

# Die Spiele

Volume 2

The constructions



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The official report  
of the Organizing  
Committee  
for the Games  
of the XXth Olympiad  
Munich  
1972

Volume 2

The constructions

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Federal Minister for Regional Planning,  
Construction, and Urban Development;  
Lord Mayor of the Bavarian Capital City  
of Munich from 1960 to 1972

Helsinki - Rome - Tokyo - Mexico City:  
When one recalls the Olympic Games in  
these cities, one recalls not only brilliant  
sporting performances and thrilling  
competitions, but also the outstanding  
Olympic buildings. One thinks of the grace-  
ful stadium of Lindegren Jäntti, of the  
daring sport palaces of Nervi, of Kenzo  
Tange's suspended roofs for the swimm-  
ing and basketball halls, and finally of the  
marvelous dome of Candila/Castañeda/  
Peyri for basketball competitions. These  
buildings stand out as examples of new  
architecture, as valid contemporary ex-  
pressions of form, as symbols of the mas-  
tery of new technical problems.

All these cases, however, concern pree-  
minent single structures; the other sports  
facilities are scattered around the entire  
cities involved. The applicants for the  
1972 Games, on the other hand, had a  
different conception in mind from the very  
beginning. In competing with Detroit,  
Madrid and Montreal at the IOC meeting  
in Rome in April, 1966, Munich submitted  
a proposal whereby stadium, sports hall,  
swimming hall, cycling stadium and  
Olympic Village were concentrated in a  
single complex, within the city and only  
four kilometers from downtown.

After the Games of the XXth Olympiad  
were awarded to the Bavarian capital, the  
organizers decided to set aside the hastily  
developed building plans for the former  
military training ground and airport at  
Oberwiesenfeld in favor of a plan which  
better captured the mood of the Munich  
Games. This resulted in a layout which  
provided the "Verdant Games" with a  
worthy, but airy and graceful "park of short  
paths". The architecture contrasts clearly  
with the monumental structures of the  
1930's and at the same time corresponds  
to the character and personality of the city  
of Munich.

One hundred teams of architects, engineers,  
landscaping and traffic planners took part  
in the 1967 planning competition. The  
judges who met in two extended deliberat-  
ing periods under the chairmanship of the  
talented late Egon Eiermann of Karlsruhe,  
awarded the first prize to Günter Behnisch  
and Associates, Stuttgart. This design  
offered an extraordinary solution. Along  
with the outstanding arrangement and  
spatial ordering of the buildings, the plan  
possessed particular landscaping merits. It  
also foresaw an unusually daring tent roof  
to unite the stadium, sport hall and swim-  
ming hall. The Chronicle contained in this  
volume documents the realization of this  
concept up to the most mature stages of  
planning. The design itself is described and  
illustrated in the main body of the work.

Along with the facilities at Oberwiesen-  
feld and in the direct vicinity (they were  
complemented by the Central University  
Sports Facility, the Press Complex and the  
Press Center), structures arose in other  
places, such as the regatta course for  
rowing and canoeing, the shooting range,  
the riding facilities, the wrestling hall and the  
basketball hall. The planners here were also  
chosen partially by competition. Other  
winners of the large contest were com-  
missioned directly with these projects.

As early as 1912, Baron Pierre de Coubertin  
drew attention in the "Revue Olympique"

to the importance of Olympic sports struc-  
tures as essential elements in urban con-  
struction. He demanded high creative  
quality from planners and called for the  
integration of the buildings into the city in  
such a way as to assure their use after the  
great sporting events. This concept of  
Coubertin's has been realized in Munich.  
In addition, the city's infrastructure has  
also been improved. As was already shown  
by the experience in Rome, Tokyo and  
Mexico City, the Olympic preparations in-  
fluenced urban planning and development.

Within the framework of Olympic prepara-  
tions, Munich gained 4.2 km. of additional  
subway lines, 275,000 sq. m. of streets,  
over 1000 units of low-cost housing, about  
5000 privately financed apartments,  
1800 student rooms, and three schools  
for about 5000 pupils. Over and above  
this, work on Munich's rail rapid transit  
system, on the radial arterial access road  
system, and on the pedestrian zone down-  
town was so accelerated that these projects  
could be completed years earlier than  
normal investment would have allowed.

Without the Games, there would probably  
be even now only a conventional soccer  
and track and field stadium at Oberwiesen-  
feld. Instead Munich has acquired a  
marvelous large recreation park which has  
enriched the individuality of the city, has  
provided a new center of varied community  
life, and has given new value to northern  
Munich.

The Editors:  
Frieder Roskam, Franz Grammling,  
Heinz-Willi Hallmann

For the first time, a volume in the series of  
Official Reports has been devoted ex-  
clusively to the buildings for the Olympic  
Games. This volume provides an inde-  
pendent survey of the planning and con-  
struction phases, the results of this work,  
the technical data and the spatial utilization  
of the facilities. It emphasizes the special  
characteristics of the sport facilities, their  
functional relationships to one or more  
types of sport, but also their possibilities  
for those seeking recreation and sporting  
opportunities.

When the results of the Olympic competi-  
tions will have been long since forgotten,  
the buildings should still convey to the  
visitor the basic concept of the planning;  
that is, the human scale of the facilities,  
despite the large dimensions necessitated  
by the number of sports, athletes and  
spectators. The judgment of the success  
of this venture is left to the reader as he  
studies this volume. He should keep in  
mind, however, that many of the functional  
demands had already been established in  
advance and that the time for planning  
and construction was extraordinarily short.

The volume on buildings should simul-  
taneously depict the tasks of the Organiz-  
ing Committee (OC) which, together with  
the International Olympic Committee and  
the international sports associations, made  
the holding of the Olympic Games possible.  
In relation to the structures, the OC had to  
— hold to international regulations and  
— coordinate the demands of the participat-  
ing sports associations;  
— construct the buildings with due regard  
for functionally correct installations for  
training and competition, and furnish  
these with the most modern sporting  
equipment;  
— provide sufficient facilities and equip-  
ment for spectators, press, radio and  
television;  
— guarantee punctual completion, and  
— keep in mind the optimal post-Olympic  
use. In numerous individual negotiations  
(future organizers would do well to find  
another method), the demands of the inter-  
national associations had to be established,  
solutions had to be provided by the plan-  
ners, and results had to be ratified by the  
participating groups. Especially proble-  
matic in this process were demands for  
maximum spectator space, which could not  
always be fulfilled, or could only be effected  
by means of temporary installations  
during the Games.

Such requirements as the following are  
subsumed under the heading of "func-  
tionally correct facilities":  
clear spatial separation of athletes, organi-  
zation, VIPs and spectators;  
the shortest and clearest possible access  
routes for athletes into and within the  
sports facilities;  
sufficient space within every place of  
competition for athletes, organization,  
VIPs, press, radio and television;  
optimal facilities for the athletes and opti-  
mal viewing conditions for the spectators.

The thorough concentration of all facili-  
ties must be mentioned in this connection.  
The demand for optimal training conditions  
included the number and types of training  
facilities proportional to the expected  
number of athletes, as well as the short  
distances between the training areas and  
the Olympic Village.



These tasks were bound up with the problems of communication as well as with the general problems caused by the pressure of deadlines on the various associates. The actual realization of the goals and structures, with the exception of the yachting installation in Kiel, was in the hands of the Olympic Construction Company which was independent of the OC and which supervised all work, from the choosing and commissioning of architects to the letting of construction contracts and to the financing.

The OC finally asserted the basic demand for most intensive post-Olympic use. The problem-spawning circumstance for such maximal use after the Games was the simultaneous occurrence of many and various sports. Therefore the number of spectator places in the stadium was reduced from 90,000 to 80,000. The sports hall was conceived not in terms of one type of sport, but rather for all-purpose, even non-sports use. Of the 9000 places in the swimming hall, 7500 were only temporary. The Central University Sports Facility, a regional installation of the Bavarian Free State, was incorporated into the Olympic Park in order to provide, in the immediate part of the training areas and a few of the competition areas which were not originally planned for the Olympic Park itself.

