity was adequate for VIPs, journalists and functionaries only. The only restaurant in the area of the Olympic Park that could be used to serve visitors was the atrium restaurant at the foot of the television tower.

Therefore, the huge restaurants and beer gardens and the multitude of kiosks, whose large capacity was needed solely during the Games, could be provided only on a temporary basis. The planners of the Olympic Park wanted these structures to indicate their temporary character, and to be a kind of sheltered landscape area with a maximum combination of "outside" and "inside"—they were not intended to be formal competitors to the tent roof.

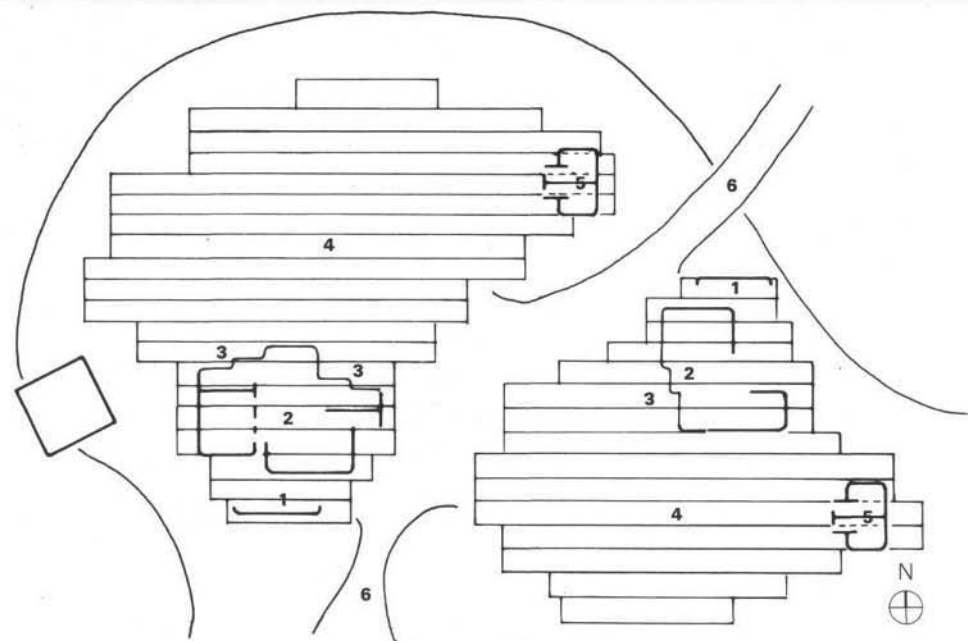
The type of protection against sun and rain which was chosen combined a roof of thin sheeting with transparent sheets on the facades capable of being opened to a height of three meters from the ground. This material was secured to the steel girders of the facade or supported on a light supporting structure—galvanized steel supports, lattice plinths, and crossed tubing arranged in arches.

Within the structures the intersecting and overlapping parapet and floor levels, the asbestos cement walls of the kitchen area, and the distinct groups of different colored chairs divided the space into various areas for eating and drinking. This gave the structures their lively appearance. Additional plants, smaller walls, bridges, overpasses, plateaus in harmonious forms, and broadly arching stairs—all these elements helped these "flying structures"¹ fit into the landscape of Olympic Park.

The large restaurants were erected at prominent points on the entry and exit paths for the visitors. They were separated from the major sports facilities in order to avoid aggravating the congestion in the area around these installations.

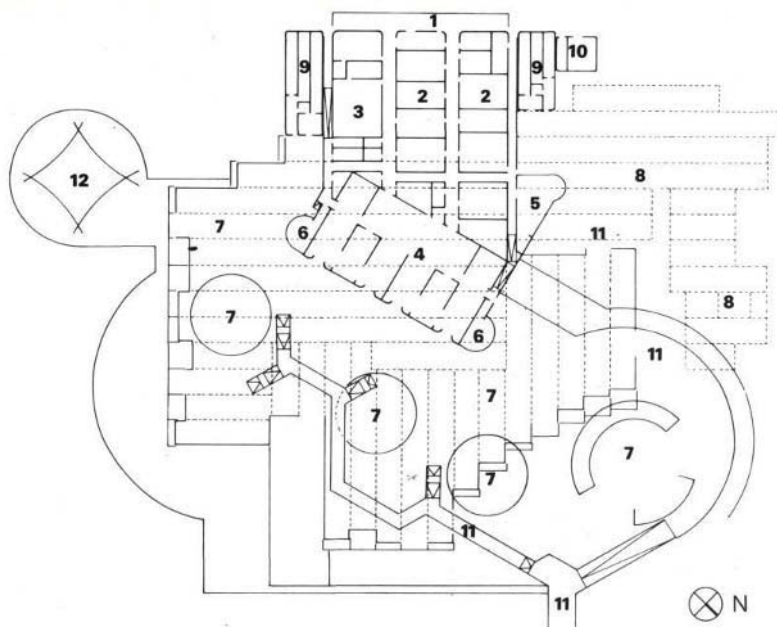
They were divided into two areas: simple country eating establishments with a rustic menu and restaurants with higher standards and a richer menu selection.

The "Beer Garden on the Lake" was built on a northerly oriented spit of land on the eastern shore of the lake. It was subdivided into two areas with 950 and 700 seats. It was conveniently located in relation to the swimming hall, the boxing gymnasium and the pedestrian zone on the eastern shore of the lake.



**Ground floor plan
to the restaurant
on the lake**

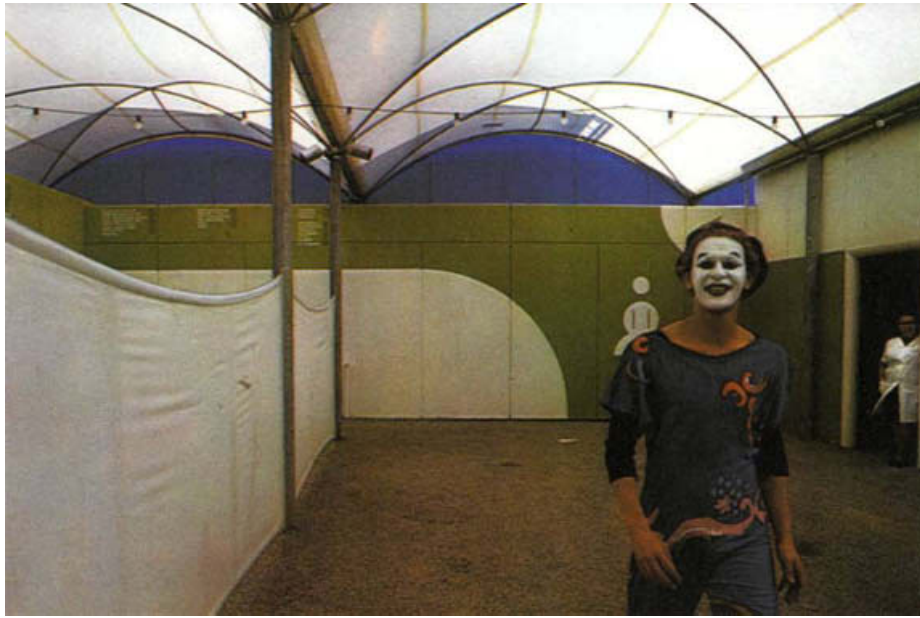
- 1 Delivery area
- 2 Kitchen and administrative area
- 3 Food serving area
- 4 Dining area
- 5 Toilets
- 6 Entrance and Exit



**Ground floor plan
of the South
Restaurant**

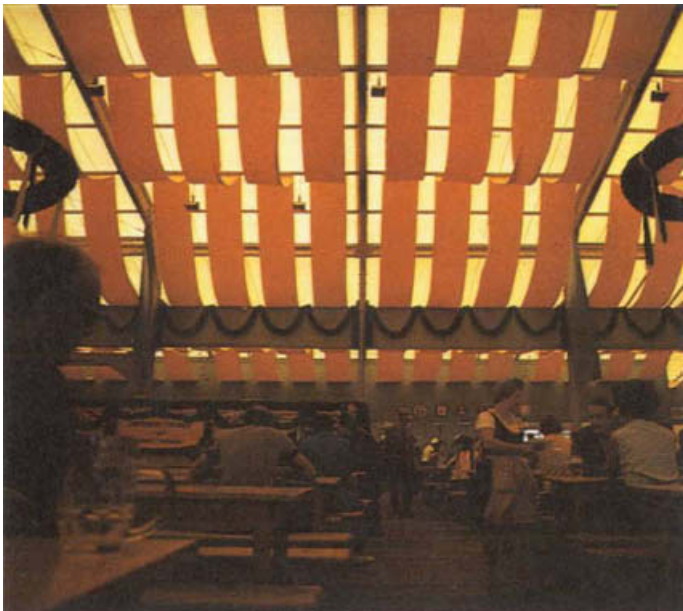
- 1 Delivery area
- 2 Pantry and food preparation
- 3 Personnel area
- 4 Main kitchen
- 5 Serving area/self-service
- 6 Serving area for drinks
- 7 Dining area/Restaurant
- 8 Dining area/Country Inn
- 9 Toilets
- 10 Transformer room
- 11 Entrance and Exit
- 12 Dining area under the trial roof for the large plexiglas tent roof

The southern restaurant, located south of the stadium and of the lake, had 3,000 places. It provided primarily for the visitors coming from the parking area for buses and from the streetcar loop on Ackermannstrasse. Finally, at the streetcar station there was a tent restaurant that could serve 1,000 guests simultaneously.



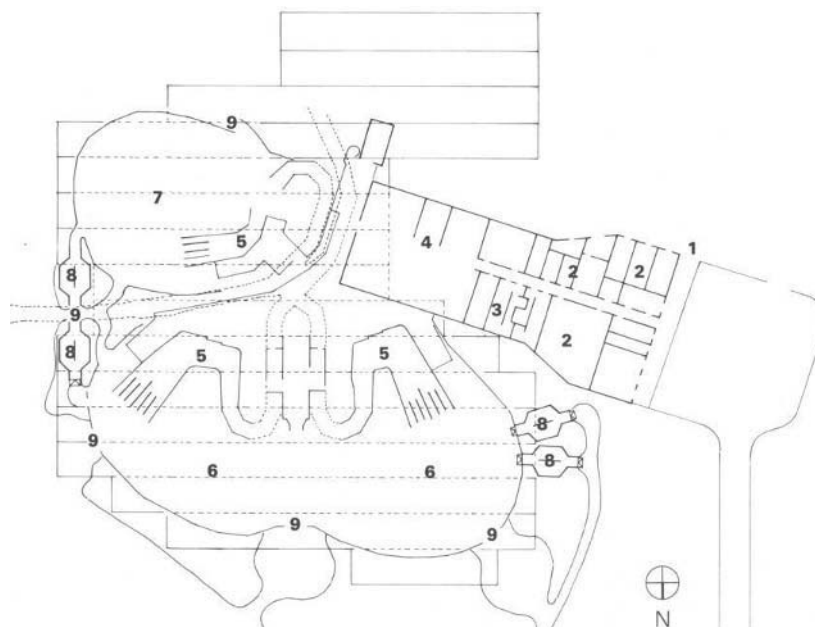
Within the individual establishments there was a difference in the design of the areas "restaurant" and "rural eating establishment". In the "restaurant", a dynamic design was the dominant theme with dining areas on various levels, lively room dividers and railings, and interesting stairways. The walls and ventilation ducts were painted in pop-art style. The lights were concentrated into a kind of "area of light" and suspended in the supporting structure of the restaurant. At night, they transformed the ceilings into broad zones of illumination.

Visitors' Conveniences,
Restaurants, Beer Gardens and
Kiosks in Olympic Park



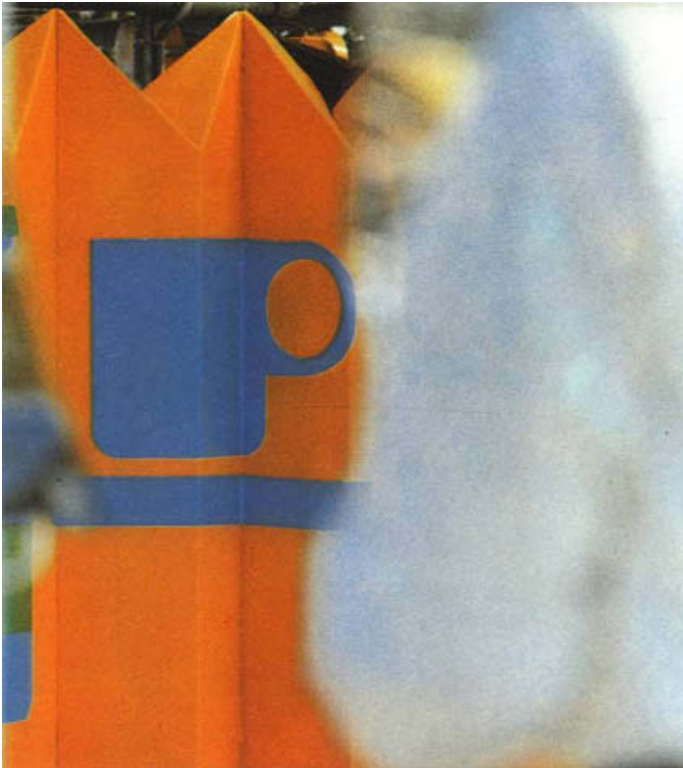
The situation of the "rural eating establishments" was different. Here one found the type of beer garden native to Bavaria, originally an outdoor locale with tables under broad shade trees. In the Olympic Park these restaurants were decorated with colorful pennants and festive garlands.

The northern restaurant had 1,000 places. It was planned primarily to serve the visitors from the northern part of the park (volleyball hall and hockey field) as well as the spectators going back and forth between the facilities in the southern part of the center (stadium, gymnasium, swimming hall) and the subway station.



**Ground floor plan
of the Northern
Restaurant**

- 1 Delivery area
- 2 Pantry and food preparation
- 3 Personnel area
- 4 Main kitchen
- 5 Serving area for food and drinks
- 6 Dining area/Self-service
- 7 Dining area/Country Inn
- 8 Toilets
- 9 Entrance and Exit



The kiosks, too, were temporary auxiliary facilities. While the restaurants only had to take care of the physical needs of the visitors, the kiosks had to serve other needs too. Besides snacks, drinks, ice cream, other dairy products, pastries, fruit and candy, they also sold various drug store items, cameras, optical equipment, commemorative medals, tobacco, newspapers, books and souvenirs.

A principal consideration in choosing the locations for the kiosks in the park as in the decision on the sites for the restaurants - was the desire not to add to the congestion in the area around the sports facilities. A further consideration was the wish to concentrate the kiosks in larger groups.

Within the gates of the sports facilities themselves the refreshment stands sold only snacks and cold drinks. The kiosk clusters with a greater selection were on the main access paths on the dams and embankments within the Olympic Park, on the footpaths to and from the public transportation and close to the parking lots.

Serving as space-dividing elements for the kiosk clusters were folding walls in the Olympic colors: yellow, green, and blue - each color appearing in one light and one dark shade. The groups of stands were roofed with translucent sheeting which was supported by light galvanized steel structures independent of the walls of the kiosks themselves.

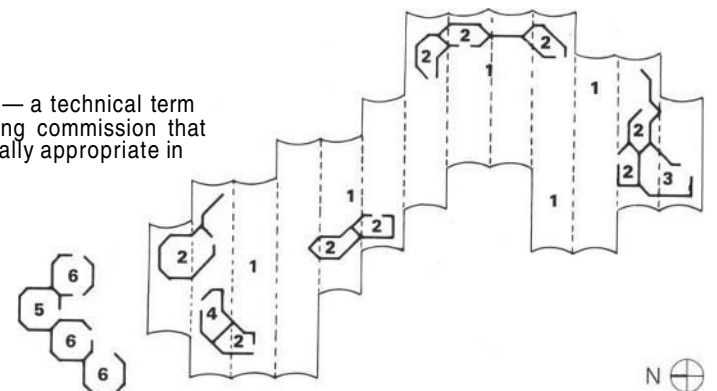
To provide restrooms for the visitors and toilet and lounge facilities for the personnel, as well as first aid stations, booths were erected in close proximity to the kiosk clusters, but not under the same roof. For the booths, simple corrugated cardboard was glued to a self-supporting three-dimensional stressed skin construction. These booths were protected from the effects of the weather by an outer skin of polyester resin strengthened by spun glass.

On the embankments within the Olympic Park, the kiosks were combined with individual trees or groups of trees so as to fit harmoniously into the overall conception of a "verdant Olympics".

Ground floor plan of a kiosk cluster

- 1 Sales area
- 2 Storage room
- 3 Rubbish room
- 4 Technical equipment
- 5 Broom closet
- 6 Toilets

Footnote
¹ "Fliegende Bauten" — a technical term of the German building commission that happens to be especially appropriate in this case.



Fairgrounds in General

Architect:

Peter Lanz, Munich

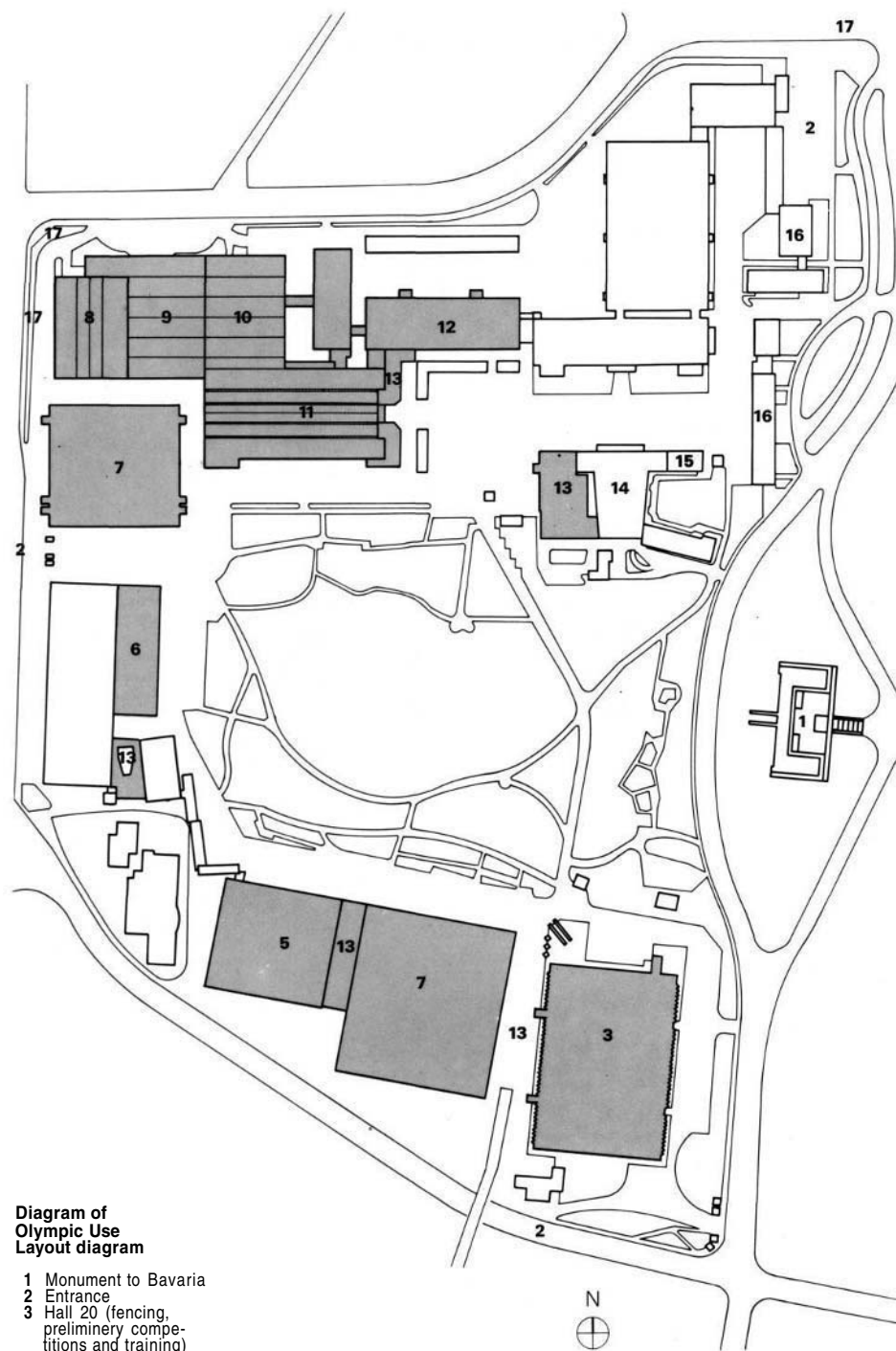


Diagram of
Olympic Use
Layout diagram

- 1 Monument to Bavaria
- 2 Entrance
- 3 Hall 20 (fencing, preliminary competitions and training)
- 4 Hall 19 (wrestling, training)
- 5 Hall 18 (judo, training)
- 6 Partial area of Hall 16 (special post office, security guards)
- 7 Hall 14 (wrestling and judo, competitions; central sports direction)
- 8 Hall 12 (fencing, competitions)
- 9 Hall 11 (fencing, dressing rooms)
- 10 Hall 9 (weightlifting, training)
- 11 Hall 7 (weightlifting, competitions)
- 12 Hall 5 (press, technical services, doping control)
- 13 Restaurant
- 14 Assembly building
- 15 Post office
- 16 Meeting building
- 17 Streetcar stop

The fairground halls were included in the program presented by Munich in Rome for the contest and training sites to be used during the Olympic Games. The accommodation of every Olympic discipline at what was formerly called "Oberwiesefeld" already was considered impossible at the first considerations regarding the program. During the preliminary and early planning stages, however, it was believed that the basketball and volleyball games could be held in the exhibition halls. When both international sports federations had stated their prerequisites for the contest sites, the exhibition halls proved to be unsuitable for these sports. Neither hall could accommodate courts with sufficient safety zones (volleyball requires a 12.5 m. high ceiling) and room for 4,000 to 5,000 spectators.

Thus the Organizing Committee decided to equip the grounds of the "Munich Fair Company" as the center for heavy athletics, wrestling, judo, weight lifting and fencing. A contest site and training hall were remodelled for each of these disciplines.

The fencers did not only train in the three-storied hall 20, they also held the preliminary and part of the intermediary bouts there. The rest of the intermediary and final bouts took place in hall 12.

The planning situation for the facilities which the weight lifters needed was ideal. The neighboring hall 7 (for contests) and hall 9 (for training) were remodelled without serious difficulties.

The hall which was initially foreseen for wrestling was rejected when it was learned that at least 5,000 spectator seats were required for this sport. Thus a new hall had to be built. For economy reasons a corresponding decision was not difficult for the people responsible in the Organizing Committee and the Olympic Construction Company since the exhibition areas in the halls belonging to the Munich Fair Company had to be enlarged anyway. Considering deadlines, a further difficulty had to be overcome due to the short planning and building period. The approval of the building project followed relatively late.

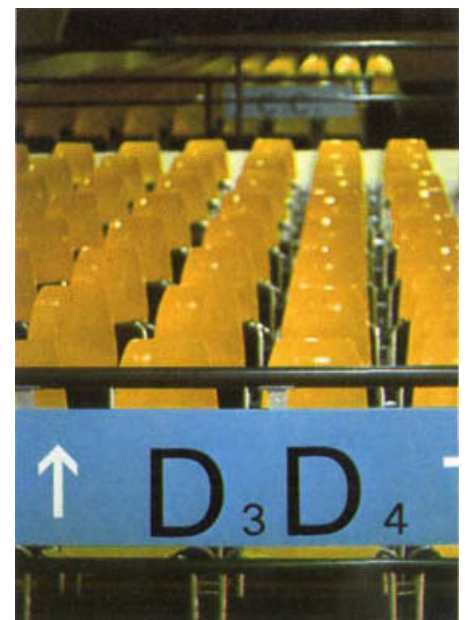
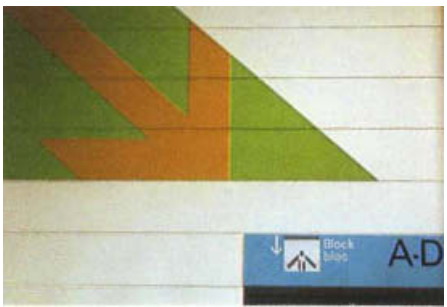
The hall in which some of the judo contests took place—the rest were in the basketball hall and the boxing hall—was converted into a two-storied exhibition hall by the construction of an intermediary floor after the Games. The judo enthusiasts trained in hall 18, the wrestlers in hall 19.

Subcenters for radio, television and the press completed the program of the second Olympic center at the exhibition grounds. The fairgrounds had another advantage as opposed to completely new facilities in that consequential installations such as the post office, restaurant, organization and meeting rooms, toilets etc. were already available.

The traffic access system, which had been tested by numerous events, functioned smoothly. Individual transportation was made practically unnecessary by a well organized shuttling service with internal or public means of transportation between Olympic Park and the fairgrounds.

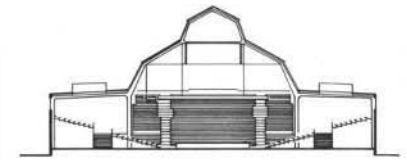
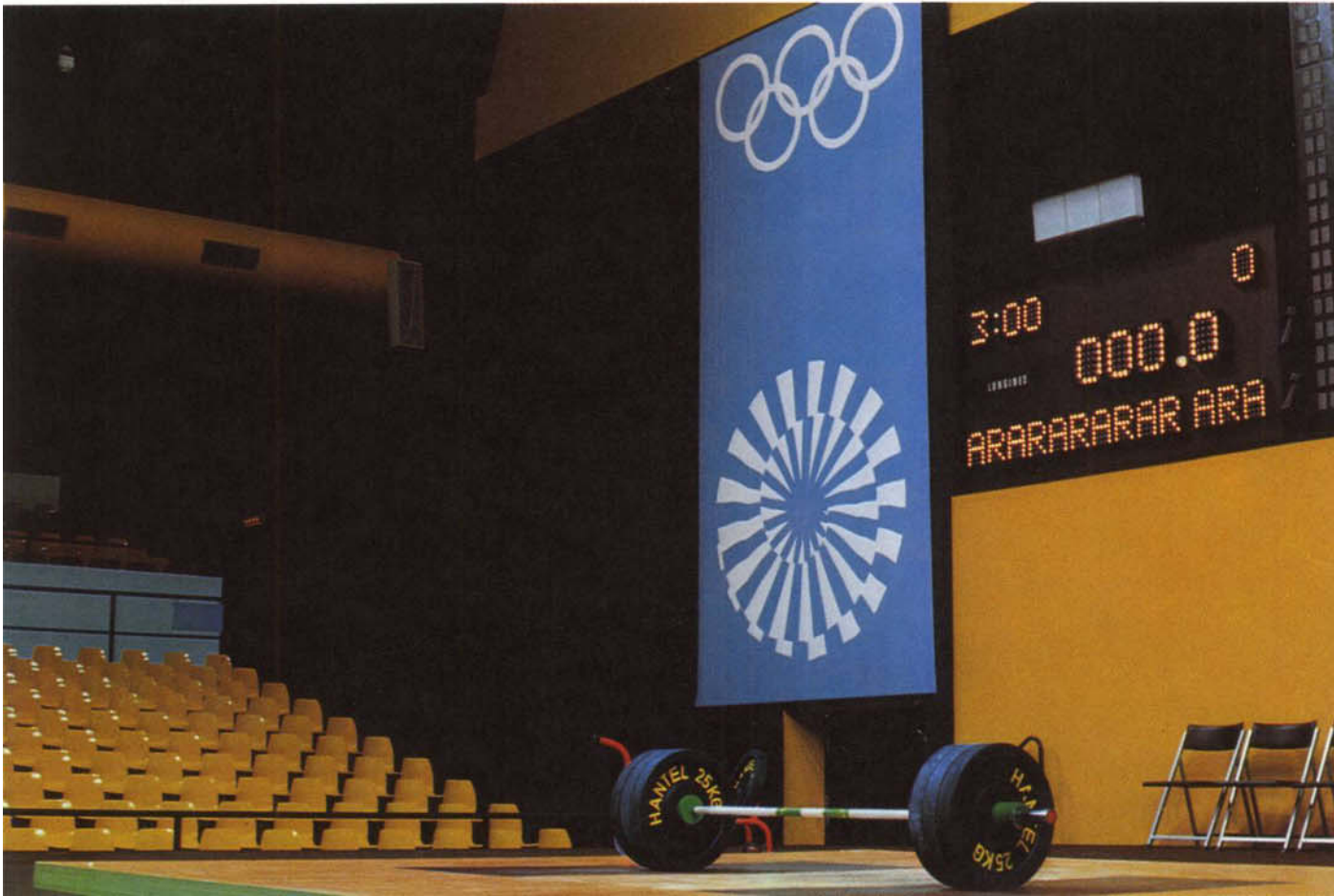
The main entrance was located on Heimeran Strasse during the Olympic Games. The contest and training halls which were arranged around a park-like green area could be easily reached from a large plaza.

An essential task remained after the solution of every structural and organizational problem; namely, to convert temporarily an incongruous building complex constructed during different eras into a sports center. The somewhat depressing utilitarian architecture of the majority of the existing exhibition buildings had to be brought near to the theme of the "cheerful Games" by minimal, but effective means. Here the planners used the Olympic colors yellow, green and blue in both light and dark shades which had been determined by the "Visual Formation" Commission of the OC. These colors and the signs carrying information concerning sports and other installations became the main elements for shaping the impressions made by the fairgrounds.

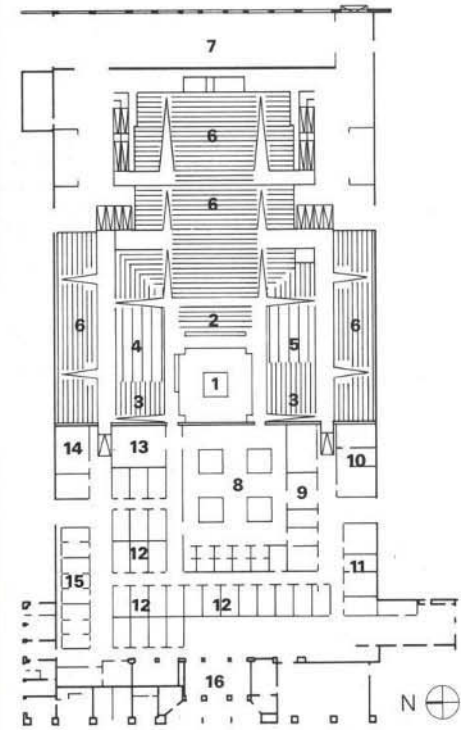


Weightlifting Hall (Fairgrounds)

Architect:
Peter Lanz, Munich

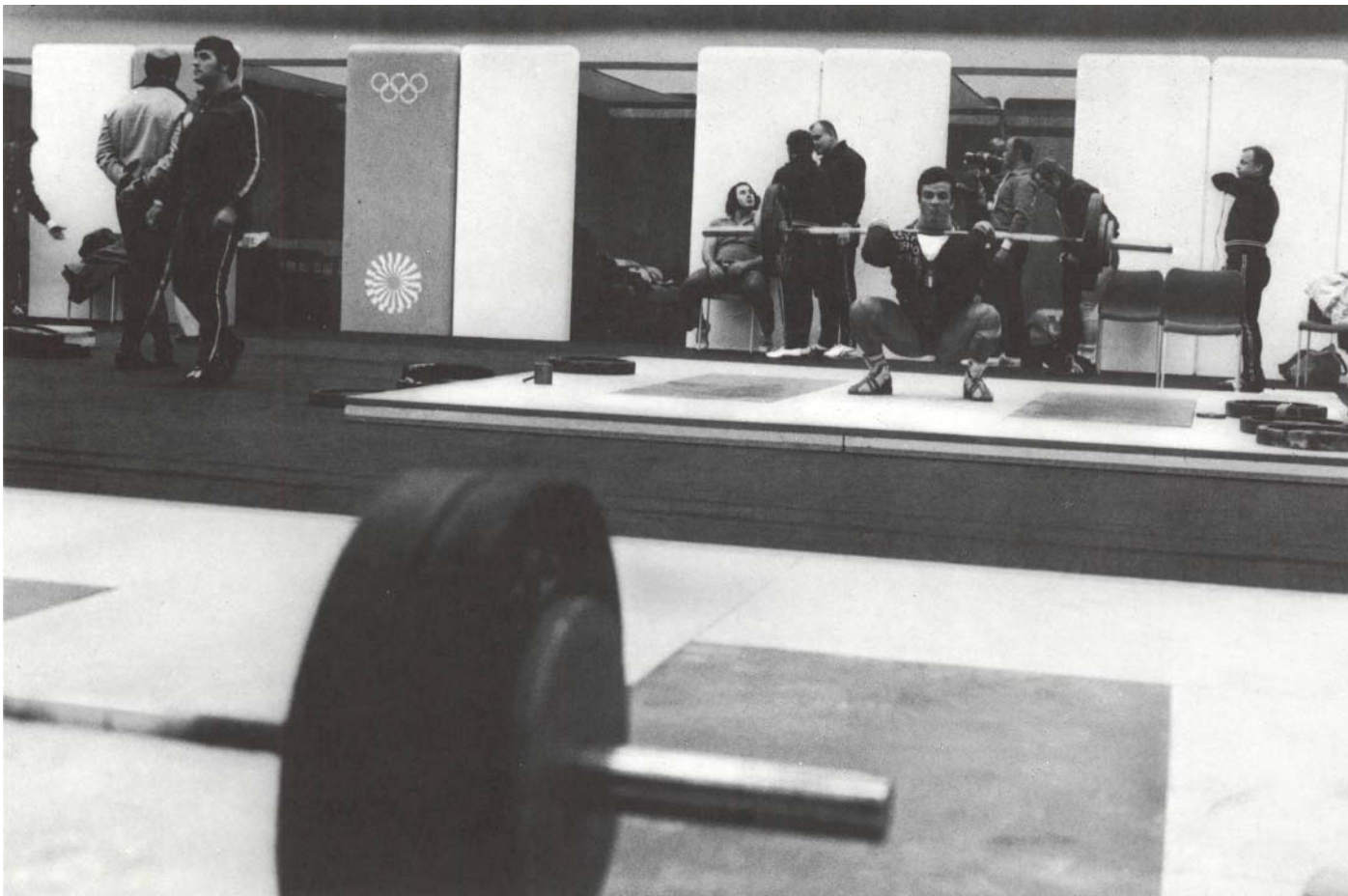


Cross section of the hall



Weightlifting hall Ground floor plan

- 1 Competition podium
- 2 VIP stands
- 3 Places for participants
- 4 Places for the press
- 5 Places for commentators
- 6 Spectators' stands
- 7 Entrance foyer for spectators
- 8 Warm-up room with 4 podiums and 18 couches
- 9 VIP and organizers' area
- 10 DOZ subcenter
- 11 FHI offices
- 12 Dressing and massage rooms
- 13 Weighing-in room
- 14 Referees' room
- 15 Showers and wash-rooms
- 16 Entrance for participants and organizers

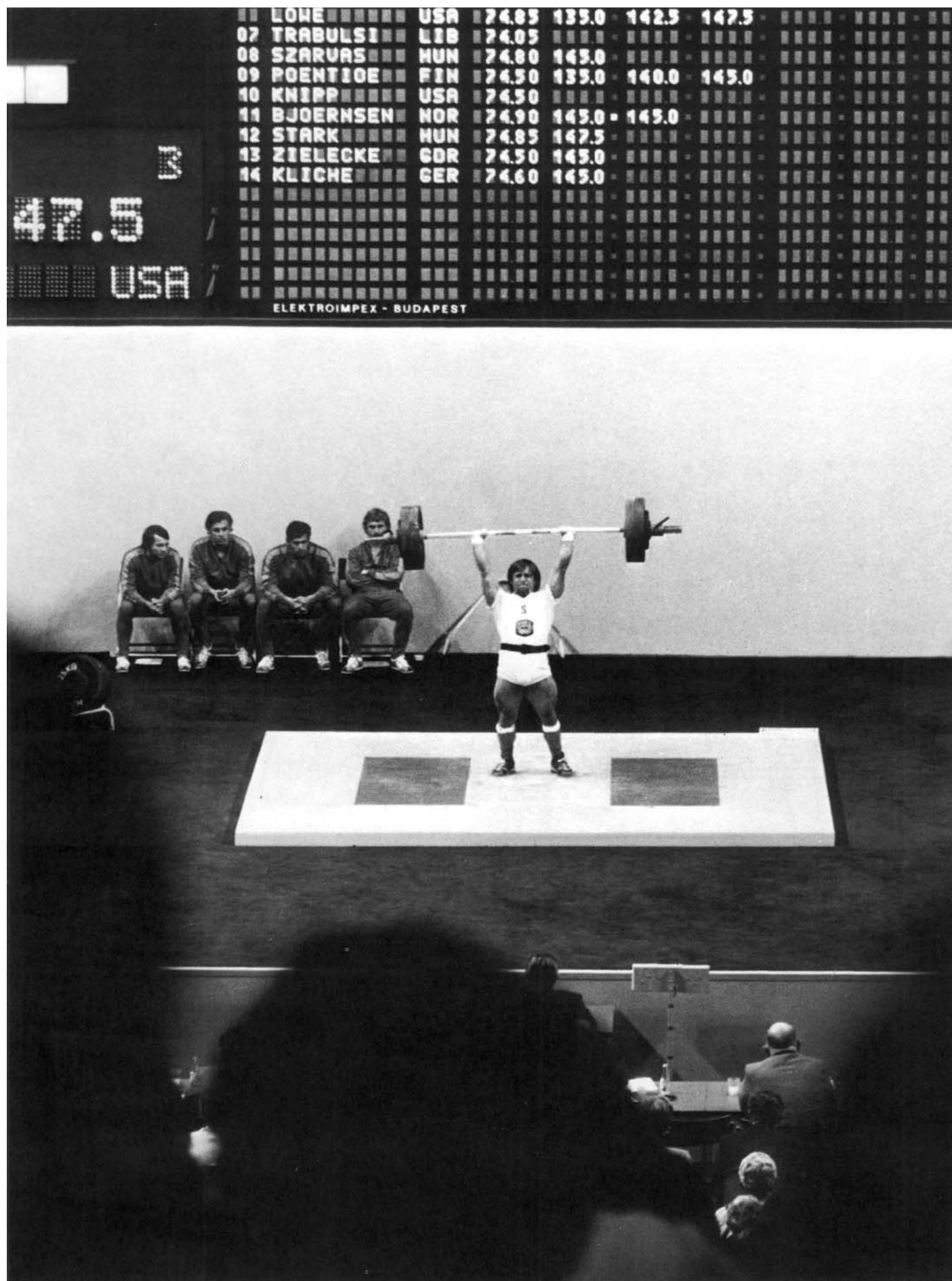


According to the rules at international competitions and at Olympic Games, weight lifting events must take place on one meter high, 12 m. x 12 m. platforms. The weight lifter faces the audience during the contest. Thus it is possible to arrange the audience's seating arrangement only on three sides of the stage. The competition area resembles an ancient theater in this form.

The remodelled hall 7 offered an advantage with its total length of 106 m. in that it was large enough to contain the athletes' readying room and the ancillary rooms for the organization and the contest jury in addition to the spectators' facilities. On account of the height of the platform it was possible to reduce the angle of incline of the spectators' stands from that which would have been necessary if the action had taken place at ground level, which would have required a construction with a steeper line of vision. Nevertheless, the height of the existing hall limited the number of seats to 3,300.

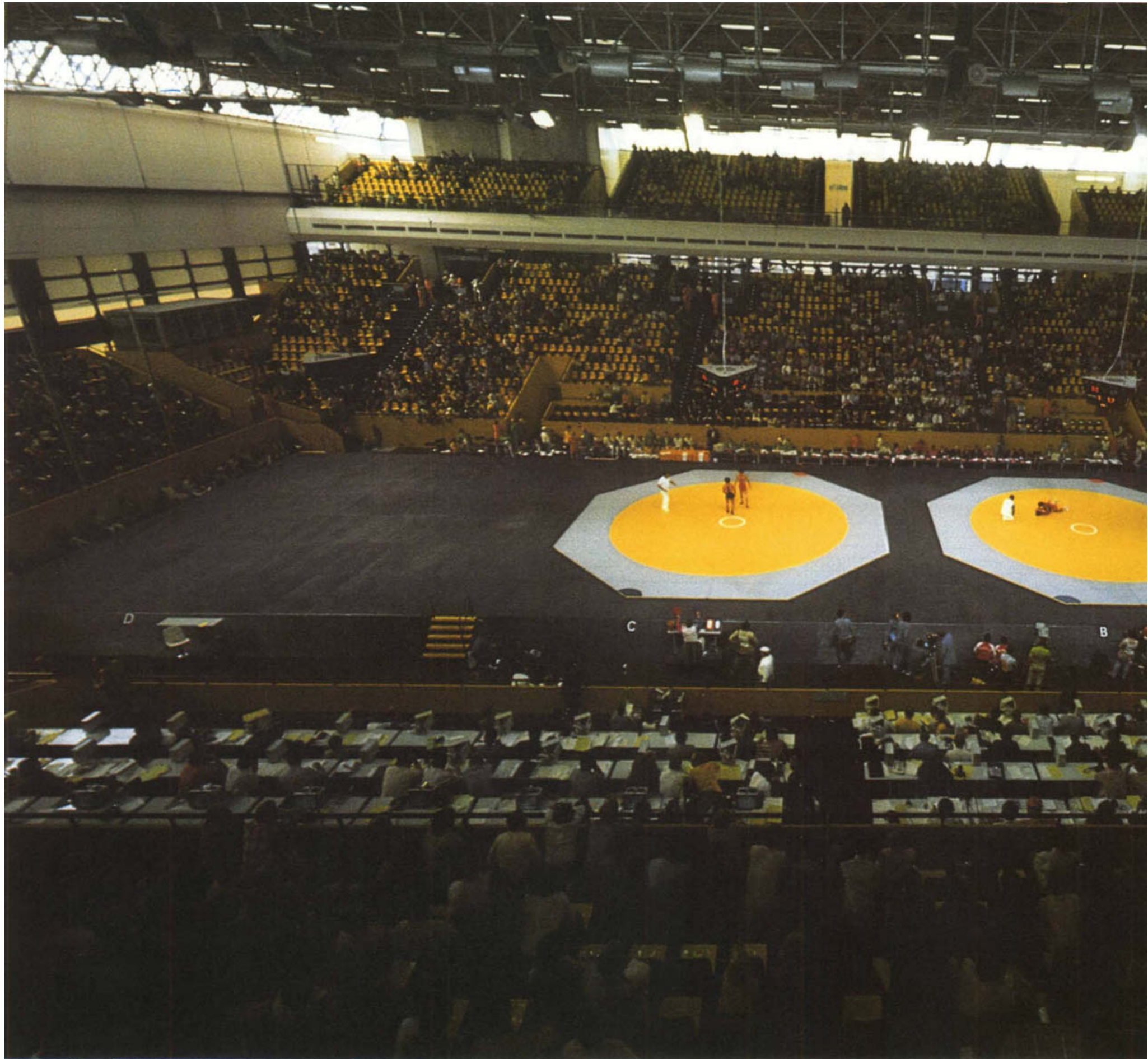
A sound absorbing wall at the rear side of the weight lifting stage separated the contest area from the readying area. The electronic scoreboard, which displayed the names, nationalities, the weights lifted in the various disciplines and the total weight, was mounted on this partition.

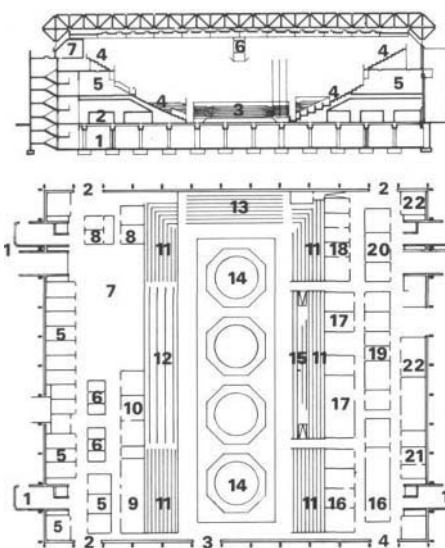
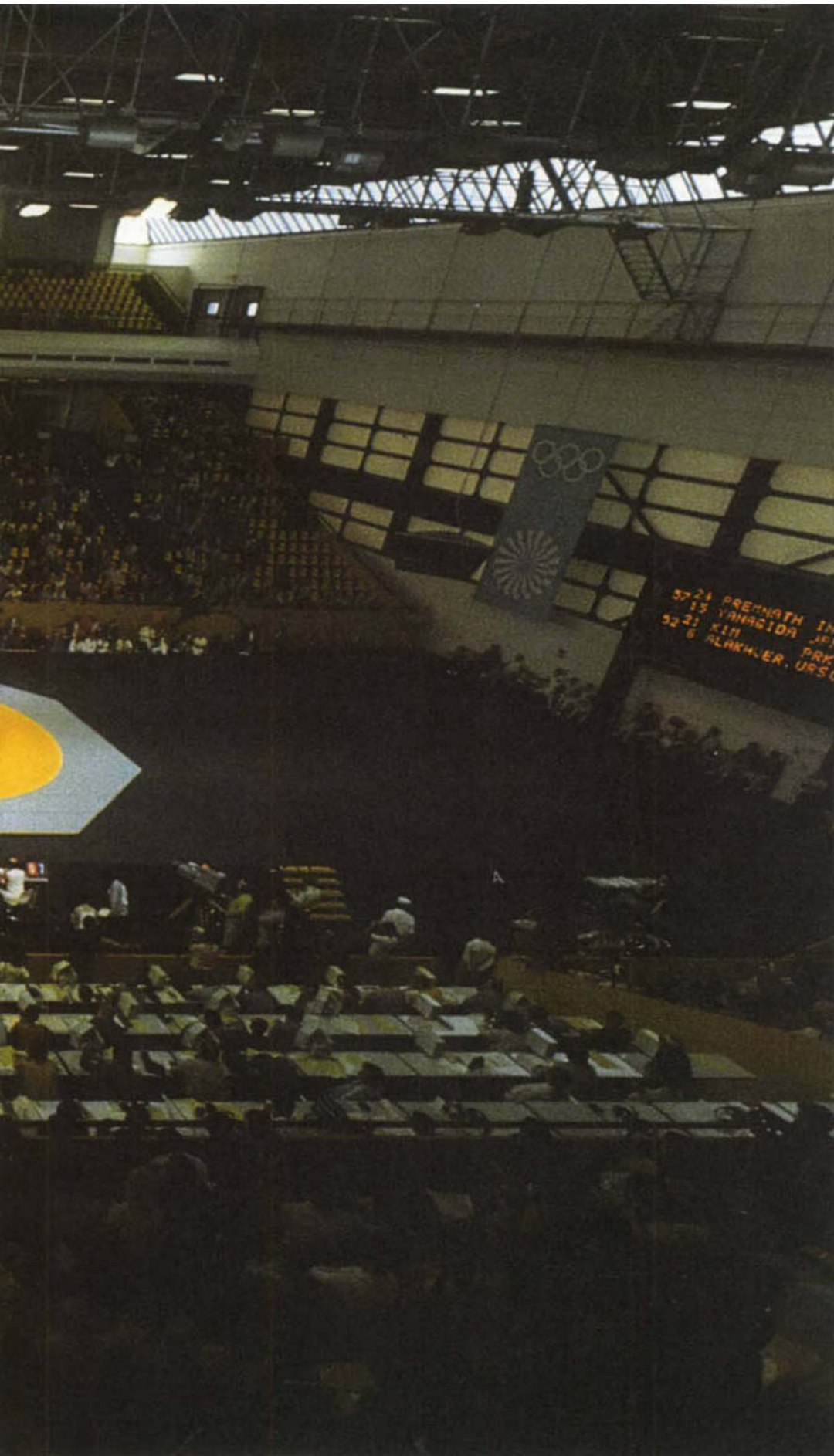
The hall was illuminated exclusively by artificial light. The weight lifters' platform stood in a bright light as opposed to the darker spectator area in which the partitions, draperies and barriers were dominated by the color yellow.



Wrestling-Judo Hall (Fairgrounds)

Architects:
Peter Lanz, Munich





The new wrestling and judo hall connects the semicircle of exhibition halls to Ganghofer Strasse and Heimeran Platz in the northwest.

This 17 m. high steel frame building is a cube with an almost square base measuring 72 m. x 78 m. whose walls are finished with cement facing panels. The hall is covered by a supporting structure constructed of prefabricated steel pipe building elements and has no interior columns. This roof is set on the framework of the building in a way that results in a band of windows around the hall which admit natural light. Characteristic of the building are the outer stairway doors for access to the upper level which were completed only in the grandstand area during the Olympic Games. (The intermediary floor which divides the entire hall horizontally and is necessary for the use of the building as an exhibition hall was installed afterwards).

Wrestling and Judo Hall Ground floor plan

- 1 Stairwell and elevator shaft
- 2 Participants' entrance (upstairs: spectators' entrance)
- 3 Press entrance
- 4 Entrance for organizers and VIPs
- 5 Athletes' dressing rooms
- 6 Athletes' showers and washrooms
- 7 Warm-up area
- 8 Athletes' lounge
- 9 DOZ subcenter
- 10 Medical rooms
- 11 Spectators' stands
- 12 Places for the press and commentators
- 13 Participants' stands
- 14 Competition area
- 15 VIP Stands
- 16 Working rooms for FILA
- 17 Storage rooms
- 18 Working rooms for the judo association
- 19 Working rooms for the OC
- 20 Referees' coat room
- 21 Director of competitions
- 22 Dressing rooms and lounge for referees

Cross section of the grandstand

- 1 Basement, storerooms
- 2 Ground floor with temporary installations
- 3 Contest platform
- 4 Temporary additions to grandstand
- 5 Entrance level
- 6 Lighting bridge
- 7 Machinery room elevator

The majority spectators were accommodated on the two-storied stands at the eastern and western sides of the hall. Another stand which ascended from the hall level was located on the southern side. In relation to the contest platform on a north-south axis, the impression was given of a symmetrical hall area which offered 5,000 spectator seats in addition to 700 seats for guests of honor, participants, press, radio and television personnel. The area under the ground floor stands was divided into work and waiting rooms for athletes, organizers, communications personnel and honored guests.

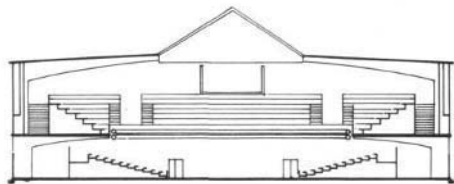
The wrestling mats were laid on a contest area 90 cm. higher than the floor of the hall. This 15 m. x 55 m. platform took up almost all of the inner area of the hall. It was sloped at the sides for the safety of the competitors. Only a narrow lane around the platform remained free for the contest jury. According to need as many as four yellow octagonal mats could be laid on the platform relieved with blue. Three-sided miniature scoreboards which displayed the contest time and number of points were suspended over each mat.

Fencing Hall 1 (Fairgrounds)

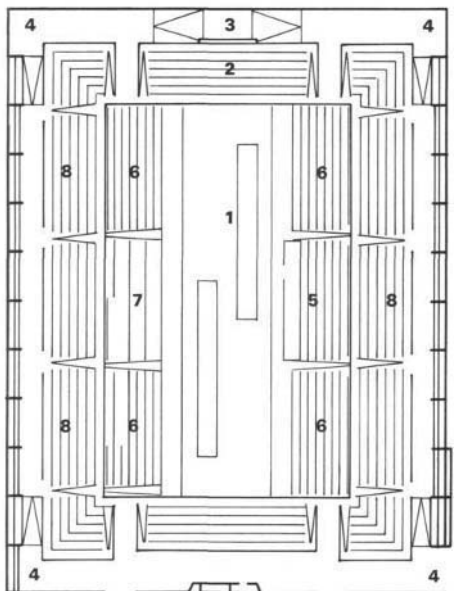
(Hall 11 and Hall 12)

Architect:

Peter Lanz, Munich



Cross section



Fencing hall 1
Upper floor plan

- 1 Competition area
- 2 Participants' stands
- 3 Access to upper floor
- 4 Access to stands
- 5 VIP area
- 6 Ground floor stands (temporary)
- 7 Places for commentators
- 8 Upper floor stands





Hall 12, also known as the Bavaria Hall, was used for shows and sport events even before the Olympic Games. Hardly any remodelling was necessary in this 3,000-seat hall for the intermediate and final rounds in the fencing events.

The grandstands on the lower level ascended up to a point under the galleries extending around the four sides of the upper level. The planners' main attention was directed to the extensive technical fencing equipment and the artistic arrangement of details. Cloth dyed in the Olympic colors was usually used to divide areas and to mark spectator limits as in the other halls.

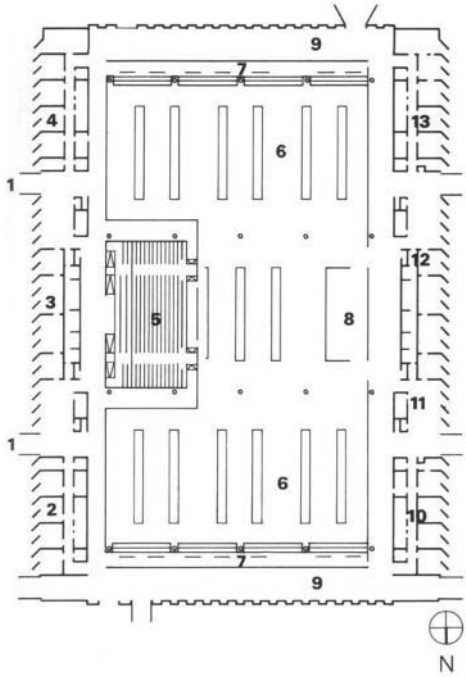
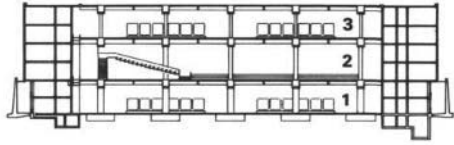
The contest area held two parallel, but not completely abreast fencing strips only at the semifinals. The inner area of the hall which was only illuminated by artificial light had a lighting intensity of 1,500 lux and provided a strong contrast to the spectator area on the galleries. The colors contributed less than the lighting effects to the creation of an exciting tournament area in this hall.

Fencing Hall 2 (Fairgrounds)

(Hall 20)

Architect:

Peter Lanz, Munich



Fencing hall 2 (preliminary competi- tions, training) Ground floor plan

- 1 Spectators' entrance
- 2 Personnel lounge
- 3 Spectators' area with snack bar and rest room facilities
- 4 DOZ subcenter
- 5 Press stands, places for commentators, VIP stands
- 6 Competition area
- 7 Spectators' stands
- 8 Podium for technical directors
- 9 Places for relaxation
- 10 Special post office
- 11 Competition office
- 12 Working rooms for technical directors
- 13 OC offices and first aid station

Cross section

- 1 Basement (training)
- 2 Ground floor (preliminary competitions) with view of side stands and section of main stands
- 3 Upper floor (training)

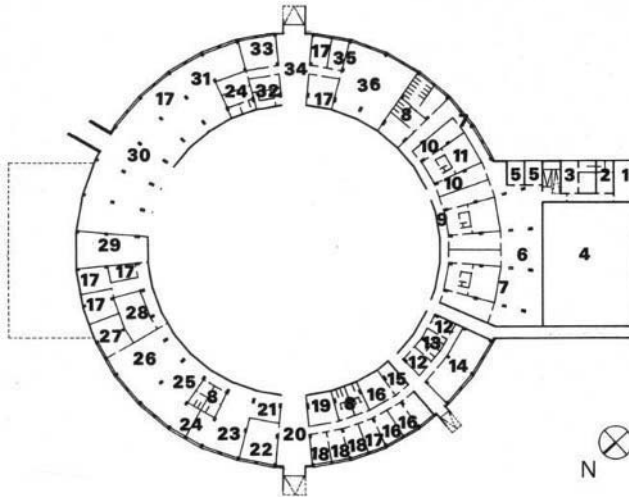
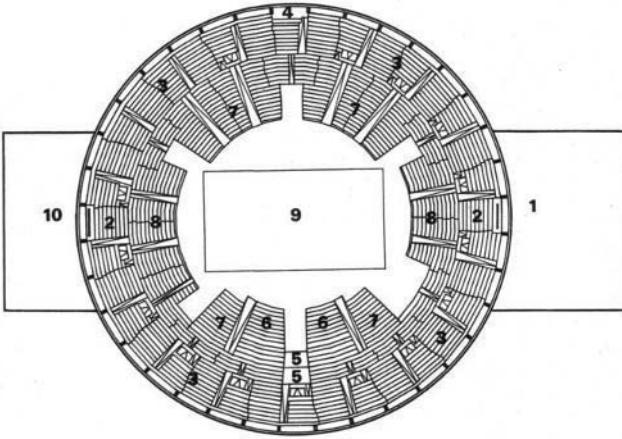
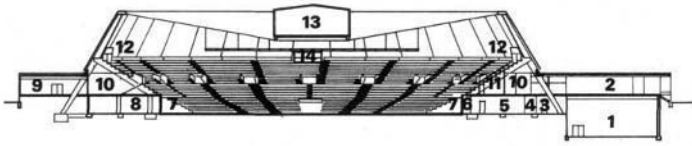




Fencers were able to train on forty strips on the lower and upper levels of hall 20. The preliminary and intermediary rounds and the sword fighting event of the modern pentathlon took place on the ground floor. Fourteen strips were available here. While the over-all lighting on this floor was set at 600 lux, the two centrally located strips were accentuated with a stronger illumination of 1,500 lux. It was only in this area that temporary bleachers were set up as spectator stands with a total of 1,000 seats. Otherwise spectators were able to wander from strip to strip and watch the bouts at close quarters. The only thing remarkable about this otherwise dreary hall was the colorful decoration. Yellow cloth was hung from the ceiling in parallel irregular lines. The judges' table was covered with a light blue cloth, the stands were covered with yellow material, and the platform areas remained black. The stands were equipped with yellow seats.

Basketball Hall
Siegenburger Strasse

Architect:
Georg Flinkerbusch,
Hagen/Westphalia



Longitudinal section

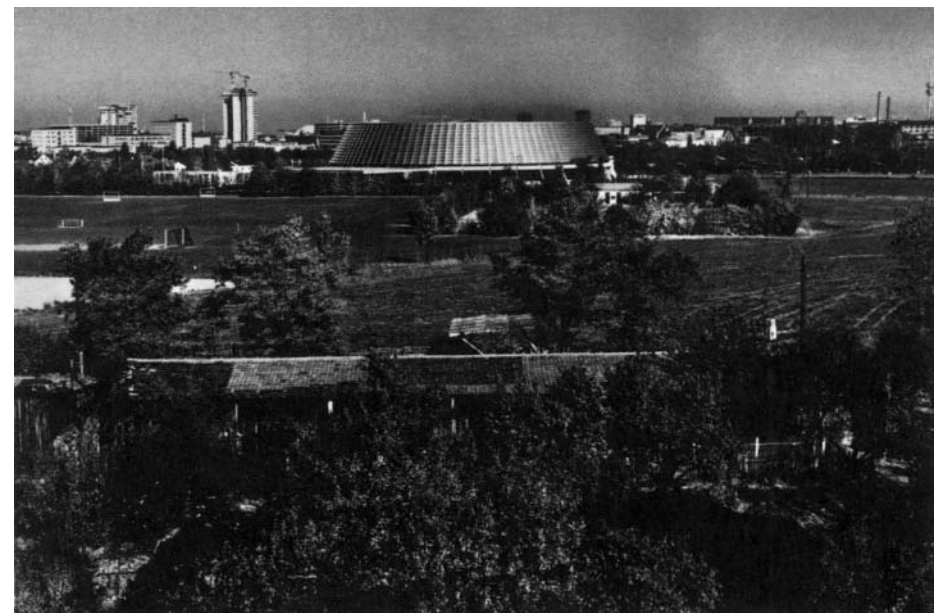
- 1 Warm-up hall
- 2 Entrance hall
- 3 Auxiliary room
- 4 Passageway for street shoes
- 5 Locker section
- 6 Passageway for gym shoes
- 7 Telescoping stands
- 8 Central radio and television installation (DOZ)
- 9 Restaurant
- 10 Foyer
- 11 Hat and coat check
- 12 Scoreboard
- 13 Central ventilation installation
- 14 Direction

Diagram of grandstand level

- 1 Roof lookout in entrance hall
- 2 Scoreboard
- 3 Permanent stands
- 4 Direction booth
- 5 Camera stand
- 6 Press seats (on telescoping stands)
- 7 Telescoping stands
- 8 Temporary collapsible stands
- 9 Special floor preparation for the basketball court

Diagram of ground floor

- 1 Technical apparatus
- 2 Doping control
- 3 Doctor's office
- 4 Air-space warm-up hall
- 5 Massage parlor
- 6 Auxiliary room
- 7 Passageway for street shoes
- 8 Toilets
- 9 Passageway for gym shoes
- 10 Locker room
- 11 Showers and washroom
- 12 Referees' room
- 13 Shower room and toilet unit
- 14 Jury
- 15 Mimeographing room
- 16 German Basketball Federation (DBB)
- 17 Organizing Committee (OC)
- 18 International Amateur Basketball Federation (FIBA)
- 19 Conference room
- 20 Entrance for the press and organizers
- 21 Information
- 22 Interview room
- 23 Cafeteria
- 24 Sales stand and reading room
- 25 Office
- 26 Press and postal use
- 27 Postal use
- 28 Printing shop
- 29 Central television installation (DOZ)
- 30 Equipment room
- 31 Dining room for VIPs
- 32 Traffic flow supervision
- 33 Hostesses
- 34 Entrance for VIPs
- 35 Technical apparatus for Scoreboard
- 36 High and low voltage central station





The hall forms part of a municipal sports ground situated in a green belt which extends as far as the center of Munich. Nearby are the exhibition grounds, the second focal point of the Olympic Games, where the fencing, judo, wrestling and weight-lifting events were held.

Along with the Olympic sports hall, the basketball hall forms the second stadium that is permanently reserved for Munich sporting events. During the Olympic Games it had capacity for 6.356 spectators. The decision on the site and space utilization program for this building was made comparatively late. In the autumn of 1969 the Olympic Construction Company invited two firms of contractors to submit tenders. The contract was awarded in February, 1970 and stipulated completion by March 15, 1972. The short time available for building necessitated the employment of a simple principle of construction and the use of prefabricated components.

The foundations and the whole ground floor were constructed by conventional methods using reinforced concrete cast on site. After only six months the prefabricated concrete elements for the external supports of the grandstands and the circular beam for the roof could be erected and the roof placed in position.

The construction is based on the principle that steel can take extremely high tensional stresses and concrete can stand extremely high pressures. Thus a suspended conical steel roof, made up of sheets 4 to 6 mm. in thickness, transfers the whole weight of the roof (i.e. its own weight including insulation, snow) to a circular reinforced concrete pressure ring which, in its turn, transfers the static forces vertically to the walls. The steel roof is braced against wind suction by a weight suspended from its centre, which also serves as the base for the structure containing the ventilation and air-conditioning units. This load results in the formation of a conical shell.

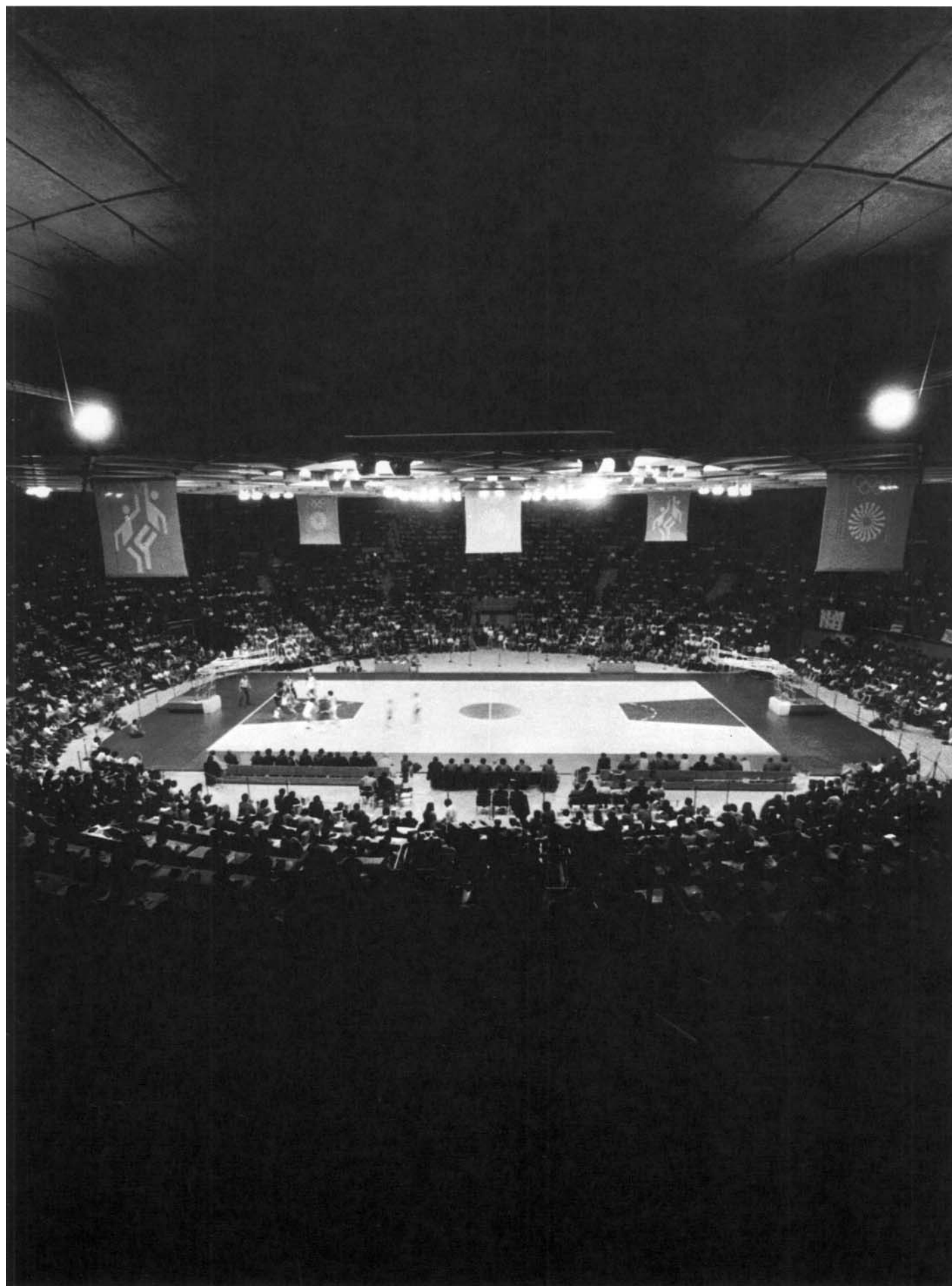
The steel sheeting for the roof was cut to shape in the factory and delivered in large segments which were welded together on site. The underside of the roof was covered with a layer of dark blue acicular asbestos as a fire safety measure and for acoustical reasons.

The stadium is illuminated solely by artificial light. The outer walls are constructed of hollow, aerated sections with heat insulation. Asbestos cement sheets were used for the exterior facade.

From the very beginning this circular hall was designed as a multi-purpose sports arena. Its diameter is 100 m. at the foundation level and 72 m. at the roof. The area available for sport measures 40 m. x 40 m. the clearance is 12.50 m. In order to provide this 1,600-square meter playing field (with a further 400 sq. m. in the warm-up hall on the ground-floor), a total usable area, including hallways of 12,200 sq.m. and an enclosed space of 104,500 cub. m. was required.

The permanent grandstands on the upper floor were supplemented during the Olympic Games by telescopic and transportable stands that could quickly be assembled. The circular upper gallery for spectators has 4,500 plastic seats with backs; a further 1,400 spectators, together with 200 athletes, 36 radio and television commentators, 220 guests of honor and 300 journalists were accommodated on the mobile grandstands. Spectators enter the stadium through an entrance hall in the south-west that is joined on each side with a circular corridor which gives access to the grandstands at the mezzanine level through doors at a number of points along its circumference. All facilities for spectators such as check-rooms, toilets, kiosks and a post office are situated below the grandstands at the entrance level. In the north-east section, opposite the entrance hall, there is a restaurant which can be entered by the public and staff without passing through the stadium. The rooms for athletes, journalists, organizers, equipment and technical services are located on a floor below the spectators' circular gallery. The warm-up hall, 24 m. x 17 m. in area and 7 m. high, is below the spectators' entrance hall. It is reached by a ramp from inside the stadium.

The 90-ton base-plate under the roof carries a structure which houses the air-conditioning equipment for filtering, warming, humidifying and cooling the air in the stadium. Below it hangs a grid-type ceiling composed of laminated wooden beams. High-pressure mercury vapor lamps are installed at regular intervals in the openings of this grid. They provide a dazzle-free illumination with a vertical power of 1,500 lux.





Floors, surfaced with polyvinyl chloride sheets, were laid on all areas used for sport, including the warm-up hall. At the request of the International Basketball Federation (FIBA), a maple floor was also laid over the playing field area. The heating installation, the caretaker's apartment, changing-rooms, and the club rooms of the municipal sports ground are situated in an adjacent building.



Shooting Range Hochbrück

Architects:

Wolfgang Kleibömer,

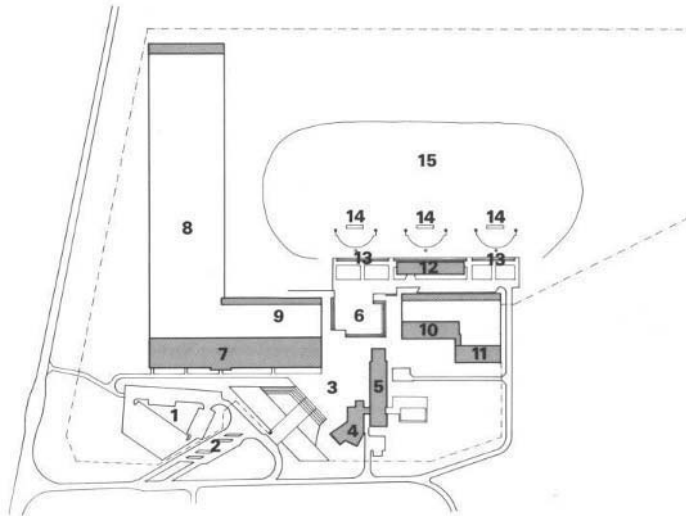
Hamburg/Munich

Michael Eberl, Munich

Erich Stein, Munich

Ground floor diagram

- | | |
|----------------------------------|--|
| 1 Restaurant diners' area | 16 Waiting room for riflemen |
| 2 Kitchen | 17 Booths for UIT moving boar targets |
| 3 Pantry and storerooms | 18 Trial shooting range |
| 4 Doctors' area | 19 Waiting room for victory celebrations |
| 5 Toilets | 20 Room for VIPs and the press |
| 6 Administration rooms | 21 Roofed stands |
| 7 Press subcenter | 22 Open stands |
| 8 Rifle booths | 23 Range for skeet and trap shooting |
| 9 Spectator seats | 24 Slit-trenches |
| 10 Judges' room | 25 Safety bunker |
| 11 Technical equipment area | |
| 12 Toilets | |
| 13 Entry hall | |
| 14 Pistol booth | |
| 15 Service corridor and magazine | |



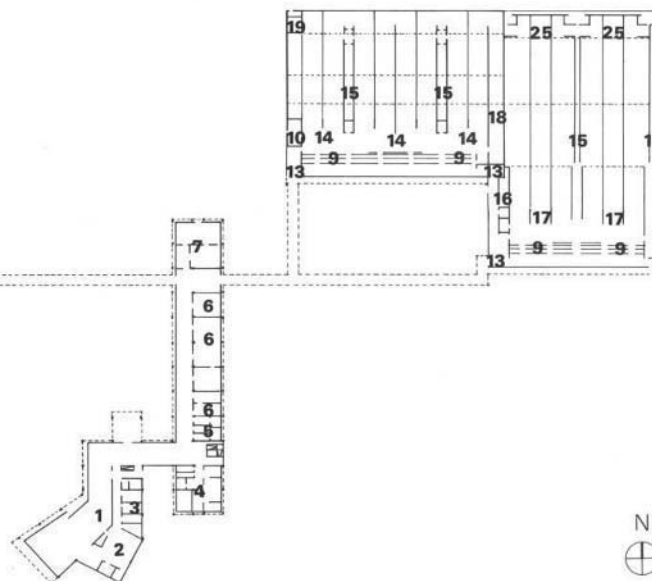
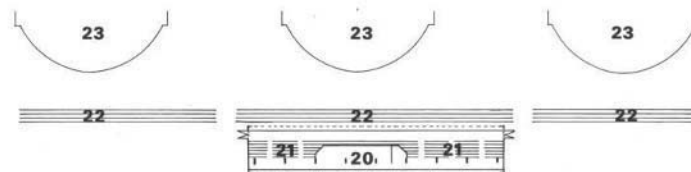
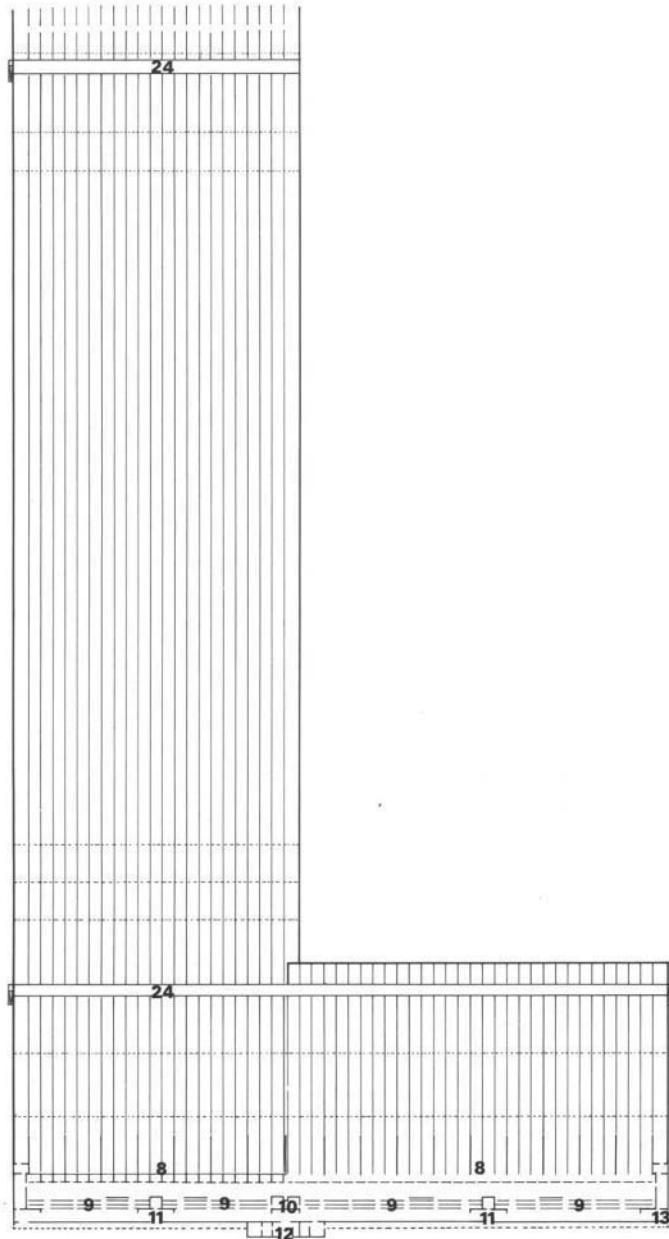
Layout diagram

- | |
|--|
| 1 Parking lot for passenger cars |
| 2 Parking lot for buses |
| 3 Plaza |
| 4 Restaurant |
| 5 Administration buildings |
| 6 Victors' ceremony area |
| 7 Gun storage building |
| 8 300-meter range |
| 9 50-meter range |
| 10 Pistol shooting range |
| 11 UIT moving boar target range |
| 12 Covered stands for the skeet and trap range |
| 13 Open stands for the skeet and trap range |
| 14 Skeet and trap position |
| 15 Security area for the skeet and trap range |

As in the case of all sports sites outside Olympic Park, the choice of a site was preceded by extensive investigations. Although shooting as a sport has a long tradition among the rural population of Bavaria, as is evidenced by the number of rifle clubs in this region, no community wanted to have the large Olympic range in its immediate vicinity for fear of disturbance by the noise. The terrain that was finally chosen, to the north-east of Munich in open woodland and far enough away from the next village, Hochbrück, can be regarded as ideal both with respect to its situation and non-interference with the environment.

The site is about seven km. from the Olympic Village and is easily reached by car or bus via Highway No. 13. The shooting ranges, ancillary buildings, and the necessary safety zones cover an area of about 43 acres. The permanent parking lot in front of the buildings was reserved during the Olympic Games for organizers and guests of honor. Temporary parking lots were provided in addition.

Visitors arrive by way of an attractively laid out approach at the forecourt, which extends to the north towards the square for awards ceremonies. Four different areas are grouped around this square. The rifle hall, 127 m. in length, is at the west. The 50 meter small-bore shooting ranges are situated near the square. The 300 meter ranges form the boundary of the terrain beyond the hall towards the highway. To the north, open to the landscape, are the three installations for skeet and trap shooting. The halls for the pistol range and for moving targets are situated to the east. The three-story building for organization and the participating teams, adjacent to the square, constitutes the southern boundary of the range. On the ground floor there is a restaurant with a terrace in front.



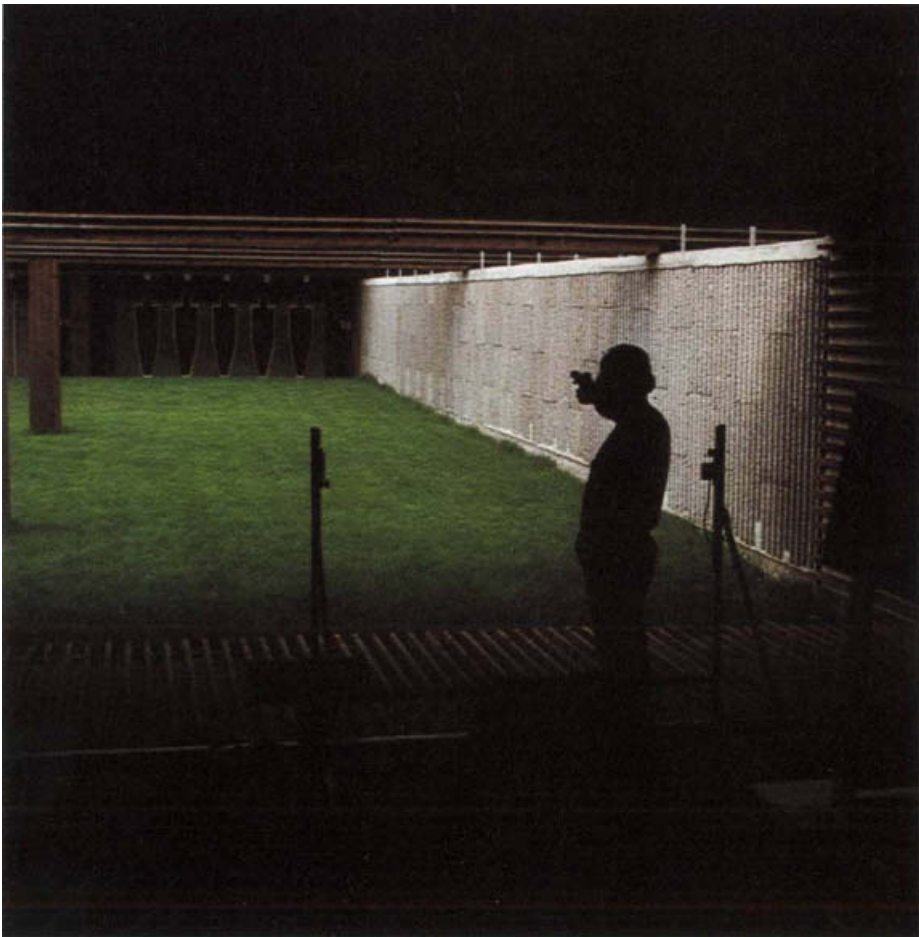
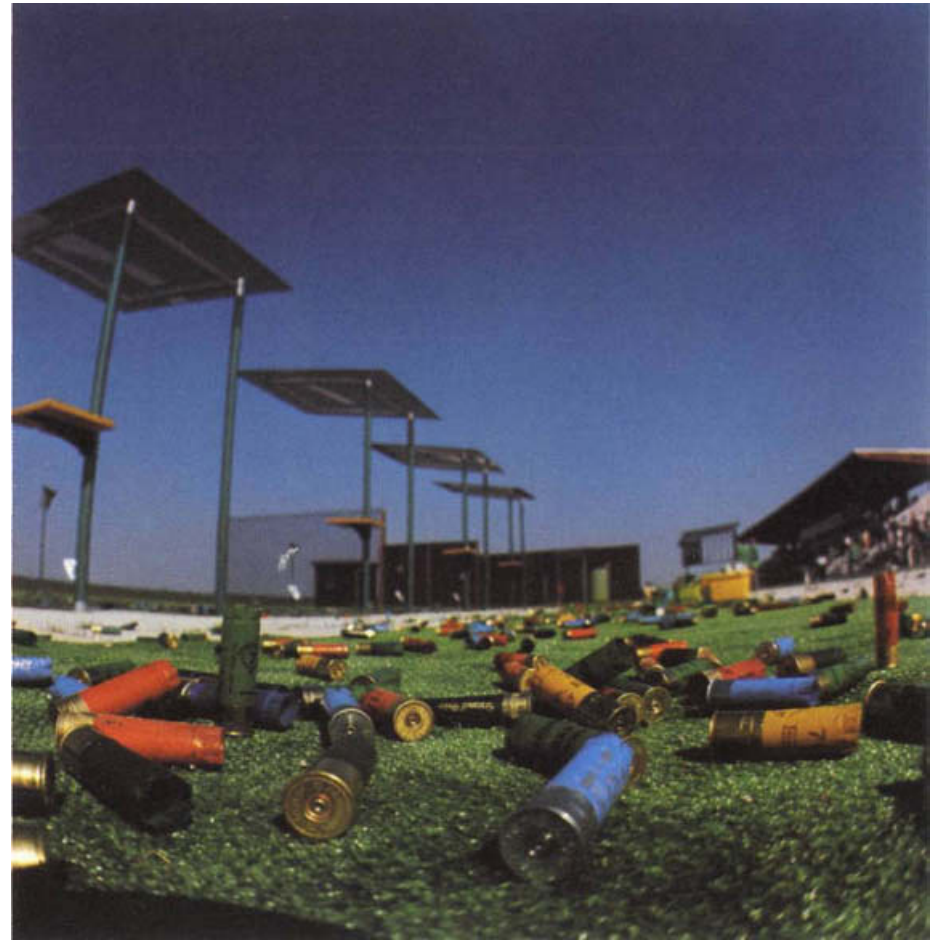




Scoring in the competition area itself was carried out manually in the case of skeet and trap shooting. In the halls for rifle, pistol and moving target shooting it was performed partly electronically and partly by telewriter. The final results were posted by hand on large scoreboards on the back wall of the grandstand and on the walls of the shooting ranges which faced the square where the awards ceremonies took place.

All Olympic shooting events were attended by large numbers of spectators. As was to be expected, most of these visitors were attracted by the skeet and trap contests. Provision had been made for them in a covered grandstand with 2,000 seats, including 600 seats for guests of honor, journalists and commentators. A certain number of seats were also provided behind the shooters in the covered ranges. Usually they were overfilled, so that many spectators had to stand crowded against the rear wall of the range. Nevertheless, they showed great discipline and maintained absolute silence in order not to disturb the shooter concentrating on his target. Communication by signals functioned very smoothly. It was only occasionally interrupted by a short dialogue between the referee and a shooter.

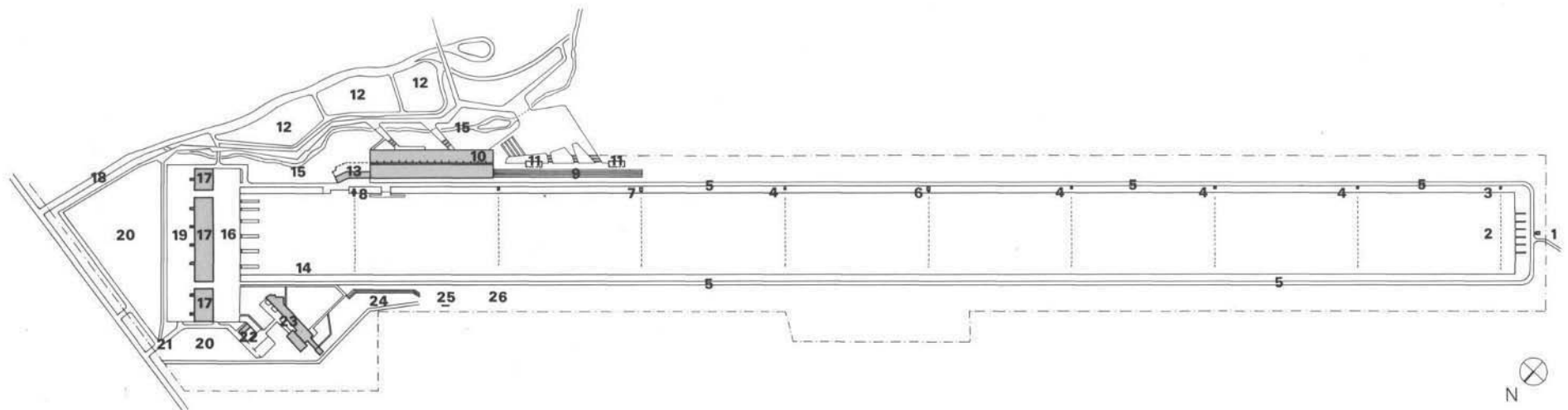




Particular attention was devoted to safety and sound proofing. German building codes require that shooting ranges must be constructed in a way which prevents unskilfully fired bullets from leaving the range. For this reason, the lawn bearing ground layer was sieved prior to sowing the grass in order to eliminate any hidden stones which might divert bullets in uncontrollable directions. Staggered protection screens were mounted above the shooting ranges.

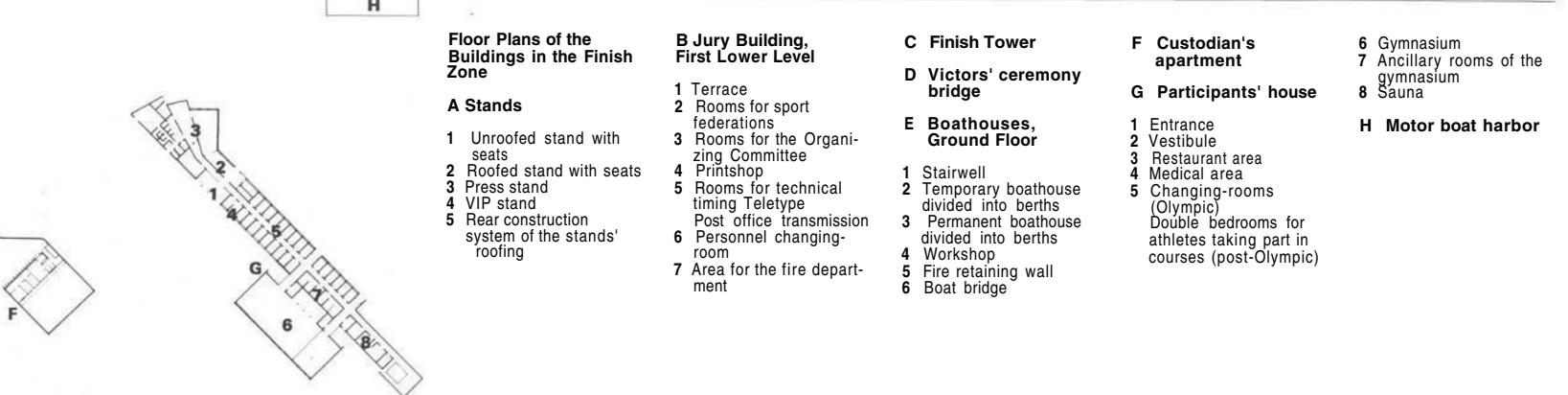
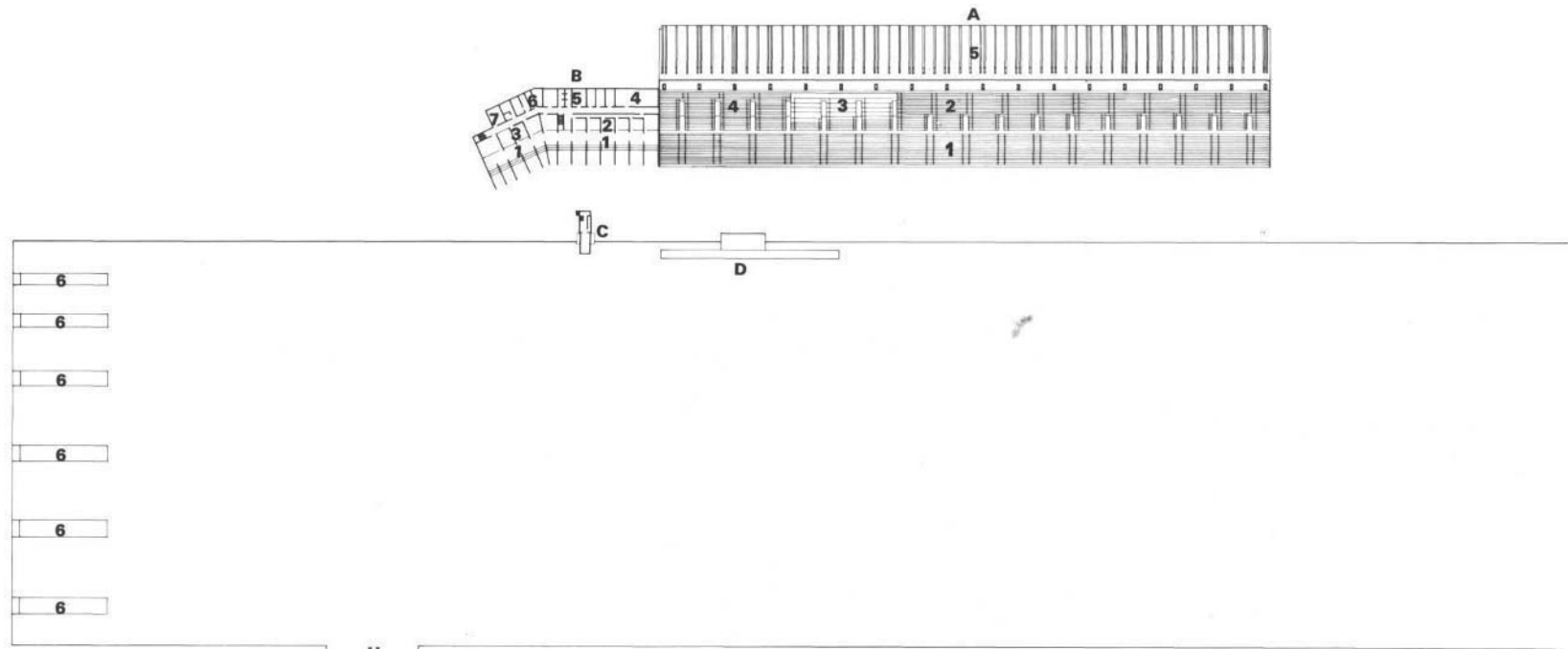
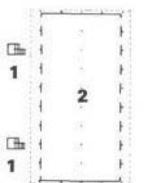
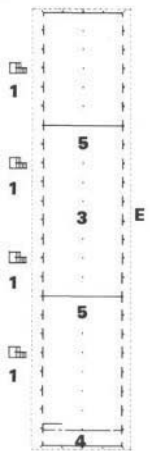
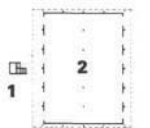
To minimize noise, the rifle halls were fitted with sound absorbing walls. In the pistol halls additional double dividing walls of sound absorbing material were installed after every second stand.