The southern section of the Olympic Park with the stadium, swimming and sports halls was conceived for public use. Many of the other sports facilities have been used since the Olympics as regional performance centers, for example, the training pool of the swimming hall, the warm-up hall by the stadium, the bicycle track, the shooting range, the riding grounds, the regatta course and the canoe slalom course in Augsburg. The Olympic Village today offers student apartments, condominiums and rental apartments with the advantage of nearness to the city, all equipped with recreational areas for play and sport. The cafeterias, the communication center for the athletes, and the medical areas were so planned that they could be used after the Olympics partly for the same functions. Other parts could be converted into schools and shopping centers. For volleyball, two gymnasiums which were needed anyway as components of the Central University Sports Facility, were combined into one large hall and were partially equipped with temporary stands, since the need of Munich's population for a sports hall and a basketball hall had already been covered. Similar considerations were involved in planning the hockey fields. At the beginning these were planned for the southern section of the Olympic Park. Reasonable arguments, however, led to their location in the northern section and to their provision with temporary stands which would not raise the permanent spectator seating capacity in Munich. In this way, the goal of "Olympic Games involving a minimum of travel" was fulfilled for hockey players and spectators. Many of the decisions bearing on the task group for Olympic buildings had to be first worked out in theory, because of the lack of experience. Fortunately most of the solutions chosen were sustained by practical experience made in the execution. All personnel involved in the building projects managed to keep a critical distance from their work in

spite of their enthusiasm for the great task, and continued to acquire experience. This volume on buildings is intended to make available this experience to all those who find themselves confronted with similar assignments.

President  
Dipl.-Ing. Carl Mertz  
Chief Business Manager of the  
Olympic Construction Company  
from 1969 to 1973

For well-considered reasons, the three consortiums responsible for the financing of the Olympic Games, i.e. the Federal Republic of Germany, the Bavarian Free State, and the State Capital City of Munich, decided to establish, alongside the Organizing Committee (OC), an independent building organization for the preparations for the Games. This Olympic Construction Company (OBG) was charged with the practical realization of the spatial and functional design programs which had been worked out by the OC and had been approved by the national and international sports organizations. In other words, the OBG commissioned the architects for the 60-odd projects of various scopes. These projects were chosen partly by architectural competition (for example, for the stadium, sports hall, swimming hall, the total conception for Oberwiesenthal, the regatta course and the shooting range), or by direct commission based on special expertise or particular suitability (for example, the riding facility at Riem and the wrestling hall on the fair grounds).

The OBG also provided the majority of the expert engineers and project consultants, directed the real estate purchases, financed the work necessary for the infrastructure around the Olympic area, oversaw the design work and the competitions, let the contracts to commercial firms, and bore responsibility for the punctual completion of all projects as well as for financial arrangements. Independent of the Men's Olympic Village, for which the OBG, in cooperation with the OC, only supervised the construction schedule, and with the exception of the buildings in Kiel, which were constructed for the sailing competitions under the sole responsibility of the City of Kiel, a total of about 60 architectural firms with around 550 persons were involved. As for the special engineers, statics experts, firm consultants and builders, another 950 persons were active in the 4½ years of planning. The total building costs administered by the OBG amounted to 1.35 billion DM.

The coordination of this "collective mass of intelligence" was an extremely comprehensive and, of course, unique task. Attempting to add this burden to the immense workload of actual OC duties would surely have led to serious complications. It was thought, and later proved in practice, that the organization of the Games and the construction of the buildings could be carried out without mutual hindrance. This was accomplished through mutual trust in the competence and zeal of both organizations and through the excellent cooperation of all involved.

Another reason for the independent status of the OBG lay in the fact that, as was the case for the Olympic Games in Mexico, Tokyo, Rome, etc., a project was selected which was to provide that "essential element of urban construction" — a landmark that was to keep alive the memory of the Games in Munich; that is, the great tent roof. Here totally unknown problems had to be solved. New technical ground had to be explored. Only a dynamic organization, having a tightly disciplined leadership and the necessary jurisdiction, could master the task. Endless discussions, fierce criticism and high praise were the musical accompaniment for the planning

and construction of the roof. But in the end, this experiment also succeeded. The roof stands, was completed on time, and remained during the Games, as it will in the future, the architectonic calling card of the Games of the XXth Olympiad in Munich 1972.

This success was only possible because the large number of team workers were prepared to accept responsibility for this new construction. It is to them that thanks are due — thanks that must also be extended to all those who worked at and contributed to the Olympic structures at Munich and Augsburg.





*A view over the city of Munich from the north toward the south; in the background the Alpine chain. In the foreground Oberwiesenfeld before construction; the light colored area in front of the rubble hill, which to a great extent has not yet been landscaped, is the grounds of "BAUMA" (Munich Exhibition of Construction Machinery). On the southern edge of the exhibition area; the television tower and Ice Stadium. Munich's center is only 3.8 km. from the future Olympic Park.*



### October 28, 1965

Willi Daume, President of the German Sports Federation and of the National Olympic Committee for Germany (NOC), suggested to Lord Mayor Dr. Hans-Jochen Vogel that Munich should offer its candidature as the site for the Games of the XXth Olympiad. Dr. Vogel agreed that serious consideration should be given to this question.

### December 8, 1965

The Bundestag welcomed Munich's application and decided that the Federal Government would bear one third of the resulting costs. The City of Kiel, capital of Schleswig-Holstein, applied for the staging of the Olympic yachting events in case the 1972 Olympic Games are awarded to a German city.

### December 14, 1965

The Bavarian Parliament welcomed Munich's application and decided that the Bavarian Free State would also bear one third of the resulting costs.

### December 18, 1965

The NOC unanimously approved Munich's application.

### December 20, 1965

The Munich City Council unanimously approved Munich's application for the Games of the XXth Olympiad.

### December 30, 1965

The documents in support of Munich's candidature were submitted to the Treasurer of the International Olympic Committee (IOC), Marc Hodler, in Lausanne. In addition to Munich, Detroit, Madrid and Montreal had also submitted their applications. This application was preceded by negotiations and agreements between the Federal Government, represented by Federal Chancellor Professor Dr. Ludwig Erhard, and the Bavarian Free State, represented by Minister President Dr. h.c. Alfons Goppel. All parties assured Munich of their support in the event of a favorable decision by the IOC. In the application it was stated that (summarized extract):

*"Munich already has a large number of sports facilities, some of which can be expanded:*

*The football stadium on Grunwalder Strasse (44,000 capacity).*

*The athletics stadium on Dante Strasse (22,000 capacity - can be increased to 35,000).*

*Football stadium at Pullacher Platz (25,000 capacity).*

*Twenty municipal sports installations, each with several playing fields. These grounds include fifteen 400-m. -tracks and other facilities for athletics, in addition to accommodations for up to 3,000 spectators.*

*Sports arenas in the Munich exhibition park:*

*Hall 7 (6,000 to 7,000 capacity), Bavaria Hall (4,500 capacity).*

*Five other halls (each for up to 2,500 spectators) and up to nine courts for indoor handball and basketball. Circus Krone Building (3,100 capacity).*

*Another 257 gymnasiums and sports halls. Swimming stadium on Dante Strasse (3,000 capacity which can be increased to 10,000) with a 21 m. x 50 m. swimming-pool and a diving pool with a 10 m.*



*The conception of the Olympic facilities at Oberwiesenfeld which was presented at the IOC-Congress in Rome in connection with the application of the State Capital City of Munich. The model shows the stadium in the north on a platform which spans the Middle Ring (city expressway), with the swimming hall and the sports hall adjoining. The Olympic Village is in the northeast. In the southeast is the ice stadium, while the stadium is located in the southwest.*

*Dr. Hans-Jochen Vogel, Lord Mayor, and Willi Daume, the later President of the Organizing Committee, accept the congratulations of IOC-President Avery Brundage after the selection of Munich as the location for the Games of the XXth Olympiad of 1972.*



*diving installation. Additional training facilities are provided by several other indoor and open-air (heated) swimming-pools within the city boundaries.*

*Amor Cycle Track (9,000 capacity, length of track: 333 1/3 m.).*

*Equestrian sports facilities in Munich-Riem. Several shooting ranges within the city boundaries, suitable for the modern pentathlon and training. During the next few years, but by 1971 at the latest, these existing facilities will be supplemented by the following sports installations to be constructed at Oberwiesenfeld, located only 3.8 km. from the center of the city:*

#### Olympic Stadium:

*Plans are nearing completion for the construction of a large stadium with accommodation for 90,000 to 100,000 spectators, 50,000 of whom will be under cover, with seats for 70,000. This stadium, the future sports center of Munich, will be equipped with facilities for almost all sports. It is therefore eminently suitable for important international sports events.*

#### Sports Hall:

*Another center at Oberwiesenfeld will be the proposed multi-purpose sports hall with a total area of almost six hectares and providing accommodation for 12,000 spectators, all of whom will have unhindered view. It will contain facilities for gymnastics, boxing, wrestling and fencing events, indoor athletics and handball, basketball, tennis and equestrian tournaments.*

#### Smaller Sports Hall:

*As early as 1966 a sports installation will be completed at Oberwiesenfeld which will include a hall for 8,000 spectators. The central floor space will measure 60 m. x 30 m. and can be used for indoor events (boxing, wrestling, fencing).*

#### Swimming Hall:

*A swimming stadium with capacity for 10,000 spectators will be built in the immediate vicinity of the Olympic Village. It will contain a swimming-pool (25 m. x 50 m.) and a diving-pool measuring 20 m. x 20 m.*

#### Cycling Stadium:

*A new cycling stadium accommodating 10,000 spectators will be built adjacent to Oberwiesenfeld for the Olympic track cycling events.*

*A rowing and canoeing course will be constructed either in Munich or on one of the Bavarian lakes.*

*Summing up it can be stated that Munich, with its existing and planned sports installations, offers optimum conditions for holding the Olympic Games. The principal existing and planned sports installations, together with the Olympic Village and the associated facilities and training areas, will all be situated on the 3 million square meter "Oberwiesenfeld" in the north of the city. Easy access to this terrain will be provided by highways, the subway, the Federal Railway System, trams and buses, and it will have parking space for 10,000 cars.*

*Installations for those Olympic sports that cannot be accommodated here will be newly constructed, together with training facilities, in so far as they do not already exist. With few exceptions they will be in the immediate vicinity of the Olympic Center or will be situated within the city boundaries at a maximum distance of 10 to 15 km. and will be easily accessible by convenient means of transportation.*

#### The Olympic Village:

*The Village will be built in close proximity to the main sports installations and, with all its facilities, will occupy an area of about eighty hectares. When the Games are over it will become a select residential quarter, well situated in relation to the city and providing accommodation for 7,000 persons. This housing development has exceptionally good communications. Its situation is such that all sports and cultural events which take place outside the main installations during the Olympic Games can be reached quickly and conveniently. Completion dates will be scheduled so that the first occupants will be the participants in the 1972 Olympic Games. The Olympic Village will contain a community center with all necessary organizational and cultural conveniences. The center will form a connecting link between the quarters of the men and women athletes and will be equipped to satisfy the different requirements of the competing nations.*

*The training and practice grounds of the Olympic Village will be located in a parkland area of about 27 hectares separating the Village from the main sports sites.*

*This green zone will provide ample opportunity for training for the contests and also for relaxation."*

### February 10, 1966

The City of Munich sent its final application documents to the 71 members of the IOC, the 132 National Olympic Committees and the 40 International Sports Federations.

### April 25, 1966

Lord Mayor Dr. Vogel stated at the presentation of the application to the IOC in Rome, "Munich offers Olympic Games with short distances and would like to give the Games a special cultural character."

An exhibit on the theme "Olympic Games in Green" demonstrated the existing and planned facilities and installations. The information sheet carried the following statement: "Munich — a city with its own distinctive atmosphere — has the best property within the city at its disposal. It does not wish to stage 'gargantuan', but rather sporting and human Olympic Games."

### April 26, 1966

At the 64th meeting of the IOC in Rome, Detroit, Montreal, Madrid and Munich, represented by their mayors and the presidents of the respective National Olympic Committees, presented their applications for holding the 1972 Olympic Games. The IOC awarded the Games of the XXth Olympiad 1972 to Munich.

### May 31, 1966

First meeting of the preparatory committee for founding the Organizing Committee



for the Games of the XXth Olympiad 1972 in Munich.

In accordance with the resolution passed by the NOC on May 19, 1966 in Kassel, it was stated that the construction of new buildings was to be the responsibility of the public authorities, i.e. the Federal Government, the Bavarian Free State and the City of Munich. For this reason a building and financing corporation would be founded, with the territorial corporations as its members. The representatives of sports would receive a qualified right of co-determination.

**June 15, 1966**

The Munich City Council decided to add a Munich-Schwabing-Oberwiesenfeld line to the subway system.

**July 3, 1966**

The Organizing Committee for the Games of the XXth Olympiad Munich 1972 (OC) was constituted in the Town Hall (see Vol. 1). The founding of the holding company, which was expected to take place at the same meeting, was postponed.

**September 28, 1966**

The City of Munich set up the "Investment, Planning and Olympic Office". Its function was to arrive quickly at decisions and to secure coordination with the other territorial corporations.

**September 30, 1966**

A the third meeting of the Executive Board of the OC the members of the Sports and Architecture and Construction Commissions were appointed (see Vol. 1). These commissions were to give precedence to working out area and space programs in agreement with the international sports federations.

**November 12, 1966**

First meeting of the Sports Commission of the OC under the chairmanship of Bernhard Baier. The competition sites for the 21 different kinds of sports were determined on the basis of the requirements known at that time. Halls were required for eleven sports. The basic lines were the measurements included in the competition circular.

**November 29, 1966**

First meeting of the Commission for Architecture and Construction of the OC under the chairmanship of Heinz Noris. With regard to the suggestions submitted by the Sports Commission, the Commission for Architecture and Construction advocated the organization of an architectural competition for Oberwiesenfeld, open to all German architects resident in the Federal Republic of Germany and West Berlin.

**December 2, 1966**

At its fourth meeting the Executive Board of the OC passed the following resolutions: "1. The territorial authorities are requested to establish a construction corporation as soon as possible.  
2. A national competition shall be organized in which due consideration will be given to the requirements stipulated by the Sports Commission.

3. The Commission for Architecture and Construction shall determine the details of the competition and forward them to the City of Munich.  
4. The City of Munich is requested to assume the functions of the construction corporation until the latter is legally constituted and to complete the arrangements for the competition in the course of January, 1967."

**December 31, 1966**

- In the general assembly of the Munich City Council Mayor Dr. Vogel stated: "The basic intentions of the city are promoted by the decision in Rome:  
1. The planning and construction of a subway system.  
2. The determination of a site for the large South Bavaria Airport.  
3. The progress of preparatory measures has made it clear that the construction at Oberwiesenfeld will benefit the north-western part of Munich. At the junction of two green zones dividing the city a preferential residential and recreational area will develop in connection with the centralized sports facilities."

**January 1, 1967**

Herbert Kunze, who was unanimously elected Secretary General of the OC on September 30, 1966, assumed his office.

**February 1, 1967**

The City of Munich announced a city-planning and architectural competition for Oberwiesenfeld. The jury for the assessment of the entries consisted of ten technical judges and nine other judges with the corresponding number of deputies in each group, one expert each for traffic problems, sport, statics, landscaping and building organization respectively, and three preliminary examiners.

Prizes and Purchases:

1st prize . . . . .	DM 100,000.—
2nd prize . . . . .	DM 80,000.—
3rd prize . . . . .	DM 60,000.—
4th prize . . . . .	DM 40,000.—
5th prize . . . . .	DM 20,000.—
also the purchase of ten entries at DM 10,000 — each . .	DM 100,000. —
Total . . . . .	DM 400,000.—

Closing date:  
The competition entries must be submitted by 11 P.M., July 8, 1967.

The object of the competition was outlined as follows: "The purpose of the competition is to obtain proposals for a worthy setting, from the city-planning and architectural point of view, for the XXth Olympic Games to be held in Munich in 1972, and also to find best functional and economic solution for the later utilization of the various installations. The competition, therefore, calls for ideas for the overall arrangement of the structures for the Olympic Games at Oberwiesenfeld on one hand, and for architectural designs for the competition sites and other installations on the other hand.

All entries must take account of the general traffic plan dated July 10, 1963 and must also maintain the green parkland character of Oberwiesenfeld, as laid down in the property utilization plan of the City of Munich. The site that is the subject of the competition is Oberwiesenfeld, situated about 4 km. north-west of the center of the city. The area of the site is approximately 280 hectares. The plans submitted for the competition must in a satisfactory way incorporate the existing television tower and ice stadium with their ancillary installations.

The candidature of the City featured the idea of "Olympic Games in a green setting and with a minimum of travel". Competition entries must take these concepts into account. All the specified buildings must be located at Oberwiesenfeld in such a way as not to detract from its parkland character.

**General Transportation**

Rail traffic:  
German Federal Railway: A station for long-distance and suburban trains will be built on the "Nordring" section of the Federal railway system, about 300 m. north of Oberwiesenfeld.

Subway: A station will be built as the provisional terminus of the Olympic line at the eastern boundary of the Olympic area. It will connect with a terminal for bus lines servicing the northern and north-western suburbs.

Trams: A tram terminal will be provided in the southern part of Oberwiesenfeld.

Roads: Oberwiesenfeld will be traversed from east to west by the "Mittlerer Ring" circular road and flanked at its western boundary by the "B 11 North" highway which runs from north to south.