Regatta Course Oberschleissheim
 Architects:
 Michael Eberl and Erich Stein, Munich



Layout diagram

- | | | |
|---|--|--|
| 1 Rowing starting tower | 9 Standing room stands | 21 Entrance for participants and organizers |
| 2 Rowing starting line | 10 Stands with seats, partially roofed | 22 Custodian's apartment |
| 3 Starter's house | 11 Toilets | 23 Participants' house |
| 4 Middle timekeepers' house | 12 Parking area | 24 Participants' stand |
| 5 Towpath | 13 Jury building | 25 Mobile Scoreboard |
| 6 Starting line for the 1,000 m. canoeing event | 14 Motor boat harbor | 26 Temporary standing room on the embankment |
| Middle point for the 1,000 m. rowing event | 15 Schwebel Brook | |
| 7 Starting line for the 500 m. canoeing event | 16 Saddle area | |
| Middle point for the 1,500 m. rowing event | 17 Boathouse | |
| 8 Finish tower | 18 Entrance street for spectators | |
| | 19 Parking area for boat trailers | |
| | 20 Temporary parking area | |



Floor Plans of the Buildings in the Finish Zone

A Stands

- 1 Unroofed stand with seats
- 2 Roofed stand with seats
- 3 Press stand
- 4 VIP stand
- 5 Rear construction system of the stands' roofing

B Jury Building, First Lower Level

- 1 Terrace
- 2 Rooms for sport federations
- 3 Rooms for the Organizing Committee
- 4 Printshop
- 5 Rooms for technical timing Teletype Post office transmission
- 6 Personnel changing-room
- 7 Area for the fire department

C Finish Tower

D Victors' ceremony bridge

E Boathouses, Ground Floor

- 1 Stairwell
- 2 Temporary boathouse divided into berths
- 3 Permanent boathouse divided into berths
- 4 Workshop
- 5 Fire retaining wall
- 6 Boat bridge

F Custodian's apartment

G Participants' house

- 1 Entrance
- 2 Vestibule
- 3 Restaurant area
- 4 Medical area
- 5 Changing-rooms (Olympic)
- 6 Double bedrooms for athletes taking part in courses (post-Olympic)

- 6 Gymnasium
- 7 Ancillary rooms of the gymnasium
- 8 Sauna

H Motor boat harbor

In order to meet the requirements of the International Sport Federations for Rowing and Canoeing in respect to water and wind conditions, the Olympic Construction Company first investigated the Upper Bavarian lakes as to their suitability for the Olympic rowing and canoeing events. They proved to be unsuitable because of the prevailing wind conditions and variations in the depth of the water. It was therefore necessary to construct an artificial course. On account of the size of such a course, a location had to be found which fulfilled the following requirements: short distance from the Olympic Village at Oberwiesenfeld, good transportation facilities, level ground without steep gradients, a high level of subsoil water, and a reasonable price for the land. These requirements were met by the locations Königsdorf in the south and Zenger Moos, Eching and Feldmoching/Oberschleissheim north of Munich, and most suitably by the latter.

The architects who won the first prize in a limited architectural competition, succeeded in designing buildings which harmonize with the extensive landscape of the Dachau Moor. The typical hedges and rows of bushes and the stream which flows into the Schleissheim Schloss canal have provided the motif as in the neighboring Schleissheim Schloss Park, and have been utilized as elements for proportioning and delimiting the area concerned. The three large groups of buildings at the finish of the course bring the long stretch of water to an end and, with their roofs sloping down towards the water, make a fitting termination to the course. The building materials of steel, concrete and laminated wooden beams are largely hidden by roofs of grey-green wood.

The feature of the regatta installation that makes the strongest mark on the landscape is the artificial watercourse, which runs from south-west to north-east. It is 2,230 m. long and 140 m. wide; its depth is 3.50 m. throughout for all tracks. In order to minimize wash, the banks on each side slope away from the water with an even gradient of 1:6.

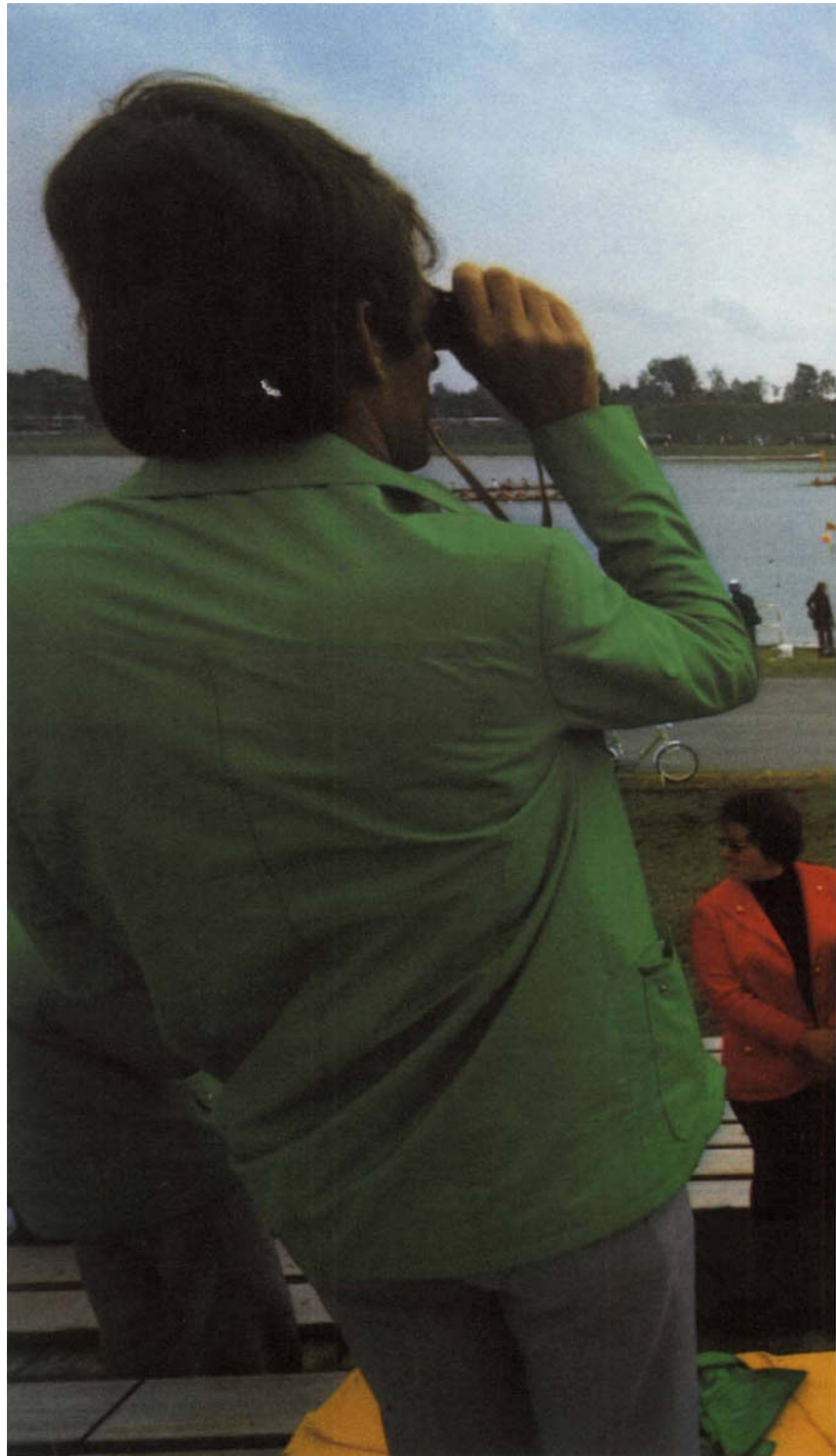
Reasons connected with sport did not permit any curves or sharp bends to be made in the course, either before or after the start to finish stretch. The excavated material was used for the embankments for the grandstands, a highway under construction in the vicinity, and for a panorama hill 1 km. away. The channel is filled with ground water, which is not far below the surface. Its level drops by about 5 m. from the start to the finish of the course, so that the channel had to be dug correspondingly deeper at the starting end. The start area is a basin formed by the two lateral banks and the terminal bank of the channel. At the end of the basin is the starting tower. This tower, the aligning house at the starting line, and the starting towers for canoes at 1,000 m. and 500 m. are the only buildings on the long course before the finishing area is reached.





As the rowers leave the enclosing banks of the starting basin, the landscape flattens out more and more while the course continues. Nothing may be planted in a zone 65 m. wide on each side of the course, in order to ensure uniform wind conditions for all six rowing lanes. Behind these zones, at varying distances from the course, typical trees and shrubs grow singly or in groups or rows, the birches standing out particularly in contrast to the blue surface of the water.

In the direction of the finish, the land is completely flat and only raised above the level of water in the channel by the difference in height between its surface and the level of the ground water. The area around the finish is a large open space enclosed by the grandstands on the eastern bank, the boathouses at the head of the channel and the buildings for competitors situated at an angle on the western bank. The higher level of this area is further accentuated by the sharply indented roofs.





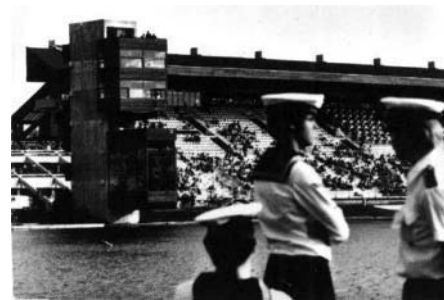
Located only 7.5 km. from Oberwiesefeld, the site presented no traffic problems after improvements had been made at the feeder roads. A further advantage is the proximity of the suburban railway station of Oberschleissheim. The parking places are enclosed by hedges and separated from the actual regatta grounds by a stream which has been diverted. From this parking area, visitors arrive at the rear of the main grandstand.



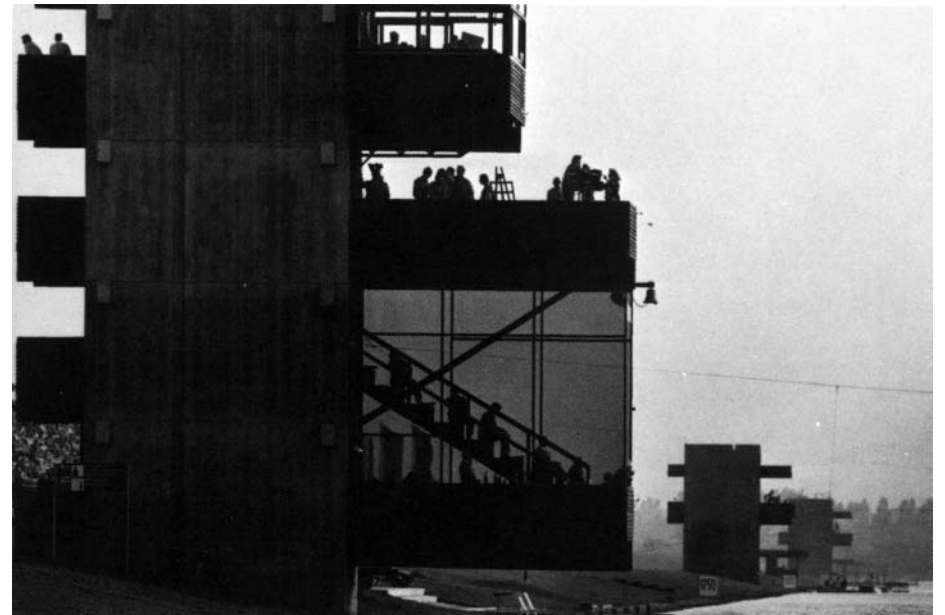
The steel beams of the framework of the grandstand are enclosed in wood and form a kind of arcade, roofed over above a certain height and leading to the three floors of the stand. Spectators occupy the first floor, guests of honor and the press use the second, while the top floor is reserved for radio and television commentators and their equipment. A post office, restaurant, first-aid station and toilet facilities are located on the spectators' floor, where there is also a boat exhibition showing the development of rowing boats and canoes. The grandstand has 8,000 seats, half of which are covered by a roof which projects as far as the middle row. For the Olympic Games, a provisional grandstand with standing room for 16,000 spectators was erected at the starting point.

Finish Tower, view from the southwest

- 1 Finish line judges' room
- 2 TV camera stand
- 3 Photo finish evaluation
- 4 Announcers, Jury
- 5 Upper platform

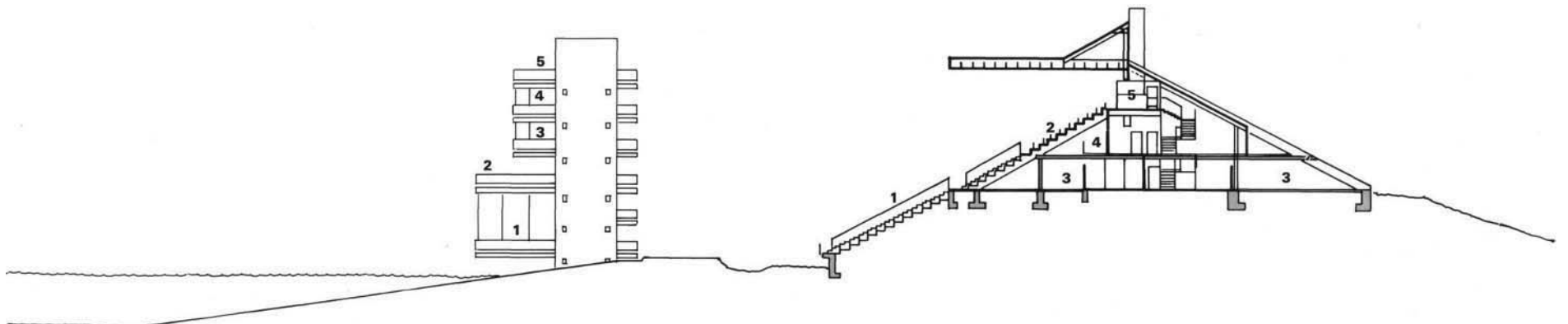


A prominent landmark is formed by the massive concrete finishing tower in front of the grandstand.



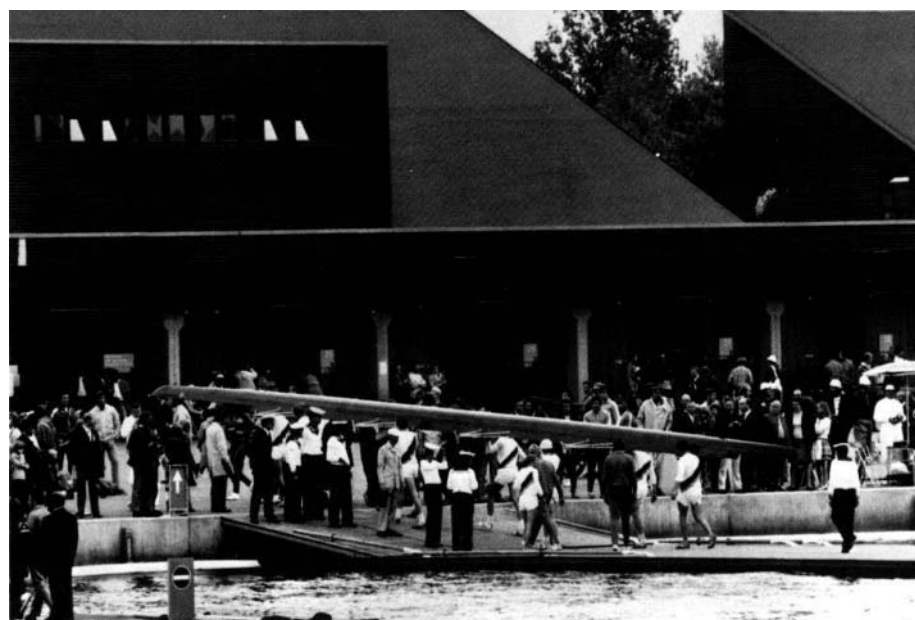
Stands, Section Northwest Southwest

- 1 Unroofed stand with seats
- 2 Roofed stand with seats
- 3 Spectators dividing level, with toilets
- 4 Dividing level, VIPs press, radio and television
- 5 Commentators' places

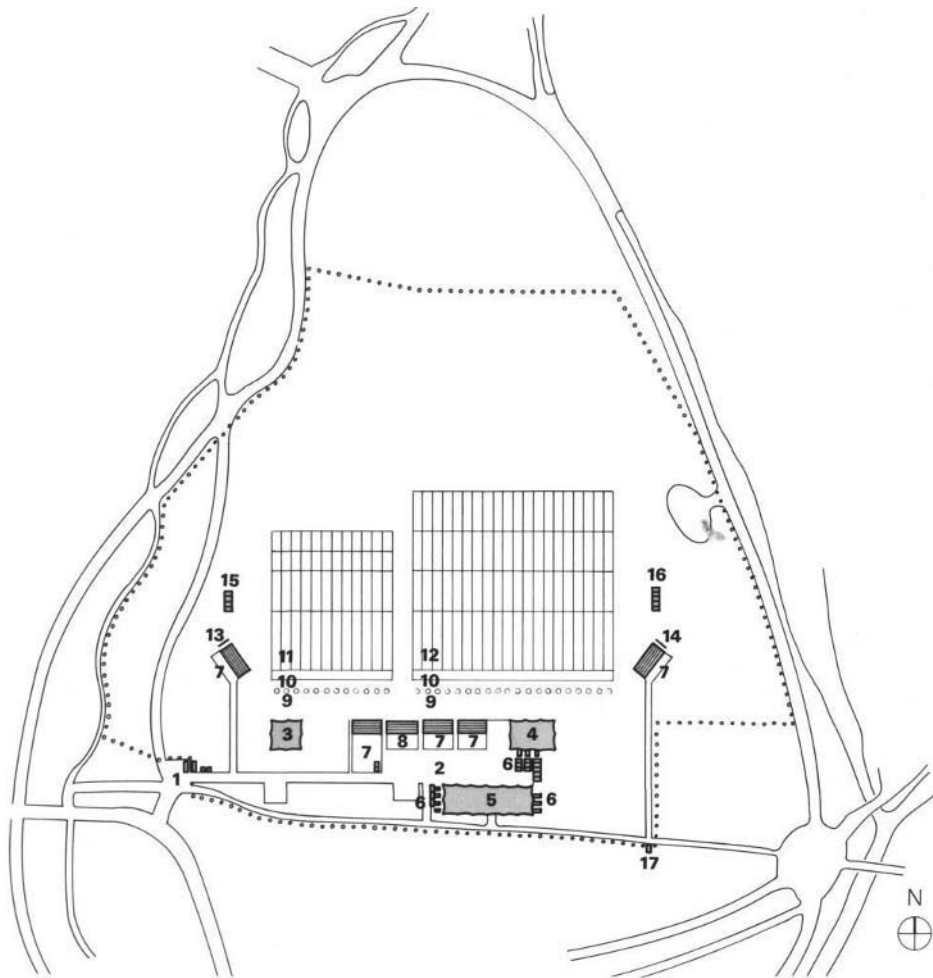


The participants' building which contains changing rooms, medical rooms, a sports hall, a conditioning hall, a sauna and several team rooms, will be used as a training center for rowing and canoeing after the Games. Between the building and the water there are a flat meadow and the athletes' grandstand with 1,000 seats. Adjacent to this grandstand a long wall was piled up and covered with lawn.

During the Games, this wall served as provisional standing room for about 15,000 spectators.



The finish area is bounded on the north-eastern side by three boathouses at the head of the regatta course, a large one flanked on each side by a smaller one, with a space for boat trailers in front of the sheds and a paddock near the water. Storage accommodation for 400 boats is provided in 36 compartments. The changing and massage rooms and sanitary facilities for the competitors are on the upper floor.



Layout diagram

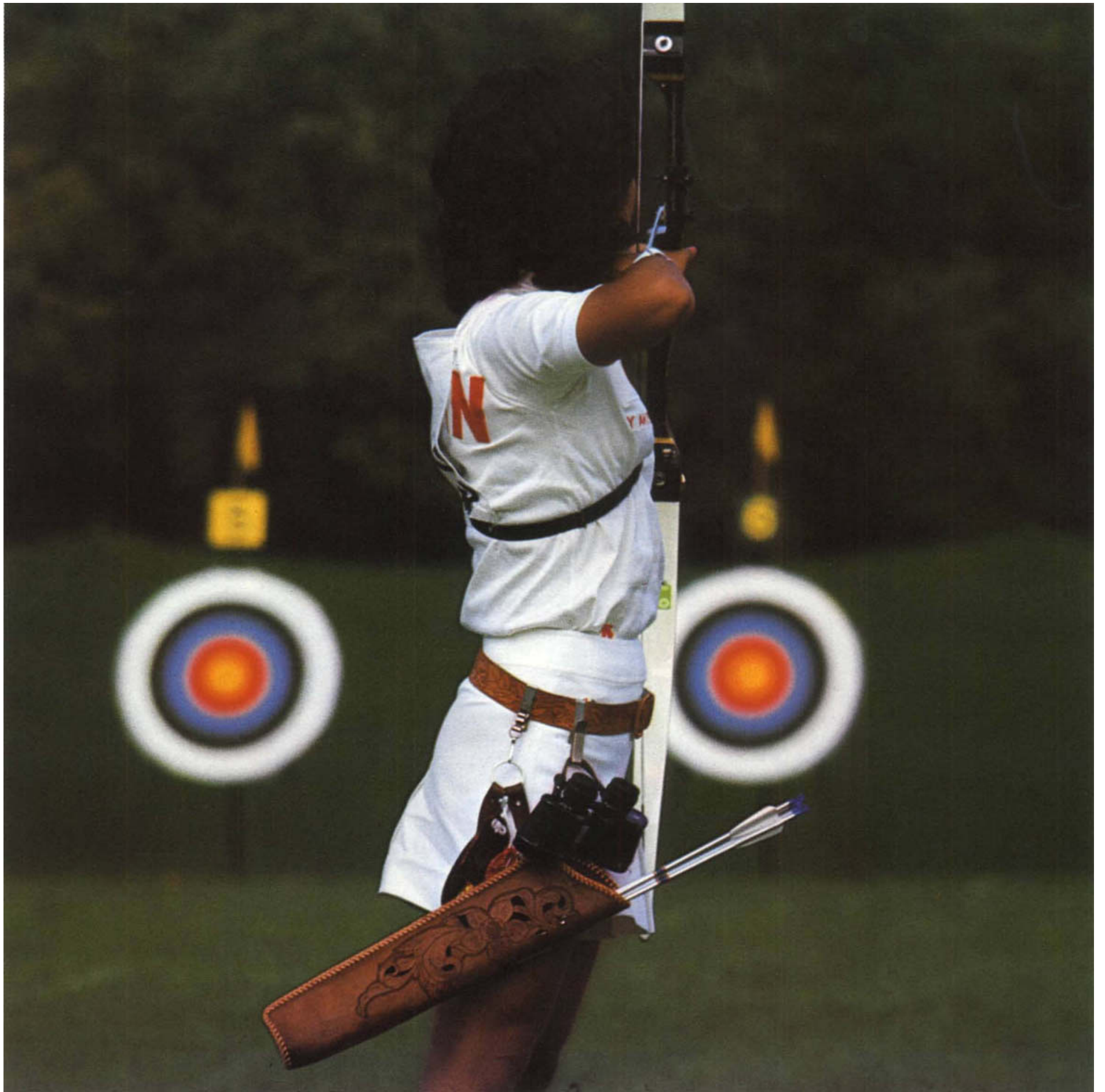
- 1 Main entrance and information
- 2 Spectators' and organization area
- 3 Tent No. 1 women athletes
- 4 Tent No. 2 male athletes
- 5 Tent No. 3 organization
- 6 Toilet facilities
- 7 Grandstands with seats
- 8 Stands for VIPs and the press
- 9 Archers' line
- 10 Shooting line
- 11 Shooting range - women's competition
- 12 Shooting range - men's competition
- 13 Individual scoreboard - women's competition
- 14 Individual scoreboard - men's competition
- 15 Evaluation and scoreboard overall women's competition
- 16 Evaluation and scoreboard overall men's competition
- 17 Control side entrance

Although at first sight an English landscape garden and the sport of archery hardly seem to have anything in common, both are colored by the hue of history.

Archery has been known from classical times, primarily as a means of war. In the late Middle Ages it became a favorite sport at the courts of kings and nobles and continued to be so up to the 19th century. The idea of the English landscape garden was not born until the end of the 18th century. It was an attempt to replace the strictly formal gardens and parks which had been the fashion up to that time by a garden that imitated the informality of nature through intentionally planned hills and hollows, winding paths, groups of trees and bushes, brooks, and lakes with inlets and islands. Games, riding, hunting, and people enjoying their leisure imparted life to these artificial landscapes. The Munich "English Garden" was no exception. A colorful archery tournament in this park was certainly quite a normal event for its architect and creator Ludwig von Sckell.

The planners of the Olympic archery range of 1972 thus had little trouble in unobtrusively suiting and adapting the necessary facilities for competitors, spectators and organizers to the character of this landscape garden without impairing it. Rather, they emphasized it. And thus, for a short time, the Olympic archery event became an integral part of the "English Garden".



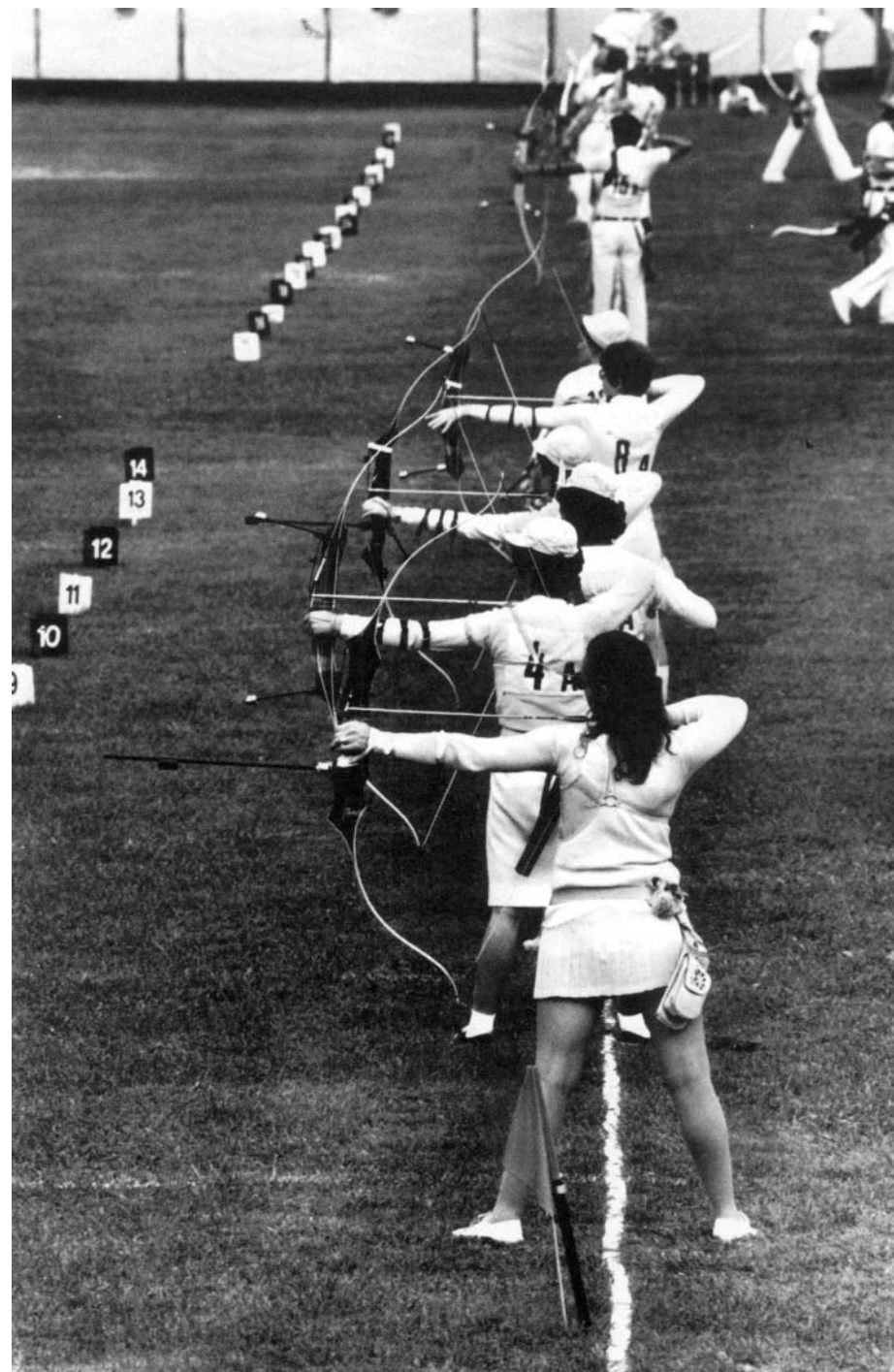
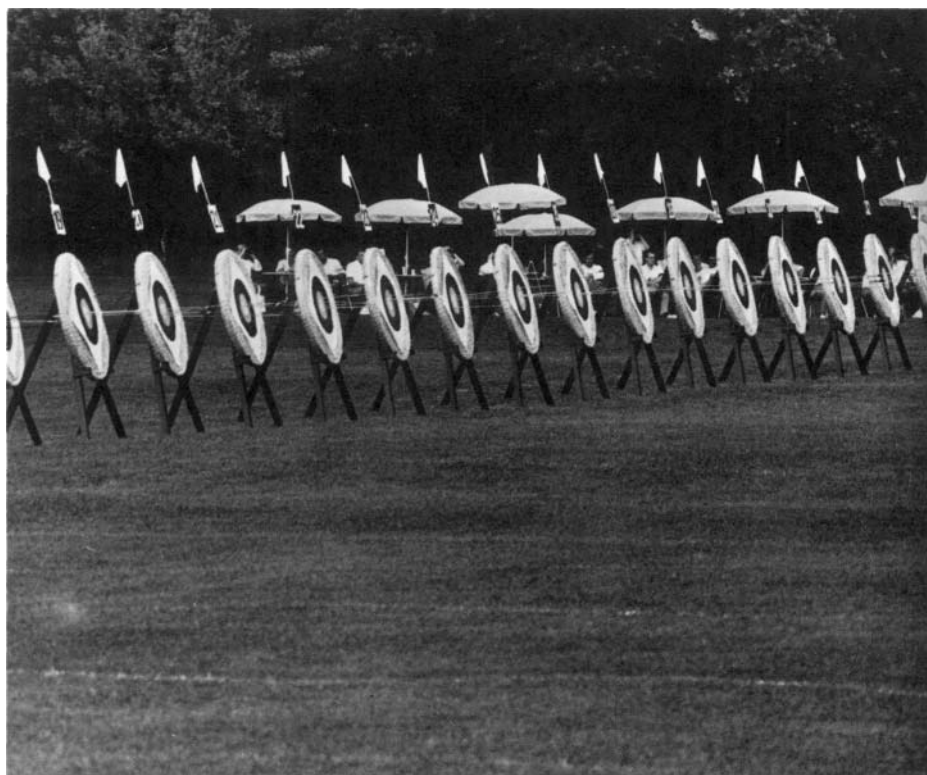
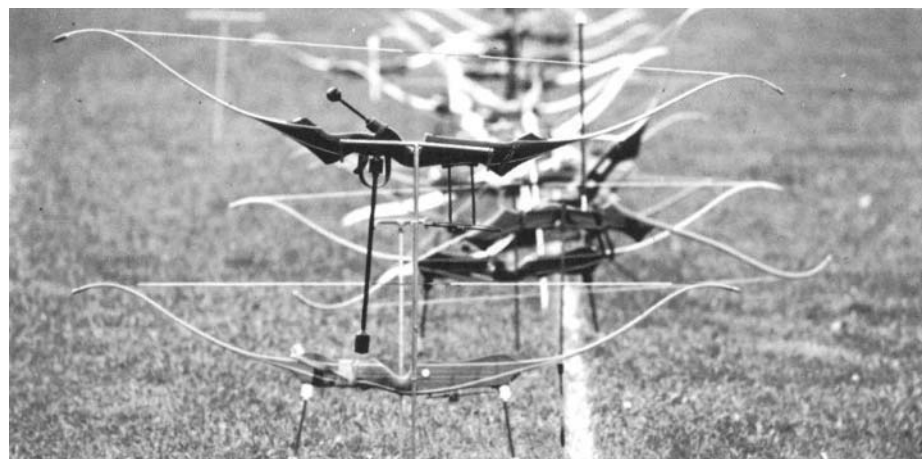


Archery Range
English Garden

The Olympic archery range was constructed, as a provisional installation, on the Werneck meadow south of the Kleinhesseloher lake.

It covered about 5,000 sq. m. and was approximately square in shape. In accordance with the regulations for this sport, the targets were situated on a level meadow so that the competitors faced them from south to north, in order to reduce dazzling by the sun to a minimum. The southern end of the range was terminated by the informally grouped auxiliary buildings, constructed of prefabricated wooden and metal components and roofed over with light-grey awnings. Standardized partitions or cells made of asbestos cement panels were used for the interior walls.

These so-called "flying buildings" (a term used in German building regulations to distinguish them from permanent buildings) housed the organization staff, changing rooms, press and film offices, a snack bar and a first-aid station. The toilets consisted of prefabricated units. The most important rooms for the event were located adjacent to the competition area.





Viewed from the grandstands at the end, the range was divided into four rows:

First came the bright green umbrellas, 2 m. in diameter, which gave welcome shade to the competitors when they rested in the intervals. Chairs and a table for groups of three archers were provided under each umbrella. The second row was formed by the stands for holding the bows, the third by the dividing line from which the competitors shot at the white targets. These, with their blue and red circles, far away and slightly tilted, made up the fourth row.

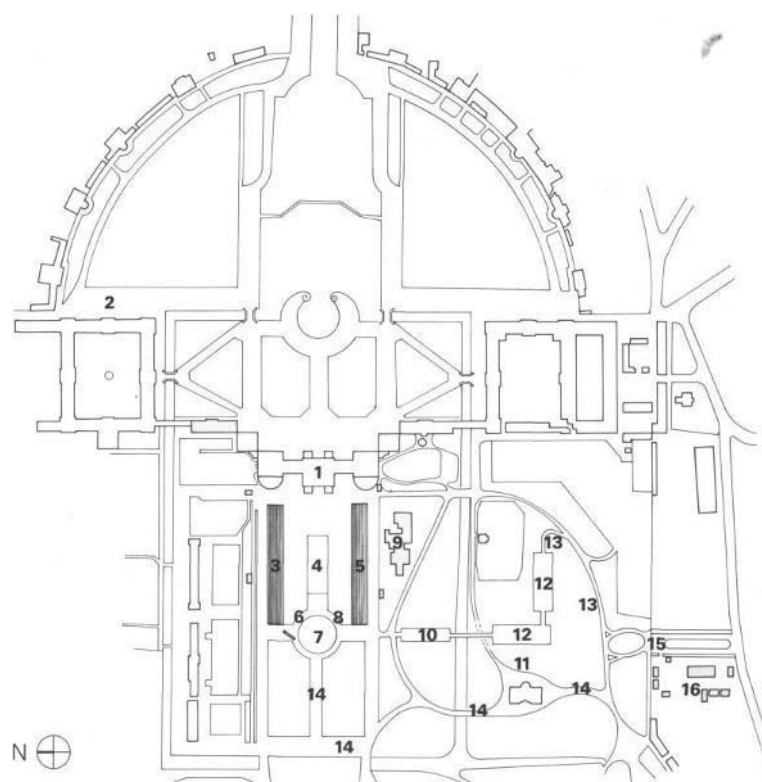
The different shooting distances, from 30 m. to 90 m. were arranged by moving the targets.

Signal lamps were set up on both sides of each range adjacent to the archers. These, together with acoustic signals, indicated the time of preparation and the moment to start shooting, the warning that shooting

time was about to end, and the end of shooting time. After each round of shooting, the archers went to the targets to collect their arrows, after the referee had determined the number of hits.

These buildings were separated from the field of competition by four low grandstands with seating accommodations. One of them, the stand for guests of honor and the press, was covered with a yellow awning. Two other open stands with seats were located at an angle to the two ranges, so that a total of 1,100 spectators could be accommodated. All grandstands offered the spectators a good view of the two ranges. The larger range at the east for men, with twenty targets, was located a short distance away from the smaller range to the west for women, with twelve targets.

Dressage Facility Nymphenburg
 Architects:
 Atelier Kleineichenhausen
 Peter F. Miller and Associates,
 Kleineichenhausen



Layout diagram

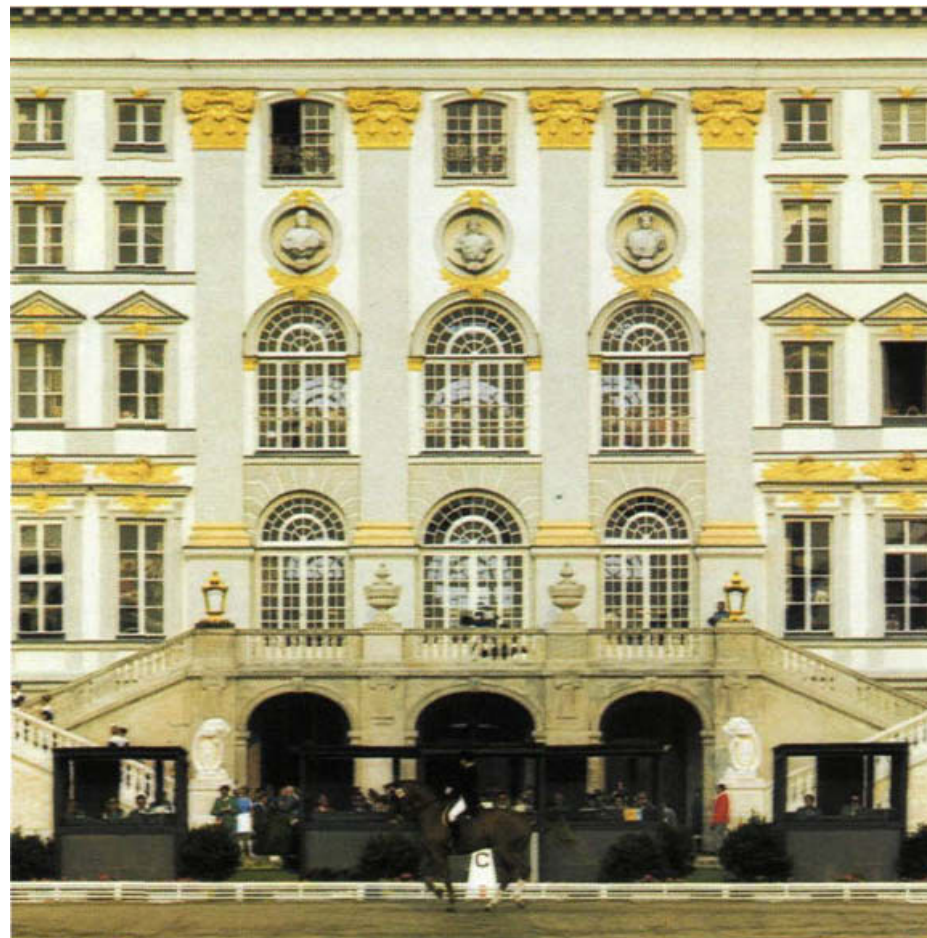
- 1 Nymphenburg Palace
- 2 Sports organization in the School of the Order of the Blessed Virgin Mary
- 3 Northern stands
- 4 Contest area 20 m. x 60 m.
- 5 Southern stands
- 6 Contest area exit
- 7 Fountains
- 8 Contest area entrance
- 9 Temporary buildings for press, radio and television
- 10 Stand-by area 13 m. x 50 m.
- 11 Amalienburg
- 12 Riding area 20 m. x 60 m.
- 13 Bridle path from the stables to the contest area
- 14 Bridle path from the contest area to the stables
- 15 Parking area for the organization and horse transporters
- 16 Temporary stables



The palace of Nymphenburg, the former residence of the kings of Bavaria, provided a brilliant setting for the Olympic Grand Prix de Dressage. The temporary facilities for competitors and spectators were created without making any extensive alteration of the general picture of the palace grounds. It was possible to arrange the whole competition area, including the accommodation for spectators, on the lower level of the French Garden. The arena itself, measuring 20 m. x 60 m., lay between the central facade of the baroque palace and the large fountain without disturbing their axial relationship. Thus the dressage events could be held at a place which had witnessed many other colorful gatherings in its history.

The riders began their preparation for the event after the horses had been transported from their quarters in Munich-Riem to temporary stables in the large Zuccalli Garden in the palace park. These stables could hold twenty horses at a time. Tent stables were put up for horses waiting to be returned to Riem after the events. The route for the competitors and their horses went in a curve from the south wall of the park through the English Garden to a large clearing which was used as the first practice arena. From here, there was a good view of the small rococo palace of Amalienburg. Up to here, the riders followed the normal pathways of the park, but from this point specially laid paths made of a mixture of sand and sawdust led to the arena. The second practice arena lay more or less at a right angle to the first, with its long side facing the Amalienburg Palace. Here a first impression could be gained of the harmony of the riders and horses with the historical buildings and park landscape.

A wooden bridge connected the practice arenas to the competitors' assembling point, which is lined on its longer sides by high beech trees.



The horsemen emerged from this shady spot onto the lawns of the palace gardens, riding past the large fountain to reach the dressage arena.

Two grandstands, each seating 4,000 spectators, were erected at a distance of 20 m. from the long sides of the arena and rose as high as the tops of the chestnut trees which form avenues separating the formal French Garden from the parkland of the English Garden. Immediately behind the south grandstand, sheltered by trees and nestling between the bushes, were the wooden pavilions for press, radio and television reporters.

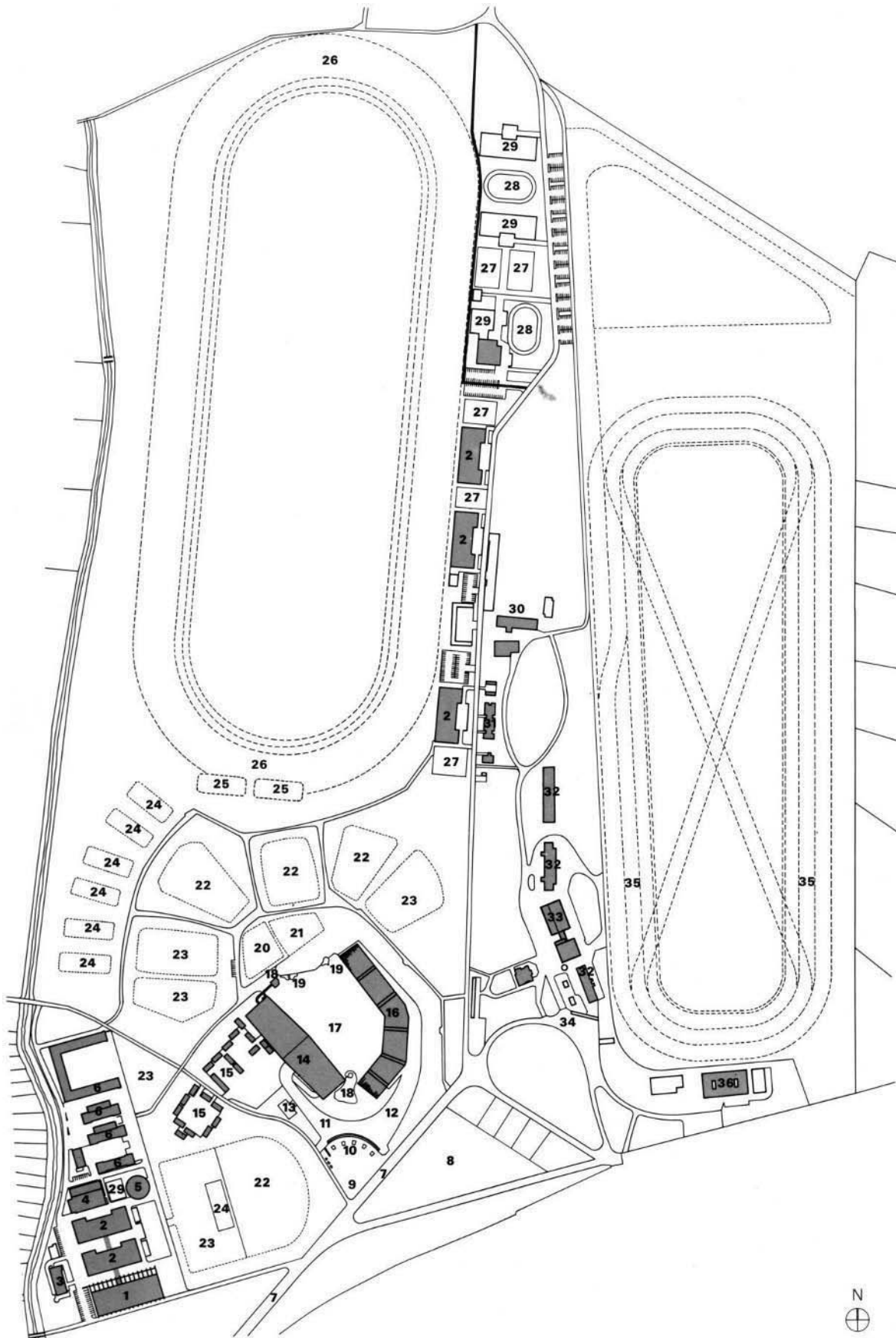
In the dressage competition, the horses and their riders drew skilfully executed designs in the sand of the arena, watched from both sides by crowds of gaily dressed spectators, some of them under slightly vaulted awnings of transparent sheeting. With the green trees in the background, the straight lines of the canal on one side and the graceful symmetry of the palace on the other, the whole scene presented a picture in which the courtly atmosphere of bygone days was successfully combined with the Olympic Games of modern times.



Riding Facility in Riem

Architects:
Atelier Kleineichenhausen
Peter F. Miller and Associates,
Kleineichenhausen

Landscape planning:
Heinz-Willi Hallmann, Henning Riese,
Christian Habeck



Layout diagram

- 1 Large riding hall
- 2 Olympic stables
- 3 Casino
- 4 Small riding hall
- 5 Performance circle
- 6 Old stables of the Racing Club
- 7 Landshamer Strasse
- 8 Temporary parking lot
- 9 Stadium plaza
- 10 Ticket window area
- 11 Access ramp to the main grandstands
- 12 Access ramp to the grandstand rampart
- 13 Branch post office
- 14 Sheltered stands
- 15 Temporary buildings for the organization
- 16 Open rampart
- 17 Inner area of the stadium
- 18 Judges' tower and scoreboard
- 19 Pond
- 20 Stand-by area (grass)
- 21 Preparation area (sand)
- 22 Jumping area (grass)
- 23 Jumping area (sand)
- 24 Dressage area (sand)
- 25 Temporary jumping area (grass)
- 26 Training track for galloping
- 27 Exercise area (sand)
- 28 Exercise area (grass)
- 29 Stables of the Racing Club
- 30 Farm buildings
- 31 Trainers' living quarters
- 32 Old grandstands of the Racing Club
- 33 New grandstands of the Racing Club
- 34 Entrance to the galloping track
- 35 Galloping racetrack
- 36 Infirmary stable

Original planning called for the provision of temporary competition facilities for all equestrian contests with the exception of the "Prix des nations", which was to take place in the Olympic Stadium. The horses were to be sheltered and trained in Munich-Riem on the grounds of the Munich Riding Club and the Riding Academy. A temporary stadium for 30,000 spectators was to be built south of Olympic Park, west of the Olympiaberg.

In Riem the stables, two riding halls, two race tracks and a two-hectare horseshoe shaped area for jumping and training were already available. However, later investigations showed that the greater portion of the stables were no longer adequate for contemporary requirements.

While a renovation of the Riding Club's stables was sufficient, it was still necessary to build eight new stables for some 400 additional horses. The eighty horses for the pentathlon on the other hand were to be sheltered in a temporary stable.

The repair of the larger riding hall was no longer feasible. It had to be torn down because of structural weaknesses due to age. In its place a 30 m. x 75 m. hall was built which contains 1,500 seats intended especially for post-Olympic use.

The southern part of the over forty hectares of grounds was chosen as the site for five stables, the northeastern part for three stables for the Riding Club. Nine jumping areas and seven training areas were to be newly laid out for the outdoor facilities.

At the end of 1970, when the construction work on the stables and halls was already in full swing, the Organizing Committee, together with the Bavarian State Ministry of Agriculture, decided to build a permanent 20,000-seat stadium in Riem instead of the temporary stadium in the Olympic Park. This decision necessitated a revision of all plans for the outdoor facilities and an extensive reorganization of the entire grounds, in addition to designing the plan for the riding stadium.

The stadium was placed in a central position and was lined up lengthwise on a north-south axis. A covered grandstand for 8,000 is located on the western side.

Adjoining the southern and eastern sides is an open air embankment for 12,000 seats. In the north, the stadium opens to the free landscape. It will be surrounded by a broad arch of stand-by areas and six jumping areas.

Finally a 54 m. x 23 m. stable for sick or injured horses is located on the eastern side of the grounds. It is equipped with a quarantine section, twenty stalls, an operating room and X-ray equipment.



The Olympic stables can be called model living quarters for horses. They have been designed according to the most up-to-date findings of experts and incorporate all possible conveniences.

Each stable measures 30 m. x 68 m. Laminated wood was chosen for supporting structures. Next to the forty-eight horse stalls are twenty apartments for stable personnel, as well as saddle, feed, hay and straw storage areas, a mash kitchen and facilities to wash the animals.

The horse stalls are lined up along two passages, the first having a row of stalls on each side, the second only on one side. On the other side are located the feed and storage areas and the mash kitchens. At right angles to the passages are connecting passages which divide the area into four clusters, each with twelve stalls. Each of these can be further subdivided into four stalls. This flexibility of layout takes the varying sizes of the participating national teams into consideration. Each stall is a

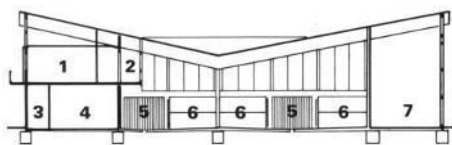
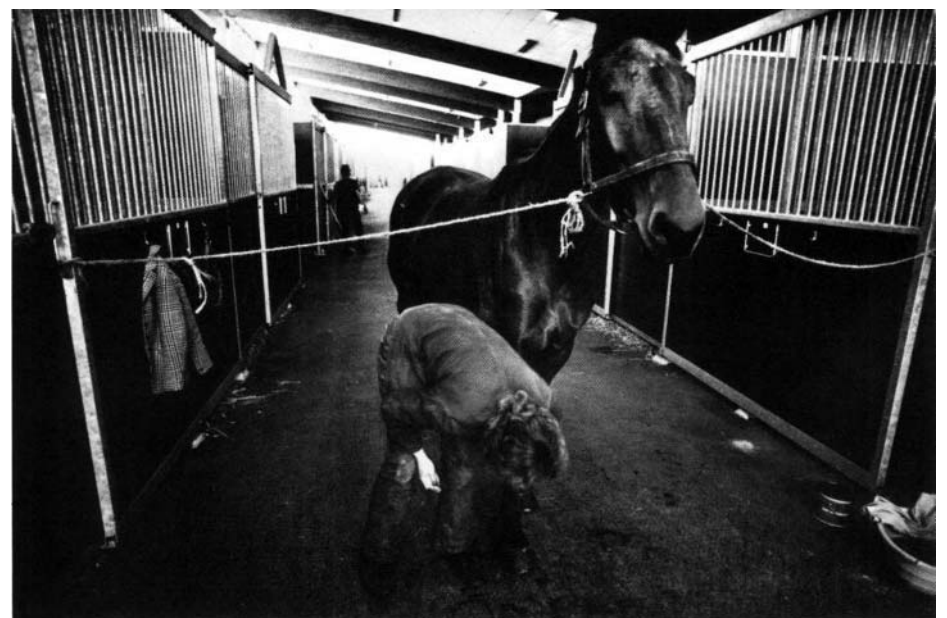
roomy square of 3.50 meters. In addition to partial air conditioning, each stall has a ventilating duct to remove ammonia fumes.

An observation walkway was built along the long side of the stable on the upper story where the grooms have their rooms. From here it is possible to see the entire stable and to watch the horses in their stalls.

A new riding hall of laminated wood construction with a sloping roof was built on the site of the old hall which dated back to the 1930's. Daylight is admitted at the north side by an eight meter wide continuous window covered with translucent plastic sheets. The balanced illumination into the depths of the enclosed area is achieved by an additional narrower strip on the southern side. The plastic panels are concave in order to diffuse the light better.

The hall has seats for 1,500 spectators along one broad and one long side. All necessary facilities such as toilets and technical rooms are located under the bleachers. There is also a ground level store room for hurdles and other equipment at the east end. Visitors can get an overall view of the hall from one of the rider's rooms located on the upper level.

The proper intensity of artificial illumination at 350 to 400 lux is provided by fluorescent lights built into the ceiling.

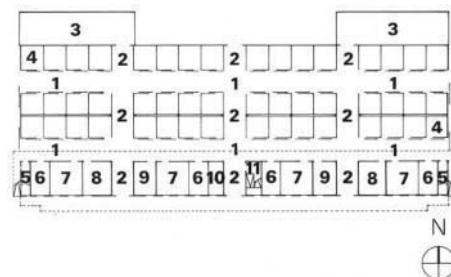


**Olympic Stable
Cross section**

- 1 Jockeys' rooms
- 2 Observation passage
- 3 Archway
- 4 Auxiliary rooms (e. g. fodder room, equipment room)
- 5 Stable alley
- 6 Horse stall
- 7 Store rooms for hay and straw

**Olympic Stable
Ground floor plan**

- 1 Stable alley
- 2 Cross passage
- 3 Storage room for hay and straw
- 4 Horse stall
- 5 Toilet
- 6 Fodder room and mash kitchen
- 7 Saddle room
- 8 Equipment room, ventilation intakes
- 9 Wash box
- 10 Ventilation exhausts
- 11 Staircase





During the Olympic Games, the riding contest of the modern pentathlon, the three-day event, military jumping competition and individual jumping contest were held in the stadium. The military cross-country race started in the riding facility and was completed in the region of Riem/Poing.

The stadium is reached from Landshamer Strasse. By crossing a chestnut tree shaded plaza, visitors approach the ticket booths which are arranged in a semi-circle. Each of the five gates has ticket booths on both sides. The gates are constructed on a central pivot and the ticket booths are set on wheels. When the event is finished, the gates are opened all the way and offer no hindrance to the spectators leaving the arena. Almost the entire semi-circle can be opened up in this manner.

A mound breaks the semi-circle of ticket booths between the second and third gates. It also divides the entrances. On the western side a concrete ramp leads to the covered grandstand, and a ramp at the eastern side leads to the open air bleachers.

The plaza and the ramps are decorated with colored friezes, paintings and figures made of bitumen on the sidewalk. The embankment has two bends in it and extends from the west to the north and east and separates the stadium from the south and east. An artificial pond lies between the embankment and the sheltered stands. This pond, together with two others in the north of the inner area, is part of the course for the modern pentathlon event. This course consists of an eight-meter wide sandtrack, which surrounds an approximately 80 m. x 140 m. lawn area and led over the four to five-meters high longitudinal mound on the northern side.

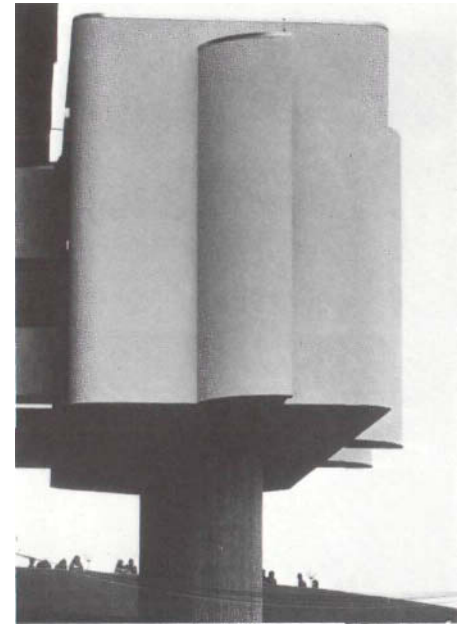


The 137-meter long covered western grandstand is composed of 24 laminated wood sections. The longest beam is a 31-meter cantilevered construction. The symmetrically arched roof is covered with transparent acrylic glass panels because color television requires the contest area to be free of sharp shadows.

The rooms for the organization were located in temporary buildings behind the western grandstand on what will be a parking lot.

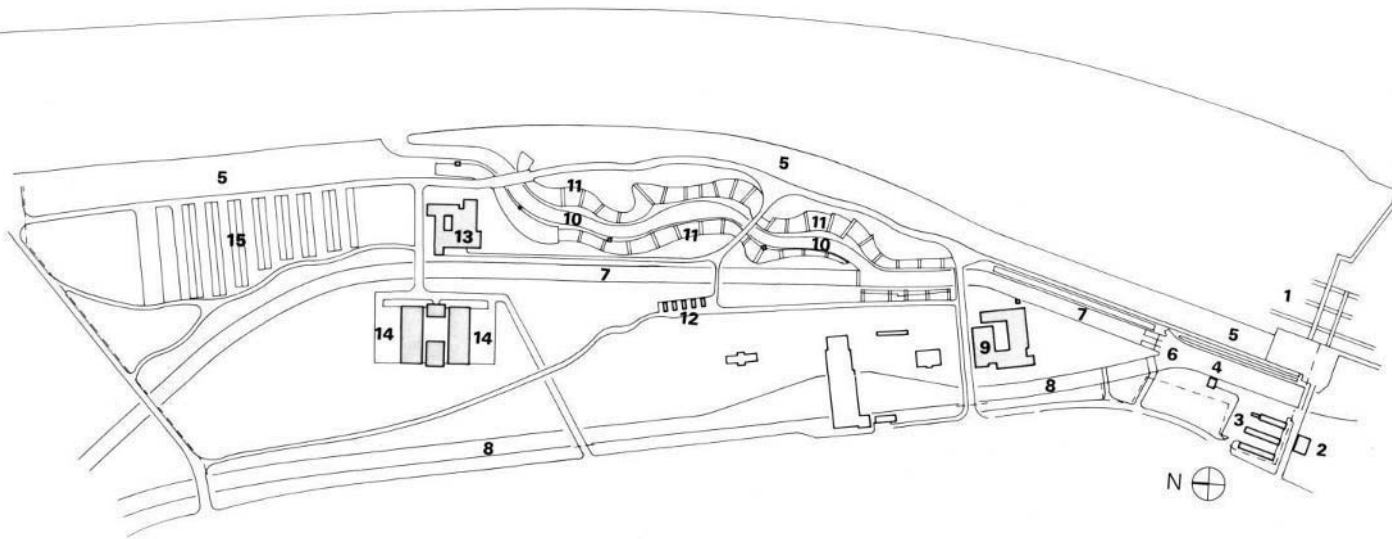
Underneath the grandstands are the business offices with a driveway into the arena. The VIP and press sections are also accessible from here. The spectators reach their seats by climbing the ramps at the entrance to the upper level and walking from there to their places. The second level contains a restaurant. The rest-rooms in the tower to the back can be reached from both levels through a mezzanine. A concrete stairway leads from the northern corner of the first level grandstand to the judges' tower. The Scoreboard is hung from the turret.





Canoe Slalom Course Augsburg

Architects:
Brockel and Müller, Augsburg
Landscape Architect:
Gottfried Hansjakob, Munich



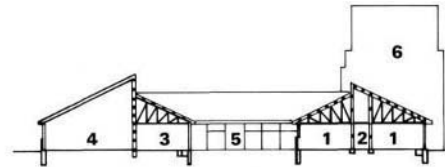
Layout diagram

- 1 High water sluice
- 2 Temporary post office
- 3 Saddle area
- 4 Starting building
- 5 The bank of the Lech River
- 6 Arm bulwark
- 7 Ice canal
- 8 Practice canal
- 9 Press and organization buildings
- 10 Slalom canal
- 11 Spectators' embankment
- 12 Temporary toilet installation
- 13 Restaurant
- 14 Boat houses and shelters
- 15 Parking lot



Boathouses and Living Quarters Cross Section

- 1 Entrance
- 2 Boathouses
- 3 Sanitation area, boat workshops, measuring room, storeroom, sauna, canoe pool
- 4 Saddle area
- 5 Quiet areas (post-Olympic as double bedrooms)
- 6 Sanitary area



Section N-S Organization Building

- 1 Organization rooms
- 2 Corridor
- 3 Press information
- 4 Press workroom
- 5 Inner courtyard
- 6 Judges tower

For the first time ever, the canoe slalom takes its place as an Olympic discipline! Originally it was Munich that was envisaged as the scene of the contests in this fascinating branch of sport, but problems of hydraulics and water control weighed against a construction of this sort on the Isar. The Augsburg "ice canal", formed by the damming of the Lech to the south of Augsburg, and already much used for canoe slalom events, suggested itself as a basis for development. The International Canoe Federation, after investigating the fundamental suitability of this stretch of water, gave its consent to the project, and the International Olympic Committee also finally agreed to the proposition.

In this way it was possible to construct an artificial stretch of water which presents all the hazards of a natural torrent but whose difficulty the organizers of a race can vary by adjusting both the speed of the water and the position of the gates.

The slalom course can be reached in about 30 minutes by special trains from the station at the Munich Olympic Center. It is situated south-east of the city of Augsburg in a near-by recreational area on the west bank of the Lech.

Before construction work began, extensive research was carried out by the department of hydro-engineering of MAN Maschinenfabrik Augsburg Nürnberg in their Gustavsburg works: the lay-out of the course, the type and form of the obstacles for the 660 m. total canal length, were determined with the aid of a 22 m. stretch of water used as scale model. (No alterations were made in the upper section of the canal, but the structure was renewed and it was provided with a triple sluice weir.)

A piece of ground near the start, where a number of ancient chestnut trees were standing, was turned into a stand-by area for the canoeists by the erection of three temporary sheds. The building from which the competitors actually started remains in permanent use after the Olympic Games. Approximately 180 m. below the start stands the administrative building, also used by the press, containing rooms for data processing and evaluation and for interviews. The tower of this building juts out over the canal and permits a view over 80% of the course for television transmissions and direction of the events. Built around a quadrangle, these premises are now, after the Games, the Club Center of the Augsburg canoeing societies. The two-story restaurant, catering for 200, is located near the finish and offers a good view of the course. Grouped around an inner courtyard are, on the ground floor, a snack bar and rooms for restaurant management and administration, and on the first floor the restaurant itself with the kitchen, a terrace facing south built out towards the canal, and an open, roofed-in balcony. During the Games the restaurant was open to competitors, officials and guests of honor; now it may be used by anyone visiting the bathing place situated north of the building.





To the west of the restaurant, under a group of trees, are boathouses and accommodation buildings which contain any accessory rooms and installations required for post-Olympic use as a training center for Canoeing.

The recreational character of the whole area was preserved: the park and the canoe slalom buildings were designed to include the trees already standing. The undulating contours of the site and the steep banks on either side of the canal, together with earth terraces edged with bongossi wood, formed a stadium with standing room for about 25,000 people. Spectators were not tied to any particular section of the stadium, but could move from one place to another during the competitions, all entrance tickets being issued as "promenade" tickets.

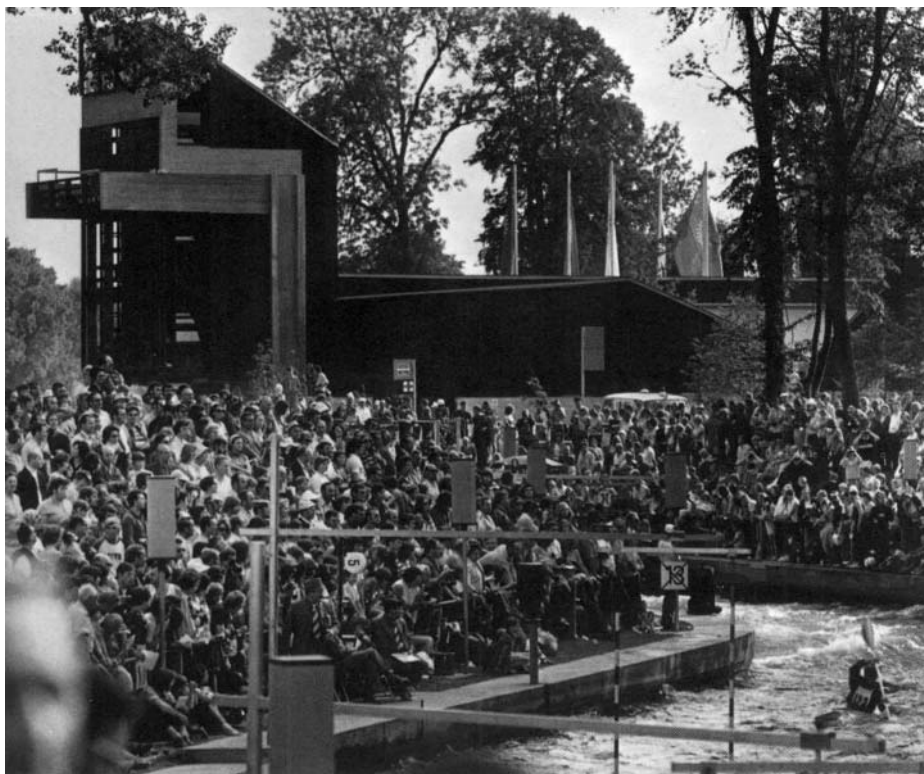
The entrances for spectators were located at the south sluice (the "upper discharge" of the Lech), and at the northern end of the course. The paths for spectators and competitors were kept separate, partly by means of provisionally erected bridges and overpasses. Apart from the transportation of boats between boathouses, starting and finishing points, no traffic is allowed within the area.



Between starting point and finish, the canal drops 3.70 m. over a stretch of 600 m., and the speed at which the water flows may vary between 3 m. and 6 m. per second. The average width of the channel is 10 m. to 12 m., and the depth, 0.40 m. to 1.20 m. 35 concrete blocks produce the back currents, whirlpools and rapids characteristic of a natural torrent. On either side of the canal, there is a 1 m. wide gangway for the organizers who erect the gates and for use by referees and the life-saving team.

In 1971, parallel to the construction work on the canal, permanent and temporary buildings were erected which, because of their design and because the materials used blended with the landscape, were in perfect harmony with their surroundings.

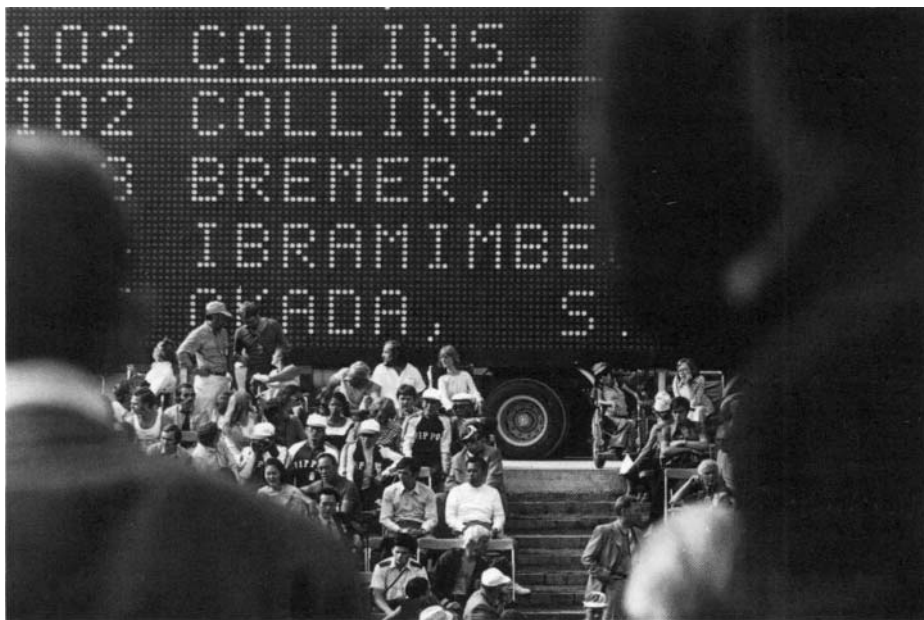




For setting up the gates for the slalom, sockets have been inserted into each side of the canal at three-meter intervals, so that the gate hanging devices can be fixed in any position required.

Immediately behind each gate stands have been erected for the gate judges. Interim times are communicated by two-way radio to the judge of each section, who in turn passes them on to the central computer. The final results are known directly after the finish of each competition.

At the last bend in the canal, to the southwest of the restaurant, a temporary roofed-in stand was constructed to seat 500 competitors and guests of honor, 100 journalists and 30 television and radio commentators.



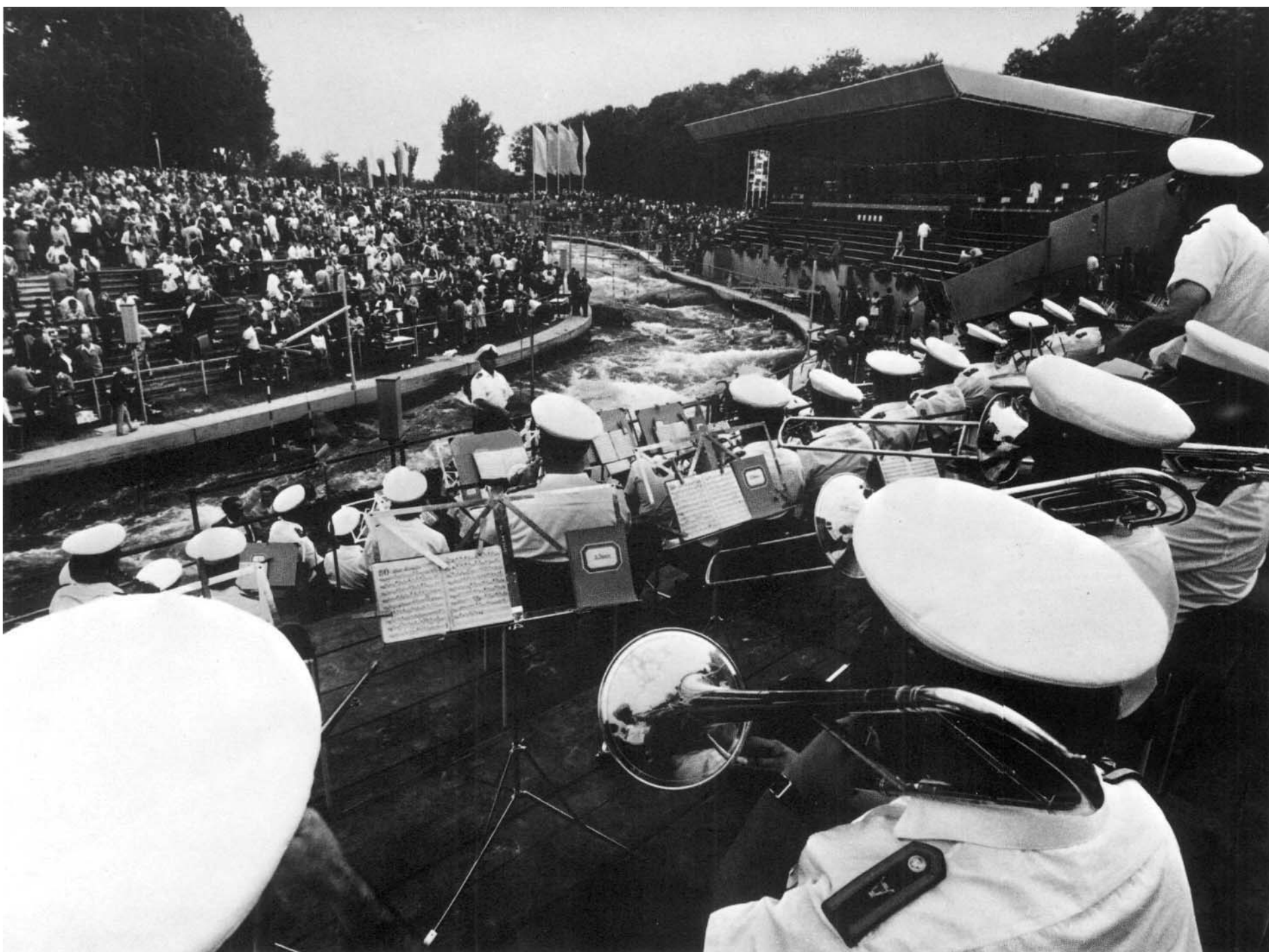
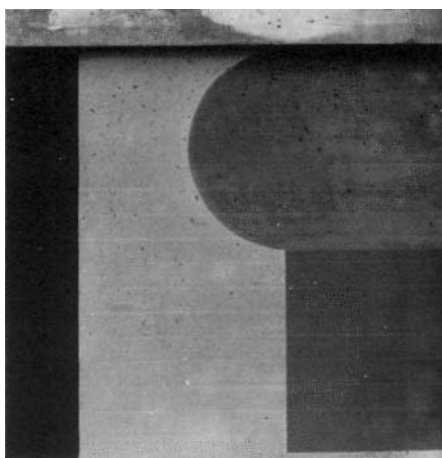
From the boathouse located in the north of the stadium, the competitors' canoes are transported to the assembly area south of the building where the race starts. This is the area where the competitors prepare themselves for the race and from which they make their way to the starting point. The light beam operating the start is positioned roughly 40 m. above the sluice letting the water into the canal.

The finishing point is reached, after the passage of 30 gates, in the curve in front of the restaurant. Behind it and immediately before the point where the canal flows into the Lech, is the landing stage.

The first gate is placed immediately below the sluice. There are further gates on the straight stretch of water which is otherwise free of obstacles and which bends slightly at the level of the administrative buildings, and merges 50 m. further on into the curving section where the artificial obstacles are placed.

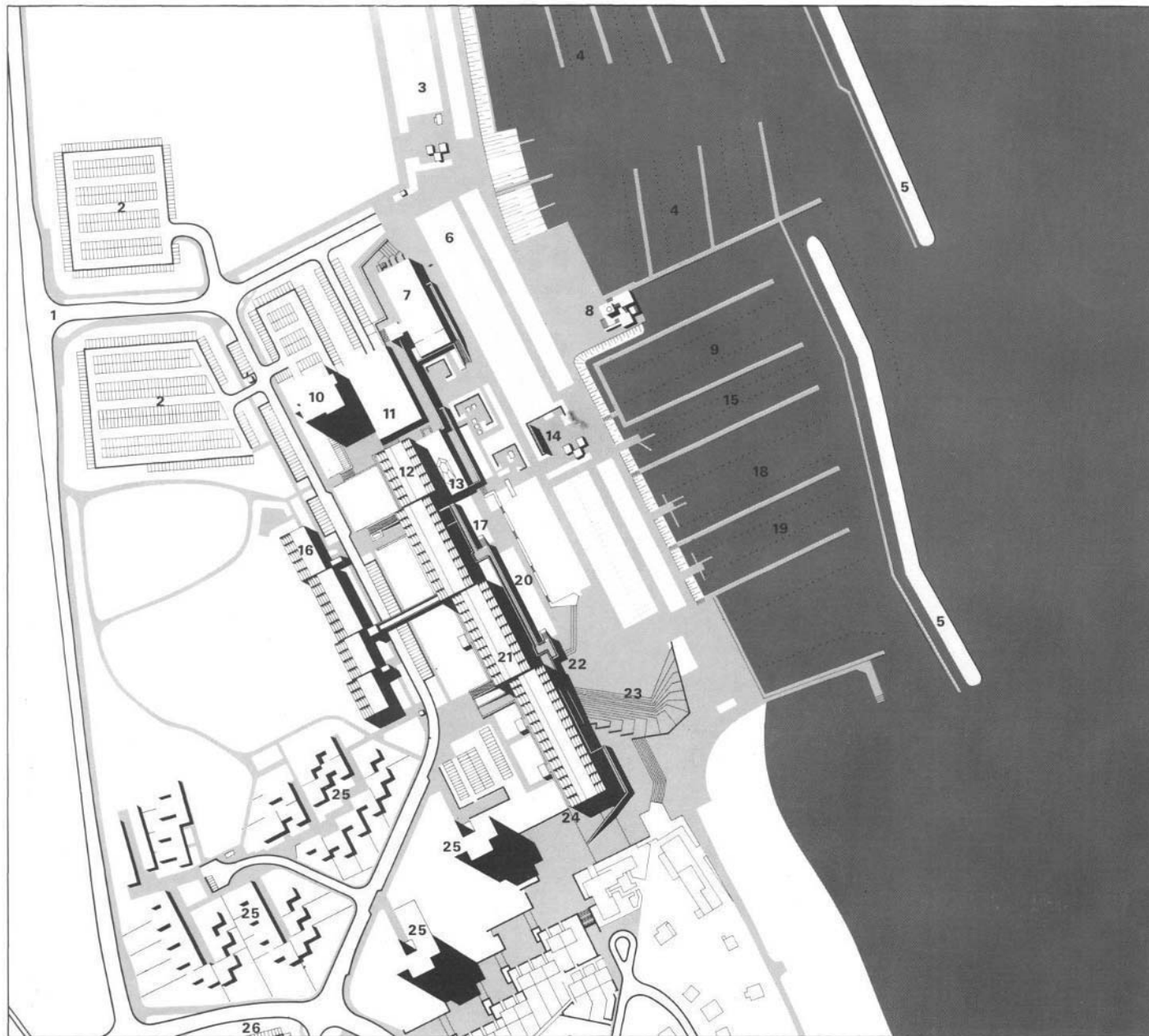
Interim times in the middle section are registered by a light beam system combined with a computerized stopwatch. Also near the finish are the Olympic flame and the victors' rostrum.

All permanent buildings are mainly wood or reinforced concrete frames faced with redwood. The sheds are roofed with anthracite-colored tiles made of asbestos cement.



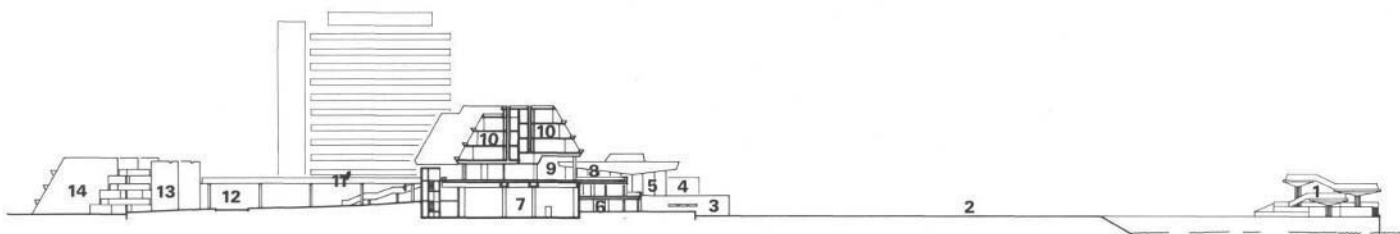
**Olympic Yachting Center
Kiel-Schilksee**

Architects:
Hinrich Storch and Walter Ehlers,
Hanover



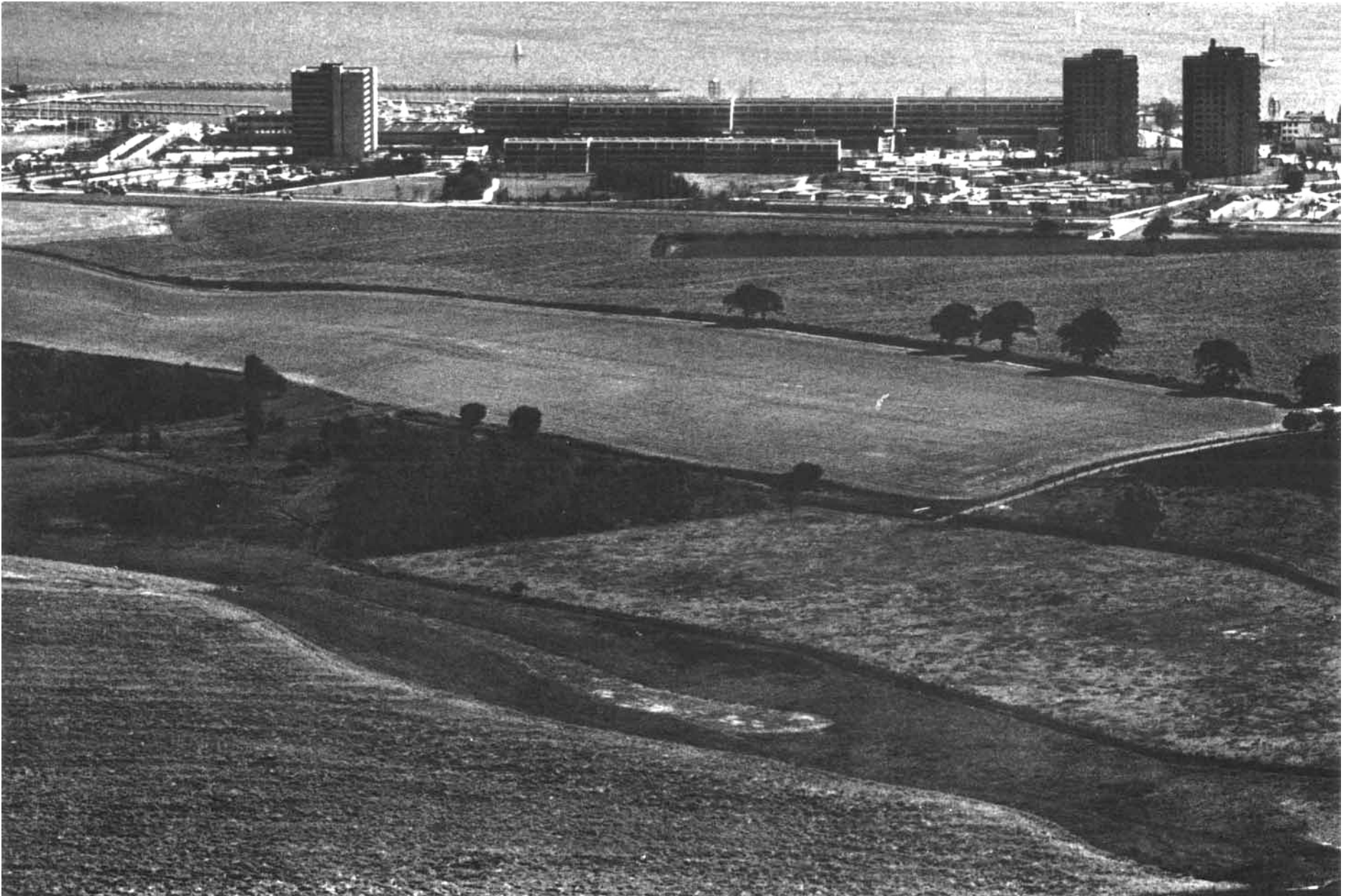
Layout diagram

- 1 Entrance to Olympic Yachting Center
- 2 Private parking lot
- 3 Dry docks for Finn dinghies
- 4 Berths in harbor
- 5 Jetty
- 6 Dry docks for Flying Dutchmen
- 7 Recreation center and restaurants
- 8 Harbormaster and Olympic Fire
- 9 Berths for Tempest
- 10 Guest apartments
- 11 Boat house, measurements office, workshop
- 12 Apartments
- 13 Indoor swimming-pool
- 14 Scoreboard
- 15 Berths for Starboats
- 16 Apartments for journalists
- 17 Press center
- 18 Berths for Solings
- 19 Berths for Dragons
- 20 Organization management, Jury
- 21 Radio and television center (DOZ)
- 22 Reception and central services of the Olympic Village
- 23 Field for celebrations
- 24 Stairway to the promenade and to information, bank, travel agency, and branch post office
- 25 Olympic Village
- 26 Public parking lot



Cross section

- 1 Harbormaster
- 2 Harbor shore
- 3 Sauna
- 4 Northern boat house
- 5 Indoor swimming pool
- 6 Regatta direction
- 7 Boat house
- 8 Promenade
- 9 Row of stores
- 10 Apartments
- 11 Connecting bridge
- 12 Road
- 13 Stairwell
- 14 Apartment house



In July, 1972, Kiel was the meeting place for sailing enthusiasts from all over the world. They had gathered for the traditional "Kiel Week", held for the 90th time. The yachting competitions of the 1936 Olympic Games also took place there. Thus it was not hard to imagine that the 1972 Olympic sailing competitions would also be held on the deep inlet at Kiel. A five-member panel commissioned by the Organizing Committee examined the sporting prerequisites and on March 8, 1967, the full Committee decided that Kiel should be the site for the sailing competitions once again.

It was just as necessary in Kiel as in Munich closely to coordinate functions involved in the manifold complicated preparation, planning, construction and completion in a relatively short period of time. In September of 1969, it was possible to begin pile driving. The foundations and slabs were produced according to methods appropriate for winter. The assembly of the prefabricated components, the installation of facade elements, and both the interior

and exterior completion of all the buildings was programmed to begin in June, 1970. The brevity of the planning time demanded that even the preliminary designs be drawn up at a scale of 1:1 so that they could simultaneously serve as a basis for coordination planning by the various craftsmen. What made things even more difficult was the fact that six different partners were at work on a single building complex. The city of Kiel was responsible for the indoor pool, the boathouses, the recreation center, the regatta administration, the information center, the contest jury and the press center as well as for the harbor and underground installations. Meanwhile, the apartment hotel, the other apartment buildings and the single family houses were financed by several apartment construction companies.

The following functional clusters were necessary:
The yachting center, a building or building complex to house locker rooms, massage facilities, a sauna, a swimming pool, a recreation center (lounges with restaurant), and boathouses;

The administration buildings for the regatta officials and the contest jury, as well as business offices and a press and information center;

The various facilities for spectators; that is, promenades, concession stands, rest rooms, a bus station, parking lots, and shelters for the Red Cross and police authorities at the camping site;

Quarters for the competitors, such as apartments, flats, and single family dwellings as well as an apartment hotel;

The public utilities, various stores, restaurants, cafés, etc.;

The harbor itself with berths and dry docks, an area for ceremonies and for the Olympic fire.

These buildings formed the architectural background for the realization of the Olympic sailing competitions. Simultaneously, they were so conceived that some of the buildings could be used as training centers for sports events after the Olympics themselves were over. The majority of these buildings would be used either as dwellings or as recreational facilities.



The designers of the Olympic Center at Kiel were chosen through an architectural design competition. The winning plan envisaged of an approximately 465 meter long series of building units parallel to the shoreline, supplemented by smaller clusters of buildings of varying heights. The bottom floor of this main building approximates the contours of the steep banks of Schilksee. At this level the general public are admitted without charge as far as the embankments north of the Olympic Center.

Situated on this bottom floor are the boathouses, the regatta officials, the administration offices, the press center, the indoor swimming pool, sauna, recreation room, and the multi-purpose hall. The apartments are terraced and consist of building units set staggered on the bottom floor. At the level of the promenade are the entrances to the apartments, a row of stores, and a restaurant seating 200 which was open to the public during the Olympics. During that time, a second restaurant was open only to journalists, special guests, and employees. The sportsmen were served in a cafeteria temporarily set up in the multi-purpose hall.

There were about 450 berths on hand in the harbor. Four cranes with a lifting capacity of between one and four tons and a seventy-meter wide ramp with a winch of fifty tons capacity covered the technical needs of the boaters.



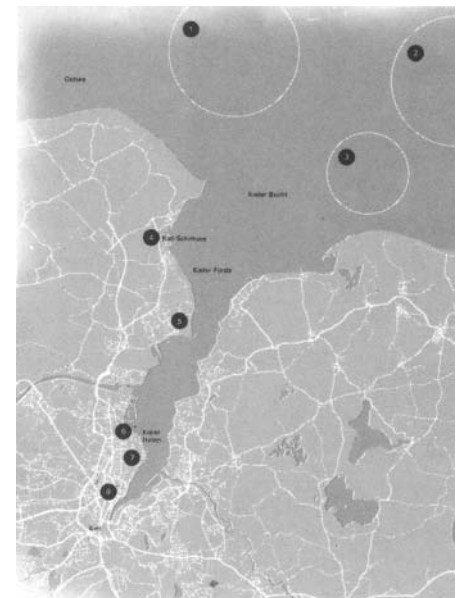




- 1 Regatta course B (Flying Dutchman, Star, Tempest)
- 2 Regatta course A (Drachen/Dragon, Soling)
- 3 Regatta course C (Finn-Dinghy)
- 4 Olympic Center
- 5 Olympic youth camp
- 6 Moorings for Tall Ships
- 7 Water Skiing
- 8 Olympic-Exhibition "Man and the Sea"

The Olympic Center is located north of Kiel on the western shore of the inlet in a landscape typical of Holstein. There are marshy low lying areas which are laced with densely growing hedges. While on the one side there are elements of a moraine landscape, the other side is characterized by the flat shores and steep banks of the Baltic Sea. It was a magnificent architectural achievement to situate an extensive building complex of vast dimensions on the coast of such a region.

The Finn-Dinghies (4.5-m. one-man boats) and the Flying Dutchmen (6.5-m. two-man boats) were assigned to areas north of the harbormaster's dry docks. The berths for Tempests (6.68-m. two-man boats) and Starboats (6.92-m. two-man boats), as well as for Solings and Dragons (8.15-m. and 8.90-m. three-man boats respectively) were located immediately in front of the terraced apartments.



The end point of the harbor area is marked by the ceremonial plaza to the south. It can hold approximately 8,000 spectators on its terraces.

During the seven days of the competition, approximately 210 boats sailed the Olympic course which was located between three and six nautical miles from the Olympic Center.

Some thirty vessels were available for towing the boats out to the starting point and back to the harbor. Around 220 vessels of the German navy and merchant fleets, as well as those of various organizations, were at the disposal of regatta officials as escort boats.

For the first time in Olympic sailing, landing craft (approximately 40 m. long and 10 m. wide) were on duty along the periphery of the racing lines for salvage and rescue operations. They were able to render immediate help if boats became immaneuverable or if any sailors fell over board.



To the south, an information center marks the beginning of the promenade. At the end of the complex at the level of the embankment was a cluster of concession stands for the visitors to the center. The apartment hotel to the north marks the counterpoint to the two high-rise buildings of different height in the south. These were complemented by a cluster of various-sized bungalows which formed the Olympic Village for the boaters. The apartments are arranged in three stories and are terraced towards the Baltic. Parallel with these there are terraced apartments facing inland, which are also set back. The bungalows, the low apartment buildings and the main cluster in front of the harbor area form a pleasant sequence.

From the promenade, the visitors had a magnificent view of the harbor and could watch the preparations for the races without interfering with the boaters.

Every day, 4,000 spectators on fourteen steamers were able to experience the regatta on the open seas. On board they received expert explanations about the competition. The services of the post office, stewardesses and doctors were likewise available.

The passengers aboard the escort boats were kept informed of activities in Munich by means of color television sets.

In Munich, it was possible to plan and construct the practice and contest facilities, the radio and television center, and the Olympic Village in independent installations. This was impossible in Kiel-Schilksee, since all of the Olympic functions had to be concentrated in one complex.

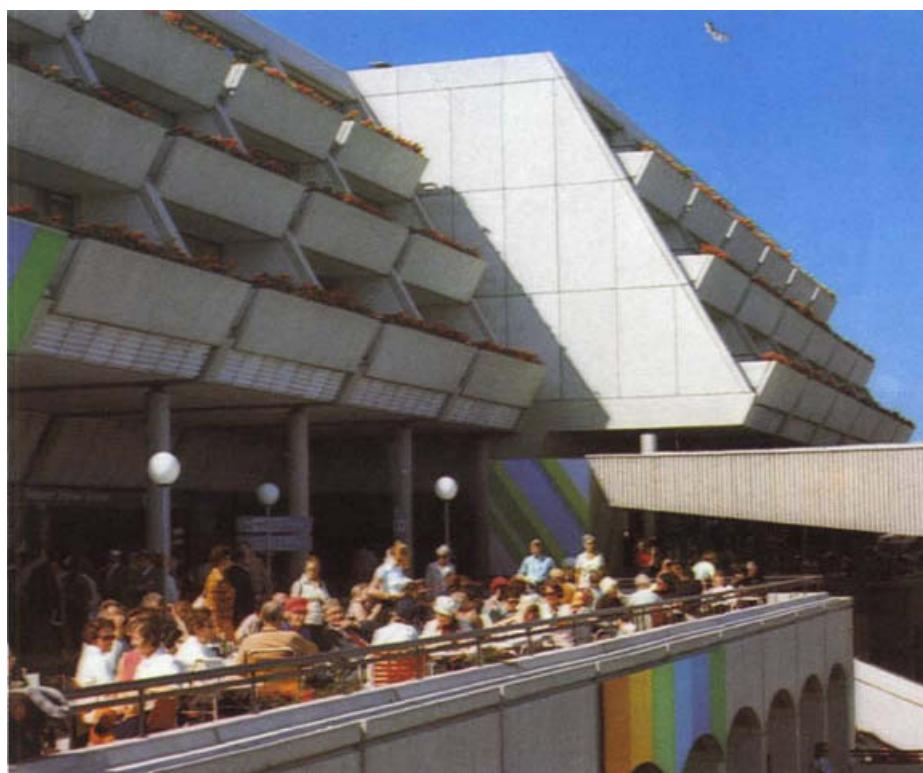
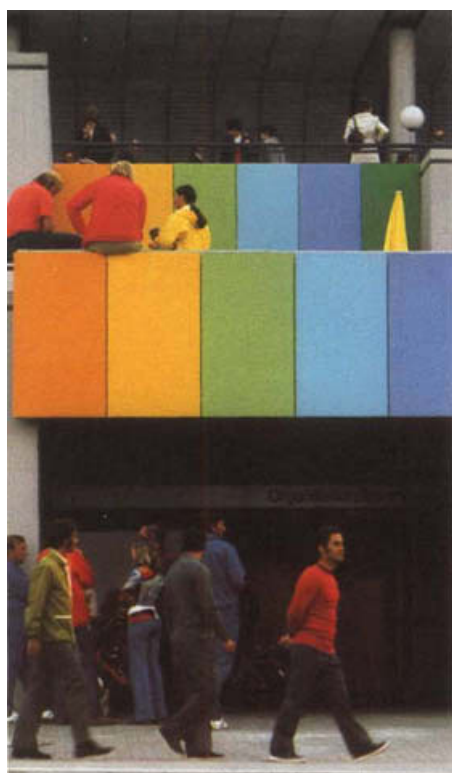
The concept of planning chosen enabled the organic merging of the building complexes into the site on the coast. The flowing succession of hilly landscape with steep banks and low-lying shore areas remained undisturbed and perceptible. The unbroken promenade from Schilksee to the beach created a new center of attraction for both Olympic fans and later visitors. Spectators could watch the events while either strolling or lounging. The elevated walk-way was the gallery overlooking the harbor, and also offered supplementary vantage points for the opening and closing ceremonies as well as for the victors' celebrations.