Parking lots: A total of about 10,000 parking places will be required for visitors during the Olympic Games. About half this number can be provided outside the Olympic area. The remaining 5,000 parking places may be open or covered, depending on the overall cost of the plan. Of these parking places, 650 must be in the immediate vicinity of the television tower.

Staff and service vehicles (such as gardeners' vehicles, refuse removal trucks, delivery vans, fire engines and ambulances) will also make use of the wide footpaths that will be necessary for major events.

Oberwiesenfeld is intersected by the "Mittlerer Ring" road. It is an essential part of the purpose of the competition to compensate for this drawback by a suitable overall arrangement of the competition sites and their subsidiary installations in a manner that will be acceptable from the city-planning and economic aspects. The "Mittlerer Ring" will be flanked on each side by sidewalks and on its north side also by a bicycle path. Oberwiesenfeld is situated at the intersection of green zones which link different parts of the city. The competition calls for bold planning of these zones including their footpaths and bicycle paths.

The estimated distribution of traffic during the Olympic Games (assuming a maximum of 130,000 spectators at any one time) is as follows:  
Subway. . . . . 25,000 persons  
Federal railways . . . . . 25,000 persons  
Trams, buses. . . . . 10,000 persons  
Coaches. . . . . 10,000 persons  
Private cars. . . . . 40,000 persons  
Pedestrians. . . . . 20,000 persons

**Overall planning competition**

Requirements:  
The following installations must be accommodated within the area of Oberwiesenfeld:

Stadium:  
Total spectator capacity 90,000 (50,000 seats, standing room for 40,000).

Sports Hall:  
Spectator capacity depends on the kind of event, with a variable number of seats (maximum numbers of spectators: Boxing 12,000, handball 10,000, gymnastics or riding 10,000, other events 11,500).

Swimming Stadium:  
Capacity for 8,000 spectators. After the Games the swimming stadium and its facilities will be used for university contests, by the general public and by swimming clubs. Then accommodations for only about 1,500 spectators will be required. It is a part of the competition to find a particularly economical solution to maintenance and operation problems.

Cycling Stadium:  
The total spectator capacity comprises standing room for 8,500 persons and seats for 1,500. After the Games standing room for only 3,500 and seats for 1,500 will be needed.

Olympic Village:  
The competition entries for the Village should present only the basic conception, including housing for 8,200 athletes, which will later be used as a residential quarter with 1,800 apartments. Another section of the Olympic Village must be planned to provide accommodations for 1,800 women athletes: this will afterwards be used as a student residence. An area must be provided between these two residential quarters for the location of the central facilities of the Olympic Village — two churches, shops, post office, bank, etc. Most of these buildings will later serve as a center for the permanent residential settlement; in particular, a primary school will be needed after the Games.

**Architectural competition**

The architectural competition comprises the various competition sites required for the Games, the Press Center, the Central University Sports Facility, the parking lots, and plans for spectator access to all these installations. The restaurants specified in the building program will be supplemented during the Olympic Games by provisional restaurants. These do not come within the scope of the competition. The same applies to the provisional buildings for the post office, the police, information and other services."

### March 4, 1967

A commission appointed by the Executive Board of the OC examined the candidatures of the cities of Lübeck and Kiel for the organization of the Olympic yachting events. The members of the commission (Bernhard Baier, Berthold Beitz, Dr. Cornelius von Hovora, Dietrich Fischer, Herbert Kunze) recommended Kiel as the site by a majority of three votes to two.

### March 16, 1967

The three government bodies (the Federal Republic of Germany, the Free State of Bavaria, and the City of Munich) negotiated the consortial contract and agreed on the list of investment measures for the buildings in Munich.

### March 18, 1967

The General Assembly of the OC decided upon Kiel as the site for the yachting events.

### May 10, 1967

Commencement of work on the subway line from Munich—Schwabing to the Olympic Center at Oberwiesenfeld.

### May 26, 1967

The City of Kiel set up a department for the coordination of the municipal Olympic arrangements.

### June 17, 1967

The Commission for the Olympic Yachting Events 1972 met in Kiel under the chairmanship of Berthold Beitz.

### July 10, 1967

Federal Finance Minister Dr. h.c. Franz-Josef Strauss, Bavarian Finance Minister Dr. Konrad Pöhner and Lord Mayor Dr. Hans-Jochen Vogel signed the consortium agreement for the construction and financing of the sports installations and facilities for the Games of the XXth Olympiad in Munich. At the same time an agreement was concluded for the constitution of the Olympic Construction Company (OBG) which has the responsibility of:

a) constructing the necessary sports installations and facilities at Oberwiesenfeld for the celebration of the Games of the XXth Olympiad in Munich,

b) constructing the Olympic Village and its ancillary buildings and facilities at Oberwiesenfeld,

c) planning and constructing or arranging for the planning and construction of the urbanization works required at Oberwiesenfeld in connection with all buildings, installations and facilities thereon and for the financing and maintenance of all these works until their final transfer to the responsible authority or authorities. In so far as individual works are not constructed and financed by the Company, the latter must coordinate the planning of these with the builders concerned and supervise the building time and financing.

The bodies of the Company are:

a) The Management whose functions will be regulated by a business arrangement.

b) The Supervisory Board.

Its twenty members are appointed (four each) or recalled by the three territorial corporations, the OC and the states which organize the Olympic Lottery. The members select from among their own ranks a Chairman and a Deputy Chairman, and the Chairmen of the Committees and their Deputies. The Board appoints a Construction Committee and a Finance and Administration Committee.

c) The General Assembly.

A resolution passed by the General Assembly is required, among other things, for reading and approval of the annual report, of the annual balance sheet and profit and loss account, for approval of the employment of any profits and the covering of any losses, for the ratification of the acts of the Supervisory Board and the Management, and for liquidation of the Company. The Company is ended after the completion of the Olympic Games in Munich 1972, not later than December 31, 1973.

### July 31, 1967

Preparatory meeting of the jury for the architectural competition in Munich. Professor Egon Eiermann, Karlsruhe, was elected as Chairman.

A group of jury members traveled to Tokyo, Rome, Los Angeles and Mexico City in order to study the facilities there.

### August 3, 1967

First session of the Supervisory Board and the General Assembly of the OBG. Federal Minister of Finance Dr. h.c. Franz-Josef Strauss was elected as Chairman, Bavarian State Minister of Finance Dr. Konrad Pöhner and Lord Mayor Dr. Hans-Jochen Vogel as his deputies. A business manager, Werner Göhner, and a technical manager, Paul Löwenhauser, were appointed. The Construction Committee and the Finance and Administration Committee were set up, the Chairmen being Dr. Konrad Pöhner and Dr. Hans-Jochen Vogel respectively.

The Supervisory Board passed the following resolutions:

*"The rights and obligations arising out of the architectural competition will be transferred from the City of Munich to the Olympic Construction Company. The road construction program submitted by the City of Munich (special Olympic program) is approved. It is understood that the streets are to be planned and constructed by the City of Munich and financed by the company according to the financial plan to be proposed by the City of Munich."*

*"The acquisition of property for the OBG will be handled by the Community Council of the City of Munich."*

An organization plan and schedule was presented which was developed by the Chair for Construction Business Management at Munich Technical College, Professor Burkhardt, on the basis of a large network plan.

### August 30, 1967

The report on the preliminary examination of the entries for the competition was completed for the meeting of the jury. One hundred plans and one written proposal were submitted. The plans were

spread out in separate booths over an area of 10,000 sq. m. on two floors of Hall 20 in the Exhibition Park. 1,600 details in each entry were checked for agreement with the conditions of the competition. The three preliminary judges (K. Wolfgang Boresch, Julius Melzer, Herbert Weidenschlager) were assisted by 52 engineers and a team of expert advisors delegated by the Institute for the Construction of Sports Installations of the German Sports Federation.

### September 7, 1967

The OBG was entered in the Commercial Register of Munich.

The consortium associates transferred equal parts of the 21,000,— DM stock capital.

### September 4 to 8, 1967

First judging session of the jury in Munich.