The Olympic Village on the south grounds consisted of 120 apartments in multi-storied buildings and 32 single family houses of various types. The apartment building built over the shops and restaurants contained 400 apartments for the press, regatta officials, and the contest jury. The apartment hotel was reserved for VIPs. It had 140 vacation apartments and a sixty-bed hotel.

The reception room of the Olympic Village was connected at the bottom floor to the information center to the south-east. Then followed the rooms for the contest jury, the regatta officials, and the press center. The indoor swimming pool (12.5m. x 25m.) adjoins the promenade, and it is possible to see into it from there. During the Olympics, the pool served as a leisure sport area for the boatmen. It has a direct entrance from the harbor. Today the entire installation with sauna and medical section is open to the public and is used by the training centers also.

The recreation center consists of an 18 m. x 36 m. gymnasium, seven groups of rooms which serve as clubrooms, and a self-service restaurant for approximately 300, which can be subdivided into four smaller rooms.

This is where the participants in the Olympic Games had their dining rooms, lounges, and quiet areas. After the Olympics the clubrooms will be available to the various sailing clubs. The gymnasium will be used by schools and societies, and it is possible to use it, after minor alterations, for smaller cultural events.



A hall with an area of 6,700 square meters was furnished with technical conveniences for the efficient performance of the regatta. There were, for example, a temporary post office, a center for radio, television, and the press, etc. Afterwards this hall will serve as a winter storage area for boats and in the summer as a garage for the tenants' automobiles.

For active athletes, refreshment stands, rest areas, and game boards were provided.

Press Complex

Architects:
Fred Angerer and Alexander von Branca,
Munich



Within the overall picture of municipal improvement planning, the press complex project northwest of the Olympic Park was just as much a part of the growth and development of northern Munich as was the Olympic Village. Similar plans as for the athletes were designed for the housing of more than 4,000 newspaper, radio and television men. The apartments that were used by these correspondents were on the average the same size and quality as those used by the athletes. The possibility to work in the immediate vicinity of the press center, the Olympic Center for German Television and Radio, and a large part of the contest sites was seen as ideal.

The location and the transportation opportunities were especially appropriate for press purposes. The main arterial roads with feeders to the expressways were located to the north and south. The rapid transit station located between the press complex and Olympic Park offered direct connections to the entire local public transit system and to the main railroad station for other more distant points. Olympic Park could be easily reached by walking over a bridge and the Kusoscinski-Damm.

Layout diagram

- 1 Reporters' living quarters
- 2 Olympic shopping center
- 3 Press Center
- 4 RIES Strasse
- 5 Rapid transit station
- 6 Footpath and driveway to the Olympic Park



Every comfort and convenience was provided for the journalists living in these apartments. The rooms, similar to the athletes' lodgings in the Olympic Village, were furnished simply and practically with furniture from the German Army. There were both room service provided by stewards and a restaurant in the adjoining presscenter.

Press Complex

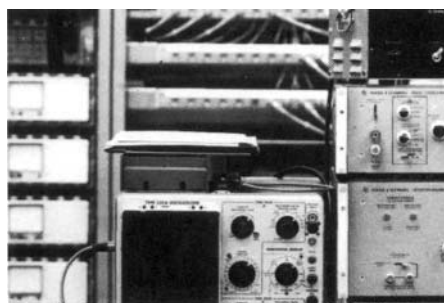
The buildings, ranging from a twenty-two story highrise to two-story low houses, were so designed that courtyards closed to traffic, and lawns where the inhabitants could relax and refresh themselves, were created.





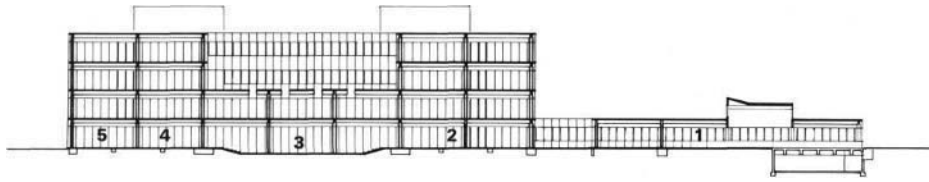
Private contractors and construction companies had already planned and built this residential section before the Organizing Committee and the Olympic Construction Company signed contracts in 1970 that assured the renting of thirteen entire blocks. There were 4,200 single rooms or apartments at their disposal, which were converted into 1,600 apartments of varying sizes after the Olympics.

The residents were also able to stroll and shop in a roofed-over shopping center large enough for its later use. At this time most of the other facilities planned for general patronage (such as lunchrooms, medical center, drugstores, indoor swimming pool with sauna, churches, etc.) were already in use. The terraces and recreation areas in the courtyards and lawns offered the reporters opportunities to meet or relax after their hectic work day at the Olympics.



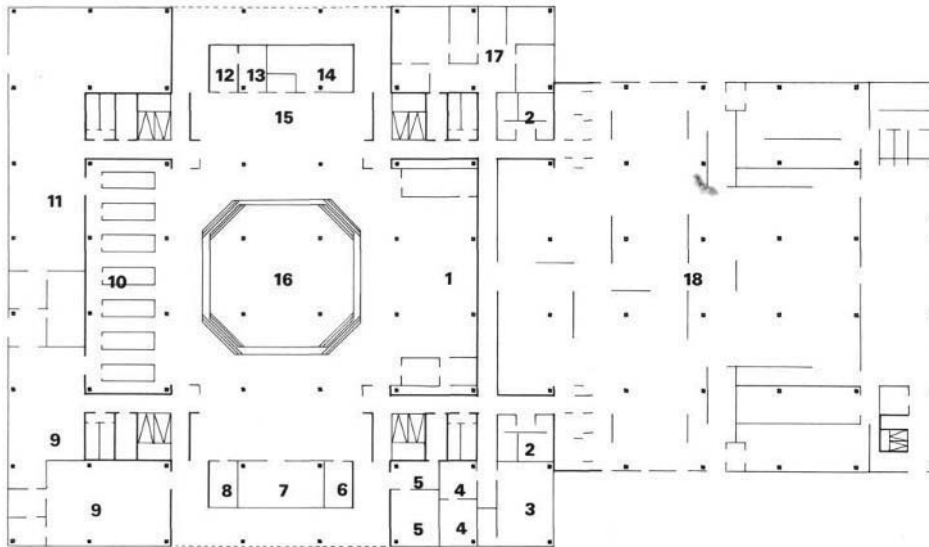
Press Center

Architect:
Design Corporation for Regional, Archi-
tectural and Engineering Planning,
Munich



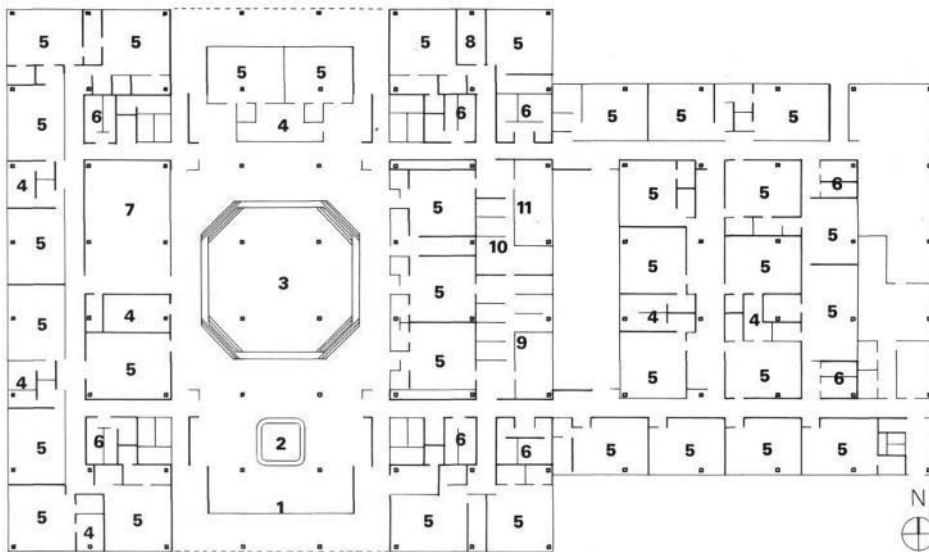
East-west section

- 1 Restaurant
 - 2 Counter Hall, accreditation, information
 - 3 Communications center
 - 4 Lockers
 - 5 Printing shop
- On the upper floors:
Agencies



Ground floor plan

- 1 Counter hall, accreditation, information
- 2 Toilets
- 3 Post office technical apparatus
- 4 Doctors' office
- 5 Drivers' stand-by room
- 6 Travel agency
- 7 Bank
- 8 Newsstand
- 9 Post office for letters and packages
- 10 Post office boxes
- 11 Printing shop
- 12 Office of the German Sports Press Federation (VDS)
- 13 Office of the International Sports Press Federation
- 14 Office of the Acting Chief Editor, Documentation
- 15 Bar
- 16 Communications Center
- 17 News department of the OC
- 18 Restaurant



Ground floor plan

(post-Olympic use as vocational school center)

- 1 Entrance
- 2 Milk bar
- 3 Recess hall, forum
- 4 Supply room
- 5 Classrooms, practice rooms, workshops
- 6 Toilets
- 7 Auditorium
- 8 Room for student government
- 9 Students' library
- 10 Teachers' library
- 11 Teachers' workroom

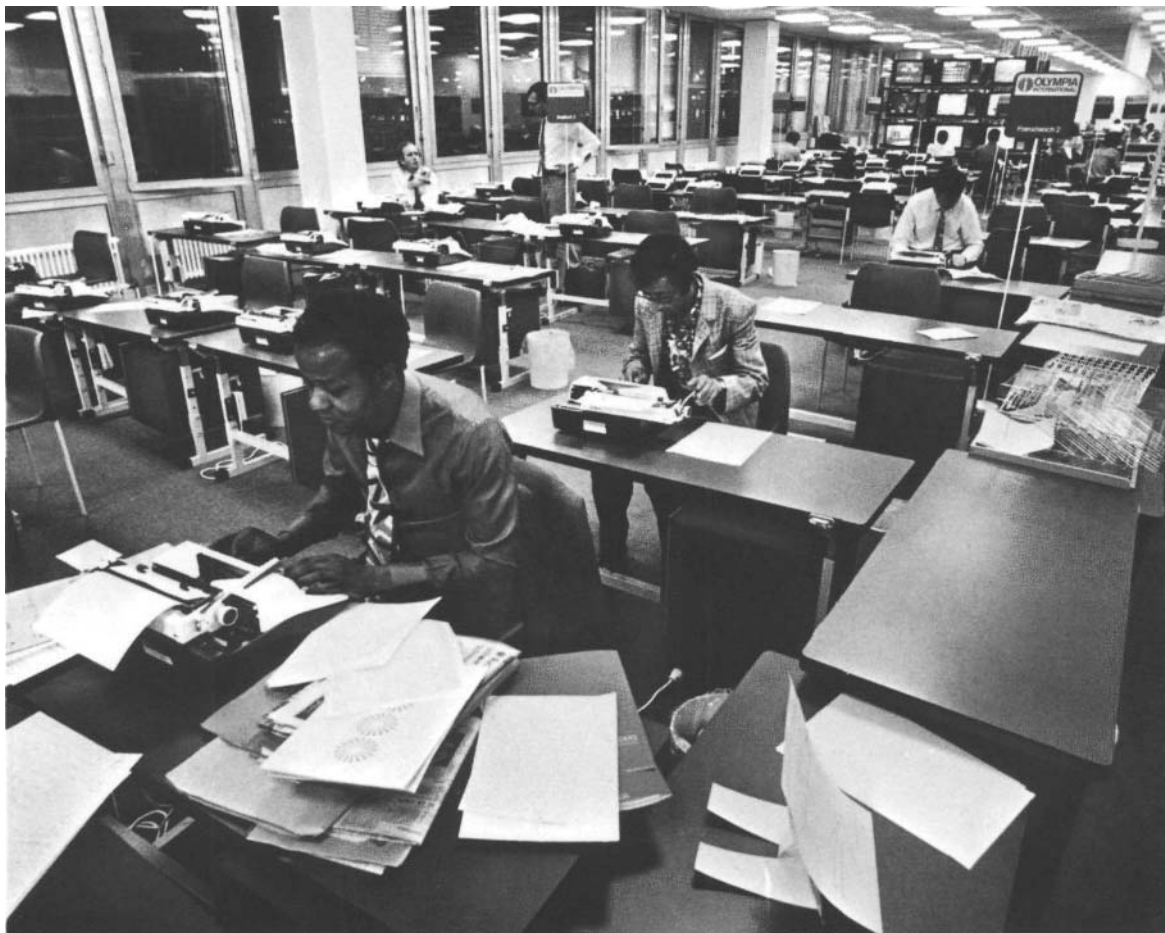
The headquarters for the 2,800 reporters and photographers was situated to the south of the press complex and on the west side of Olympic Park. It was accessible from Ries Strasse. It was easy to reach the city's main arterial streets by way of Hanauer Strasse. This ideal location was the basis of a fast and smooth shuttle bus system to all of the sites outside of Olympic Park.

The Press Center was supposed to be temporarily housed in the new Munich city office buildings. It was only in the autumn of 1970 that this solution proved to be unworkable. Further calculations showed that a temporary building near the press complex would cost almost as much as a permanent one. Therefore it was decided to build a multiple purpose building. This building had to be completely practical for use by the press and at the same time be able to be converted without drastic remodelling into a secondary school for some 2,000 students. Planning began at the end of 1970.

It was decided to build a four story building of steel and steel re-inforced concrete construction. This way it would be possible to achieve the broad flexibility demanded in furnishing and later re-dividing the rooms.

During the Olympics, this building was at once meeting place for journalists, newsroom, club, communications center, work room, news agency, office, photo laboratory, and central station for telephone, teletype and telephoto systems. All of these facilities were distributed through four stories with a total of 18,000 square meters. This was done in such a way that they would be able to communicate the Olympic events to the public in the best possible way.

These rooms are arranged around a square inner courtyard. Each inside corner has a stairway and an elevator. During the time that it was used as a press center, the courtyard was covered by a roof that could be walked onto from an upper story. The work rooms underneath had natural lighting with sky lights. After the Olympics this roof was removed: the school has an open courtyard and the inside classrooms enjoy daylight.





Architecturally this square building was simply constructed. Each story is marked by a row of identical windows alternating with a white facade. The facade was constructed of 1.20 meter panels. The aluminum construction was completed with window and windowsill elements.

Immediately upon entering, the visitor was able to view the centrally located communications center. This was a large area sunken below the entrance level which seated 120. It was equipped with numerous TV monitors which carried the happenings of twelve sports events. Around this center were the counters for processing credentials, information, a post office, travel agencies, a newspaper stand, and a bar. Each journalist had a private mail box and was also provided with results of the various events by a printing office located behind the boxes. Near the entrance, the stand-by drivers and doctors had their rooms. Lastly, the Organizing Committee had a closed-off work area in the north-eastern part of this floor.

Adjoining at ground level on the east side was a 1,100 seat restaurant. Although it was only set up temporarily, it was, nevertheless, equipped with all the necessary kitchen facilities to prepare a meal to satisfy even the most discerning palates. This building is presently used for school rooms, and when necessary it serves as a cafeteria.

On the second floor almost 1,000 square meters of usable space stood ready for 350 workers as a press room. Besides these, there were rooms with teletype machines, television sets, telephone booths, with 110 direct lines, as well as film and photo processing laboratories and the office of the national photo-pools.

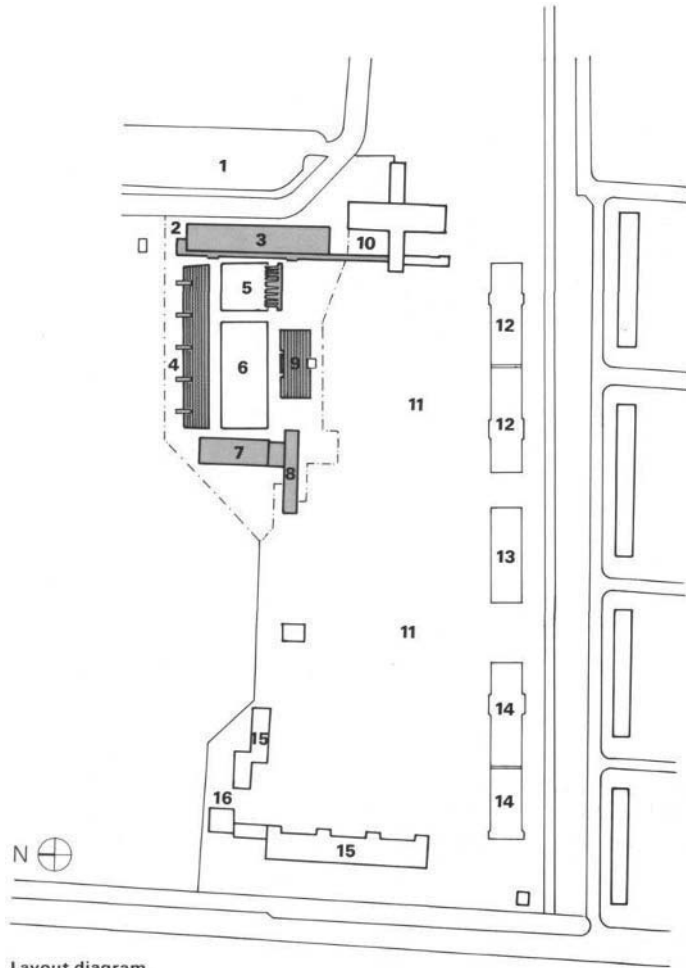
Twenty-six news agencies had their offices on the two upper stories.





Dante Swimming Pool

Architect:
Kurt Becker, Munich



Layout diagram

- 1 Parking lot on Homer Strasse
- 2 Entrance
- 3 Eastern structure with restaurant and administrative areas
- 4 Stands
- 5 Diving pool
- 6 Swimming pool
- 7 Western structure with dressing facilities for athletes, water treatment installation
- 8 Spectator facilities (snack bar and rest room area)
- 9 Temporary stands
- 10 Existing dressing wing for winter use
- 11 Grass area for playing and sunning
- 12 Pool 3
- 13 Pool 2
- 14 Pool 1
- 15 Dressing facilities and service areas for summer use
- 16 Entrance to outdoor pool for summer use

When the city of Munich was competing for the Olympic Games at the IOC meeting in Rome in 1966, among the existing sports facilities, the Dante Swimming Pool was rated as preferable to all other pools in Munich. Although it was built at the turn of the century and had been expanded and partially remodeled several times, it was predestined for Olympic use because of its size, seating capacity for spectators immediate proximity to Olympic Park. In addition, it was one of the first heated outdoor pools in Germany, was supplied with warm water from the nearby gasworks, and was open year-round for outdoor swimming.

According to the rules of the International Swimming Association (FINA), the swimming and diving events at the Olympic Games had to be held indoors; so the Dante Pool was not considered for the competitions. At the beginning of the planning for the Olympics, the renovation and preparation of the pool was considered only in the light of providing the major training facilities for swimming, diving, and water polo. As it turned out, however, most of the water polo competitions had to take place there because of the schedule for the swimming events: the swimming pool in the auditorium of the Olympic Park was scheduled for such heavy use that only a few evening water polo games could be held there.

In remodeling the Dante Swimming Pool, it was decided to give maximum possible consideration to post-Olympic interests. Attention was concentrated on the eastern part of the complex with its facilities for competition: the swimming pool, diving pool and grandstands. The relatively new winter locker rooms here could be included practically unchanged in the restorations. The summer locker rooms remained untouched the southern pool for non-swimmers and the multi-purpose pool were remodelled.

Of the three older pools which are located on the southern edge of the Dante Pool complex, two, each 100 meters long, were subdivided by the addition of extra starting bridges. The result were two fully functional 50-m. swimming pools and two 49-m. pools for training. The pools were sealed with plastic film. To allow for water circulation, pipes for inflow and outflow were built into the starting bridges. This resulted in a considerable improvement in both the flow and the quality of the water.



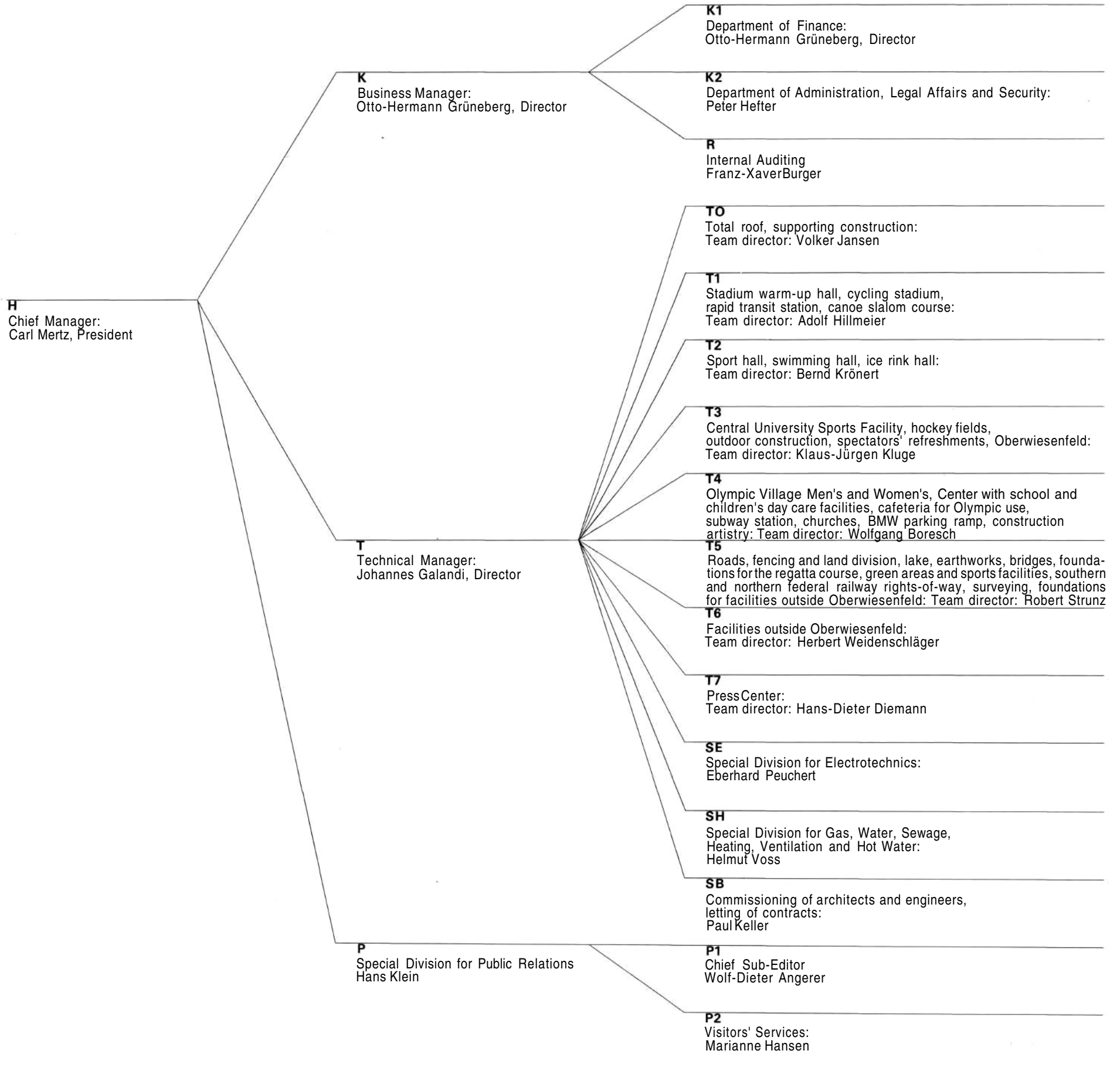


The two main structures to the east and west of the swimming stadium were newly built. On the ground floor of the eastern building rooms were provided for organization personnel and for the communication media. Upstairs are the restaurant and the sauna. The floor plan and layout in relation to the winter locker rooms of the heated outdoor pool take the later use of the facility into consideration. In the western building, there are new facilities for water

processing in the basement, and locker rooms for the athletes on the first and second floors. There is also a garden restaurant as a one-story addition. The swimming-pool, diving pool and diving tower were remodeled. Even underwater spotlights, underwater windows and water

circulation equipment for the diving pool are not lacking at this pool. A four-masted floodlight system with 600-lux illumination allows for possible use until late at night. A temporary wooden grandstand was erected across from the northern reinforced concrete grandstand.

**The Organization
of the Olympic Construction Company, Ltd.,
as of May 1, 1971**



Olympic Park

Location:

8000 Munich 40

bounded by Lerchenauer Strasse to the east, Moosacher Strasse to the north, Landshuter Allee to the west, Nymphenburg Canal and Schwere Reiter Strasse to the south.

The following contest and training areas and other assorted facilities were constructed in the Olympic Park in connection with the Olympic Games:

Olympic Stadium
Sports Hall
Swimming Hall
Boxing Hall (remodelling of the existing Ice Sport Hall)
Cycling Stadium
Volleyball Hall in the ZHS
Hockey facilities
Warm-up hall at the Olympic Stadium
Training and warm-up areas
Press complex and press center
Men's Olympic Village
Women's Olympic Village
Avenue of Entertainment
ZHS-Radio and Television Center (Deutsches Olympia Zentrum, DOZ)
Rapid Transit System Station (S-Bahn)
Subway station (U-Bahn)
Visitors' Restaurants
Concession stands and kiosks
Gardeners' courtyard
Offices of the Olympic Construction Company, Ltd.
Garages and Parking Lots

Team director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Robert Strunz

Project director for the Olympic Construction Company, Ltd.:
Landscape architect Siegfried Lukowski, Darmstadt Building Engineer Jens Petzold, Munich

Design, planning and total concept:
Behnisch and Associates, Independent Architects, Munich/Stuttgart
Prof. Günter Behnisch, Fritz Auer, Winfried Büxel, Erhard Tränkner, Karlheinz Weber

Northern embankment area, southern area with Olympiaberg, planning of the green zones and paths:
Office of Prof. Grzimek, Kassel

Traffic planning:
Engineering Office of Dipl.-Ing. Hundsdorfer, Stuttgart

The planning of the Olympic Lake and water drainage, as well as the public utilities for the Olympic Park:
Engineering Office of Civil Engineer and Architect Schlegel, Munich

Bridge design:
Engineering Office of Dr. Grimme, Munich

Electrical installations:
Engineering Consortium BMS, Munich

Planning of the watering system for the green zones:
Brandt Engineering Office, Frechen near Cologne, and Karl Bauer Company, Schrobhausen

Area of the Central University Sports Facilities

General over-all planning:
Prof. Erwin Heinle, Dipl.-Ing. Robert Wischer and Associates, Independent Architects, Stuttgart/Munich

Planning of green zones and sport areas:
Landscape architects Wolfgang Miller and Hans Luz, Stuttgart

Sewer planning and coordination of public utilities:
Engineering Office of Civil Engineer and Architect Schlegel, Munich

Lighting and floodlight planning (electrical facilities):
Engineering Consortium BMS, Munich

Street planning:
Engineering Office of Billinger and Associates, Stuttgart

Pump station planning:
Engineering Office of Aschl, Munich

Planning for watering the outdoor sport areas:
Brandt Engineering Office, Frechen near Cologne

Building Supervisors:
for the northern embankment area, the southern area with Olympiaberg, the Central University Sport Facilities (ZHS):
State Capital City of Munich
Building Commission of the municipal department of parks
Engineering Consortium for Olympic Buildings, Munich
Rüping Engineering Office, Düsseldorf, Dr. Walter Engineering Office, Essen

Characteristics of Design and Construction

Before construction work began for the Olympic Games in Munich, Oberwiesenfeld was a nearly level area of approximately 2.8 million square meters. A television tower was the only constructed accent and the rubble mound in the southeast dominated the landscape. The basic plan proposed the dividing of this property into manageable lots and the extension of the municipal transit system into the Olympic grounds. The separation of vehicular traffic and pedestrian walkways results in an essential constituent for the future structure of the landscape. Embankments for walkways, viaducts, bridges, depressions and elevations, aqueducts, a lake and the buildings form the overall image of the Olympic landscape. The landscape lines are taken up in the taller buildings which extend and intensify the forms of the modeling of the grounds. In this way any undesired monumentality of the buildings was avoided. The landscape continued to dominate despite the extensive volume of the buildings. The various individual areas which are grouped around the central plateau constituting the forum of the main competition sites, the theater and recreation area, the training area, and the Village with its facilities serving various functions, form a large area of experience with human dimensions. It is a park for visitors.

External Access

Vehicular traffic:
By widening the Middle Ring, Landshuter Allee, Moosacher Strasse, Dachauer Strasse and Ackermann Strasse, Olympic Park was served by the inner city by-pass system and thus connected to the main highways leading out of the city, the autobahns to Stuttgart, Nuremberg, Salzburg and Garmisch. The location of Olympic Park approximately four kilometers from the center of the city, together with the highways and inner city street network, offered an optimum external connection with the city.

Public transit:
The subway station at the Olympic Village and the bus and streetcar station to the south of Oberwiesenfeld supplied the connection to the inner city transit lines. The rapid transit station to the west connected Olympic Park with the public transit system of the entire Munich area.

Internal Access

Twenty-three bridges of various types, some temporary and others permanent, were constructed. This made frictionless internal movement within the Olympic Park possible. It was necessary that the walkways from the public transit stations and parking lots to the various contest sites be without street crossings. At the same time reasons of organization and protocol required vehicular access for employees, administration officials and VIPs. The greater problems presented themselves in laying out the pedestrian paths which interconnected all parts of the Olympic Park. These had to cope with an influx of at least 80,000 spectators per hour for the main events. This influx concentrated on the so-called central plateau, an enclosed area of approximately 42,000 square meters around which the swimming hall, sports hall and stadium were clustered. These were the most popular sport sites and counted a total of 100,000 spectators. This high attendance called for the construction of bridges up to 25 meters wide. In spite of the calculation of all determining factors, the unaccountable behavior of pedestrians in crowd situations left room for the possibility of disruptions and therefore for problems. A good street sign and public address system in the areas of congestion was to facilitate movement and allow for traffic control when needed. The internal street traffic, which was completely separated from the pedestrian walkways, consisted mainly of the shuttle buses from the Press Center and Olympic Village to the sport sites, as well as of administration service, VIP and emergency traffic. A minimum street width of 6 meters sufficed to provide adequate and troublefree transportation.

Parking:
Inside Oberwiesenfeld 5,000 to 8,000 parking spots were available. These were not open to visitors during the Olympic games, however, but were rather used for special purposes, for example, VIPs and officials. Around Oberwiesenfeld about 30,000 parking spaces were constructed for visitors.

Green Areas

About 2.2 million cubic meters of fill were required for landscaping purposes. A total of approximately 350,000 cubic meters of top soil was prepared and used to cover a green area of 1,440,000 square meters. Forty tons of grass seed were needed to

sow this area. 3,100 large trees were planted as well as thousands of smaller trees, bushes and shrubs. Different species of trees were used for the various outdoor areas and thus facilitated orientation. Lindens were planted in the pedestrian areas; maples, ashes and poplars beautified the traffic areas; willows and alders graced the lake, and stone pines were planted on the rubble heap. It was possible to walk on the level lawns and all slopes were cultivated as meadows.

The Roof

Location:
8000 Munich 40
Olympic Park

The roofing of the Olympic Stadium, sport hall and swimming hall

Director for the Olympic Construction Company, Ltd.
Dipl.-Ing. Volker Jansen, München

Project director of the Olympic Construction Company, Ltd.:
Dipl.-Ing. Volker Jansen, München

Concept and Design:
Behnisch and Associates, Independent Architects, Munich/Stuttgart
Prof. Günter Behnisch, Fritz Auer, Winfried Büxel, Erhard Tränkner, Karlheinz Weber

Development:
Prof. Frei Otto, Warmbronn

Construction and Statics:
Prof. Dr.-Ing. Fritz Leonhardt, Dipl.-Ing. Wolfhard Andrä and Dipl.-Ing. Dr. Jörg Schlaich

Arrangement:
Prof. Dr.-Ing. Klaus Linkwitz, Institute for Applied Geodesy at the University of Stuttgart
and
Prof. John H. Argyris, Institute for Statics and Dynamics of Aero-space Construction at the University of Stuttgart

Construction Physics Advisor:
Prof. Dr.-Ing. Wilhelm Schaupp Institute for Applied Building Studies and Construction, Munich-Grünwald

Building Supervisors:
Engineers Team Olympic Buildings, Munich
Engineering Office Rüping, Düsseldorf
Engineering Office Dr. Walter, Essen

Characteristics of Design and Construction

The tent roof extends over the western stands in the stadium, the sport hall, the swimming hall and the pedestrian areas in between. The tent roof can be designated as a continuation of the grounds' modeling. It caused the main sport areas to merge into a cohesive structure. The chosen pre-stressed cable network construction made the realization of the planned dimensions (spans) of the canopy possible. A surface of approximately 75,000 sq. m. with spans up to 450 meters had to be suspended over the various contest sites. Pylons, freehanging supports (air suspenders) numerous foundations (heavy-duty foundations, slit wall foundations — comparable to oversized tent pegs — and compressed tension anchors at less important parts of the structure, and pre-stressed acrylic glass panels 4 mm. thick and mostly 3.00 m. x 3.00 m. in size (at the tops of the masts 1.50 m. x 1.50 m. and smaller) formed the translucent skin. This seemed to be the most practical material to meet the requirement of the German Olympic Center for Radio and Television (DOZ) that shadow contrasts be kept to a minimum to insure trouble-free television transmission. The visible inner lining of the tent roof closely followed the form of the outer roof skin.

The temporary stands in the swimming hall were covered by a temporary roof. It was surfaced with PVC coated polyester fabric which was draped over randomly strung cables from the main pylon and the temporary masts outside of the stands. The cables lying on the roof surface prevent its being inflated by the wind.

Dimensions of the Facility

Total area	74,800 sq. m.
Stadium	34,550 sq. m.
Sport hall	21,750 sq. m.
Roofs in-between	6,600 sq. m.
Swimming hall	11,900 sq. m.
Temporary roof above the temporary stands	3,200 sq. m.
Number of main pylons	12
Number of masts	36
Longest mast	81 m.
Greatest diameter	3.5 m.
Maximum wall thickness	75 mm.
Number of air suspenders	10
Length of air supports	up to 20 m.

Network cables:
Size of mesh 75cm. x 75cm.
Diameter of cables 2 x 11.7 mm.
or 2 x 16.5 mm.
Total length of cables 400,000 m.
Border cables:
Diameter of the seam-cables: 82 mm.
No. 1 through No. 4
Total length approximately . . . 15,000 m.
Foundations:
Number of tension points: More than 100 stress foundations (heavy-duty foundations, slit wall foundations, tension anchor foundations).

Construction Components

Tension foundations:
Three kinds of foundations were used:
1. Slit wall foundations, which act on the same principle as tent pegs.
2. Heavy duty foundations: The great weight of these foundations and the pressure of the earth which lies over them counteract the stress exerted on them.
3. Ground anchor foundations, on account of difficulties in approval, were only used for subordinate building elements.

Masts and pylons:
These consist of cylindrical pipes with a diameter of up to 3.5 meters and a wall thickness of 75 mm. During installation the masts were set up on steel-reinforced concrete footings and ball bearings which allowed the mast to be moved in any direction. After the entire roof was installed the steel ball bearings were buried in concrete. The movements of the masts caused by the shifting of the roof were absorbed by the rubber grommets above the steel ball bearings.

Main cables:
The cables consist of bundles of parallel laid strands with a 15 mm. diameter. The cable heads were cast from a newly developed material. Ten bundles of strands with a diameter of 130 mm. were coupled at the principal edge cable of the stadium. A bundle of strands consists of 55 individual strands.

Border cables:
These were produced as a patented spiral cable with a diameter of 81 mm. All lines were pre-stressed at a specific temperature, hung exactly and provided with the necessary assembly marks.

Network cables:
These consisted of double strands which

formed a mesh with 75 cm. wide spaces and were fastened with aluminum clamps. By screwing together two clamp elements at the crossing point of two lines a net knot was formed, on which the roof surface (acrylic glass panels) was fastened with rubber cushions.

The junction points of the construction system:
The junction points (high points, mast heads, turning saddles) consist of cast steel. The heaviest construction weighs approximately 27 tons.

Roof Area

The Stadium:
Nine saddle-shaped curved roof surfaces, enclosed by border cables, were positioned in a continuous series. The roof is supported by eight masts, each with guylines leading directly to the foundations, by high junction points hung from the masts, by free hanging air suspender cables, and by the large edge cable, which connects all inner cable junctions and is further supported by both of the ball bearing foundations to the south and the northeast.

Sports Hall:
The roof consists of five saddle-shaped curved segments, which are all joined to each other and are suspended between two main pylons (in the north) and are held by direct guylines to the other foundations.

The Swimming Hall:
This roof has a free form surface geometry. The segments are hung on the main pylon and curve down to two low points. The temporary stands were covered by the temporary roof described above.

Olympic Stadium

Olympic use:
Opening ceremony, Track and Field, Modern Pentathlon, Football, Equestrian Sports (Prix des Nations), Closing ceremony

Location:
8000 Munich 40
Olympic Park

Team director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Adolf Hillmeier, Augsburg

Project director for the Olympic Construction Company, Ltd.:

Buildings:
Architect Gerhard Riegert, Munich
Competition and training grounds:
Building Engineer Jens Petzold, Munich

Design and Planning:
Behnisch and Associates, Independent Architects, Munich/Stuttgart
Prof. Günter Behnisch, Fritz Auer, Winfried Büxel, Erhard Tränkner, Karlheinz Weber with Jürgen Joedicke

Project director for Behnisch and Associates:
Dipl.-Ing. Hans Beier, Munich

Statics:
Dipl.-Ing. Heinz Isler, Burgdorf, Switzerland

Landscaping:
Günther Grizmek, Kassel

Direction of Construction:
Engineering Consortium for Olympic Buildings, Munich
Engineering Office Rüping, Düsseldorf
Engineering Office Dr. Walter, Essen
State Capital City of Munich
Building Commission of the Direction of City Gardens

Characteristics of Design and Construction

The almost perfectly round Olympic Stadium is set into the western slope of the central plateau (forum). The single gallery spectator stands are enclosed by earthworks (about 2/3 of the shell) and by the stadium structure itself (about 1/3 of the shell). The long axis measures 260 m. The cross axis of 245 m. deviates 10° to the west of true north-south. The edge of the stand has step-like elevations on both straight sides. The slope of the steps is plotted to present an unencumbered line of sight. The maximum distance from a spectator seat to the farthest point of the playing fields is 195 m. The height of the individual steps ranges from 20 cm. to 48 cm. Because of special seating demands during the Olympic Games the normal spectator capacity of 81,000 was reduced to 77,000. Filling and emptying the stadium are accomplished through a common access level. The grandstand structure on the western side is built upon a 34 m. high frame, on which 1,280 prefabricated steps with a maximum length of 16.05 m. are mounted. The landfill grandstand with earthwork up to 18 m. in elevation is covered with 30 cm. — thick poured concrete slabs, which support a total of 24,700 running meters of cast concrete steps. The stands contain three floor levels, on which all necessary auxiliary rooms are arranged. A lower corridor

connects the athletes' areas to the preparation rooms and to the warm-up hall.

Dimensions of the Facility

Stadium site including all ancillary stadium installation	250,000 sq. m.
Stadium tract with infield area	56,000 sq. m.
Space for spectator movement in front of stands (outer periphery)	27,600 sq. m.
Infield area	18,000 sq. m.
Spectator surface	37,500 sq. m.
Sport field 105 m. x 68 m.	7,140 sq. m.
Parking area	120,000 sq. m.

Only VIPs and organization personnel were permitted to use these parking areas during the Olympics.

Access

By car:
The stadium is integrated into the internal road and driveway network of Olympic Park. A strict separation is maintained between vehicular and pedestrian traffic zones. Internal vehicular traffic to the stadium is restricted to the western side of the structure and to authorized groups. In post-Olympic times, spectators arriving by car are directed to the parking lots on the western side of the stadium. These spaces, however, were reserved for VIPs and organization personnel during the Olympics.

Public transport:
The pedestrian walkways from the rapid transit and subway stations in the northern parts of the Olympic Park and from the streetcar and bus station south of the stadium lead to four passage zones (northwest, northeast, southeast, southwest) and feed from there into the stadium access level.

Total Cost excluding Incidentals

Stadium exclusive of roof and inner area	80.0 million DM
Inner area	2.3 million DM
Roof	55.0 million DM
Warm-up hall	5.8 million DM
Training grounds	2.1 million DM

Utilities

Heating:
The grass grounds and the grandstand structure as well as the rest-rooms under the periphery are heated.

Ventilation:
All rooms in the grandstand structure are mechanically ventilated. The technical systems are divided into the following zones:
1. grandstand structure
2. service garage
3. spectator rest-rooms under the periphery
4. direction booth

The rooms in the grandstand structure are ventilated in the summer. The VIP and press areas are supplied with cooled air (warm air heating in the winter). Cooling capacity in the VIP and press areas is 300,000 kcal/h. On level 1 (VIP and press areas) space heaters provide warmth along the glass facade. The operating zones can be separated from each other in accordance with various uses.

High voltage electrical installations:
The floodlight system consists of a fourmast installation which delivers a vertical illumination of 1875 lux (new value). Two floodlight banks, each with 144 spotlights, are mounted on scaffold-type masts at the northern and southern ends of the eastern grandstand. Two floodlight banks,

each with 78 spotlights, are mounted on the forward cast of the edge cable of the western grandstands. To illuminate the infield (western broad jump field) six smaller banks, each with 20 spotlights, have been attached to the trusses of the roof structure. There are also supervisory installations to check electrical capacity, installed transformer output, safety transformer reserves and connection values.
(The following values are mentioned in this order:)

Total	9,100 kVA	2,485 kVA	6,356 kW
Floodlight system	4,000 kVA		
1,855 kVA			2,006 kW
Grandstand structure including direction			1,100 kW
Ventilation, heating and hygienic installations	2,060 kVA		1,000 kW
Scoreboards—1,150 kVA			1,100 kW
Radio and television (technical vehicles, stadium subcenter)			250 kW
ELA system and information television monitors			20 kW
Data processing system			
1,260 kVA 630 kVA			500 kW
Telephone, intercom and clock systems			30 kW
Ticket windows and kiosks			
630 kVA			350 kW

Low voltage electrical installations:
Communications technology
Telephone system with 240 main circuits and 2,800 extensions. This installation was the central exchange for the whole Oberwiesefeld.
Intercom systems
Terminals for data processing, data input, data recall, fire alarm system, commentator network, clock system, antenna facility, pneumatic messenger system.

Utility rooms:	
Hygiene stations, total	216 sq. m.
High voltage electric plant	125 sq. m.
Transformer room, outlets	64 sq. m.
High voltage installation, outlets	97 sq. m.
Low voltage installation, outlets	95 sq. m.
Heating and ventilation stations, total	805sq. m.
Battery room	53sq.m.
Emergency power supply	148sq.m.
Porter	60sq.m.

Technical Installations for Sports

Time measurement:
The timekeeping system was temporarily installed. No measurements were taken by hand.

The starting gun delivered an electronic an optical and an acoustic signal. This signal set off the crystal clocks of the electronic timing system (primary system). The starting impulse was simultaneously transmitted telemetrically to the direction booth (secondary system). The finish was marked by a dual electric eye. For the measurement of middle times, additional electric eyes were set up at every 200m. Three finish line cameras, which were controlled from the timing booth on the upper edge of the stands, recorded the finishes for final decisions. The elapsed times were blended onto the films and onto the television pictures which were taken by an additional camera.

Measurement of throws:
Distances were not measured by tape, as in the past, but rather by electronic instruments. The point of impact of the javelin, hammer or discus was marked by a prism reflector, which was aimed by two telescopes in the

direction booth. The results were determined by measuring instruments linked to vertical and horizontal triangulation components and processed by a connected desk computer.

Measurement of jumps:
Distances were measured by means of an optical telescope which could be moved along guiding rails mounted parallel to the sand pit.

Scoreboards:
Two electronic Scoreboards (for Olympic and post-Olympic use), executed in "matrix technique" and fixed on the northern and southern sides of the upper grandstand edge, consisted of

a main board	19.80 m. x 8.60 m.
a subsidiary board	7.64 m. x 3.40 m.
a clock for normal time, diameter	4.00 m.

The following information could be displayed on the main board:
starting lineup, numbering, names and nationalities of the athletes, interim results, end results and order of athletes according to end results.

The subsidiary board contained the digital stopwatch and displayed Olympic and world records.

Four Scoreboards (light chamber technique) were located in the infield. These were 2.58 m. wide, 1.20 m. high, and could be swiveled 90°. These boards showed the individual results of the jumping, shooting, and throwing competitions, and were set up in the corresponding contest areas.

Competition Area

Infield surface 18,800 sq. m.
The reporters' trench, 2 m. deep and 3 m. wide, surrounds the entire infield. There is a 400 m. track with eight lanes and with eight sprinting lanes on the straightways. Water trenches for the 3,000 m. steeplechase were provided in the northern segment.

Pole-vaulting was assigned two fields in the northern segment; high jumping two fields in the south.

Broad jump, two running start lanes in the west, parallel to the sprinting lanes.
Broad jump and triple jump, two alternating running start lanes on the eastern side parallel to the track.

A grassy field, 105 m. x 68 m. for discus, shot put, hammer and javelin events at each end of the stadium.

The 400 m track, the straightaways and the running start lanes of the jumping areas, as well as the northern and southern sectors behind the goal line boundaries are done in "Rekortan", a massive plastic coating with a bitumen base (7,225 sq. m. total).

The main playing field has a grass surface, which is heated by a warm water system. The buildup from bottom:

20cm. drainage layer (medium thickness) of gravel 0—30, 16 cm. filter layer of sand and gravel 0-3 (grass fertilizers and "Montigel" are mixed in), 10 cm. supporting layer of a 40:60 peat moss and sand mixture (grass fertilizers are mixed in).

Grass mixture: 70 % *poa pratensis* "Merion", 15 % *phleum nodosum* "S 50", 15 % *cynurus cristatus* "Credo".

Boundaries and drainage of the playing field: The playing field is executed as an even surface without grade. A drainage system was dispensed with in view of the permeable gravel base. Only the two straight ways were drained. The water which collects on the Rekortan surfaces is collected by a

plastic concrete gutter along the inner track edge and is sluiced off into cisterns. The coating of the gutter is of a piece with the track. A collapsible bar, which is built of squared tubing with a plastic coated profile of 5 cm. x 5 cm., serves as the track boundary.

Sprinkling: The automatic system has sixteen countersunk sprinklers. Each long side has four and each end has three semicircular nozzles, while there are two circular nozzles in the middle.

Heating: A warm water heating system extends the grass growing season into the spring and fall and keeps the field virtually snow-free in winter. (A snowfall of 1 cm. per hour can be melted.) The heating consists of plastic tubing which is laid 25 cm. under the turf at 40 cm. intervals. The provisional maximum temperature is 36°C. The competition office 39 sq. m. is located in the western direction booth 424 sq. m. on the upper edge of the stands. The center is built on a platform which fits well into the geometry of the stadium. This booth is the coordinating center for all events in the stadium.

The sporting equipment room is on level 3, total 400 sq. m.
Preparation for Competition
Confer the training grounds.

Olympic Use

From August 26, 1972 (opening ceremony) to September 11, 1972 (closing ceremony)

Athletes' Area

Entrance area—level 2:
12 dressing rooms, each with 38 sq. m. Each dressing room is provided with a shower room with 32 sq. m. and two toilets, each with 7 sq. m.

Medical supervision and doping control:

1 doctor's office, 2 treatment rooms, 1 massage parlor and lounge, 1 X-ray room and 1 lab with a total of 285 sq. m.

2 hygienic stations for athletes at both Marathon gates, each 58 sq. m.
1 lounge and massage parlor with 425 sq. m. (divided into 40 cubicles)

Athletes' stand-by room before competitions on level 3 by the Marathon:
1 room 183 sq. m.

Level 4:
2 locker rooms for soccer with a total of 200 sq. m. (dressing rooms, showers, toilets, and relaxing pools)

Access:
By bus to the athletes' entrance on level 2; then directly to the changing rooms (hygienic rooms), medical facilities, lounge and massage; via staircase to level 3 and the stand-by room; there is the assembly area and call-up for the contests. (There is a tunnel connecting this stand-by room to the preparation zone, the warm-up hall and the warming-up area).

Spectator Area

Total capacity of the spectators' grandstands:
during the Olympics 77,000 seats for 44,000 standing room for 33,000
Of these, the following number of seats will be used by:

invalids 70
participants 2,452
post-Olympic capacity 81,000

The Olympic press and commentators' seats account for the difference. The western half of the stadium, with about 54% of all spectator places, is sheltered. 300 places under the roof were assigned to the main VIP stand, whose central section was reserved for IOC members and official representatives of the various nations. More VIP places were located above both to the left and to the right. 135 commentators' tables, each with two chairs and equipped with a television set and a commentating unit, were also sheltered. 413 press tables with two seats each were available, as well as 870 press seats without tables for non-accredited newsmen. There were also 70 seats for handicapped spectators and 2,452 places for participants.

VIP and IOC area:
Total surface 1,382 sq. m.
This area is reached via the driveway on level 1 and is subdivided as follows: From the foyer there is direct access to the VIP stands, the lounge and the restaurant with its 228 seats, as well as to the conference room to the right of the foyer, the office areas, the hostesses' rooms, the coatrooms, and the telephone booths. (An information desk is set up in the foyer.)

Spectator stands:
The grandstands are divided into 28 blocks which are designated by letters A to Z. The capacity of each seating block 2,400-3,600
Standing room blocks 3,000-3,400
Size of one seat 0.50 m. x 0.80 m.
Size of one standing place 0.50 m. x 0.40 m.
The all-plastic seats are of the individual bucket type and have no backs.

Meal service for spectators:
Spectators were served from 53 sales units, which were grouped into nine clusters. These offered snacks, refreshments, and sundry small articles. The clusters were equally distributed around the periphery.

Hygiene:
The hygienic areas, toilets and washrooms are located directly off the access stairways to the blocks. The stadium has a total of twenty toilet installations with 106 seats and 598 urinals for men and 144 seats for women.

First aid:
Four first aid stations are located along the through-passageways. Two of these measure 80 sq. m. each and two 20 sq. m. each.

Spectator access:
Admission to the access level is through the four passage zones. The western stand (above-surface structure) offers entrance via centrally placed openings, from which seats are reached from above and below. In the eastern stands (earthwork section), however all seats are reached from above. The blocks are partitioned by 90 cm. banisters. Seating and standing room areas are sealed off from each other by 130 cm. security glass panels. Breakwalls of 1.10 m. height and 3.10 m. length are installed at every tenth step in the standing room areas.

Ticket sales for spectators and inspection:
The four passage zones from the pedestrian walkway network have a total of 74 ticket windows, 77 inspection gates, and 21 exit gates. The inspection facilities are built

into the 2.25 m. fence which surrounds the stadium. Two central box offices are provided for final accounting.

Communications Area

The press area, which covered a total of 1,980 sq. m. was subdivided into working and telephone rooms and a press block in the stands.

Press driveway on level 1:
A snack bar with 80 seats was installed left of the foyer. To the right of the foyer the press offices with 100 desks were located, followed by the telephone room (50 booths) and the teletype room (20 machines). An information booth and lists of contest results were to be found in the lobby. The press seats were in the stands. There were direct stairways from the press area both to the press seats in the stands and to the reporters' trench.

DOZ editors' rooms:
Total surface 643 sq. m.
Access to the editors' rooms was via the athletes' entrance on level 2, while the direction booth was reached via passages in the upper stands, the editors' rooms and radio and television rooms. ABC was allotted a total of 650 sq. m. which consisted of 14 rooms, direction console booths, studios, and information rooms.

Transmission facilities:
There were 14 permanently built-in camera platforms in the grandstand area (11 for television, 3 for movies). Up to five portable cameras could be connected in the infield. The 155 microphone desks (135 open places in the stands and 20 commentators' posts in the direction booth near the DOZ subcenter) covered a total of 200 sq. m. A 3 m. x 7 m. platform was installed under the direction booth for an ABC camera.

Parking space was provided for technical vehicles underneath the western stands. Access was through the Marathon gate. A total of 16 vehicles from radio and television services, as well as service units of the police, fire department and the Red Cross could be accommodated. The post office technical rooms covered 271 sq. m.

Data processing system in the Olympic Stadium (Computer Center):
The system was installed on the technical level of the grandstand story. There were three Siemens Type 4004 computers, of which one was in reserve. The purpose of the installation was to provide the press, radio, television, and the spectators with fast and accurate information about the results of the Olympic contests. Here the results of all competitions were collected, processed, and passed on by teletype and data monitoring stations continuously and on demand to any contest area.

Competition and General Organization

Grandstand structure, level 1:
1 Room for the president of the IOC 28 sq. m.
1 Room for the president of the German NOC 28 sq. m.
Stadium direction office 25 sq. m.
OC technical staff—
6 rooms, totalling 212 sq. m.
Printing shop 175 sq. m.
OC short term help—
4 rooms, totalling 365 sq. m.
Grandstand structure, level 2:

13 offices for national and international sports associations 482 sq. m.
OC security guard 191 sq. m.
Grandstand structure, level 3:
Personnel rooms for
Medical personnel 48 sq. m.
Firefighters 46 sq. m.
Police 45 sq. m.
4 workshops, totalling 391 sq. m.
Grandstand structure, level 4:
Preparation room for victory celebrations 34 sq. m.

Restaurants

VIP restaurant with 228 seats (level 1) 445 sq. m.
Lounge with bar (level 1) 228 sq. m.
Kitchen and side rooms (level 3) 440 sq. m.
Press snack bar (level 1) 244 sq. m.
Kitchen 94 sq. m.
Canteen for short-term help, including preparation room 135 sq. m.
There were 53 sales areas for spectators to buy refreshments, drinks, and small sundries.

Training grounds

A training hall (warm-up hall), a modified type B track and a throwing field are installed on a three-hectare site.

The training hall which is set into the ground, measures 95 m. x 50 m., and has a net inside height of 5.50 m. The usable inside surface is 5,200 sq. m., the total volume 34,800 cu. m. Sporting installations in the hall:
a 200 m. track with banked curves, equipment and space for broad jumping, and triple jump, shot put field, 6 m. x 60 m. sprinting track, and a high jump facility (in this area the hall is 8.50 m. high).
Side rooms:
2 locker rooms, each with 30 sq. m.
2 Washrooms, each with 24 sq. m.
2 Toilet facilities
2 Training rooms, each with 15 sq. m.
1 First aid room 13 sq. m.
1 Technical room 40 sq. m.
1 Equipment room 130 sq. m.
1 Toilet facility for the fields 40 sq. m.

The track has six 400 m. lanes and eight sprinting lanes. There are two high jumping facilities and one throwing circle for discus and hammer in the southern sector. The northern sector is provided with 1 hurdle ditch, 2 pole-vaulting facilities, 1 area for broadjumping, 1 combined broad jumping and triple jump field, and a throwing circle for discus and hammer.

Grass area 105 m. x 68 m.
Construction of the lawn and the tracks is the same as for the stadium.

The throwing field has two javelin and two shot put areas.

This field is a mixture of sand and topsoil. The construction of the javelin runway is the same as in the stadium. This whole outdoor area is lighted by a seven-mast floodlight system which produces an illumination of 150 lux (new value). In the southwestern corner of the total area there is a manually operated athletes' call system.

Sports Hall in Olympic Park

Types of Sport:
Gymnastics and Handball finals

Location:
8000 Munich 40
Coubertin Square

Team director for the Olympic Construction Company, Ltd.:
Graduate Engineer Bernd Krönert, Munich

Project director for the Olympic Construction Company, Ltd.:
Graduate Engineer Hans Korn, Munich-Grafring

Design and Planning:
Behnisch and Associates, Independent Architects, Munich/Stuttgart
Prof. Günter Behnisch, Fritz Auer, Winfried Büxel, Erhard Tränkner, Karlheinz Weber

Project director for Behnisch and Associates:
Dipl.-Ing. Architect Bernd Rosewich

Statics and Construction:
Engineering Office of Dr. Günter Scholz, Munich
and Leonhardt and Andrä, Consortium of Consulting Engineers VBI, Stuttgart

Heating and plumbing installations:
Engineering office of Brandt, Frechen near Cologne

High and low voltage electrical technology:
Engineering office of Roland Gackstatter, Stuttgart

Direction of Construction:
Engineering Consortium for Olympic Buildings, Munich
Engineering Office Rüping, Düsseldorf
Engineering Office Dr. Walter, Essen

Characteristics of Design and Construction

The sports hall or multi-purpose hall lies between the swimming hall and the stadium and forms the northern boundary of Coubertin Square (the central plateau). The nearly oval layout plan of the single level of stands, which surrounds the building, gives the entire construction its distinctive form. In the same manner as the stadium and swimming hall, the sports hall with its shell of stands is set into the partly artificial topography of the Olympic Park. The building can only be seen in its full height from the north. From the south only the roof with its enclosing facade is visible above the terrain. The grandstands rise on all sides from the central arena (level 1) up to the visitor access on level 4, and constitute a transition through the glass facade into the Olympic Center, that is, the central plateau. The auxiliary rooms are located on levels 2 and 3 underneath the slopes of the stands. The only exception is the warm-up hall or gymnasium which is enclosed in its own underground structure set on the continuation of the lengthwise axis to the west. The entire building is constructed of reinforced concrete. The prefabricated steps in the stands are mounted on poured concrete beams.

Dimensions of the Facility

Total built-over space	427,300 cu. m. including air space
over the hall	288,000 cu. m.
Total usable surface	46,000 sq. m.
Axis of the total complex (less warm-up hall), lengthwise	about 150 m.
Axis of the sports hall crosswise	about 120 m.
Greatest height from arena floor to lower roof surface	about 42 m.
Arena area (inner area) with temporary stands for Olympic use	2,000 sq. m.
Arena area without temporary stands (post-olympic use)	4,000 sq. m.
Total surface of the podiums for Olympic gymnastics competitions	854 sq. m.
Handball court 20 m. x 40 m.	800 sq. m.

Access

By car:

Coming from the Olympic Village, motorists use Lerchenauer Strasse, the Middle Ring, and Spiridon Louis Ring. From there the entrance driveway on level 1 (arena) is reached by a ramp.

Public transit:

The subway station of the Olympic Park lies about 600 m. to the east. A connecting path leads over a footbridge to the access level of the hall. The rapid transit station for the Olympic Park is about 800 m. to the northwest. A footpath connects with the sports hall. The street-car stop is on Schwere Reiter Strasse, about 1.2 km. away. Again footpaths connect to the sports hall.

Parking lots:

During the Olympic Games parking spaces near the sports hall were provided only for VIPs, functionaries and service groups.

Total Cost (Excluding Incidentals and Roof Construction)

72 million DM

Utilities

Heating, cooling, ventilation:

Heat connection value	6.6 Gcal/h.
Connection to the urban hot water heating network	
Cooling capacity	2.5 Gcal/h.
Ventilating capacity	800,000 cu. m./h.
Enclosed space	427,300 cu. m.

Of this, air space in the hall comprises 288,000 cu. m. The entire sports hall is heated by warm air. Only the administration rooms are equipped with supplementary radiators. The actual hall area can be cooled in summer. The air which is needed for heating or cooling is drawn in from intakes located under the stands in the north and south of the hall. It is either preheated or pre-cooled before being passed on to the eighteen adjustable vents above the stands, from which the treated air is blown into the hall or the foyer. The exhaust air is removed to 70% through the steps in the stands, to 10% through the arena floor, and to 20% through the two high points of the roof. Eighteen stations for ventilation machinery are symmetrically distributed around the arena on the administration level. They can be operated alone or in groups. The warm-up hall, the restaurant and the auxiliary rooms are served by their own stations. The exhaust air is collected in a duct ring under the arena level and

is blown out about 25 m. away on the eastern and western sides of the building. Vestibules on the western and eastern facade create an air curtain and separate the heated hall from the outside air.

The following room temperatures are achieved:

Foyer, warm-up hall, workshops	18°C.
Dressing rooms, doctors' offices, administration	24°C.
Press, rooms, restaurant, administration	22°C.
Storerooms, auxiliary rooms	12°—15°C.

High voltage installations:

Installed transformer power output	4,870 kVA
Emergency generator power output	300 kVA

Illumination (floodlight installation): sixteen lighting platforms with a total of 126 spotlights (each bulb 2 kW) for the direct lighting of the arena are situated on the uppermost edge of the stands above the spectator banks. 64 more spotlights (each bulb again 2 kW) illuminate the edge of the roof. On the central lighting platform, which is joined by a catwalk to the upper direction booth and to the four cross walkways, 144 more spotlights are mounted. These platforms provide for the special post-olympic lighting needs of the cycling track, boxing ring, and stage performances. The glare-free lighting demanded for color television has an intensity of 1,875 lux (new value) vertically and about 4,000 lux horizontally.

Stage lighting system:

This consists of sixty light intensity-controlled circuits, electronic programming of all circuits for 100 different lighting arrangements and a control box with a "blind" schematic. The lighting can be directed from two switch consoles, one of which is portable. According to the needs of each individual event, the lighting is controlled either from the direction booth on the long northern side of the arena level or from the booth built above the foyer on the southern side. The portable console can be put into service on the lighting platforms or at other connection points, while the master switch console in the control booth maintains priority.

Low voltage installations:

PA system: sixty loudspeaker clusters are located on the lighting platforms to serve the spectator area and playing fields. The speakers for the foyer, the dressing rooms, and preparation rooms are collected into separate groups. The restaurant and the warm-up hall possess their own stations, which are connected to the main amplifier center. At post-olympic stage performances, any desired effects can be achieved by switching in special PA systems. Direction can alternate between the central booth and the sports booth. The control console in the sports direction booth can also be used in the arena. There is also a telephone system with 150 extensions from the central exchange in the Olympic Stadium. In addition there are six intercom systems for important communications posts, a clock system, an antenna installation for television, electronic data processing and data transmission facilities, data monitoring stations and a fire alarm system.

Technical Installations for Sports

Scoreboards:

Four main scoreboards are hung above the middle of the arena at a height of 16 m. and at a distance of between 40 m. and 65 m. from the spectators. Each scoreboard consists of a main board (11.82 m. x 2.94 m.), a moving headline band (6.72 m. x 0.45 m.) and a running lane indicator (0.70 m. x 2.94 m.) which is mounted on the left side of the scoreboard in front of the PA system columns. Main Scoreboard: ten lines each with 41 characters of 231 mm. height.

Moving headline band: Complete screen of lights with character height of 231 mm. Running lane indicator: One symbol band with white characters on a black ground for individual gymnastics disciplines and handball. Height of characters 330 mm., one black covering band for partial concealment of the figures.

Input of information and results from data monitoring stations in the field direction booth or from the central booth, depended on the competition. A closed-circuit television system with three cameras transmitted pictures of the main scoreboards to monitors in the field direction booth.

Six individual scoreboard installations for the various competition areas supplemented the four main ones. These consisted of three-sided portable point scoreboards in "light chamber technique". Each supplementary board was supplied with four input consoles for use by the judges. The final score was transmitted to the main control station through an input board operated by the referee (chief judge). The clearing of the individual scoreboard was regulated by a light signal.

Competition Area

Gymnastics:

In the inner area of	2,000 sq. m.
the podium for gymnastics was erected. On a total surface area of 47.58 m. x 23.18 m.	1,103 sq. m.
a gymnastics podium was built, divided into five areas with a total surface area of	850 sq. m.

The dimensions and execution of these podiums met the specifications of the International Gymnastics Federation (FIG). The podium consisted of fields of 1.22m. x 0.61 m. size or of 0.61 m. x 0.61 m. in areas of particularly heavy loads. The highest possible stress was set at 400 kg./sq. m. The height of the podium was 91 cm.

The framework consisted of a collapsible steel structure. The gymnastics floor surfaces were constructed of 25 mm. thick Oregon pinewood slats, a 14 m. square area of which was covered with heavy-duty carpeting. The running start lanes for the horse vault were covered with a 25 m. x 1 m. all-plastic mat.

Ten stairways provided access from the arena floor to the podium. Seats for the participants and their coaches were arranged in their respective competition zones. The podium was divided into six parts for the men's gymnastics, and into four for the women's.

Each area was equipped with five intercom installations and five input boards for use in the individual systems or for directing final results to the main scoreboards. Seats were provided for four judges, a referee and a technical observer each.

Handball:

For handball a removable elastic wood floor covered with PVC (polyvinyl-chloride), and measuring 22 m. x 42 m. 924 sq. m. was inserted into the arena floor. The handball court itself measured 20 m. x 40 m. 800 sq. m.

After the Olympics, the sports hall will be used for gymnastics and handball competitions, as well as for track and field, cycling equestrian sports, boxing, fencing, roller skating, etc. It can also be utilized for stage performances, ice revues, concerts, conventions and exhibitions. Two arena partitionings are possible for track and field: a shortened round track if the cycling track is built-in, or a 200 m. track (4 m. x 200 m. oval, 6 m. x 60 m. sprinting track) with an expanded cycling track.

A shot put and broadjump trench which can be adjusted both horizontally and vertically by a hydraulic mechanism, was built within the track. Running lanes and starting lanes for polevaulting, sprinting, broadjumping, and highjumping are constructed of Rekortan and are laid out on the arena floor. The ice rink for hockey or ice revues is formed on the unprepared arena floor. Cooling ducts and ice machines are provided.

The arena floor is covered with a removable hardwood floor for other events. The necessary technical equipment for stage productions (lighting platforms, machinery for curtains, projection screens, and stages) are available. 300 sq. m. of storage space on the arena level may be used for gym equipment, stage components, etc.

Olympic Use

August 27, 1972 to September 1, 1972 for gymnastics.
September 6, 1972 to September 10, 1972 for handball finals.

Athletes' Area

The rooms for the athletes were located on the arena level (level 1) in the north-western sector.

8 dressing rooms, each with 1 6 running meters of benches and 2 lockers totaling	38 sq. m.
For every 2 dressing rooms there is a hygienic unit, each with	32 sq. m.
Each hygienic unit contains 2 showers and 2 washrooms with 2 massage tables	

Doping control area - level 1 at the entrance hallway:	
1 doping control room in the arena (west)	24 sq. m.
1 waiting room	24 sq. m.
Doctor's area — level 1 at the entrance hallway:	
Hygiene room	21 sq. m.
Examination room	14 sq. m.
Doctor's office	14 sq. m.

(with corresponding toilets)
Preparation for competition:

The warm-up hall is located in an annex on the western curve of the sports hall. Surface area 21 m. x 42 m. 882 sq. m. The net height of the structure is 5.62 m.

The whole space can be divided into three rooms by folding walls. The floor consists of a removable elastic wood base coated with PVC.

The calisthenics hall is contained in the same annex as the warm-up hall. Surface area 12 m. x 16 m. 192 sq. m.

with a net height of 4.30 m.
The floor is a removable elastic wood base coated with PVC. For acoustic reasons parts of the ceiling were lowered. The walls are of unfinished masonry. A common equipment room with 61 sq. m. is available for the warm-up hall and the calisthenics hall.

Conditioning room: Facing the calisthenics hall but in the western sports hall is the conditioning room with a surface area of 150 sq. m. and a net height of 3.60 m. The floor is covered with wood tiles.

390 spectator seats are at the disposal of participants. These were located in the western curve of the sports hall and were linked to the athletes' rooms by a separate passage.

Access:

Admission is on the northwestern side of the sports hall on level 2 (administration level). This entrance is also used by the personnel. From here the athletes pass the doorman's room and descend the separate staircase to the entrance hall on level 1 (arena level). The dressing rooms and hygienic units are accessible from this point. Farther on, under the middle of the curve of the western stands, one reaches the doping control and medical areas as well as the warm-up hall, the conditioning room and the gymnastics hall. From here one proceeds on the same level to the western entrance of the arena.

Spectator Area

Total spectator capacity 10,563
Seats in the permanent stands 4,771
Seats in the temporary stands 1,800
Standing room places 3,992
Seating in the stands consists of individual folding chairs with upholstered backs and cushions.
Breakdown of the grandstand capacity:
VIP seats in the northern stand 198
(accessible via separate vestibule and foyer with a passageway to the VIP lounge.)
Participants' seats 390
Press seats with tables 200
Press seats without tables 100
Commentators' seats 104
Meal service for VIPs:

There was a refreshment bar in the VIP lounge with 160 sq. m.

Meal service for spectators:

There were two stationary concession stands on level 3. Fifty mobile refreshment carts were formed into groups of two and distributed equally throughout levels 3 and 4.

Hygiene:

25 spectators' toilets, each with 16 sq. m. are located on level 3.

First aid:

2 hygienic rooms for first aid on level 3
1 examination room 16 sq. m.
1 waiting room 16 sq. m.

Hat and coat check:

After the Games, 57 portable coatracks with a total of 5,000 hangers are available on level 3.

Spectator access:

Spectators are led from main entrances in the southwest and southeast (admission control) on level 4, from where they go directly to the upper seats. The lower seats are reached through access mouths on level 3. Forty-eight emergency exits lead from the foyer into the open.

Communications Area

Arena level (level 1):

1 interview room 62 sq. m.
1 Interview waiting room 62 sq. m.
1 Studio 52 sq. m.
1 Direction room (DOZ) 34 sq. m.
1 Radio room 12 sq. m.
1 Television room 12 sq. m.

1 Data evaluation room with copying and mimeograph machines and teletype 24 sq. m.

Administration level:

1 Press office with information booth 150 sq. m.
Data monitoring station 76 sq. m.
Post and telephone room 76 sq. m.
1 Darkroom 21 sq. m.
1 Press snack bar with coat-room and toilet 76 sq. m.

Transmission facilities:

4 DOZ television cameras, 1 ABC television camera, 4 DOZ film cameras, 8 technical transmission vehicles with 300 sq. m. parking area in immediate vicinity of the sports hall.

Competition and General Organization

Rooms for national and international sports associations on level 1:

Northeast (behind the arena area)
Fédération Internationale de Gymnastique (FIG)
FIG President 35 sq. m.
FIG business manager 22 sq. m.
FIG and DTB secretarial staff 50 sq. m.
Deutscher Turnerbund (DTB)
DTB President 24 sq. m.
DTB secretary general 20 sq. m.
Fédération Internationale de Handball (IHF)
IHF President 27 sq. m.
IHF business manager 18 sq. m.
IHF and DHB secretarial staff 41 sq. m.
Deutscher Handballbund (DHB)
DHB president 23 sq. m.
DHB secretary general 19 sq. m.
1 room security guards (police) 300 sq. m.
10 referee dressing rooms, each with 19 sq. m. and every two locker rooms share 1 toilet and 1 shower
1 referee lounge (directly off the arena) 24 sq. m.

Administration level (level 2):

1 Room for management of the sports hall 64 sq. m.
2 Rooms for technical area management, total 72 sq. m.
2 Rooms for subdirection for sports (gymnastics), total 64 sq. m.
1 Room for subdirection for sports (handball) 40 sq. m.
1 Room for subdirection for traffic movement 64 sq. m.
2 Rooms for ticket takers each 67 sq. m.
1 Dressing room for female personnel 67 sq. m.
1 Dressing room for male personnel 67 sq. m.
1 Room for hostesses 37 sq. m.
1 Room for porter (at entrance for participants and personnel) 24 sq. m.
1 Room for technical personnel 30 sq. m.
Workshops
2 Carpentry shops, each 50 sq. m.
1 Metal working shop 50 sq. m.
1 Painting shop 50 sq. m.
1 Electrical acoustic systems shop 50 sq. m.

1 Room for low voltage electrical equipment 36 sq. m.
Printing shop 36 sq. m.
Competition office 36 sq. m.
Waiting room for victory celebrations 45 sq. m.

Restaurant

Restaurant (bowling alleys):

At the service of the Olympic short term workers with 300 places; including kitchen, bars, pantry and personnel dressing room 530 sq. m. (western curve above the annex for the warm-up hall)

Press bar, cafeteria 64 sq. m. on level 2, north

VIP snack bar 25 sq. m. on level 2, north

Meal service for spectators:

Two built-in snack bars, as well as fifty mobile refreshment carts on levels 3 and 4.

Swimming Hall at Olympic Park

Types of Sport:

Swimming, Springboard diving, and Platform diving, Water Polo, Modern Pentathlon (swimming)

Location:

8000 Munich 40
Coubertinplatz

Team director for the Olympic Construction Company, Ltd.:
Graduate Engineer Bernd Krönert, Munich

Project director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Eckhart Reissinger, Munich

Design and Planning:

Behnisch and Associates, Independent Architects, Munich/Stuttgart
Prof. Günter Behnisch, Fritz Auer, Winfried Büxel, Erhard Tränkner, Karlheinz Weber

Project director

for Behnisch and Associates:
Dipl.-Ing. Architect Jörg Bauer, Munich

Stressing and building construction:

Engineering Office of Dr. Engineer Otto Höllner, Munich

Heating and plumbing components:

Brandt Engineering Corporation, Frechen near Cologne

High and low voltage electrical installations:

Engineering Office of R. Barth, Munich

Director of Construction:

Engineering Consortium for Olympic Buildings, Munich
Rüping Engineering Office, Düsseldorf
Engineering Office of Dr. Walter, Essen

Characteristics of Design and Construction

The swimming hall closes off the eastern side of the plateau of the forum and the Coubertinplatz. Like the Olympic Stadium and the sports hall, the swimming hall is not conceived as a monumental architectural work in itself, but rather as an integral part of the total design concept of the main sports arenas. From the plateau level, the foyer of the three-story building attracts the viewer's attention, whereas from the first level the roof and the enclosing glass facade dominate the view. The foyer constitutes a transition from the central square of the plateau to the stationary spectator stands. These drop off toward the east and are set off from the competition level by a curved breastwork. Deeper still is the poolside level, on which the diving pool and tower and the racing pool adjoin each other on a south-north axis. The eastern edge of this competition area was enclosed by the temporary spectator stands. In the forum area north of the pools, the snack pavilion was set up in the immediate entrance area on the foyer level. The dining areas were grouped in free forms around the vertical middle axis of this plant building. The platforms and breastworks were constructed of steel tubing which was covered with a web of stainless steel.

Volleyball Hall, Olympic Park

Large playing fields with surfacing:
There are four large surfaced playing fields measuring 109 m. x 70 m. located between the handball fields or relatively north of them.

Hockey fields:
There are two hockey fields measuring 99.40 m. x 59 m. each. The lawn was built up as described above.

Basketball courts:
There are five basketball courts each measuring 15 m. x 28 m. and a basketball throwing circle with a diameter of 36 m. The surface is covered with "Akus-Elastik".

Fields houses:
There are three shelters with toilets and an equipment storage room within the ZHS southern open-air sports facility.

Total Cost excluding Incidentals
21.6 million DM.

Olympic Use

The facilities were used exclusively for training purposes and were available for the following sports: football, track and field and hockey.

Post-Olympic Use

The entire installation will be permanently used as the Central University Sports Facility of the Munich Technical University. The facilities that were constructed exclusively for the Olympic Games will be removed. Purposes corresponding to current needs will be found for these free areas. Realization of the planned tennis facility (26 courts) will be temporarily postponed. It would be located in the southeastern area on the site of the temporary restaurant "North".

Type of Sport:
Volleyball

Location:
8000 Munich 40
Connolly Strasse

Team director for the Olympic Construction Company, Ltd.:
Architect HBK Klaus-Jürgen Kluge, Munich

Project director for the Olympic Construction Company, Ltd.:
Construction-engineer Wilhelm Pankow, Munich

Design and Planning:
Prof. Erwin Heinle and Dipl.-Ing. Robert Wischer and Associates, free architects, Stuttgart/Munich

Statics and Building Construction:
Dip.-Ing. K. Boll as associate of the Partnership Leonhardt and Andrä, Stuttgart

Heating, Ventilation, Plumbing:
Engineering Office Brandi, Frechen near Cologne

Electrical and Electronics:
BMS Engineering Company, Munich

Landscaping:
Garden and Landscaping Architects Miller and Luz, Stuttgart

Direction of Construction:
Engineers' Pool for Olympic Construction, Munich
Engineering Office Rüping, Düsseldorf
Engineering Office Dr. Walter, Essen

Characteristics of Design and Construction

In regard to its spatial relations, its construction and design, the volleyball hall is an integral component of the building complex of the Central University Sports Facility (ZHS) which accommodated the "German Olympic Center" for radio and television (DOZ) during the Olympic Games. The hall lies to the west of the forum and is constructed, like the other parts of the complex, in a visible Cor-Ten steel skeleton construction. The wall components are built of suspended sandwich panels (multi-layer sheets). The roof construction consists of Cor-Ten steel concave box rafters which, with an inclination of 60°, were assembled into symmetrical "sheds". The entry hall of the competition facility was situated at the east of the complex, on the level of the forum. Visitors entered from the forum. For Olympic usage the level of the play area was temporarily lowered below that of the driveway, so that the hall obtained a total open height of 12.50 m. (from the upper surface of the floor covering to the lower edge of the rafters). Auxiliary rooms are under the grandstands, on the level of the driveway. The athletes' locker room area is situated under the entrance hall. After the Olympics, the height of the hall will be reduced to 9.00 m.; the hall will be separated into two gymnasiums of 28 m. x 56 m. each by an immovable dividing wall.

Dimensions of the Facility

Interior space of the volleyball-hall 58,700 cu. m.
Area under roof (plane
507.50 sq. m. driveway level
79.20m. x 64.80m.) 5,132 sq. m.
Clearance height of hall 12.50 m.
Inner area, 20m. x 34m. 680 sq. m.
Playing surface (for competition) 9 m. x 18m. 162 sq. m.
Contest preparation:
Total area under roof of
warm-up hall 21.60 m. x
36.00m. 778 sq. m.
Interior space of the entire
hall 6,200 cu. m.
Interior dimensions of the contest
preparation area of the warm-up hall
(two-fifths of the hall's floor space were
used for the additional cooling installations)
21.00 m. x 21.50 m. 451 sq. m.
(2 playing areas) 451 sq. m.
Playing areas, each 9 m. x
18m. 162 sq. m.
Clearance of hall 7 m.

Access

See access "German Olympic Center (DOZ)".

Total Cost excluding Incidentals

See Construction Data DOZ/ZHS.

Utilities

Heating (warm air heating):
Total circulated volume
of air. 173,000 cu. m./h,
of which 70,000 cu. m./h were circulated
by a temporary installation.

Cooling:
The hall was cooled by a temporary cooling
machine with a capacity of 2 Ccal/h.

Ventilation:
Air-intake is via the concave rafters in the
roof; the air is blown straight down into the
hall. The exhaust flows mostly through
the permanent grandstands and partly
(40,000 cu. m./h) through the temporary
grandstands.

High voltage installations:
Electric current was supplied via the ZHS
installation.
Lighting: The lighting bars for the 56
floodlight lamps (each 2 KW) were in-
stalled along the "shed-roof" rafters.

Low voltage installations:
The following equipment was installed:
PA system, clock system, fire alarm system,
data processing and transmission system,
15 extensions of the stadium telephone
system, intercom system.

Technical Installations for Sports

Electronic Scoreboard:
For information concerning the current
contest two electronic scoreboards, exe-
cuted in light chamber technique, were
installed on the eastern and western walls of
the hall, along the axis of the hall between
the gallery and the lowest edge of the
ceiling. The boards were 2.30 m. x 1.10 m.
The following data were displayed: the
nationality of two teams in the current
game, indication of the serve, time outs,
score within the game, results of the indi-
vidual games in the set.

Manual display board:
Two magnetic display boards, each 3 m. x
2 m. were installed on the front walls of
both warm-up cubicles. The following
data were given: starting number and names

of the players of the two participating
teams of the current contest, as well as
the names of the coaches.

Intercom:
There were intercom stations for the
referees, the competition director, the
locker rooms, the control room, the practice
hall, the jury, the records desk and the
warm-up cubicles. An acoustical signal was
installed to indicate the time outs.

Contest Area

The contest area was situated in the tem-
porarily deepened part of the hall between
the two temporary grandstands, and 3.50 m.
below the grandstand access level.

Inner area 20 m. x 34 m.
Playing area 9 m. x 18 m.
The entire inner area had an elastic playing
floor with a polyvinyl-chloride covering.
The competition playing surface inside the
marking lines (9 m. x 18 m.) was set off
by its dark green color from the rest of the
light colored floor surface.

Two practice cubicles with an area of
3.50 sq. m. each and a height of 5 m. were
erected on the middle axis of the hall,
8 m. from the two front sides of the playing
area.

Outside of the playing area, on the exten-
sion of the center line, the elevated seat of
the referee was set up; additional seats
for four line judges, the second referee,
the record keeper (with desk) as well as
six places for reserve players per team
were available on the northern side.

Contest preparation:
Within the practice hall, a competition
warm-up area of 21.50 m. x 21.00 m. was
created with a playing floor and covering
of polyvinyl chloride. This floor was
divided into two playing areas of 9 m. x
18 m. marked in accordance with the com-
petition playing area.

Olympic Usage

August 27 - September 9, 1972

Athletes' Area

Inner area (contest area of the
volleyball hall). 680 sq. m.
Competition warm-up (prac-
tice hall). 451 sq. m.
5 athletes' locker room
complexes, each. 66 sq. m.
Each complex contained a locker room of
26 sq. m., a washroom, a shower room with
5 showers, and a toilet.
1 suite for doctor and
doping control. 80 sq. m.
The doctor's area consisted of a doctor's
examining room, a room for doping control,
a toilet and a waiting room.
228 spectator seats for athletes.

Access:
The entrance for the athletes was situated
on the level of the forum. The main en-
trance was on the eastern side of the hall.
From there the participants reached the
area of the locker rooms and showers, and
the contest area. The locker rooms were
on the eastern side of the hall and were
separated by an access corridor from the
auditorium area. The participants could
get to the practice hall and to the contest
area via the access corridor. The rooms
for medical care and doping control were
situated between locker rooms number
3 and 4 on the common access corridor.

then 8 cm. foam lava basalt 0/15 mm. as a drainage and holding layer, next the turf supporting layer consisting of a mixture of 30% top soil, 30% peat moss, 30% fine lava basalt grit 0/17 and 10% sand 0/15; finally a 4 cm. top layer consisting of a mixture of 60% sand 0/5 (DIN 1045) and 40% peat moss soil with 60 grams of full fertilizer per square meter. The lawn was sown 20 grams per square meter with a mixture of 70% *poa pratensis* "Merion", 15% *gynosurus crestatus* "Credo" and 15% *phleum nodosum* "Evergreen". At the far end of each field, four high walls of wire netting were erected outside of the safety margins to catch stray balls.

Preparation for competing:
Provided by a training field east of playing field No. 2 as well as by two additional training areas (grass areas) situated approximately 250 m. south of the main playing field.

Olympic Usage

August 27th until September 4th, 1972
September 7th until the 10th, 1972

Athletes' Area

Locker rooms	150 sq. m.
Washrooms and toilets	38 sq. m.
Doctors' area:	
Hygiene room	25 sq. m.
Toilets	13 sq. m.
Doctors' room	25 sq. m.
Treatment room	13 sq. m.
Doping control room	10 sq. m.
Rooms for ball boys	50 sq. m.

Access:
There was also a shuttle bus service for the athletes between the Olympic Village and the hockey grounds with an entrance at 0.00 m. level.

Spectator Area

Total number of spectator places including VIP places	21,900
Total number of spectator seats including VIP seats	17,200
Main playing field No. 1	
Grandstand	3,960
Collapsible bleachers	4,500
VIP seats, field No. 1	149
VIP seats, field No. 2	150
Seats for the press with tables	
Field No. 1	52
Field No. 2	15
Field No. 3	9
Field No. 3	9
Seats for the press without tables	
Field No. 1	167
Field No. 2	62
Field No. 3	20
Field No. 4	20
Seats for athletes	
Playing area No. 1	149
Playing area No. 2	150
30 seats for commentators (roofed)	
Playing field No. 1 and No. 2	30
Refreshments for VIPs:	

There was a snack bar for twenty-five VIPs under the grandstand at elevation 0.00 m.

Spectators' facilities:
Roofed refreshment stands at + 5.00 m. of the grandstand as well as at elevation 0.00 m. west of the grandstand.

Sanitary facilities:
Toilet facilities in the grandstand were installed at 0.00 m. elevation and at the connecting level + 5.00 m., as well as west of the grandstand under the collapsible stands at 0.00 m. elevation.

First aid:
The medical facilities were located in the doctors' area under the grandstand.

Access for spectator:
The VIPs were provided with their own entrance at the middle area of elevation 0.00 m. of the grandstand. From there, a direct entrance led to the VIP snack bar and the special seats in the grandstand for playing fields No. 1 and No. 2. The entrance for other spectators was located south of the hockey grounds on Kusoczinski-Damm, where the ticket booths and ticket takers were.

Communications Area

Under the grandstand at 0.00 m. elevation the print shop was located 12 sq. m.
At 5.00 m. elevation were the press area and interview room . . . 12 sq. m.
the hostesses' room 19 sq. m.
DOZ subcenter 50 sq. m.
Hat check and toilet facilities.
At 20.00 m. elevation were a temporary post office teletype room with adjoining offices. 25 sq. m.
2 telephone booths.

Television installations:
2 DOZ television camera stands
4 DOZ motion picture camera stands
For four technical equipment trucks, a parking area of 160 sq. m. was required.

Contest and General Administration

At 0.00 m. elevation of the grandstand were the following rooms:
Federation Internationale de Hockey (FIH)
FIH-President 38 sq. m.
FIH delegates 19 sq. m.
German Hockey Federation (DHB) 31 sq. m.
Sport areas administrator 25 sq. m.
Technical director 12 sq. m.
2 lounges for referees with direct access to the fields. 37 sq. m.
Fire and police department 19 sq. m.
Car pool 19 sq. m.
Guards and ticket takers 25 sq. m.
Technical maintenance personnel 25 sq. m.
Electrical equipment room 13 sq. m.
Sanitary facilities and other rooms for personnel 25 sq. m.

Restaurant

Under the grandstand at 0.00 m. elevation VIP's cafeteria with storeroom (no kitchen) 63 sq. m.
Under the grandstand at 5.00 m. elevation Spectators' snack bar with storeroom (no kitchen) including sanitary facilities 100 sq. m.
Outdoors area at the elevation of the main playing field 0.00 m.
2 spectators' snack stands with a total of 100 sq. m.

Boxing Hall, Olympic Park

Types of Sport:
Boxing and Judo
(Finals)

Location:
8000 Munich 40
Spiridon Louis Ring

Team coordinator for the Olympic Construction Company, Ltd.:
Graduate Engineer Bernd Krönert, Munich

Project director for the Olympic Construction Company, Ltd.:
Building technician Georg Galli, Wolfratshausen-Deining

Concept, Planning and Building supervision:
Dipl.-Ing. Rolf Schutze, Architect, Munich

Characteristics of Design and Construction

Temporary bleachers were built over the existing grandstands and parts of the ice skating rink in the Munich ice sports hall. These temporary stands left a free rectangular inner area of approximately 21.40 m. x 18.80 m. The ring was set up here for the boxing matches, whereas a platform of 16 m. x 16 m. was built here for the judo contests. The window strips were temporarily hung with lengths of blue cloth so that a new appearance was given to the interior of the hall by the optical interaction of the new stands, the partially draped ceiling and the revamped lighting (which was concentrated over the middle area according to the needs of the boxing or judo matches). The lighting for the television cameras was set up so that the vertical lighting would also include the audience. The temporary stands were constructed of steel pipes. The traffic areas were covered with wooden planks carpeted with coarse felt.

Dimensions of the Installation

Built-over areas of the hall 5,870 sq. m.
Space under roof 73,000 sq. m.
Inner area
21.40 m. x 18.80 m. 402 sq. m.
(Inner area for boxing ring, mobile camera stands, special guests, referees, jury, doctors and the press)
Boxing ring 7 m. x 7 m. 49 sq. m.
The inner area for the judo matches as above
Judo mat 16 m. x 16 m. 256 sq. m.

Access

By car:
There is a connection from the Olympic Village to the boxing arena via Lerchenauer Strasse. The main connection to the city traffic arteries is via the Middle Ring and the Spiridon Louis Ring.

Public transit:
The subway station for the Olympic Park is located approximately 500 m. away. From there the boxing arena is reached by pedestrian paths. The rapid transit station is located approximately 1,500 m. from the boxing hall. There are sidewalks leading from there to the boxing hall. It is also possible to use the street car stop at Schwere Reiter Strasse.

Parking lots:
The available parking lots were only for

the use of VIPs and the necessary service personnel.

Total Cost excluding Indirects
4.2 million DM

Utilities

Heating:
The existing heating system was utilized for the various rooms (hot water heat).

Ventilation:
The shower and washrooms were temporarily heated by electric space heaters. The rooms were also ventilated. The boxing arena was ventilated by ten roof ventilators.

Ventilation capacity:
The ventilators could be set at either one of two speeds.
Stage I (minimum) 100,000 cu. m./h.
Stage II (maximum) 200,000 cu. m./h.
The fresh air was conducted through the existing blinds of the hall. Maximum ventilation was 30 cu. m./h. per person.

High voltage installations:
Installed transformer capacity 1,030 kVA

Lighting:
Floodlights as required for color television
E mean = 1.500 lx
E mean = 3.1 00 lx
Emergency lighting

Low voltage facilities:
Ela-system, clock system, fire alarm system, antenna installation, data processing, data transmitting, etc.

Intercom system:
Boxing match directors and referees.

Technical Facilities for Sports

Scoreboards:
Two electronic scoreboards executed in light chamber Technique 5.00 m. x 1.60 m. were hung over the spectator stands on the northern and southern sides of the hall. The following information was displayed: the starting number of the current match, name, nationality, class and weight, points, match number, weight category, contestant number, name, nation, individual evaluation, total-result.

Contest Area

Inner area 21.40 m. x 18.80 m. 402 sq. m.
Boxing ring:
The boxing ring was located on a platform 7.00 m. x 7.00 m., 1.00 m. high in the middle of the inner area. 49 sq. m.
The collapsible framework of the ring was constructed of steel pipe with a wood floor. In the remainder of the inner area were the referee seats of the Association Internationale de Boxe Amateur (AIBA), the Deutscher Amateur Boxverband (DABV), the physicians panel, seats for the doctors' commission, 2 standing places for mobile television cameras, and press seats. The directors' cubicles including that of the match supervisors were located on the western side of the hall over the stands. 35 sq. m.

Olympic Use

Boxing—August 27 until September 8, 1972
Judo (finals) - September 9, 1972
Boxing - September 10, 1972

Athletes' Area

Inner area 402 sq. m.
12 locker rooms, each 26 sq. m.
with 4 sanitary areas, each 33 sq. m.
with a total of 22 showers, 14 toilets and washrooms.

Hygiene area:
In the athletes' locker room area
Doctors' office with reception room 20 sq. m.
2 sports doctors' offices, each . . . 13 sq. m.
Doping control 18 sq. m.
Examination room 37 sq. m.
Toilets and washroom 13 sq. m.
2 boxing glove store rooms, each 30 sq. m.
1 refreshment stand in the locker room area.

Access:
The entrance was on the northern side of the hall at the contest level. From there the athletes proceeded to the locker rooms, hygiene areas, and through the boxing glove store room to the ring.