Technical Judges:

1. Prof. Dr.-Ing. Gerd Albers, Munich
2. Prof. Dr.-Ing. E. h. Egon Eiermann, Karlsruhe (chairman)
3. Prof. Herbert Jensen, Braunschweig
4. Prof. Dr.-Ing. F.W. Kraemer, Braunschweig
5. Dipl.-Ing. Architect Ernst Maria Lang, Munich
6. City Surveyor Edgar Luther, Munich
7. Prof. Roland Rainer, Vienna
8. Ministerial Director Hans Rossig, Bad Godesberg
9. City Surveyor (retired) Walter Schmidt, Augsburg
10. Assistant Ministerial Director Prof. Clemens Weber, Munich

Other Judges:

1. Mayor Georg Brauchle, Munich
2. President Willi Daume, Dortmund
3. State Minister of Education Dr. Ludwig Huber, Munich
4. Ministerial Counsellor Dr. Cornelius von Hovora, Winterscheid, deputy for the Federal Minister of the Interior, Paul Lücke, Bensberg
5. Certified Sports Instructor and Architect Frieder Roskam, Junkersdorf, deputy for Heinz Noris, Munich
6. Secretary of State Anton Jaumann, Munich, deputy for State Minister of Finance Dr. Konrad Pöhner, Munich
7. Ministerial Director Ludwig Spörl, Munich
8. Assistant Ministerial Director Dr. Hans Stumm, Munich, deputy for Federal Minister of Finance Dr. h. c. Franz-Josef Strauss, Bonn
9. Lord Mayor Dr. Hans-Jochen Vogel, Munich.

Deputy Technical Judges:

1. Ministerial Counsellor Gerhard Rothenfusser, Munich
2. Dipl.-Ing. Architect Reinhard Riemerschmid, Munich
3. Dipl.-Ing. Architect Georg A. Roemmich, Munich.

Expert advisors for transport:

Prof. Karl-Heinz Schaechterle, Munich, and his assistant Dipl.-Ing. Kurzak, Munich

Expert advisor for sport:

Assistant Ministerial Director Bernhard Baier, Hannover

Expert advisor for landscaping:

Prof. Ludwig Roemer, Söcking

Expert advisors for building organization: Prof. Georg Burkhardt, Munich, and his assistant Dipl.-Ing. Hruschka, Munich

Expert advisor for statics:

Prof. Dr.-Ing. Hubert Ruesch, Munich, and his assistant Dipl.-Ing. Berg, Munich.

Special advisor:

Government Building Director Paul Lowenhauser, technical business manager of the Olympic Construction Company.

Consultants:

City Director Dr. Hubert Apress, administrator of the Olympic Directory-Investment-Planning Office of the City of Munich. Legal Advisor Werner Göhner, commercial business manager of the Olympic Construction Company.

Preliminary judges:

1. Government Building Director Julius Melzer, Munich
2. Government Building Advisor K. Wolfgang Boresch, Munich
3. City Building Counsellor Herbert Weidenschlager, Munich.

Ninety-one of the one hundred entries received were completed and submitted in time. Two other entries which deviated only slightly from the conditions were admitted; thus 93 entries were eligible. The jury eliminated 70 entries in three rounds leaving a total of 23 entries for final selection. Re-examination of the remaining entries, particularly from the economic standpoint, was to be carried out before the second meeting of the jury.

### October 11 to 13, 1967

Second judging session of the jury in Munich. The jury decided to change the distribution of prizes announced at the opening of the competition. The first three prizes were to be awarded as announced; these were to be followed by three 4th prizes of 30,000.— DM each and seven purchases of entries at 10,000.— DM each.

### October 13, 1967

The decision of the jury:

1st prize

Behnisch & Associates, Stuttgart  
Günther Behnisch, Fritz Auer, Winfried Büxel, Erhard Tränker, Karlheinz Weber, Jürgen Joedecke.

2nd prize

Klaus Nickels, Timm Ohrt, Anke Marg, Hamburg

3rd prize

Erwin Heinle, Robert Wischer, Stuttgart

4th prize

G. Ludwig and F. Raab with G. Wiegand and W. Zuleger, Munich

4th prize

Architects Partnership Holstein and Frowein

J. & E. Kiefner, P. Müller, Dr. Zabel, Stuttgart

4th prize

Engineering and Architects Partnership Beier, Grube, Dahms, Harden, Laskowski, Braunschweig

The following seven entries were purchased:

Curt Siegel, Rudolf Wonneberg, Stuttgart  
Wilhelm Deiss, Munich





*From the final meeting of the judges' panel for the architectural competition for the structures at Oberwiesefeld: the chairman of the jury, Prof. Dr. Engineer Egon Eiermann, converses with Dr. Vogel, Mayor, and Willi Daume. (Behind him, Deputy Mayor Georg Brauchle, who was the first to suggest holding the Olympic Games in Munich.)*



*The prize-winning design of architects Behnisch & Associates, Stuttgart (first prize). The designers of this work gave form to the "rubble hill", conceived a free-form lake as a connecting element to the "Olympic Landscape", and the main sports facilities clustered around a center with coordinated light roofs which they also introduced into the northern grounds of Oberwiesefeld beyond the Middle Ring.*

Hubert Schraud, Josef Karg, Munich  
K.H. Bayer, F. E. Maron, Munich  
Meinhard von Gerkan, Folkwin Marg,  
Hamburg  
Dansard, Hellenkamp, Kalenborn,  
Dusseldorf  
Fritz Novotny, Arthur Mähner, Offenbach.

The reasons for the decision of the jury  
(extracts):  
1st prize: Behnisch & Associates, Stuttgart  
Opinion:

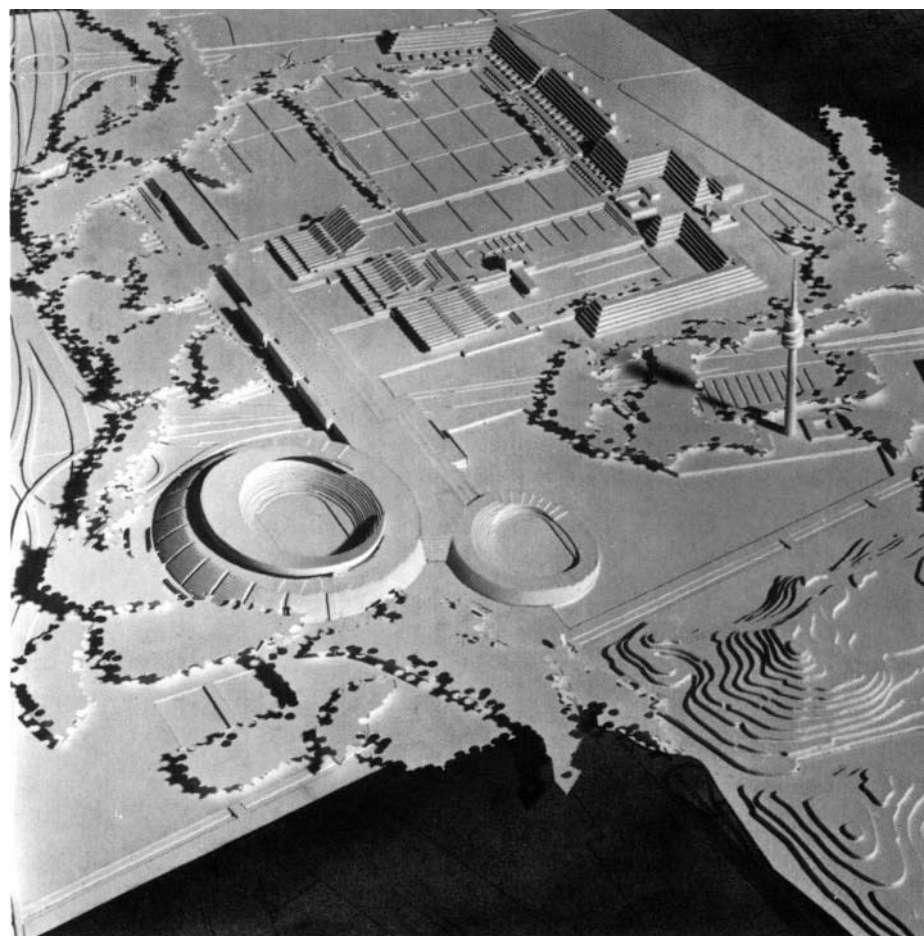
*"The efforts of the authors to facilitate the solution of the problem through artificial alterations of the terrain deserve recognition. The site is enlivened by the inclusion of the hill, formed by an old rubble dump, in the configuration of the Olympic complex. The modelling of the terrain as proposed in the plans forms a basis for solving the problem of accommodating the complex of Olympic installations on a site which is not endowed with natural features, and is laudable not only from the economic but also from the city-planning viewpoint.*

*The jury welcomes the fact that a special part is played by water in this connection. The artificial lake is visually pleasing and is also of practical advantage, since it not only enhances the landscape but the earth that will be excavated to create it can be used for setting up elevations that are required elsewhere. The heightening of the north-to-south connections from the suburban railway station embellishes the landscaping of the site. This vantage point offers of fine view of the various sectors such as the residential quarters and the Sports Academy with its playing fields. It also breaks up otherwise undefined areas into distinguishable and well arranged parts.*