Spectators' Area

Total spectator seats 7,360
Individual bucket seats (as in Olympic Stadium) 6,038
Special seats 36
VIP seats 228
Participants' seats 283
Press seats with tables 153
Press seats without tables 106
Commentator seats with tables 124
Commentator cubicles with tables . . . 36
Chairs for the press in inner area . . . 195
VIP seats 54
AIBA Jury 5
AIBA 26
Referees' seats 43
DABV 12
Doctors' commission 19
Doctors' jury 3

VIP services:
The VIP restaurant seating fifty was located on the third tier and included a refreshment service, kitchen, toilets, and other rooms.

Spectator services:
There was a snack stand on the first level in the ambulatory.

Sanitary facilities:
Four rest rooms totaling 120 sq. m. were located at the northern and southern sides of the hall at the contest level.

First aid:
One room at the contest level . . . 14 sq. m.

Spectator access:
Three main entrances on the southern side of the grounds, then over the plaza and up the two ramps to the middle encircling spectators' entry level; from here entry through one of ten doors to the seats. The ticket windows were immediately accessible from outdoors.

Communications Area

The entire communications area was housed in a single-storied temporary prefabricated building outside the boxing hall next to the western wall.
Press writing room 87 sq. m.
Press office 24 sq. m.
Interview room 94 sq. m.
Post office and teletype room . . . 170 sq. m.
ABC room 40 sq. m.
2 rest rooms (toilet and washrooms) total 40 sq. m.
Lobby (for information and telephone booths) 150 sq. m.
DOZ room 120 sq. m.
Printing shop in adjoining area of the boxing hall 33 sq. m.
Special post office for visitors at the northern side of the hall under the galleries.

Broadcasting facilities:
Four DOZ television camera places were located on the stands or in the inner area, as well as one space for an ABC TV camera and four more spots for DOZ movie cameras. The post office transmitting room was located in the side rooms of the hall 10 sq. m.
Three hundred square meters of parking area had to be provided for eight technical equipment trucks.

Contest and General Organization

Association Internationale de Boxe Amateur (AIBA)
AIBA President 43 sq. m.
AIBA Office 15 sq. m.
2 AIBA extra rooms, each 30 sq. m.
Conference room 40 sq. m.
Deutscher Amateur Boxverband (DABV)
DABV Presidium 26 sq. m.
DABV Office 20 sq. m.
International Judo Federation (IFJ) 23 sq. m.
Deutscher Judo-Bund (DJB) 23 sq. m.
Contest area supervisor 20 sq. m.
Technical supervisor 22 sq. m.
Referees' locker room 23 sq. m.
Referees' lounge 38 sq. m.
Jury conference room 40 sq. m.
Hostesses' room 34 sq. m.
2 security guards rooms, each . . . 14 sq. m.
1 room checking service 22 sq. m.
Fire department stand-by room . . . 38 sq. m.
Police stand-by room 11 sq. m.
Car pool drivers 20 sq. m.
Repairmen 50 sq. m.
Various store rooms 150 sq. m.

Access:
The rooms of the national and international federations as well as those of the sport area supervisors had their own entrance and lobby.
Other separate entries were reserved for the doctors and the press.

Restaurant

A restaurant to serve VIPs was located at the western side of the hall above the stands 180 sq. m. (with refreshment counter, kitchen and other areas).
Six refreshment stands stood in the corridors under the stands on three sides to serve the spectators.

Olympic Village

Location:
8 Munich 40
Olympic Park North

The Olympic Construction Company, Ltd. was responsible for the project "Olympic Village" only until the preliminary design stage. Afterwards, of the entire project only the amusement center (the eventual school and childrens' day care center) and the food service center remained under the control of the Olympic Construction Company. Five Munich building contractors were entrusted with the completion of the Olympic Village Center and the Men's Olympic Village (approximately 3,000 apartments for about 10,000 inhabitants). The DEBA, Deutsche Wohnbau, with an approximately 50% interest, the Bavarian Hausbau with approximately 31 %, the Public Benefit Bavarian Building Corporation with approximately 9%, the Münchner Grund Gesellschaft with 5% and the Süd Grund Gesellschaft with 5% interest incorporated themselves into the "Olympic Village Project Corporation" (ODMG). For this area the ODMG awarded contracts for the approaches, external traffic and the community facilities. It was also responsible for the Park House, the pneumatic refuse removal system, and the interior and exterior building of all facilities required by the Olympics.

All construction projects in regard to houses and apartments were executed by the individual building corporations themselves. Beyond this, the ODMG was commissioned by its members to preserve the concept that resulted from the architectural competition and to guarantee the completion of the projects on time. Here the Olympic Construction Company had a control function.
The Women's Olympic Village which was built under the auspices of the Munich Student Works Company, made up 12 % of the total Olympic Village building project and was also included by the ODMG in the approaches and pneumatic refuse removal system.

Head business director of the ODMG:
Karl Gerhard Hinderink, Munich

Department head for approaches and Olympic use:
Ing.-grad. Manfred Lanzl, Munich

Deadline planning:
Dipl.-Ing. Arnt-Michael von Levetzow, Munich

Team director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Wolfgang Boresch, Munich

Project director for the Olympic Construction Company for the food service center (cafeteria) simultaneously entrusted with the supervision of the Olympic use in the entire Village:
Building Engineer Gerhard Gietz, Munich

For the amusement center (school and childrens' day care center):
Building Engineer Ernst Stahl, Munich

Olympic Construction Company— deadline supervisor for the entire village in relation to the ODMG:
Building Engineer Alois Kargl, Munich

General planning of the Olympic Village:
Prof. Erwin Heinle and Dipl.-Ing. Robert Wischer and Associates, independent architects, Stuttgart/Munich

Olympic Village Center:
Prof. Heinle, Wischer and Associates

Men's Olympic Village:
Prof. Heinle, Wischer and Associates, in cooperation with Wiegand and Zuleger, independent architects, Munich

Amusement center (school and childrens' day care center):
Prof. Heinle, Wischer and Associates

Outdoor facilities of the Olympic Village Center Men's Olympic Village and amusement center:
Team of garden and landscape architects Miller and Lutz, Stuttgart, Garden and landscape architects Leitzmann and Kagerer, Munich

Church and community center:
Christ and Karg, independent architects, Munich

Women's Olympic Village:
Eckert and Wirsing, independent architects, Munich

Characteristics of the Design for the entire Project:

The Olympic Village is located in the northeast section of Olympic Park between Lerchenauer Strasse, Moosacher Strasse and the Georg Brauchle Ring. This small town with about 5,000 apartments and all other general furnishings was supposed to offer the Olympic participants suitable lodgings near the main sport sites. It thus had to have the best transportation arrangements to and from all areas and at the same time was expected to fulfill all the requirements of a modern residential district after the Games. The total separation of pedestrian and vehicular traffic produced a pedestrian mall which extends from the village center through the streets of the housing wing and ends at the pedestrian path embankments in Olympic Park. It is possible to drive into every village area because there are viaducts under the pedestrian mall. The Olympic Village has its back to the noisy and busy streets in the north and east, and faces the sunny and quiet green zones in the south and west. The village center is situated immediately near the subway station on Lerchenauer Strasse. The two main entrances, which serve the pedestrian mall and vehicular traffic respectively, are located on both sides of the building complex. This forms the functional and architectural pivot of the entire ensemble. The traffic areas of the center on both levels are distributors and feeders to the housing tracts and other parts of the Olympic Village. Although the housing tracts form closed-off living quarters, they nevertheless receive optimal sunshine despite the housing density because of the terracing and angling. The terrace house type which was created for this residential area can be called a drive-in terrace house because the parking areas will be located under the pedestrian malls for its post-Olympic use.

Post-Olympic use:
The entire complex will be converted into a sixteen-class grammar school with two gymnasiums, a movie house and a children's day care center.

Utilities:
The building was heated by radiators like G 2. Only certain areas had ventilators installed.

Food Service Center (Cafeteria) at Helene Mayer Ring 8

Location and construction:
The cafeteria was located on the pedestrian level at the end of Connolly Strasse and connected to the central area. The structure was built with a visible steel or visible steel-concrete framework construction. The walls are partially glass and partially of multi-layer wall elements. The building has a total of three floors.

Olympic function:
During the Games, all Olympic participants were served on the three levels.

Post-Olympic use:
After the Games, the steel construction structure was demolished and thus the volume of the building was reduced by about a third. The remaining building serves the student population as a cafeteria.

Utilities:
See G 2.

Men's Olympic Village

Location, construction and dimensions:
Three tracts extend westward from the center along the crooked Strassberger, Nadi, and Connolly Strasse. The terraced highrises with ten to fourteen stories are located north of these streets and the one- to four-storied houses are situated to the south. The terraces face either the south or southeast. A total of 3,000 housing units were built ranging from single rooms to five-room apartments. Up to 10,000 occupants (participants and accompanying personnel) were sheltered during the Games.

General furnishing in the Men's Olympic Village:
Rows of showers with massage rooms were located under the pedestrian level and over the garages in the terraced highrises. Single showers were situated in the low-built area for Olympic participants. These measures were necessary for hygienic reasons because all apartments in the Olympic Village were destined for future use. For the use of participants, three swimming pools each with an adjoining sauna were located in the breaks in the housing tracts. Store rooms for the centralized fruit and linen dispensaries were located on the garage level. The buildings were built of conventional steel and concrete with attached prefabricated white concrete facade elements.

Olympic function:
This building was used to house Olympic participants during the period between August 1. and September 19, 1972. There were four types of living quarters in the Men's Olympic Village:

1. A room for a single athlete
2. A room for two athletes
3. Studio and living room for the "Chef de Mission"
4. Studio and living room for the team captain.

The rooms were furnished as follows:

1. Furnishings for a single room in the Men's Olympic Village:
one clothes and personal effects cabinet with two doors; one table 78 cm. x 78 cm. x 72 cm.; one chair; one arm chair; one multipurpose book shelf, 78 cm. x 72 cm. x 38 cm.; one bed 200 cm. x 80 cm.; one floor lamp.

2. Furnishings for a double room in the Men's Olympic Village:
two two-door clothes and personal effects cabinets; one table 117 cm. x 78 cm. x 72 cm.; two chairs; one arm chair; two multiple purpose book cases, 78 cm. x 72 cm. x 38 cm.; two beds, 200 cm. x 80 cm.

3. Furnishings for the studio and room in the Men's Olympic Village for a "Chef de Mission":

one two-door clothes and personal effects cabinet; one wooden chest of drawers; one table 117 cm. x 78 cm. x 72 cm.; one cabinet for the desk; one arm chair; one multi-purpose bookshelf, 78 cm. x 72 cm. x 38 cm.; one coffee table, 100 cm. x 60 cm. x 42 cm.; three arm chairs; one bed, 200 cm. x 80 cm.; one television set.

4. Furnishings for the studio and room in the Men's Olympic Village for a team captain:

one two-door clothes and personal effects cabinet; one wooden chest of drawers; one table, 117 cm. x 78 cm. x 72 cm.; one small cabinet for the desk; one multi-purpose book shelf, 78 cm. x 72 cm. x 38 cm.; one chair; one arm chair; one bed, 200 cm. x 80 cm.

Women's Olympic Village

Location and construction:
The Women's Olympic Village consists of a highrise which is located south of the center parallel to Lerchenauer Strasse, four terraced buildings situated south of Connolly Strasse and the 1½ story single room bungalows. The highrise with a maximum of eighteen stories contains eighty one-room apartments. The terraced houses have 127 large sized one-room apartments for married couples and the bungalows contain 800 one-room apartments. 1,800 women athletes and their accompanying personnel could be housed in the Women's Olympic Village during the Olympic usage. The highrise was built of prefabricated steel and concrete room cells. The terraced house and bungalows were constructed with conventional steel and concrete. All apartments in the highrise and bungalows were furnished with prefabricated "wet cells" (toilets, shower and sink units). These were produced from fiberglass re-inforced plastic and were especially designed for these buildings.

The one-room apartments housing one person in the bungalows and the highrise were furnished as follows: shower bath ("wet cell"); refrigerator; a bed formed like a "sleeping bench", 200 cm. x 80 cm.; a bench; a table, 78 cm. x 78 cm. x 72 cm.; a built-in closet; a book shelf with work area; a wall light.

Olympic function:
The buildings were used to house the women athletes and accompanying personnel from August 1 until September 19, 1972. The rooms were equipped similarly to those in the Men's Village.

Post-Olympic function:
The one-room apartments in the highrise and bungalows will be used as student housing. The apartment units of various sizes in the terraced houses will be rented

to married students. The entire complex containing the cafeteria, highrise, terraced houses and bungalows will be called the "student quarter".

Utilities:
The rooms were heated by radiators corresponding to the arrangement in highrise G 2.

Eating services for spectators, restaurants, beer gardens and concession stands in the Olympic Park

The selection of eating places for visitors: **Southern Refreshment Center, Northern Refreshment Center, Beer Garden on the Lake opposite the Olympic Swimming Hall, Concession Stands** for quick snacks, drinks, and fruit; the sale of sundry articles, photo supplies, newspapers, rain gear, etc.; bank services, information on television monitors, data display sets and telex projection, loudspeakers.

Location:
Olympic Park along the main access routes

Southern Refreshment Center at the south entrance, Northern Refreshment Center at the North Crossing, Beer Garden on the Lake on the southern shore of the Olympic Lake. Concession clusters along the visitors' paths, mainly at the subway station, rapid transit station, bus station on Ackermann Strasse, and at the boxing hall.

Team coordinator for the Olympic Construction Company, Ltd.:

Architect HBK Klaus Jürgen Kluge, Munich

Project director for the Olympic Construction Company, Ltd.:

Dipl.-Ing. Wolf Speer

Design, planning and direction of construction:

Southern Refreshment Center

Architect Dipl.-Ing. Peter Lanz, Munich

Northern Refreshment Center

Behnisch and Associates

Munich/Stuttgart, with

Domenig and Huth, Graz

Beer Garden on the Lake

Architects Leyck and Hugel, Munich

Concession stands

Architect Dipl.-Ing.

Ray Lardschneider, Munich

Characteristics of the Design

The Northern and Southern Refreshment Centers, the Beer Garden on the Lake and the concession clusters were conceived as light temporary buildings. A standardized basic frame was produced partly of steel girders and partly of light tubing profiles. A 0.65 mm. thick, hardly inflammable PVC (polyvinyl chloride) soft foil was stretched over a web of tubing to form the actual roof. In order to minimize unwanted heat radiation, parts of the underside of the foil surfaces were coated with aluminum, without seriously reducing transparency. The soft PVC foil was also used on the outer walls. The static rib cage and the stretched foil formed the roof surfaces, which were extended, structured and partly staggered in height. The table areas, bars, and serving counters were thus sheltered by a light and transparent cover. The kitchens and preparation rooms were housed in winterfast structures which could be locked and were erected of prefabricated steel construction with asbestos cement curtain walls.

Southern Refreshment Center

Enclosed surface 9,200 sq. m.
3,000 seats in the sit-down restaurant,
1,000 seats for the self-service beer garden. The combined seating area was divided within itself by variations in height. Access was over an upper ramp, which led to the pedestrian zone in the western stadium area of Olympic Park and to the

approaches for buses and streetcars in the southeast. The visitors' entrance also served as an orientation point throughout the Refreshment Center. Rest rooms were set up in kiosks. Provisions were supplied to the western side of the kitchen wing.

Northern Refreshment Center

Enclosed surface 8,200 sq. m.
3,000 seats, of which 1,000 belonged to the self-service restaurant and 2,000 to the self-service beer garden. The dining rooms were divided among three levels. Coffee stands augmented the services offered. Rest rooms for the particular areas were provided in self-contained units. The center was reached over a raised orientation ramp, which started from pedestrian access paths (the Norddamm was the pedestrian artery between the subway and rapid transit stations) and then wound in a semicircle through the refreshment center before rejoining the foot paths. Entrances to the individual seating areas opened off the orientation ramp. The kitchens were added at the eastern side, from where they were also supplied.

The Beer Garden on the Lake

Enclosed area 3,200 sq. m.
1,650 self-service places. The Beer Garden was partitioned in two by the Roopsingh-Bais-Weg. The table area and the dining area, each with a self-service counter, were on one level. The preparation kitchen in the western part supplied the entire beer garden. Rest room units were provided in both parts. Access was via the footpaths. Provisions for the kitchen were brought in via the driveway to the southwest.

Concession Clusters (8 units)

Total enclosed surface 7,640 sq. m.
The kiosks for information and for the sale of visitors' supplies were furnished with information columns, showcases, and counters. Folding walls of heavy cardboard closed off the storage rooms. Plastic-coated cardboard sheds were set up as toilet units and rooms for short-term personnel

Access

These facilities opened only onto the footpaths, and were strictly separated from vehicular traffic. Deliveries to the kitchens and sales areas were executed over the Olympic driveway network. No visitors' parking places were allotted to the refreshment centers and kiosk clusters. A few storage and short-term parking spaces near the kitchens were placed at the disposal of the personnel.

Total Cost excluding Incidentals

Southern Refreshment
Center 6.9 million DM
Northern Refreshment
Center 4.2 million DM
Beer Garden on the Lake 0.8 million DM
Concession clusters 4.4 million DM

Utilities

The refreshment centers, the beer garden, and the concession clusters were temporary buildings without heating. Ventilators were installed in the kitchens and rest room areas only. The Kitchens were powered by gas-produced low pressure steam and by electricity.

Electrical Installations

High voltage:
Illumination was supplied from along the roof and ramp lines in accordance with the architectonic concept of the buildings.

Low voltage:
Intercom units for the kitchens
Telephone lines
Loudspeaker systems
Installed transformer capacity
Southern Refreshment Center 1,000 kVA
Northern Refreshment Center 1,500 kVA
Beer Garden on the Lake 250 kVA
Concession clusters, total 950 kVA

Fairgrounds General Notes

Types of Sport:

**Wrestling, Judo, Weight lifting,
Fencing**

Location:

8 Munich 12
13 Theresienhöhe

Team director for the Olympic Construction Company, Ltd.:

**Dipl.-Ing. Herbert Weidenschlager,
Munich**
Project director for the Olympic Construction Company, Ltd.:
**Construction Engineer Friedrich
Schalk, Munich**

Planning and supervision of construction:

**Architect Dipl.-Ing. Peter Lanz,
Munich**

Engineering and supervision of technical work (heating, plumbing, ventilation, electricity):

Plang, Ltd., Munich

Statics of the wrestling hall and consultation for the fairgrounds:

**Engineering Office Dr.-Ing. Otto
Höllerer, Munich**

Olympic Usage of the Exposition Halls

Hall 5 (already available) —temporary installations for Olympic communications, organizational and technical personnel.
Hall 16 (already available) —temporary installations for postal and short-term workers.
Hall 17 (already available) —temporary installations for printing.
Hall 14 (newly built) —wrestling and judo competitions.
Hall 18 (already available) —temporary installations for judo training.
Hall 19 (already available) —temporary installations for wrestling training.
Hall 7 (already available) —temporary installations for weight lifting competitions.
Hall 9 (already available) —temporary installations for training for weight lifting.
Hall 11 and Hall 12 (both already available) —temporary installations for use as Fencing Hall No. 1 (for final competitions).
Hall 20 (already available) —temporary installations for use as Fencing Hall No. 2 (training and semi-finals).

After the Olympics, all the buildings are used as exposition halls.

Total Cost for the Fairgrounds (excluding incidental expenses)

Temporary adaptation of extant exposition halls:
Hall 5 1,560,000 DM
Hall 16 320,000 DM
Hall 17 60,000 DM
Hall 18 750,000 DM
Hall 19 880,000 DM
Hall 7 2,960,000 DM
Hall 9 400,000 DM
Hall 11 and Hall 12 2,170,000 DM
Hall 20 2,410,000 DM
Grounds 640,000 DM
Construction of wrestling-
judo hall 25,000,000 DM

Hall 5

(Communications, organization and technical installations)

Adaptation for the Olympics:
By hanging lamellas of yellow cloth from the ceiling of the hall and lowering the

lighting fixtures a lower ceiling was created optically. The walls of all the temporary rooms were constructed of collapsible prefabricated sections. All floors were covered with sisal carpeting.

Room allocation and functions:

Fairgrounds press center
Journalists' office area 286 sq. m.
Press mail, incl. counter area 394 sq. m.
Teletype room 63 sq. m.
Supervision 16 sq. m.
Counter service area 16 sq. m.
Public pay telephones 68 sq. m.
Press information area 128 sq. m.
Press interview room 105 sq. m.
Press interview room 98 sq. m.
Waiting room and cloak room 50 sq. m.

Fairgrounds central doping control:
Waiting room 20 sq. m.
Adjoining room 10 sq. m.
Office 20 sq. m.
2 examination rooms for doctors 20 sq. m.
2 toilets with vestibule

Technical area of the fairgrounds:
Technical administration OC section
Technical equipment 32 sq. m.
Data processing 80 sq. m.
Measuring 72 sq. m.
Scoreboard technology 46 sq. m.
Scoreboard technology 42 sq. m.
Spare parts 70 sq. m.
Stand-by personnel, manual
workers 90 sq. m.
Stand-by personnel, electrical 70 sq. m.
Storeroom 1 42 sq. m.
Storeroom 2 30 sq. m.
Storeroom 3 91 sq. m.
Head hostess 20 sq. m.
Hostesses' room 40 sq. m.
Chauffeur pool 20 sq. m.

Plumbing:
Toilet facilities consisted of six individual prefabricated units, with 9 sq. m. each. They were set up in front of the northern side of the hall between the press entrance and the entrance for technical personnel.

Hall 16

(Postal and short-term personnel)
Remodelling for the Olympics:
The walls of all the temporary rooms were constructed of prefabricated asbestos cement panels that could easily be dismantled. The entire floor was covered with a sisal carpet. The lighting was determined by the requirements of the individual rooms.

Room allocation and functions:
Area for short-term personnel
Chief of security guards 20 sq. m.
Security guards 66 sq. m.
Instruction room for security
guards 60 sq. m.
Police squad commander 21 sq. m.
Police 66 sq. m.
Coordinator of medical staff 30 sq. m.
Waiting room 15 sq. m.
Doctors' examining room 28 sq. m.
2 rooms of payroll office, each 15 sq. m.
Fire fighters' lounge and
stand-by room 34 sq. m.

Post office, fairgrounds branch:
Work area, including personnel
room 132 sq. m.
Service area, with 90 sq. m.
5 counters, 25 telephone booths, 9 pay
telephones, 2 telex windows, 12 teletype
machines, 1 supervisor.

Plumbing:
Toilet facilities were provided by prefabricated sanitary booths.

Weightlifters' Hall, Fairgrounds

Hall 17

(Printing shop)

Adaptation for the Olympics:

The exposition hall remained basically unchanged for the Olympics, but all the electrical and water connections needed for the printing presses and other equipment were installed.

The exposition area of 730 sq. m. was used in its entirety as a printing shop.

Access for Short-term Personnel

By car:

From the Olympic Park the fairgrounds could be reached via the Middle Ring, from there along Heimeran Strasse and Ganghofer Strasse to the fairgrounds parking lots, or to the various entrances to the individual areas of the fairgrounds.

Public transit:

There are streetcar stops on Heimeran Strasse and on Ganghofer Strasse. From there one can get to the various entrances of the fairgrounds which are on Heimeran Strasse, and from there to Halls 5, 7, 16 and the other work areas.

Restaurants at the Fairgrounds

In one part of the main fairgrounds restaurant, the guests of honor and the press were served. 300 seats.
In the restaurant in Hall 7, the competition personnel were served. 435 seats.
In the restaurant between Hall 18 and Hall 19, the short-term personnel were served. 425 seats.
For the visitors, there were kiosk clusters at various places on the fairgrounds to sell refreshments and other small articles.

Type of Sport:

Weightlifting

Characteristics of Design and Construction

The already existing edifice of Hall 7 was an exhibition hall with three naves the middle one of which was higher. The interior was temporarily adapted to fit Olympic requirements. A massive wall divided the interior into the competition and spectator areas, and the auxiliary space needed.

Competition hall area:

The new, artificially illuminated competition hall was created by covering the window areas and clothing the surfaces of the walls and ceiling with rolls of black and, in part, yellow material. The lifters' platform was erected in front of the newly built front wall of the hall. The spectators' places, temporary wooden stands built on a steel tubing framework, rose on three sides from the area around the podium. The floors of the entire audience area were covered with brown sisal carpets. The competition area of the lifters' platform was 1.00 m. above the floor of the hall. The entire podium was covered with brown velour. A new interior was also created in the auxiliary area by covering the ceilings with rolls of material (yellow ceilings, white walls). The rooms of the officials were carpeted with velour, the rest of the hall with sisal. The walls of all the temporary interior rooms were constructed of asbestos cement prefabricated panels so they could be dismantled after the Games.

Dimensions of the Facility

Area under roof. 5,000 sq. m.
Competition area 350 sq. m.
Podium surface. 144 sq. m.
Competition surface,
lifters' stage. 16 sq. m.

Access

See wrestling-judo-hall, fairgrounds.

Utilities

Ventilation and cooling:

As an exhibition hall, Hall 7 was equipped with four air-intake installations (total capacity: 100,000 cu. m./h.). Two of these installations were equipped with a cooling register at the intake vents to take care of the competition area. The space under the main grandstands was turned into a high pressure chamber (two air-intake installations with a total capacity of 70,000 cu. m./h.). Pre-cooled air flowed into the audience area through slits in the platform steps of the grandstands. The warm air left through exhaust vents in the roof.

High voltage installations:

The entire power supply came from the northern transformer station of the fairgrounds: five transformers with a built-in capacity of 400/600 kVA. Emergency power unit with a capacity of 125 kVA (switched in manually). An extra lighting system was installed in the hall, so that the average illumination was 400 lux. Special lighting for color television, consisting of 28 spotlights of 2,000 watts each, resulted in average horizontal illumination of 4,000 lux and vertical illumination of 2,100 lux in the area of the lifters' stage.

Low voltage installations:

The PA system covered the entire hall with 40 speaker clusters, of which each rated

24 watts. The following additional installations were available: intercom system with 5 speaker's stations, time system with 12 synchronized clocks, a common antenna for 20 users, 1 industrial television system with camera and monitor, 1 videotape installation with 1 camera and 1 video-recorder. The already available fire alarm system was expanded.

Technical Installations for Sports

Scoreboard:

The board was constructed in light chamber technique, 8.77 m. long, 3.63 m. high, and installed in the dividing wall of the hall. The following information was displayed: Name and country of the competitor, weight of the participant, number of the attempt, and results of the various contests subdivided according to events. Time for the 3-minute rule was displayed on a digital clock with luminous digits. An acoustical signal was sounded after two minutes and after three minutes. Two clocks were available to control the display on the board. Red and blue lamps indicated the decisions of the jury.

Competition Area

Competition platform:

Floor space 20.44 m. x 17.14 m. 350 sq. m.
Platform 12 m. x 12 m. 144 sq. m.
The platform was 1 m. above the floor of the hall (two sets of stairs). Lifters' stage, hardwood 4 m. x 4 m., 10 cm. high; one table 6 m. long (to the right of the platform) for the competition direction, one table 10 m. long (in front of the platform) for the jury.

Competition preparation:

Warm-up room (4 lifters' stages, each 4 m. x 4 m.). 340 sq. m.
Hall direction 10 sq. m.
Equipment room. 30 sq. m.

Training:

For training in Hall 9, twenty lifters' stages with the appropriate auxiliary rooms were built along with two sauna booths.

Olympic Usage

August 27—August 31, 1972
September 2—September 5, 1972

Athletes' Area

Entrance for participants. 45 sq. m.
25 dressing and massage rooms,
each. 15 sq. m.
8 prefabricated sanitary cells,
each. 9 sq. m.

Competition preparation:

Area (warm-up room with 4 lifters' stages) with 18 couches,
total. 340 sq. m.
Weighing room. 61 sq. m.
Competition area 350 sq. m.

Doctor's area:

Sports doctor. 12 sq. m.
First aid personnel. 20 sq. m.
(Doping inspection was centralized for the entire fairgrounds in Hall 5.)

Access:

Hall entrance on the southwestern side, from there access to the locker room area, massage, toilet facilities, weighing room and medical area. From the competition preparation area to the competition area of the hall there was a direct corridor.

Spectators' Area

Spectators' places, total. 3,297
Guests of honor. 96
Press seats with desks. 152
Press seats without desks 82

Commentators' places. 60
Participants' spectator seats. 110
Spectators. 2,797

VIP Area:

Arrival by car for guests of honor with entry on the southeastern side of the hall, from where they went past the administrative and organization area to the VIP lounge in the competition part of the hall.

Refreshments for the spectators:

A refreshment stand was set up next to the cloakroom. Other kiosks were spread about the fairgrounds outside.

Sanitation:

Spectators' toilets were set up under the grandstands: ten prefabricated sanitation booths of 9 sq. m. each.

Access for spectators:

On the northern side of the hall were two entrances which led into the foyer. The cloakrooms were on both sides of the way to the grandstands. The grandstands were reached by stairs from the foyer.

Communications

Press center, centralized in Hall 5 for the entire fairgrounds.

DOZ-subcenter of the weightlifting hall and mail room. 30 sq. m.
DOZ-interview room. 24 sq. m.
DOZ office. 18 sq. m.

Transmission facilities:

30 commentators' desks for radio and television in the grandstands, 4 DOZ camera stands for television, 2 DOZ movie camera stands, 1 DOZ mobile transmission unit, 3 technical vehicles.

Parking places required for the transmission and technical vehicles. 164 sq. m.

Competition and General Administration

Competition area:

In front of the platform, tables were set up for the jury and for the competition supervisors.

Auxiliary rooms area of hall:

Sport facilities direction of OC
Fédération Haltérophile Internationale (FHI)
FHI President 25 sq. m.
FHI Secretary general 20 sq. m.
German Weightlifting Federation (BVDG)
Office of BVDG. 15 sq. m.
Office. 20 sq. m.
Office. 15 sq. m.
OC office. 21 sq. m.
OC office. 17 sq. m.
Office. 15 sq. m.
Mimeographing room. 15 sq. m.

Restaurant

One kiosk in the entrance area was provided for the spectators. For other refreshment facilities, look under "Restaurant" in "Fairgrounds, general notes".

1 statistics room	32 sq. m.
1 mimeograph room	32 sq. m.
Hostesses' room and preparation for awards ceremonies.	24 sq. m.
2 cloakrooms, each	30 sq. m.
1 prefabricated toilet for office personnel storage room.	81 sq. m.
telephone booths auditorium administration.	15 sq. m.
A separate stairway led from the ground floor office area to the spectator entrance level.	

Fencing Hall 1, Fairgrounds (Hall 11 and Hall 12)

Type of Sport:
Fencing
Final Matches

Characteristics of Design and Construction

The already existing halls 11 and 12 were temporarily remodelled to form a competition hall. In Hall 11 were the spectators' entrance area, the foyer, the cloakroom and the spectator services. The appearance of the entrance was changed by lowering the ceiling. The walls of all temporary rooms were constructed of prefabricated asbestos cement panels that could be easily dismantled. Show cases with a weapon exposition partitioned the foyer. In Hall 12 were the competition area and the spectators' viewing area. The main elements of the interior of this hall were the two grandstands which faced each other on the ground floor level (parallel to the long sides of the fencing area), four grandstands on the upper tier, a decorative suspended ceiling, and the special lighting for color television.

Dimensions of the Facility

Total area under roof.	5,380 sq. m.
Hall 11.	3,240 sq. m.
Hall 12.	2,140 sq. m.
Competition area	607 sq. m.
Fencing surface 9.20 m. x 46.00 m.	423 sq. m.
2 fencing strips (final matches) 2 m. x 20 m., each.	40 sq. m.

Access

See "Wrestling-Judo Hall", Fairgrounds.

Utilities

Ventilation equipment, cooling:
The already available air-intake installation (capacity: 60,000 cu. m./h.) was incapable of eliminating the heat generated by 3,000 spectators and the 75 kW of lighting. The system was supplemented by a circular duct which ran along the gallery, and thus surrounded the competition area. In addition, axial ventilators were installed in the gable ends of the hall to draw the exhaust air from the upper part of the hall. On the hall's exterior more air-intake equipment with water cooling was installed. This increased the air intake capacity to a total of 100,000 cu. m./h. The room temperature did not exceed 25.5°C.

High voltage installations:
The Fencing Hall 1 is connected to the northern transformer station of the fairgrounds with five transformers which produce 400/600 kVA.

For stand-by emergency power a mobile unit with a capacity of 85 kVA was planned. It could be switched in manually. The already available general hall lighting was increased. In the competition area additional special lighting for color television was installed. This consisted of 24 floodlights, each of 2,000 watts. The average illumination was 4,000 lux horizontally and 1,600 lux vertically.

Low voltage installations:
The PA system consisted of 64 speakers installed in the ceiling (each 10-12 watts), 24 speaker complexes of 24 watts each, and a wireless microphone system. Intercom system with switchboard and five units, clock system with ten synchronized clocks, a common antenna system with fifteen connections.

Technical Equipment for Sports

Scoreboard:
Two electronic display boards, using the light chamber technique, each board 6.00 m. wide and 2.75 m. high. The following information was displayed: Type of competition, starting numbers, countries, name of participant and individual competition results.

Scoreboard:
The contact scoreboard consisted of a set of lights visible to the spectators with red, green and white lamps as well as of the control cable.

Fencing strips:
Metal fencing strips of phosphor bronze, 2 m. x 20 m. (for final matches).

Timekeeping:
To measure the effective duration of a match, an electronic counter with light display for minutes and seconds was installed. Acoustical warning signal, 1 minute before the end of a period, acoustical signal when the time was up. Synchronized clocks for the public were set up outside the field of vision of the competition strips. The starting impulse was given manually.

Competition Area

(Final matches, Foil, Épée, Saber)
Interior area, 13.20 m. x 46 m.. 607 sq. m.
Competition surface,
9.20 m. x 46 m. 423 sq. m.
2 metal fencing strips, each
2 m. x 20 m. 80 sq. m.
(Tournament strips for the final matches)
A table for competition direction, a table for the jury. The row of tables stood in the middle of the VIP grandstand.

Competition preparation:
Warm-up room with a total of
four fencing strips. 378 sq. m.
Hall direction 1. 15 sq. m.
Hall direction 2. 6.5 sq. m.

Training:
On the upper floor and ground floor of Fencing Hall 2 (cf. "Fencing hall 2")

Olympic Usage

August 29 - September 9, 1972

Athletes' Area

Competition area 607 sq. m.
Grandstand seats (participants)
Warm-up room with four
fencing strips. 378 sq. m.
2 locker rooms, each 20 sq. m.
1 lounge 24 sq. m.
Doctor's area:
Waiting room 20 sq. m.
Doctor's office 25 sq. m.
3 sanitary cells, each 9 sq. m.

Access:
Athletes' entrance on the northern side of Hall 11, from there access to the warm-up room, locker rooms, lounge, bathrooms as well as to the athletes' doctor, from there access to the competition area.

Spectators' Area

Spectator places, total. 3,198
On the level of the competition area there were grandstands on two sides of the hall, parallel to the length of the fencing strips. These included the VIP grandstand and the places for the press and commentators. On the gallery, which went all the way around the exposition hall on a higher level, there were grandstands on all four sides.

Allocation of places:
Guests of honor. 48
Press seats with desks. 59
Press seats without desks 60

Commentators' places for radio and television 42
Roped-off observers' places 9
Audience places for participants 110
Spectators' places. 2,870
VIP area:

The guests of honor were taken by car to the main entrance for spectators. From there they could go through the foyer of Hall 11 (with cloakroom) to the VIP lounge (28 sq. m.) before going to Hall 12. There was direct access to the VIP grandstand from the lounge. The guests of honor were served their meals centrally in the VIP restaurant of Hall 7 of the fairgrounds.

Spectators' refreshments:
In the foyer of Hall 11 a kiosk was provided to sell refreshments; other refreshment stands were located at various places on the fairgrounds.

Sanitary installations:
In the foyer of hall 11, four sanitary cells of 9 sq. m. each were set up to provide toilet facilities.

Spectator access:
From the main spectators' entrance on the southern side of the building, the visitors came to the foyer of Hall 11, where the cloakroom and toilet facilities were located. From the foyer, a passage led to the lower grandstands, and to the spectators' seats in the gallery.

Communications

The press center for the whole fairgrounds was set up centrally in Hall 5. The following rooms were available in this particular structure:

DOZ-subcenter (Hall 12, ground floor). 52 sq. m.
DOZ-office. 14 sq. m.
DOZ-auxiliary room. 7 sq. m.
Mailing room. 20 sq. m.
Interview room. 36 sq. m.
3 Press telephones
2 DOZ telephones

Transmission installations:
2 DOZ television cameras,
2 DOZ movie cameras, 1 DOZ mobile transmission unit, 4 technical vehicles. Required as parking area for the heavy technical vehicles were 138 sq. m.

General and Competition Organization

Competition area:
In the competition area there was a table set up for the competition direction and jury.
Hall superintendent, Hall 12.... 26 sq. m.
Auxiliary room area, Hall 11:
Hall superintendent. 16 sq. m.
Sport facilities direction of OC-sports section:
Fédération Internationale d'Esgrime (FIE)
FIE President 20 sq. m.
German Fencing Federation (DFB). 20 sq. m.
1 office 15 sq. m.
Technical commission. 50 sq. m.
Statistical evaluation. 15 sq. m.
Jury deliberation room. 25 sq. m.
Auxiliary room. 20 sq. m.
Mimeographing. 20 sq. m.
2 Referees' locker rooms, each 20 sq. m.
Technical direction,
QC - 2 offices, each. 20 sq. m.

Restaurant

See "Fairgrounds, general notes" under "Restaurant".

Fencing Hall No. 2 (Hall No. 20)

Types of Sport:

Fencing, Modern Pentathlon (Fencing)

The semi-finals took place on the ground floor and the other floors were used for training.

Characteristics of Design and Construction

Hall No. 20 which existed before Olympic planning began, was temporarily remodelled to function as a fencing competition and training hall. The ground floor contest area for the semi-finals received a suspended fabric ceiling. A stand for spectators was built in the center opposite the two fencing strips and the judges' podium. Stands for the participating fencers were set up along both ends of the hall and behind them were the booths of the various participating nations. A special lighting rig was installed over the two main fencing strips for color television.

Dimensions of the Installation

Built-over area of the hall. . . . 6,350 sq. m.
(Useful space on the three main floors including the mezzanines).
Competition area 600 sq. m.
Two competition fencing strips, 1.8 m. x 2 m., each 36 sq. m.

Access

See wrestling-judo-hall, fairgrounds.

Utilities

Ventilation:
The temperature of the hall was controlled by the ventilation system which utilized existing air intake and exhaust ducts. An additional water-cooled ventilation system was installed for the ground floor's inner area because of additional lighting and the large number of spectators. With an outdoor temperature of +30.5°C the maximum indoor temperature could be held to 26°C. The capacity of the existing ventilation system in Hall No. 20 was 100,000 cu. m. per hour. The additional system had a capacity of 70,000 cubic meters per hour. The cooling effect was approximately 2°C. The lavatories had axial ventilators.

High voltage electrical installations:
The current for Hall No. 20 was obtained through two transformers. 800 kVA.
The emergency power would be supplied by a mobile electrical generator. 75 kVA.
On the main floor an additional junction box was installed to cover the increased power consumption in the competition area. The general lighting facilities of the entire building were either replaced or augmented.

The mean horizontal lighting intensity in the competition area was 600 lux. The intensity of the special lighting for color television for the two fencing strips with twelve 2,000 watt spotlights each had a mean value of 3,000 lux horizontally and 1,400 lux vertically.

Low voltage electrical installations:
The existing public address system was used and the three subcenters were linked together.

The system consisted of the following components: Two-way inter-communications system with a total of 29 extensions, fire alarm system, 11 synchronized clocks,

community antenna system with 26 connection outlets. The existing telephone system was extended.

Technical Equipment for Sports

Scoreboard:
Every strip had a manually operated scoreboard 2 m. x 1.5 m. The names of the fencers, their nationalities as well as the results of the bouts were displayed.

Touching signal system:
The touching system consisted of a set of spectator lights, each with a red, green and white bulb. Besides these, a combination signal for foil and epee plus a basic cable control were installed.

Fencing strips:
The metal strips were 18 m. x 2 m. of phosphor-bronze and simply drilled.

Timing:
An electronic time and light display of minutes and seconds was installed to measure the length of a bout. A horn was provided for the acoustical pre-signal one minute before time ran out. A synchronized clock for the audience was installed out of sight range from the strips. The signals were fed into the system manually.

Contest Area

The general contest area for the preliminaries had an area of 3,800 sq. m. and consisted of 14 strips each 2 m. x 18 m., which were paired off into units. A table and four chairs were provided for the messengers and writers, and there was also one place per strip for a judge. The podium for the technical direction of the hall had an area of 72 sq. m.

Contest Preparation:
On the upper and lower floors of the hall, there were 21 strips in a training area consisting of a total of 5,200 sq. m. in addition to 16 prefabricated sanitary units each 9 sq. m.

Olympic Use

August 29 - September 9, 1972.

Athletes' Area

Contest area on the ground floor. 3,800 sq. m.
Training area on the lower and upper floors of the hall. . . . 5,200 sq. m.
16 hygiene facilities with toilets, sinks and showers.
Locker rooms and toilets on all main floors and mezzanines.
(Six mezzanines were located on both sides of the three-storied fencing hall No. 2.)
36 Women's rooms, each. . . . 23 sq. m.
36 Men's rooms, each. 23 sq. m.
8 lounges for contestants, each 23 sq. m.
1 TV room 35 sq. m.
Weapons (distribution). 23 sq. m.
Repair shop. 35 sq. m.
Weapon control. 35 sq. m.
Weapons (collection). 23 sq. m.
Fencing booths for disarming, each. 5 sq. m.
Spectator seats for contestants . . . 320

Doctors' Area:
Physician's room and first aid. . . 9 sq. m.
Hygiene room. 23 sq. m.

Access:
Participants coming from the bus stop and the entrance on the western side of the hall and from there proceeded to the various rooms, changing, picking up their equipment; then to their assigned strips.

Spectators' Area

Available seats total. 978
VIP seats. 36
Commentators' seats. 20
Press seats. 86
Spectators' seats. 856
(320 seats for contestants included)

Guest service:
VIP area with cafeteria. 35 sq. m.
Spectator services:
A snack bar was set up behind the spectator stands.

Sanitary facilities:
All necessary sanitary facilities were reachable from the spectators' exits.

First aid:
First aid installations were located centrally in the fairgrounds.

For the Fencing Hall see Physicians' Area - "Contestants' Area" above.

Spectator access:
The entrance to Fencing Hall No. 2 was on the eastern side of the hall, and from there a passage led to the grandstand.

Communications Area

Commentator seats (with tables). 10
Press seats (without tables). 86
Interview room. 23 sq. m.
Office. 23 sq. m.
Film storeroom. 23 sq. m.
Transmission equipment:
DOZ-motion picture cameras 4
Post office. 11 sq. m.
Parking lots for two technical equipment trucks. 60 sq. m.

Competition and General Administration

Contest site administration,
2 rooms each. 23 sq. m.
Hall manager. 23 sq. m.
The rooms for the national and international fencing federations were located in the eastern and western mezzanines.
Fédération Internationale d'Esclime (FIE)
FIE president. 20 sq. m.
FIE general secretary. 20 sq. m.
FIE conference room. 20 sq. m.
FIE cafeteria. 23 sq. m.
Deutscher Fechter Bund (DFB)
DFB president. 20 sq. m.
Outer office. 10 sq. m.
DFB trainers, 2 rooms, each.... 23 sq. m.
DFB lounges. 23 sq. m.
DFB TV room. 23 sq. m.
DFB technical rooms, four, each. 23 sq. m.
Mimeograph room. 23 sq. m.
DFB cafeteria.. . . . 23 sq. m.
4 judges rooms with a total of... 115 sq. m.
Television. 23 sq. m.
Discussion room. 35 sq. m.
2 lounges. 35 sq. m.
Evaluation, 3 rooms, each 20 sq. m.
Technical management,
three rooms, each. 23 sq. m.
Personnel, three rooms, each ... 23 sq. m.
Technical division OC,
2 rooms, each 20 sq. m.
Special post office, 2 rooms, each 30 sq. m.
Cafeteria
personnel, two rooms, each.... 35 sq. m.
Toilet facilities on every floor

Restaurant

See "Fairgrounds, general notes" under "Restaurant".

Basketball Hall on Siegenburger Strasse

Types of Sport:
Basketball, Judo

Location:
8000 Munich
Siegenburger Strasse

Team director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Herbert Weidenschlager, Munich

Project director for the Olympic Construction Company, Ltd.:
Graduate Engineer Wolfgang Göhde, Munich

Design and planning:
Architect Dipl.-Ing. Georg Flinkerbusch, Hagen i.W.

Characteristics of Design and Construction

This round hall is built of prefabricated reinforced concrete with a steel cone and shell-shaped suspended roof. The building has a diameter of 100 m. at the foundation level and 72 m. at the height of the stress ring. The grandstand forms a ring around the quadrangular contest area. The necessary ancillary rooms are under the grandstands, between the contest or warm-up level and the upper passage level of the stand. Two rectangular buildings are attached at opposite sides of the main circular hall. These are the lobby with two usable levels and a one-story restaurant. The construction of the hall itself is formed by 36 binders each consisting of a slanted outer truss and the girders bearing the stands. The binders are secured between each other by steel and concrete through a beam with a U cross section. The stress ring on which the steel cone roof is suspended rests on the outer trusses. The stress bearing structural components are made of prefabricated reinforced concrete. The partitions are formed by chalk sandstone faced brick walls. The facade is formed by beveled baked enamel sheet aluminum panels mounted on a steel framework. Suspended sheet metal paneled ceilings with built-in acoustic padding close off the rooms. The floor of the hall's inner area is a mechanically ventilated elastic floor with a PVC covering. The basketball court floor, which can be dismantled and is 6 cm. thick, is made of hard maple and is laid on the elastic hall floor. The individual fold-up seats are fastened to the prefabricated concrete steps with assisting tracks. The hall was built by a general contractor completely ready for occupation.

Dimensions of the Facility

Enclosed volume. 104,500 cu. m.
Built-over area. 7,850 sq. m.
Interior area of the hall without the telescoping stands. 2,516 sq. m.
Free area 32 m. x 40 m..... 1,280 sq. m.
Basketball floor
19 m. x 32 m. 645 sq. m.
Basketball court
14 m. x 26 m. 364 sq. m.
Overhead clearance. 12 m.

Access

By car:
Connection from Olympic Village via Mittlerer Ring, Garmischer Strasse and Siegenburger Strasse to the basketball hall.

Public transit:
Inner city bus lines, bus stop on Garmischer Strasse.