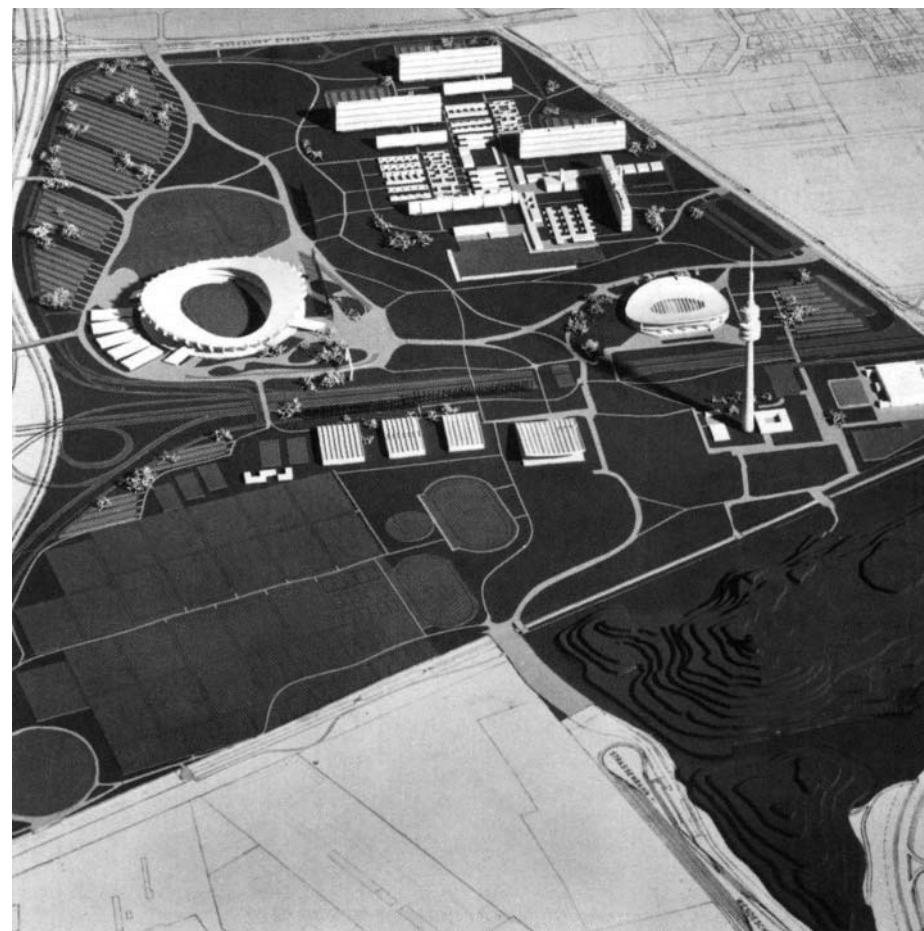
*"Careful attention has been paid to the problem of connections with public transport services. The access paths to the Stadium are laid out charmingly. Unfortunately they are not wide enough for the heavy traffic that is expected. In view of the dimensions of the sports installations they are too remote from the subway station. The proposed provision of an electric railway here would certainly animate the scene as a whole, although during peak periods a railway of this kind would not suffice as a means of transport for large crowds. The parking facilities for cars, buses and coaches are well planned. Careful consideration has been given to the access of service vehicles to the principal sports sites and groups of buildings independently of visitor traffic.*

*"In view of the clear and economical disposition of the parking areas, no objections are raised against the expenditures on the approaches to the "Mittlerer Ring" and adjoining roads. The location of the Central University Sports Facility is good, both for the period of the Games and for its utilization afterwards. There is, however, no close coherence between this installation and the swimming stadium. The internal layout of all sports buildings is excellent, including the routing of spectators, guests of honor and athletes. The service rooms, and the training grounds and training hall are conveniently situated with respect to the stadium. The use of embankments*

*The second prize design of architects Nickels, Ohrt, and Marg, Hamburg.*



*Model photo of the work of the third prize winner: Architects Heinle & Wischer, Stuttgart.*





in the erection of the sports installations is well planned, especially since these embankments are not high and no special tunnels are needed.

"The main problem in this entry is presented by the tent roof design. Even though the jury supports the view that the further employment of any form, once it has actually been built and used, thanks to certain technical and constructional developments and the availability of suitable materials, is the logical continuation of these developments, it is questionable whether the prototype tent design used in Montreal can be adopted for the construction of a permanent roof of these dimensions.

The jury finds itself unable to make a definite statement regarding the practicability of this proposal and regrets that, in view of its doubts concerning the proposed roofing with reference to the specified conditions of durability and reliability, it must make reservations in regard to this entry, outstanding though it is in all other respects.

Similar doubts are entertained regarding the effectiveness of the roof drainage and the possibility of closing off the open-air areas. Drafts in the stadium will be unavoidable.

The plans reveal astonishing vision and vitality, even though no proposals are made regarding the design of the Olympic Village. With the exception of the tent roof, concerning which insufficient experience is available, the experts consider that the project can be regarded as very economical."

2nd prize: Nickels, Ohrt, Marg, Hamburg. Opinion:

"By dividing the site into large areas, and by concentrating the constructional works in large entities and interlocking them through vigorous modelling of the terrain, the authors have arrived at a general conception with a commanding effect. A bold architectural arrangement has been imposed on the existing conditions, its orientation being governed by the necessary position of the stadium. On the basis of the integrating traffic system (in which the Mittlerer Ring road is skilfully rendered inconspicuous), a composition of structures and green areas which form a tangible, coherent spatial system has been created. Architectural and spatial components combine to produce a dynamic layout with its focus on the principal building, the stadium.

The strong general effect is achieved by the fact that the strict architectural forms of the project offer a conscious contrast to the contours of the landscape. This effect is produced not only by the dominating character of the large terrace but also by the architectural treatment of the artificial lake, the graded arrangement of the sports installations, the sunken playing fields and, last but not least, the vigorous vertical line of the television tower.

"The exterior aspect of the stadium which is designed as an earth construction, fits extremely well into the overall plan, and the architectural effect of the interior

is impressive. The design of the subsidiary installations is impractical and expensive.

"The sports installations are clearly arranged; their roofing is unsuitable, even though the cross-section employed offers certain general advantages. The homogeneity of the design of these structures results in an impressive overall architectural pattern. The Central University Sports Facility and the swimming stadium together form a functional unit.

Through the well conceived general arrangement and architectural design, consistently maintained in both the functional and aesthetic aspects, an overall project of a high order has been produced which worthily gives expression to the concept of Olympic Games in a green setting and also creates a splendid sports and re-creation area for the City of Munich."

3rd prize: Heinle, Wischer, Stuttgart Opinion:

"The motif 'Olympic Games in a green setting' has been very well interpreted. The idea of a rather loose arrangement of the sports venues in a kind of park, like the 'English Garden', represents a quite feasible solution. Despite the relatively long distances and the proposed intensive planting, the authors have succeeded in creating a perceptible coherence between the various structures. The design of the Olympic Village also merges well into the general composition. A problem arises with the large pool which cuts deeply into the free green area.

"The Olympic Village is well situated; its design is disciplined and the buildings are grouped in an interesting way.

"The clear-cut design of the stadium gives it the simple appearance which is typical of a stadium. The drainage of the roofing above the stands gives rise to serious misgivings. The functional problems with respect to the sports hall, the swimming stadium, and the Central University Sports Facility have been well solved. The design of the sports hall is risky and may cause time and technical problems in its execution because, in view of the proposed dimensions, technical difficulties may arise which would be hard to overcome and would, moreover, call for a lengthy construction time.

A good solution has been found for the temporary spectator stands in the swimming stadium. The idea of constructing the Central University Sports Facility out of uniform elements is interesting. The project is cultivated and imaginative, and displays a high level of ability in all details. From the economic standpoint only the sports hall is subject to criticism; all other buildings can be constructed very economically. The draft plans ensure rapid progress of the work of construction."

October 13, 1967

Jury Recommendation:

"The Jury recommended that the organizers of the competition adopt the

plans of the entry which received the 1st prize and use these as the basis for further work on the project. The Jury was of the opinion that the proposed tent roof could be replaced by another design without affecting the other merits of the entry which were responsible for the decision of the Jury." The Jury also recommended that another (single-stage) architectural competition for the Olympic Village be organized.