Parking (permanent):
Twenty places for cars belonging to VIPs and officials are available in front of the athletes' entrance. There are also thirty places for the press, communications personnel and officials in the western yard. During the Olympics 1,000 parking places were available to spectators on the grass west of Garmischer Strasse about 250 m. away from the hall and another 500 places south of the hall on Welser Strasse, about 500 m. away from the hall.

Total Cost excluding Incidentals
19 million DM.

Utilities

Heating, ventilation:
Three gas-fired furnaces 3 x 1,400,000 kcal/h. for the warm air heating (operational heat 110/70°C). Standard and flat radiators were used in all other areas. The air regulating equipment was installed in the bottom panel at the middle point of the roof. Intake air is blown into the main hall through ring-shaped vents in the slanted ceiling.
50% fresh air, 50% circulated air.
Total capacity 280,000 cu. m./h.
The hall is quickly heated by four large ventilation vents above the playing area. There are additional decentralized ventilators in the main entrance totaling 45,000 cu.m./h.
The warm air heating has fresh air intake and exhaust ducts in the main hall and in the warm-up hall.

Ventilation:
Lobby, corridors, wash and changing-rooms, massage and referee rooms, toilets, direction room, interview room, cafeteria, restaurant and kitchen have fresh air and exhaust vents.
The capacity of the cooling machinery which provided the cooling column with chilled water was 1.1 million kcal/h.

High tension installation:
1,400 kVA installed transformer capacity. Emergency generator 68 kVA. Contest vertical illumination 1,875 lux (new value) for sports area (2,000 lux new value special lighting for the boxing ring) produced by halogen metal vapor lamps, each 2,000 watts, part of which are immediately relightable. The illumination of the other interior areas was according to DIN 5035.

Low voltage equipment:
Telephone exchange with 64 extensions, Central clock system, Intercom system with 18 instruments, Wireless microphone system (microport), PA system, Terminals of the electronic data processing installation, Data read-out station in the press-sub-center, telex in the press subcenter, Hall administration, Printshop.

Technical Sports Facilities

Scoreboards and timing devices:
Two permanently mounted scoreboards in light chamber technique.
Measurements: length 5.60 m., height 3.00 m. Integrated double parallel running installation with the following information: the countries, the score, the time past in minutes and seconds, the score time for each team, the personal fouls of each player, the last three minutes of play

(red light bulbs), light signals on the baskets for the 30-second rule. There is also an acoustical signal at the beginning and the end of the playing periods. Time out could be called from the players' bench with a button (light signal on the judges' table).
The timing was backed up with manually operated stop watches.
The Scoreboard was operated from the writing table on the court (or contest area).

Contest Area

Basketball floor 19 m. x 32 m. . 645 sq. m.
Basketball court 14 m. x 26 m. . 364 sq. m.
Hard maple court on the elastic hall floor 6 cm. high (suggestion of the International Basketball Federation).
Mobile basketball net stands
Hydraulic control of the basket
Basket arm extends 4.00 m.
Measurements of the base 4.10 m. x 2.10 m. x 1.00 m.
The baskets are made of steel pipe, the back board is safety glass.
Two tables for game evaluators opposite the press stand.
One scoring table with the scoreboard controls.
One table for the FIBA.
Two benches for substitute players.

Olympic Use

August 27 to September 9, 1972.

Post-olympic Use

Sport clubs, school sports
Contests of various types of sports Hall inner area 32 m. x 40 m. 1,280 m.

Athletes' Area

Inner area:
Two benches for substitute players
Intermediate level:
Six locker rooms, each 31 sq. m.
Two massage rooms, each. 15 sq. m.
Three shower and wash rooms, each. 57 sq. m.
and corresponding sanitary facilities.
Lower level:
Warm-up hall. 408 sq. m.
Training area 107 sq. m.
Doctors' room. 20 sq. m.
Doping control. 13 sq. m.
Ancillary room. 13 sq. m.

Access:
Entrance at the eastern side of the lobby, from there to the locker room in the intermediate level of the south side hall area with showers and toilets.
Warm-up facilities are under the lobby.
The lower level is reached by a ramp to the playing area through a separate players' entrance foyer.

Spectators' Area

Total spectators' seats. 6,635
Participants' seats. 200
VIP seats. 200
Press tables. 50
Press seats. 190
Commentators' tables. 54
VIP dining facility:
Cafeteria with 60 places. 120 sq. m.
Spectators' dining facilities:
Main restaurant 180 sq. m.
Two kiosks, each. 36 sq. m.
Sanitation:
Four toilet facilities, each. 74 sq. m.
First aid:
First aid room with an ancillary room and a quiet area, total. 43 sq. m.

Spectators' access:

Southern entrance hall (lobby).
Four ticket offices at the corridor and access level. Raised entry way to the spectator seats. Ticket takers are at the entry ways.

Communications Area

Press subcenter on the intermediate level:
Information area 28 sq. m.
Interview room. 54 sq. m.
Writing room. 105 sq. m.
Press post office. 105 sq. m.
Cafeteria. 105 sq. m.
and corresponding sanitary facilities.
Transmission equipment:
Four DOZ TV cameras (camera platforms)
One ABC TV camera
Two DOZ motion picture cameras
Permanent parking area for the following vehicles:
One DOZ transmission truck
One ABC transmission truck
Four additional technical equipment trucks

Contest and General Organization

Playing floor, inner area:
Table for FIBA
Two tables for the game evaluators
One scoring table
One announcer's table
Spectators' area:
Direction booth. 23 sq. m.
Intermediate level:
Fédération Internationale de Basketball Amateur (FIBA)
Three FIBA offices, two, each. 20 sq. m.
one. 16 sq. m.
Deutscher Basketballbund (DBB) - German Basketball Federation—
Three DBB offices. 21 sq. m.
Two referee rooms, each. 15 sq. m.
Two medical rooms, each. 10 sq. m.
Two OC offices. 20 sq. m.
Copying room. 17 sq. m.
Conference room. 33 sq. m.
Post office (technical). 39 sq. m.
OC (technical). 22 sq. m.
DOZ (technical). 28 sq. m.
OC. 84 sq. m.
OC. 33 sq. m.
Printshop. 50 sq. m.
Ancillary rooms. 30 sq. m.
40 sq. m.

Equipment rooms. 505 sq. m.
Cleaning equipment. 40 sq. m.
Personnel rooms. 17 sq. m.
Hostesses' room. 41 sq. m.
Stand-by drivers. 11 sq. m.
Corresponding sanitary facilities
Technical 20 sq. m.
Scoreboard apparatus. 22 sq. m.
Maintenance personnel. 33 sq. m.
(Utilities, etc. 350 sq. m.

Ground floor:
Fire department 20 sq. m.
Police. 31 sq. m.
Ticket office, accounting 15 sq. m.
Two ticket offices, each. 5 sq. m.
Special post office, two rooms, each. 45 sq. m.
Annex buildings:
Administrator's house. 70 sq. m.
Heating and cooling unit for the entire contest site in the lower floor of the administrator's house. 110 sq. m.

Restaurants

Main restaurant (150 places) for spectators and for the officials in the northern restaurant annex. Serving areas including adjoining rooms. 180 sq. m.
A connected serving counter for spectators is located on the entrance level.
Cafeteria for the press, radio and television personnel (56 persons) in the north-western part of the lower level, next to the press area. 100 sq. m.
VIP cafeteria (60 persons) in the north-eastern part of the intermediate level at the entrance for guests of honor. 120 sq. m.
Two kiosks for spectators at the entrance level of the north-eastern and south-western corridor, each. 36 sq. m.

Equipment room
12.30 m. x 4.76 m. 58.5 sq. m.
First aid functions were performed by
motorized stand-by units of the coast
guard and the navy.
After the Olympics the competition area
will be used as an active performance cen-
ter for rowing and canoeing. It will also
fulfill the needs of various clubs, school
sporting programs, and regatta events.

Olympic Use

August 27, 29, 31, September 1 and 2, 1972
for rowing.
September 5 to 9, 1972 for canoeing.

Athletes' Area

Upper stories of boathouses:
19 dressing rooms for male
rowers. 627 sq. m.
10 dressing rooms for female
canoeists. 201 sq. m.
14 dressing rooms for male
canoeists. 316 sq. m.
Auxiliary rooms for rowers:
4 massage parlors, together . . . 99 sq. m.
7 clothes drying rooms,
together. 142 sq. m.
Toilets, washrooms, showers,
together. 238 sq. m.
Auxiliary rooms for female canoeists:
2 massage parlors, together . . . 76 sq. m.
1 clothes drying room 17 sq. m.
Hygiene installations, together 110 sq. m.
Auxiliary rooms for male canoeists:
2 massage parlors, together . . . 29 sq. m.
3 clothes drying rooms,
together. 39 sq. m.
Hygienic installations,
together. 120 sq. m.
Ground floors of boathouses:
20 berths for rowboats, each
6.35m. x 26m. 165 sq. m.
Female canoeists:
Six berths at 6.35 m. x 26 m. 165 sq. m.
Male canoeists:
Nine berths at 6.35 m. x 26 m. 165 sq. m.
1 dry berth 6.25 m. x 26 m. 162 sq. m.
Parking lot for boat transports
50 m. x 270 m. behind boathouses.
Participants' house:
20 lounges, each. 15 sq. m.
2 massage parlors, each 23 sq. m.
4 washrooms and showers,
each. 15 sq. m.
Doctors' area:
2 hygiene rooms, each 15 sq. m.
1 doping control room 15 sq. m.
1 doctors' office 15 sq. m.
Athletes' bar: in the house restaurant.
The entire athletes' area was fenced off
from the spectator area.

Access:

The bus stop from the Olympic Village was
near the finish area. The entrance for the
competitors was west of the participants'
house. From there they could easily reach
the boathouses, the dressing rooms, the
berths, and the lounges in the participants'
house.

Spectator Area

Total places for spectators 41,000
Seats for participants in
stands within the finish zone . . . 2,000
Earthwork stands for standing
spectators along the north-
western bank of the course 15,000
Standing room bleachers along
the southeastern bank 16,000
Sheltered grandstands:
VIPs. 1,000
Press seats with tables 198

Press seats without tables 208
Commentators' seats 140
Sheltered spectators' seats 3,500
Open spectators' seats 4,000
Meal service for VIPs:
A cafeteria was erected under the main
grandstand for the VIPs.
Meal service for spectators:
A beer tent for the spectators was set up
behind the standing room bleachers.
Rest rooms:
Spectators in the western stands could use
the portable toilets which were mounted on
trucks. The spectators in the main grand-
stand could use the rest rooms under the
stand and on level zero of the bleachers.

First aid:
The army supplied the necessary facilities
for first aid to the spectators.

Spectators' access:
The main entrances were in the finish zone
on the northwestern and southeastern
banks. From there access was open to all
spectator areas.

Communications Area

News rooms. 18 sq. m.
Post office transmission room . . . 18 sq. m.
Post office trouble shooting
room. 18 sq. m.
Under the main grandstand:
Press information. 115 sq. m.
2 offices. 114 sq. m.
Public telephones. 111 sq. m.
Public teletype room. 111 sq. m.
Interview room. 160 sq. m.
Direction of subcenter. 25 sq. m.
Transmission installations:
Mobile camera at the 1,800 m. mark.
Mobile camera on the grandstand roof at
the 200 m. mark.
Stationary camera under the grandstand
roof (for victory ceremonies).
Finish line camera; a camera room with
lab set up in the finish tower.
Under the main grandstand:
DOZ subcenter. 46 sq. m.
Post office transmission room . . . 32 sq. m.

Competition and General Organization

First lower level of jury building:
Direction of sports facilities
for rowing. 24 sq. m.
Direction of sports facilities for
canoeing. 20 sq. m.
Sporting Associations:
Fédération Internationale des
Sociétés d'Aviron (FISA). 18 sq. m.
Fédération Internationale des
Canoe (ICF). 18 sq. m.
Deutscher Kanuverband (DKV) 18 sq. m.
Deutscher Ruderverband
(DRV). 18 sq. m.
Organizing Committee:
Technical direction. 18 sq. m.
Data processing. 28 sq. m.
OC technical apparatus. 24 sq. m.
Inspection. 42 sq. m.
Printing shop. 81 sq. m.
Timekeeping. 28 sq. m.
Scoreboard technology. 28 sq. m.
Fire department 28 sq. m.
Hygienic facilities and
dressing rooms for personnel . . 115 sq. m.
Second lower level of jury building:
Jury room. 315 sq. m.
Regatta office. 56 sq. m.
Police and security guards. 61 sq. m.
OC technical apparatus,
maintenance personnel and
hygienic facilities. 48 sq. m.
Fourth level of finish tower:
Jury deliberation room. 24 sq. m.

Restaurant

Participants' house-participants' restau-
rant seating 120.
VIP cafeteria in the main grandstand seating
160.
Cafeteria in the main grandstand for press,
radio and television seating 76.

Archery Range in the English Garden

Type of Sport:

Archery

Location:
8000 Munich-Schwabing
Werneck Meadow in the English Garden
south of the Kleinhesseloher Lake

Team director for the Olympic Construction
Company, Ltd.:
Dipl.-Ing. Herbert Weidenschlager,
Munich

Project director for the Olympic Construction
Company, Ltd.:
Graduate Engineer Ralf Petry, Munich

Design, planning and building director:
Dipl.-Ing. Architect Peter Lanz, Munich

Characteristics of the Design

The meadow in the park landscape of the
English Garden used for the contest site
was marked off by the clusters of trees
already growing there and the buildings,
tents and stands set up for the Olympic
events. The tents themselves were divided
into various areas with asbestos cement
partitions. The building components were
the same as those used at the fair grounds.
The bleachers were constructed of alu-
minium and wood. The archery range was
temporary.

Dimensions of the Facility

Size of the entire area 200 m. x 250 m.
Built-over area. 2,000 sq. m.
Total contest area 10,500 sq. m.
Women 70 m. x 60 m. 4,200 sq. m.
Men 90 m. x 70 m. 6,300 sq. m.

Access

By car:
From Olympic Park via Mittlerer Ring or
Ackermann Strasse, via Schwabinger
Strasse to the main entrance of the archery
range.

Public transit:
Subway at Leopold Strasse, city bus stop
on Thieme Strasse.

Parking lots:
There were 150 provisional places on a
closed off park path.

Total Cost excluding Incidentals

1.1 million DM

Utilities

Ventilation:
Mechanical ventilators were installed
only in the prefabricated boxes.
Plumbing:
Toilets were installed in prefabricated
boxes.
High tension installations:
Every temporary building was connected
to the city electricity system.
Emergency power generator:
A temporary generator was installed to
provide emergency current.
Low voltage facilities:
The following equipment was installed:
one telephone exchange with thirty exten-
sions, two data read-out stations, ten telex
machines, one intercom, a public address
system.

Technical Sport Facilities

Scoreboards:
Manually operated magnetic scoreboards
were used for each of the men's and
women's contest. Individual contest
results were posted on a central manually

operated magnetic scoreboard (daily results).

Signals:
Electrical lights with a parallel horn signal were used to announce the permission to shoot.

Intercom:
The organization had an intercom system.
PA system:
For announcements in the buildings.

Contest Area

The Werneck Meadow in the English Garden was prepared for the contest by grading.

Women: 5 m. x 12 m. = 60 m. wide, 70 m. long.

Men: 5 m. x 14 m. = 70 m. wide, 90 m. long.

The archery range was set up so that the archers faced due north. The judges' table was between the two contest areas (signal to shoot and control).

There was one range for every three archers.
Women: 24 ranges, each 2.50 m. x 70 m.
Men: 28 ranges, each 2.50 m. x 90 m.

Olympic Use

September 7 to 10, 1972.

Athletes' Area

There were two bad weather tents for men and women participants each measuring 20 m. x 20 m. furnished with chairs and tables. The sportsmen's area between the stand and the waiting line along the entire breadth of the field was furnished with sun umbrellas, chairs and tables. The archers' medical facilities were located before the men's shelter tent.

Access:
By bus to the eastern and western main entrances, from there to the tents and contest site (the archers' places at the waiting line were the equivalent of the stand-by areas at the other sport sites).

Spectators' Area

Seats on six stands total 1,100
VIP seats 50
Press seats on the VIP stand and the press stand total 50
VIP food service:

There was a temporary restaurant for guests of honor in the organization tent.

Sanitary facilities and first aid:
These were accommodated in the prefabricated boxes.

Spectators' access:
Main entrances east or west with ticket offices and control (parking places were as far as 2 km. away). Unhindered admission to the stands.

Communications Area

Press, information, telephone room, writing room. 30 sq. m.
Interview room, writing room 30 sq. m.
DOZ room. 15 sq. m.

Contest and General Organization

The contest and sports site administration had one area consisting of two prefabricated boxes totaling 24 sq. m. one room (2 prefab boxes) for the Fédération Internationale de Tir à l'Arc (FITA) totaling 24 sq. m. One room (2 prefab boxes) for the Deutschen Schützenbund (German Archers Federation) (DSB) with a total of 24 sq. m. Organization tent 15 m. x 45 m. with the following equipment and rooms:

Telephone center. 20 sq. m.
Post office. 15 sq. m.
Storeroom. 15 sq. m.
Craftsmen. 15 sq. m.
Control personnel. 20 sq. m.
OC technical. 15 sq. m.
OC administration. 15 sq. m.
Scoreboard equipment. 9 sq. m.
Data processing. 9 sq. m.

Contest evaluation:
Three booths for men, each 15 sq. m.
Two booths for women, each 15 sq. m.
Furnishings: tables, chairs, telex machines.

Medical area:
Medical room 9 sq. m.
Doctors' room 9 sq. m.
Waiting room 9 sq. m.
Hostess' room, preparation for victors' ceremonies
(women's bad weather tent) 15 sq. m.

Restaurant

The VIP dining area was in the organization tent (self-service kiosks).
Kiosks for spectators.
Food service for officials and personnel totaled. 300 sq. m.

Dressage Facilities at Nymphenburg

Type of Sport: Equestrian Sports-Dressage

Location:
8000 Munich, 19
Nymphenburg Palace

Team director for the
Olympic Construction Company, Ltd.:
**Dipl.-Ing. Herbert Weidenschlager,
Munich**

Project director for the
Olympic Construction Company, Ltd.:
**Graduate Engineer Hans Peter
Alexander, Munich**

Design, Planning and Building supervision:
**Atelier Kleineichenhausen
P. F. Miller and Associates,
Kleineichenhausen**

Characteristics of Design and Construction

The dressage facilities were built temporarily in the palace park within the wooded area at the western front on the axis of the palace's middle tract. The facilities consisted of the contest area, the three preparation areas and the temporary bleachers and buildings. The contest area of 20 m. x 60 m. was located on a park lawn. The spectator bleachers were placed parallel on both sides of the contest area. The entire facility was so planned that the background provided by the palace and park could be thoroughly appreciated.

Dimensions of the Facility

Total area used in the vicinity of the contest area. 21,000 sq. m.
the contest area itself
20 m. x 60 m. 1,200 sq. m.
Length of the bleachers 125 m.
Width of the bleachers. 16 m.
The auxiliary rooms in temporary wooden buildings in the nearby wooded area had a capacity of approximately. . . 2,200 cu. m.

Access

By car:
Nymphenburg Palace is connected to the city streets by the entrance driveway.

Public transit:
Streetcar line and municipal buses have stops at Romanplatz and Verdi Strasse.

Total Cost excluding Incidentals

2.1 million DM

Utilities

All temporarily erected rooms were equipped with the required electrical and sanitary installations.

Sport Technicalities

Scoreboard:
The scoreboard was manually operated (magnetic)
Length 13.20 m.
Width 2.83 m.
The following data was displayed:
Start order, numbers, name and nationality of the contestant, the horse's name, individual as well as complete summary of the results.

Timing:
The start signal was given by a manually operated device, and the finish was likewise manually measured.

Contest Area

Contest site: 20 m. x 50 m.
Construction from top to bottom was as follows: mixture of sand and sawdust (6 cm.), cinders (4 cm.), and frost proof gravel.

Five referee booths were built, one on each of the northern and southern sides of the contest site as well as three on the eastern side.

The bandstand was built in front of the open stairway to the middle tract of the palace.

The contest officials were located on the southern grandstand together with those responsible for timing, results, teletype, and announcements.

Contest preparation:
Two starting places
(sand) each 20 m. x 60 m.
One stand-by area 15 m. x 50 m.

Olympic Use

The grounds were used for the Olympics on September 5, 6, and 8, 1972.

Participants and Horses

The participants were provided with five tents each 50 sq. m. washroom, toilet and snack bar were located on trucks in the stable area in the southern palace grounds.

The horses were provided with:
1 temporary stable 350 sq. m.
20 stalls each 3.00 m. x 3.50 m. 200 sq. m.
The feed was stored in two tents each. 50 sq. m.
The veterinarian had a tent with the doping control.

Access:
The contestants reached the riding areas No. 1 and No. 2 from the stables by park paths. From there they proceeded to the stand-by area where they waited for the signal to enter the competition area.

Spectators' Area

The spectators were provided with temporary stands and bleachers
Total number of spectator seats 8,000
Seats that were sheltered 4,000
Southern stand:

VIPs 250
Press seats with tables. 50
Press seats without tables. 100
Commentator seats: thirty booths were provided, fifteen for television and fifteen for radio.

Spectator Comfort:
The spectators were provided with refreshment tents set up behind the stands. There were also mobile sanitary facilities for general use.

First aid:
Red Cross personnel were on duty on the stands and in the first aid rooms for possible emergencies.

Spectators' entrance:
The palace park gates on both sides of the middle tract served as entrances. The ticket booths and ticket control were located here. From the ticket control there was unhindered entry to the spectator stands. (The contest site was screened off.)

Communications

(in temporary buildings)
Press subcenter. 35 sq. m.
Information 30 sq. m.
Writing room 50 sq. m.
Teletype room 45 sq. m.
Interview room. 40 sq. m.

Contest Area

Individual jumping,
Partial contest military,
Individual jumping for the modern pentathlon:
Stadium space 15,200 sq. m.
Contest area 14,600sq. m.
Construction of the contest areas: frost guard gravel down to the natural soil, 20 cm. humus consisting of sand, peat and humus, roll lawn cover.
Permanent obstacles:
Three water hazards
Judges' tower at the contest site:
Contest director 20 sq. m.
Jury room 30 sq. m.
Contest preparation:
(Between the judges' tower and the training areas)
Contest preparation area 2,000 sq. m.
Stand-by area 2,000 sq. m.

Olympic Usage

August 27, 1972 — modern pentathlon riding
August 29, 1972 — military dressage
August 30, 1972 — military dressage
August 31, 1972 — military cross-country
September 1, 1972 — military jumping
September 3, 1972 — Jumping Grand Prix (individual competition)

Area for Contestants and Horses

Stables for horses with the exception of the horses used in the modern pentathlon.
5 Olympic stables totaling . . . 240 stalls
Each Olympic stable (30 m. x 68 m.) contained the following rooms:
Ground floor:
48 stalls, each 3.50 m. x
3.50 m. 12.25 sq. m.
4 saddle rooms, each 25 sq. m.
2 rooms for stable supervision, each 15 sq. m.
4 feed rooms, each 17 sq. m.
2 equipment rooms, each 21 sq. m.
2 washing stalls, each 18 sq. m.
Toilet facilities 12 sq. m.
There are two lofts on each stable wall for hay and straw with a capacity of 900 cu. m. each.

Upper level:

Nineteen rooms for two grooms with an area of 15 sq. m. each, including three sanitary facilities with showers, wash basins and toilets.
In the four existing stables a total of 139 stalls measuring 3.50 m. x 3.50 m. were installed.
Stables for the horses for the modern pentathlon.
80 temporary stalls 3.00 m. x 3.50 m.
One hospital stable with twenty stalls 4.00 m. x 4.00 m.; five stalls are included in each section.
Treatment room with X-ray equipment for large animals 49 sq. m.
Laboratory 25 sq. m.
Quarters for stand-by doctors . . . 30 sq. m.
Kitchenette 10 sq. m.
Conference room 30 sq. m.
Waiting room 20 sq. m.
4 studios for veterinarians from outposts 80 sq. m.
2 washrooms, each 10 sq. m.
2 toilets, each 10 sq. m.

Riding hall:

Training areas during inclement weather. Area 30 m. x 75 m., 6.50 m. to 11.50 m. clearance (the ancillary rooms and the restaurant in the riding hall were not used during the Olympics).

Readying area (warm-up site before competition)
Sand area 2,000 sq. m.
Holding area (grass):
From here the contestants were called to compete 2,000 sq. m.
Physicians' area (in the casino basement near the new riding hall):
total 130 sq. m.

2 rooms for stand-by physicians 40 sq. m.
2 treatment rooms, each 20 sq. m.
Waiting room 20 sq. m.
Office 15 sq. m.
Laboratory 15 sq. m.
Toilets
Parking lots for two ambulances.
The doping checkpoint is included in the physicians' area.
Veterinarian (stadium basement):
Doctors and assistants have two rooms totaling 46 sq. m.

Spectator Area

Spectator places total 23,000
Seats 20,000
Standing room (temporary stand on the embankment) 3,000
Sheltered seats (grandstand) 8,000
Division of places:
VIP seats 500
Press seats with desks 250
Press seats without desks 200
Commentators' cubicles 50 (over the spectators' grandstand)
Athletes' seats 350
VIP facilities:
The VIPs were served refreshments in the stadium restaurant on the second level above the stands. There was a direct entry to the VIP seats from the restaurant.

Spectator facilities:
There were thirty concession stands southwest of the stadium and on the embankment stands to sell refreshments and sundry items.
Sanitation:
There were mobile toilets set up for the spectators on the embankment stands. The spectators in the sheltered stand area had access to the toilet facilities in the tower.
First aid:
A doctor's room, treatment room and waiting room were set up in a temporary army field house with a total of 70 sq. m. to aid spectators.

Spectators' access:
The spectators' entrance was located on Landshamer Strasse. From there, people passed ticket windows and checks to either the open-air stands on the embankment or they entered the sheltered stands via the ramp.

Communications

All communications areas were located in army field houses west of the stadium.
Press subcenter:
Press writing room 70 sq. m.
Press post office 140 sq. m.
Interview room 70 sq. m.
Information including back room 70 sq. m.
Mimeograph room 20 sq. m.
The press and commentator area was located on the viewers' grandstand.
DOZ-subcenter with post office transmission and interference elimination 70 sq. m.
DOZ two offices and film storage totaling 70 sq. m.
Special post office — field house 140 sq. m.

Transmission equipment:
Four camera spots were reserved for filming and television. A parking area was arranged under the grandstand for five heavy technical equipment trucks 200 sq. m.

Contest and General Administration

Riding Academy Casino:
Fédération Equestre Internationale (FEI)
Deutsche Reiterliche Vereinigung (FN)
Contest administration total 85 sq. m.
FEI Presidium, (two rooms)
total 50 sq. m.
FN Sports director, 4 rooms
totaling 80 sq. m.
Interpreters' room 20 sq. m.
Telephone exchange 20 sq. m.
Conference room 50 sq. m.
One room each for dressage, military, and jumping with Training area and contest supervisors 30 sq. m.
2 rooms for typing pool, each 20 sq. m.
One room each for mimeographing, care and cleaning service, maintenance, each 20 sq. m.
2 rooms for OC sports stand-by personnel, each 20 sq. m.
1 room for OC technical stand-by personnel 30 sq. m.
Telecommunications (two rooms) total 60 sq. m.
Refreshment room and back room 30 sq. m.
Toilet facilities for men and women
Technical apparatus for scoreboard 20 sq. m.
Data processing 30 sq. m.
Timing 20 sq. m.
Stand-by repairmen 200 sq. m.
Field houses (German army):
FEI Presidium 50 sq. m.
Sports director 30 sq. m.
Reporting office 30 sq. m.
2 writing rooms, each 50 sq. m.
Mimeograph room 15 sq. m.
Supervision — stadium 50 sq. m.
Interpreters' lounge 30 sq. m.
Hurdle and equipment service and custody 30 sq. m.
Men's and women's toilet.
Stadium grandstand lower level:
Police, fire department, and security guards, had 25 sq. m. each. The rooms for the administration and modern pentathlon were housed in the pre-Olympic buildings of the Munich Racing Club:
Nine offices including extra rooms totaled 200 sq. m.
Black smith's shop 40 sq. m.
Saddle shop 40 sq. m.
Carpentry shop 60 sq. m.
Painters' shop 60 sq. m.

Restaurant

The main restaurant in the stands (2nd level) was laid out for 200 seats (the restaurant and cafeteria were reserved for VIPs).
The canteen for short-term employees was in the pre-Olympic Racing Club canteen and seated 300.
Spectator service: there were thirty concession stands in the spectators' area to sell refreshments (entry area-ramp, embankment).
Casino snackroom with kitchenette for employees (50 persons).
Field house snack rooms with kitchenette (50 persons).

Canoe Slalom Course-Augsburg

Type of Sport:
Canoe Slalom

Location:
8900 Augsburg
On Spickel Strasse

Team director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Adolf Hillmeier, Augsburg

Project director for the Olympic Construction Company, Ltd.:
Construction Engineer Eberhard Regulski, Munich

Design, Planning and Supervision of Construction for Superstructures:
Dipl.-Ing. R. Brockel and E. K. Müller, Augsburg

Planning:
Gottfried Hansjakob, Munich

Characteristics of Design and Construction

The competition course for the canoe slalom consists of a concrete canal built into the landscape. The obstacles, made of poured concrete, are built into the channel. The slopes along the course are reinforced in such a way that they can also be used as spectator grandstands. The following permanent buildings were erected within the sports complex: the starting building in the south; the press and administration building in the southern third; the finish line building, boat houses, participants' building and restaurant in the north. The buildings were constructed with reinforced concrete skeletons and partially with wooden construction. The dominant materials are: concrete, wood, Eternit (asbestos cement), glass. Additional buildings were constructed temporarily: four army field huts for the short-term personnel, three wooden stand-by halls, and VIP bleachers of tubular steel construction near the finish line.

Dimensions of the Facility

Course:
Length approximately 660 m.
Width 6 m-8 m.
Depth 0.40m.-3.00 m.
Starting building (two floors):
Enclosed space 60 cu. m.
Usable floor space 20 sq. m.
Press and administration:
Tower (3 levels)
Building (1 floor)
Enclosed space 5,300 cu. m.
Usable floor space 1,100 sq. m.
Restaurant (2 floors):
Enclosed space 3,900 cu. m.
Usable floor space 950 sq. m.
Boat houses and participants' building:
Competition center (3 floors)
Enclosed space 13,300 cu. m.
Usable floor space 3,200 sq. m.
Finish line building (1 floor):
Enclosed space 50 cu. m.
Usable floor space 15 sq. m.

Access

By car:
From the Munich—Augsburg Autobahn via Friedberger Strasse and Spickel Strasse.
Public transit:
The line from the Munich rapid transit station at the Olympic Village connects the Olympic Village with the railway station, Augsburg-South, which is located near

Radio and Television Center (DOZ)

Function:
It served as a DOZ radio and television subcenter and had two recording studios with control rooms and other equipment. There were also an "off-tube-room", technical equipment and offices.

Location:
It was situated in the south boathouse.

Construction:
It was equipped with suspended ceilings, sound conditioning walls, and floating floor construction.

Press Center:

Function:
Press representatives were received and accredited here. Mail was distributed to the press. A conference room, a data transmitter and read-out station, long distance telephone call booths and teletype machines were located here. Also provided were a photo service with 10 small laboratories, a large laboratory which also sold accessories, and work areas in the Carrel System. Agencies for pictures and texts with their own photo laboratories were located here.

Location:
It was situated in the south boat house and in the lower garage level and was connected to the adjacent permanent press center and DOZ.

Construction:
See "special post office" above.

Personnel Area

Function:
Hiring and outfitting of short-term personnel was taken care of here. The area also served as their lounge.

Location:
It was situated in the garage under the changing rooms of the swimming pool.

Construction:
It was equipped with lighting, ventilation and partitions.

Measuring Area

Function:
The participants' boats were measured here. The participants could also keep their tool boxes and make repairs in this area.

Location:
The area was situated in the north boat house.

Construction:
Platforms were provided for the measurers. The measuring area was partitioned off and wooden boxes were provided.

Access

By car:
The complex had access to the city street network by the construction of Förde Strasse. Parking lots, some of which will also be boat storage areas, are located immediately at the entrances. Additional temporary parking areas are located west of Förde Strasse outside the building site.

Public transit:
Visitors could use either buses or steamers.

Pedestrians:
Pedestrians reach the promenade and harbor area from the parking lots, the bus stop or Schilksee through a wide entrance area which gives the center a certain charm. This pedestrian area meets the promenade at a point enlivened by the resort and beach activity. It is arranged on terraces and descends gradually. There is an unobs-

tructed view of the Baltic Sea, the harbor and the Olympic flame. The promenade itself forms part of the pedestrian path network.

Dimensions of the Yachting Center

Total area 285,000 sq. m.
Built-up area 77,000 sq. m.
Usable floor space 70,000 sq. m.
Total volume 300,000 sq. m.
Harbor surface 96,500 sq. m.

Cost

The entire cost of buildings and furnishings required for the Olympics totaled 82.2 million DM.

Utilities

The entire project was heated by a central heating plant located in the basement of the Apartment Tower II. It was fired with light heating oil and furnished approximately 3.0 Gcal/h. The bungalows had their own individual gas heat. The swimming pool, the sauna, the restaurants, the multi-purpose hall and the recreation center were ventilated. Temporary ventilators were installed in the south boat house and in the garages where the special facilities were temporarily accommodated.

Low voltage installations:
100 main telephone connections were installed. These had 600 extensions and additional extensions were installed for the Olympic Games. All buildings had common antennas for radio and television reception. Temporary antennas were installed for radio communications with the regatta course, etc. Clock systems were installed in the harbor area and swimming pool and recreation center. A public address system was installed in the harbor area and swimming pool. Temporary intercoms were installed in all functional areas. In addition there is a fire alarm system.

Data processing centers:
Electronic data processing machines were temporarily located in the regatta administration offices. Temporary data transmitters and data read-out centers were situated in the spectator, press and sport areas.

Technical Sport Aids

Scoreboards:
5 manually operated scoreboards were installed in the harbor area to display regatta results in each of six Olympic yachting categories.

Timing:
The events were timed electronically with multi-counters.

The Yachting Competition Courses

The competition areas for the yachting events are located on the Kiel Outer Forde. The approximate center points of the regatta areas are as follows:

Regatta area A (Soling and Dragon)
54°29'50" N., 10°22'00" E.

Regatta area B (Flying Dutchman, Tempest, Star)
54°30'30" N., 10°13'00" E.

Regatta area C (Finn)
54°27'30" N., 10°17'45" E.

The regatta courses have the shape of right angle isosceles triangles. The triangle base of courses A and B measures 2 nautical miles; that of course C, 1.5 nautical miles. The total length of regatta courses A and B is 11 nautical miles; that of course C, 8.4 nautical miles.

Olympic Use

August 29, until September 1, 1972 and September 4, 5, and 8, 1972.

Spectators' Area

There are no special spectator facilities at the Olympic Yachting Center in Kiel-Schilksee. The viewers may stroll freely on the promenade. Information booths were set up along the promenade where fans could keep themselves informed about Olympic yachting events with models and plans. Visitors could also keep up on Olympic events happening in Munich by enlarged television pictures and a data read-out station.

For fans who wished to witness the yachting events at close range, there were fourteen bay steamers sailing every day to the regatta course. They could carry as many as 4,000 persons.

The Restaurant

Visitors were provided with food service in temporary stands with roofs, kiosks and chairs.

Press Center

Use:
Work Area for Journalists

Location:
8000 Munich 40
Ries Strasse

Team director for the Olympic Construction Company, Ltd.:
Construction Engineer Horst Chmielorz, Munich

Project director for the Olympic Construction Company, Ltd.:
Construction Engineer Horst Chmielorz, Munich

Design and Planning:
Planning Company for Regional, Architectural and Engineering Planning, Ltd., Munich

Project director:
Werner Wirsing, Uwe Breukel, Munich

The Journalists' Village with the Press Center and Olympic Shopping Center is situated in the northwest of the Olympic Park west of the Landshuter Allee and north of the Middle Ring, only a few hundred meters from the main Olympic sports facilities and from the Olympic Village. The entire complex was divided into three functional areas.

1. The Press Center, i.e. the working area for journalists.
2. The Journalists' Village, the living quarters for journalists, with 4,238 single rooms and apartments.
3. The Olympic Shopping Center, which had all the businesses necessary to cater for the personal needs of those living in the Journalists' Village. (The following text will handle only the Press Center, which was adapted for Olympic needs and is supposed to become a school after the Olympics.)

Characteristics of Design and Construction

The Press Center was planned as a four-story square building (length of sides, approximately 70 m.). The restaurant for the journalists (the neighboring building), a square, one-story building with sides approximately 50 m. long, adjoins the Press Center on its western side. The Press Center with the restaurant was constructed in the short time of sixteen months by using prefabricated construction methods. Both buildings were erected of a steel and reinforced concrete laminated construction, on a square grid foundation. A steel skeleton system of primary and secondary supports is combined with the reinforced concrete finishing panels. The main building is supported by four main construction elements, which are in the corners of the building (or, on the third and fourth floors, in the corners of the inner court) and contain stairwells, elevators as well as necessary auxiliary rooms. All exterior walls of the building consist of one-story high aluminum elements, which are covered with multi-layer, heat conserving panels in the areas around the windowsills and in the areas between the floors. With the exception of the walls of the four main construction elements which serve a support function, all interior walls are constructed of multi-layer mobile wall

sections. All rooms, except for bathrooms, etc., are covered with a sound absorbing synthetic textile floor covering.

Dimensions of the Facility

Area under roof 7,050 sq. m.
Interior space 90,000 cu m.
Total usable floor space..... 17,400 sq. m.

Access

For cars and pedestrians:
From the Journalists' Village on Ries Strasse there was a direct connection to the Olympic Village via Lerchenauer Strasse, Moosacher Strasse and Hanauer Strasse, or via the Middle Ring to Olympic Park. These were the shortest ways for service vehicles from all parts of Olympic Park and also provided good connections to all other sports facilities.
The pedestrian paths led about 1,000 m., without crossing a street, from the central plateau next to the main sports facilities, via the dam paths to the German Olympia Center (DOZ), the volleyball hall, the hockey field, to the Journalists' Village and the Press Center. There was also a pedestrian path of less than 1,000 m. leading to Olympic Village.

Public transport:
Bus shuttle service during the Olympic Games. Pedestrian and road connection to the rapid transit station 500 m. away. Shuttle-buses for athletes, journalists and officials connected all the sports facilities with the Journalists' Village and the Press Center. The central bus stop was right at the entrance to the Press Center.

Parking places:
Near the Press Center, 52 parking places were available for cars with special permits.

Total Cost excluding Incidentals

23.7 million DM

Utilities

Heating:
The site was supplied by district heating. The capacity of the connection was 2 million kcal/h. Rooms were heated with hot water radiators. Some individual rooms received supplementary warm-air heating. The hot water was heated by a heat exchanger.

Plumbing:
Water and sewage lines were led from and to the main construction elements (stairwell and elevator shaft). The regulating devices are in the space between the floors and are accessible at regular intervals in accordance with the layout of the building.

Ventilation:
The central ventilation installations are in the main construction elements. The floors are supplied by vertical shafts; the horizontal distribution of the intake and exhaust air is channeled in the space above the ceiling.

High voltage installations:
Installed transformer output 6 x 630 kVA.

Lighting:
All rooms were illuminated by fluorescent tubes. In the forum, extra spotlights were put in for special lighting. The wiring of the laboratory and of the darkroom was determined by their special requirements; the other rooms were wired according to general building codes.

Low voltage installations:
One telephone extension switchboard with 550 phones, 170 teletype machines, 8 data viewing stations, 1 antenna system for

approximately 200 television sets, 1 ELA installation for the foyer, OC press, and the kitchens, as well as six picture transmission machines, and a fire alarm system.

Space Allocation and Functions

Ground floor:
On the ground floor were located the central hall, the communications and information center with 120 seats for the journalists, television sets, data viewing stations and teletype machines. These installations gave the journalists the possibility of complete information. All the happenings of the Olympic Games in all their phases could be followed from here without any gaps. A bar adjoined the central hall. The following services and institutions were grouped around the hall: thirty accreditation windows, the issuance of meal tickets, general information, the chauffeurs, the issue of press cards, two rooms for the doctor on call, two rooms for the chauffeurs and couriers, the freight and travel office, the bank counter, the newspaper kiosk, the letter and package post office, the post office boxes for every accredited journalist; in addition the printing plant with forty printing and sixteen collating machines with the required reproduction and copying equipment. In addition, the following offices were accommodated:

Office of the Association of the German Sports Press

Office of the International Press Association (AJPS)

Office of the Chief of Service

Office for Documentation

Office of the Olympic Press Chief.

Second floor:
Two journalists' work rooms with a total of 961 sq. m. and 350 places each equipped with desk, chair and typewriter, the central photographic laboratory, the counter for receiving and returning films, the sales room and information, the filmdeveloping lab and the rooms for do-it-yourself developing (34 developing places and 35 printing cubicles), as well as the office of the national Fotopool, the camera repair workshop, the wire photo facility of the German Federal Post Office with six facsimile transmission machines and two rooms of the sports information service, the telephone room with 70 telephone booths and 20 telephone shells with 20 coin-operated telephones, the teletype room with 48 teletype machines and the telex counter. In addition, a milk bar was situated in the area of the German Federal Post Office.

Third floor:
Deutsche Presseagentur (dpa), European Press Photo Agencies Union (EPU), International Fotopool, Polska Agencja Prasowa (PAP), Politikens Pressfoto, Denmark, Sport-Illustrierte, Federal Republic of Germany, Ekstra Bladet, Denmark, two rooms for the United Press International (UPI), one interview room and the offices for the Associated Press (AP).

Fourth floor:
Agenzia Nazionale Stampa Associata, (ANSA), Algemeen Nederlands Presbureau, (ANP) conference room for 150 people and two interview rooms as well as a bar. Adjoining was the following row of additional agencies:

Agence France Press (AFP)
Jiji Japan
Austria Presse Agentur (APA)
Springer Verlag, Federal Republic of Germany
Dagens Nyheter, Sweden
Expressen, Sweden
Süddeutscher Verlag
Münchener Zeitungsverlag
Tidningarnas Telegrambyrå, Scandinavia
Reuters, Great Britain
Kyodo, Japan
ADN Allgemeiner Deutscher Nachrichtendienst, German Democratic Republic
CTK Ceskoslovenska Tiskova Kanelar Administration, press subcenter
Administration, Press Center
L'Equipe, France
Sports Illustrated, USA
Sport Zürich, Switzerland
Tanjug, Yugoslavia
Tass, USSR
Press committee
MTI, Hungary
EFE, Spain
Press and Information Service of the German Federal Government
City of Munich, Free State of Bavaria.

Restaurant

The restaurant of the Press Center has at its disposal 1,000 seats inside and an additional 400 places on the terrace. The capacity was estimated to serve 6,500 persons (in several shifts). The total area of 3,500 sq. m. was divided into the dining room, the room with the self-service bar (only accessible by going past a control point), as well as the kitchens and preparation rooms.

Dante Swimming Pool

Type of Sport:
Water Polo

Location:
8000 Munich 19
Homer Strasse

Team Director for the Olympic Construction Company, Ltd.:
Dipl.-Ing. Herbert Weidenschlager, Munich

Project Director for the Olympic Construction Company, Ltd.:
Architect Franz Grammling, Munich

Design, planning, engineering, and supervision of Construction:
Dipl.-Ing. Kurt Becker, Engineering Office, Munich

Characteristics of Design and Construction

The two-story buildings at the eastern (office building with restaurant) and the western (locker rooms, concession stand and wing for the toilets) ends along with the grandstands on the northern side together close off the rectangular swimming area. This area consists of a swimming pool (used for the water polo competitions), a diving pool and a 10-meter diving tower. The temporary grandstands on the southern side form the boundary between the swimming stadium and the adjoining sunbathing area. The two larger buildings are constructed of a reinforced concrete framework (concrete poured on the site) with wall panels of limestone. The exterior walls are finished with concrete construction panels which have a white gravel surface.

Decorative design elements include facade panels and dark anodized aluminum windows on the exterior, with ceramics, natural stone, wood or plastic ceiling panels on the inside. The swimming and diving pools consist of watertight, resilient reinforced concrete with rough ceramic covering. The pools are equipped with "Pyrmont type" overflow gutters.

Dimensions of the Facility

Area of the swimming stadium site:
approximately 15, 000 sq. m.
Volume of buildings:

Total 16,860 cu. m.
Eastern building 9,017 cu. m.
Heated corridor 515 cu. m.
Concession stand and toilet wing 1,290 cu. m.
Warm-up room 864 cu. m.
Western building 5,173 cu. m.

Volume of the swimming pools:
Total 4,544 cu. m.
Competition pool 2,215 cu. m.
Diving pool 2,330 cu. m.

Built-over area:
Swimming stadium, approx 12,500 sq. m.
Surface area of the swimming pool 1,075 sq. m.
Usable surface of the water polo playing area:
20 m. x 30 m. 600 sq. m.

Access

By car:
From the Olympic Village via the Middle Ring, Dachauer Strasse and Homer Strasse to the Dante Pool.

Public transit:
Streetcar stops on Dachauer Strasse and Dante Strasse.

**Selected Literature on the Buildings
Erected for the 1972 Olympic Games
in Munich**

Period of Survey: 1965-1972
No. 725.826/.89 (430.1 M) Buildings
erected for the Olympic Games (Munich)

Documentation center for building techno-
logy of the Fraunhofer Society,
7000 Stuttgart W. Silberburgstr. 119A

Contents:

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15. Hockey field. 2 titles
16. Ski sport facilities. 1 title
17. Rowing and canoe regatta
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18. Sailing center at Kiel-
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19. Total installation, utiliza-
 tion after the Games. 3 titles

The greater part of the structures and
installations listed separately under 7
to 18 are also covered by general reviews
under items 1 and 2.

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Notes on the digitized version of the Official Report of the Organizing Committee for the Games of the XXth Olympiad Munich 1972 (Volume 2)

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The original document

The original paper version of the 1972 Official Report (Volume 2) has dimensions of 10.9 x 11.9" (27.5cm x 30cm).

The volume's spine is of green cloth. The number "2" appears in white on the spine.

The book has 217 pages.

The fonts used in the digital version book for text, photograph captions and chapter headings are Helvetica and such system fonts as best approximate the original fonts.

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