October 17, 1967

Site investigations at Oberwiesefeld were commenced on the basis of the concept which won the first prize. Geoelectric examinations of the soil strata were made and test borings were carried out.

November 3, 1967

Work on the approaches to Oberwiesefeld was begun. The OBG assigned this work which had been planned by the City of Munich.

November 11, 1967

The City of Kiel, after consultation with the Federal Government, the Land Schleswig-Holstein and the Organizing Committee, announced an architectural competition for the center for yachting events in Kiel-Schilksee. Extracts from the conditions of the competition:

"All buildings are intended to form an Olympic Center as an architectural setting for the yachting events and will later be used as a center of attraction for competitive sports and as a residential settlement for the general public.

1.

Yachting Center

Building with massage rooms, sauna, swimming-pool, showers, changing-rooms, recreation center (lounges with a restaurant); boat-houses (multi-purpose buildings).

2.

Organization and Press Building  
Regatta officials, jury, press center, administration, information.

3.

Arrangements for Spectators

Promenades, Red Cross building on the camping site, police station, etc. with sanitary facilities, waiting-room at bus terminal.

4.

Olympic Quarters

Apartments with shopping center and restaurants, flats in multi-storied buildings and individual houses, hotel with coffee bar.

5.

Special Installations

Olympic Flame, flagpoles, etc."

January 1, 1968

The OC set up a branch office in Kiel for the Olympic yachting events.

February 22, 1968

The Television tower at Oberwiesefeld in Munich was opened.

In the interests of rapid progress in the planning of the future students' quarters, for which plans had already been submitted before the competition by architects Eckert and Wirsing, the Executive Board passed the following resolution: "The Executive Board of the OC recommends that the OBG does not arrange

an architectural competition for the Olympic Village.

The Board suggests on the contrary that a team be formed of the architects who were prize-winners or whose plans were bought in the competition for the overall projects, and that this team draw up plans for the Olympic Village. In preparing these plans care must be taken that the Olympic Village, as regards both its landscaping and architectural aspects, fits into the overall concept of architects Behnisch & Associates. In addition, the question should be examined as to how far the existing plans of architects Eckert & Wirsing can be put into effect."

February 24, 1968

The Executive Board and the General Assembly of the OC recommended that the firm of architects Behnisch & Associates be commissioned to execute their prize-winning entry. The final decision regarding the design of the roof was postponed.

March 1, 1968

The Supervisory Board of the OBG passed the following resolutions:

"In accordance with the decision of the jury for the architectural competition for the Games of the XXth Olympiad in Munich, 1972 and the recommendation of the OC for the preparation for the Olympic Games the first prize design by architects Behnisch & Associates and Professor Joedicke, Stuttgart, will be the overall concept for the Olympic grounds at Oberwiesefeld. Because the Supervisory Board, in agreement with the OC, is presently not able to come to a final decision for one of the two roof-solutions under discussion; namely  
a) a stretched hanging roof with shell-like wood construction  
b) a peripherally or radially supported hanging roof

both solutions are to be developed so that a comparable and final estimation can be possible in regard to the following points:

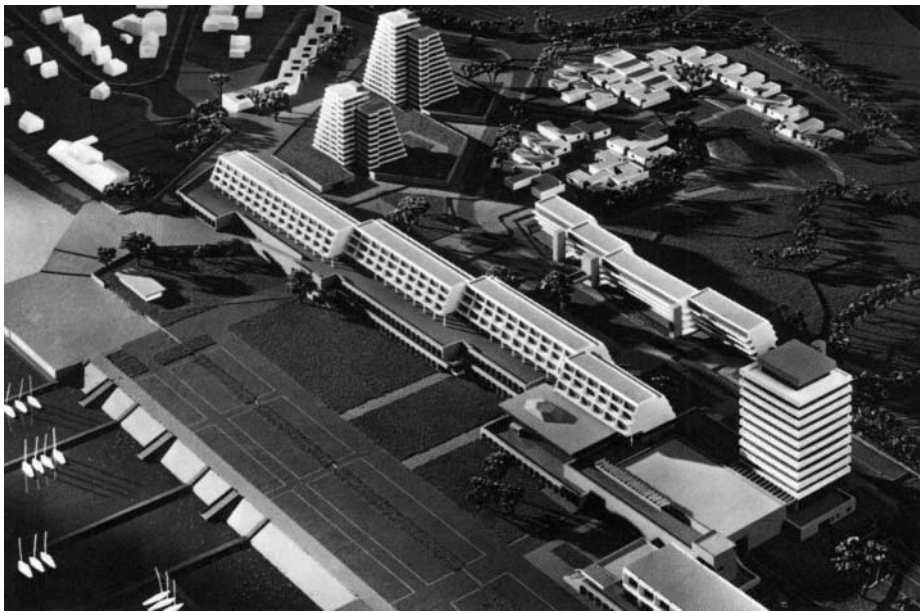
1. functional suitability for sports events
2. architectural and aesthetic effect
3. technical safety and durability
4. building and maintenance costs.

The Supervisory Board commissions the Management to give a contract to the first prize winner for the corresponding research work on both alternatives. This is to be carried out so that the result can be presented to the Supervisory Board by June 1, 1968.

The Supervisory Board notes with approval that the contracted architect will incorporate the constructive considerations of the third prize winner Professor Heinle & Wischer, Stuttgart into his examination of alternative b."

Architects Behnisch & Associates and Prof. Joedicke received a contract to

- a) set up the design of the overall construction plans for Oberwiesefeld as the basis of the construction planning procedure.
- b) to finish the architectural design for the stadium, the sports hall, the swimming hall as well as the corresponding outdoor facilities south of the Mittlerer Ring.



*In the architectural competition for the yachting facility at Kiel-Schilksee, the first prize was won by Architects Storch & Ehlers, Hannover.*

*The model of the Olympic Village and the Central University Sports Facility, according to the designs of Heinle, Wischer & Associates, Stuttgart.*



Architects Prof. Heinle & Wischer shared the contract under condition 'a' for the architectural design for the Central University Sports Facility (ZHS) and its corresponding installations south of the Mittlerer Ring.

"In accordance with the recommendation of the OC, the Supervisory Board has decided not to hold a competition for the Olympic Village. The Board requests the Management to entrust the planning of the Olympic Village to the third prize-winner, architects Heinle & Wischer. Care must be taken that the Olympic Village fits into the overall concept of the first prize-winner in regard to economics and architectural form. Architects Eckert & Wirsing are to take part in the planning in so far as the later use of part of the Olympic Village as a student residence is concerned." On the same day the Management assigned the designing of the Olympic Village to architects Heinle & Wischer. A joint planning team was formed by architects Heinle & Wischer and Eckert & Wirsing. Earthwork began for landscaping the artificial hill and clearing Oberwiesenfeld.

#### **April 1, 1968**

The top-soil was removed from 2 million sq.m. of Oberwiesenfeld and stockpiled in the southern sector for later use. About ten tons of unexploded bombs were discovered and removed.

#### **April 23, 1968**

Deputy Mayor Georg Brauchle, member of the Supervisory Board of the OBG, passed away. Many years earlier Georg Brauchle had been the first to advocate in public that the Olympic Games be held in Munich.

#### **May 2, 1968**

Work started in Kiel on lengthening the Hindenburg Promenade. After its completion, Kiel's sea promenade would extend all the way from the visitor's harbor to the city, via the Oslo quay.

#### **May 6, 1968**

The Executive Board of the OC agreed to a project submitted by the firm Gewerbebauträger GmbH, Munich, for building a press center on the east side of Oberwiesenfeld to accommodate 4,000 journalists during the Games. The OBG moved into offices for 350 persons at Melcher Strasse, now renamed Willi Gebhardt Ufer. 75% of this office space was to be used by drafting architects and various experts outside of the OBG.

#### **May 8 to 10, 1968**

The jury for the architectural competition for the yachting installations in Kiel met under the chairmanship of City Architect Dr.-Ing. Müller-Ibold. The project submitted by architects Hinrich Storch & Walter Ehlers, Hannover, won the first prize out of 65 entries which complied with the conditions of the competition. The other three prizes were awarded to architects Neveling, Kiel; Morgenroth, Essen; and Siegel & Wonneberg, Stuttgart. In addition to the simplicity of its conception, the entry which won the first prize was noteworthy, above all, for the skilful arrangement of spaces and paths, which, without disturbing the com-

petitors, brings the spectator close to the activities in the harbor and to the scene of preparation for the events. By constructing a wide promenade through the entire Olympic Center, this plan brings the spectator into proximity with a sport which, due to the distance at which it takes place, offers little contact with the competitor. At the same time this consistent horizontal separation between yachting and the spectators is of considerable advantage from the organizational standpoint. The plans have been conceived so well both functionally and aesthetically that there is no need for major alterations, which will make it possible to execute them quickly. The jury unanimously recommended that the entry which gained the first prize should be adopted.

#### **June 14, 1968**

Work was commenced on the construction of the embankments in the northern part of Oberwiesenfeld, precedence being given to the embankment for the subway.

#### **June 15, 1968**

The Executive Board of the OC recognized the high aesthetic and cultural merits of the "point-supported suspension roof" developed from the original tent roof design which was to be used as the roofing form for the Olympic sports facilities at Oberwiesenfeld. The Board felt that now in the further considerations among the bodies of the Olympic Construction Company the question should be seriously considered whether the merits of this architecture would not justify the additional costs resulting from its execution.

The OBG was, however, instructed to ensure optimum flood lighting, good grading of the grandstands, the installation of screens at the sides as protection against the wind, as well as adequate sound-proofing of the sports hall and the swimming stadium against external noise.

#### **June 18, 1968**

Work was begun on the traffic intersection of the Mittlerer Ring road in the Oberwiesenfeld area.

#### **June 21, 1968**

After expert opinions were submitted to the Supervisory Board of the OBG, the Board decided definitely on the point-supported suspension roof proposed by architects Behnisch & Associates. The commencement of its construction at Oberwiesenfeld was scheduled for spring, 1969 and work was to be finished by the end of 1971.

The Supervisory Board accepted the preliminary report from the panel appointed to examine the possibility for economy and requested that the work panel complete its task. Among other things the capacity of the stadium was reduced by 10,000 spectators to 80,000.

#### **July 16, 1968**

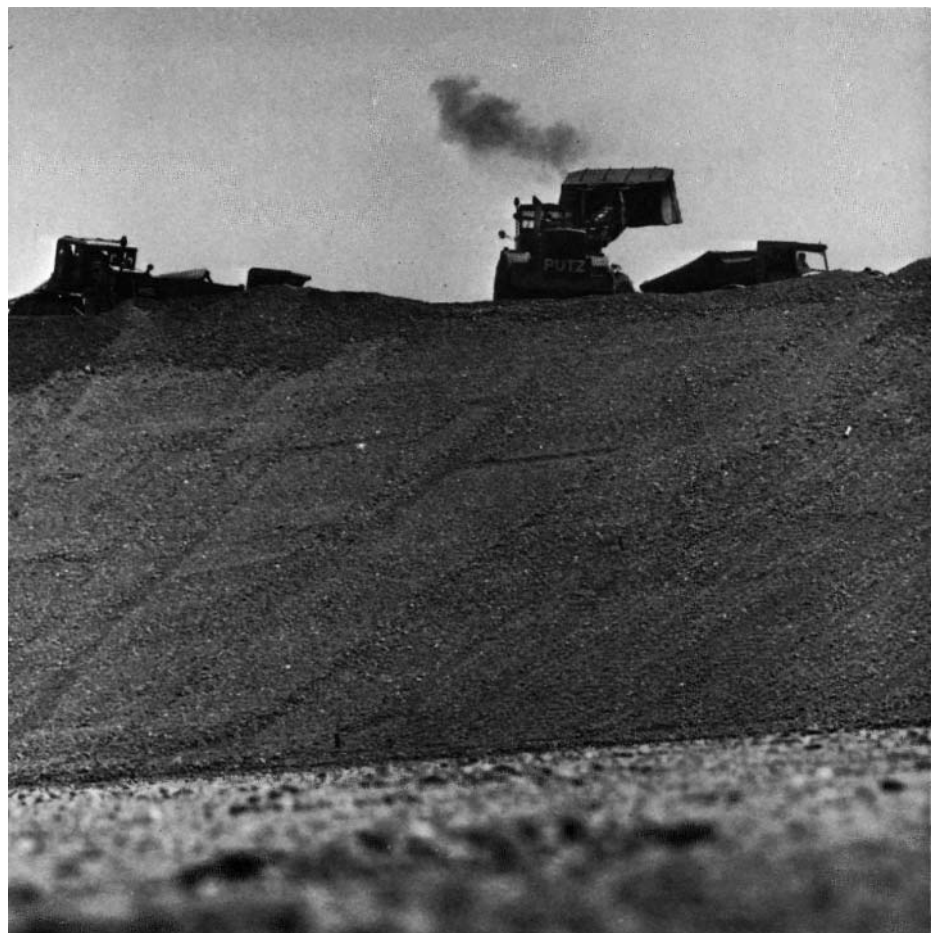
The contract between the OBG and architect Prof. Behnisch were signed in Munich.

#### **July 17, 1968**

Upon conclusion of the optimization procedure in connection with the Olympic









Village an advisory commission composed of the following experts was set up: Prof. Candilis, Paris; Prof. Ling, Nottingham; Prof. Bakema, Rotterdam; Dr. Ervi, Helsinki; Prof. Lutz, Munich; Dipl.-Ing. Billinger, Munich; Prof. Gosele, Munich; Dipl.-Ing. Tonne, Stuttgart; Government Architect Boresch, Munich; Prof. Eyer and Dr. Beckert, Munich; Landscaping Architect Miller, Stuttgart.

#### July 31, 1968

The contracts between the OBG and architects Prof. Heinle & Wischer were signed in Munich.

#### August 6, 1968

At its fifth meeting the Supervisory Board of the OBG passed the following resolution: *"The report and the draft plans submitted by architects Heinle & Wischer for the Olympic Village for men and women, including the center, are approved as the basis for further architectural planning."*

#### August 14, 1968

The former airport building at Oberwiesenfeld was demolished.

#### August 30, 1968

The Supervisory Board of the OBG decided that the resolution regarding the holding company for the Men's Olympic Village and center was incumbent on the property owners. The criteria for a decision set up by the Board were especially fulfilled by two purchasing groups according to the formulation of the Supervisory Board: The Independent Housing Construction Group "Olympic Village", Munich, and a similar group "Olympic Village", Munich.

#### September 9, 1968

The members of the Executive Board of the OC decided that the Schliersee Lake, due to its unsuitable wind conditions, and the Sylvenstein reservoir on account of its distance of 73 km. from the Olympic Village, could not be considered as possible regatta courses for the rowing and canoeing events. No other natural waters suitable for a regatta course were available. It was decided to investigate the potentialities of Schleissheim, Zenger Moos and other places as sites for an artificial course.

Concerning the site of a cycling stadium, the Executive Board passed the following resolution:

*"1. The Board is in favor of constructing a new cycling stadium at Oberwiesenfeld.*

*2. It is advisable that the cycling stadium be roofed over in order that the Olympic cycling events can be held under proper conditions. A roof is also highly desirable for the post-Olympic utilization of the stadium."*

#### September 30, 1968

At its seventh meeting the Supervisory Board of the OBG approved the layout and construction plans for the stadium and swimming stadium projects.

#### October 12 to 27, 1968

During the XIXth Olympic Games in Mexico City a study group of the OC gathered material in the sports, organiza-

tional and cultural fields. At a meeting of the IOC Congress in Mexico City Willi Daume and Dr. Hans-Jochen Vogel reported on the progress of the preparations for the Munich Olympic Games. The OC exhibited plans and models of the Olympic installations at Oberwiesenfeld.

#### October 14, 1968

Work was started in Kiel-Schilksee, clearing the Marine Depot to make room for the Olympic Center.

#### October 28, 1968

Earthworks in the central area between the stadium, sports hall and swimming stadium were commenced at Oberwiesenfeld.

#### October 30, 1968

The landscaping of the "Schuttberg" was completed and the sowing of grass and the planting of trees and shrubs began.

#### November 20, 1968

Work started south of Oberwiesenfeld on the by-pass canal of the Nymphenburg-Biederstein canal. This was the first stage in the creation of the "Olympic Lake".

#### December 9, 1968

The Supervisory Board of the OBG decided on the construction of the last of a total of 21 bridges and tunnels to ensure a smooth flow of traffic at Oberwiesenfeld. The construction and functional plans and the project for the sports hall were approved after a review of its multi-purpose utilization after the Olympic Games. Afterwards equestrian, cycling, gymnastics and other indoor sports events would be possible here.

The construction and functional plans and the project for the Central University Sports Facility were also approved. The agreement with the Cultural Ministry of the State of Bavaria as the post-Olympic user was concluded beforehand.

#### January 16, 1969

At the thirteenth meeting of the Executive Board of the OC the following resolutions were passed: The OBG is advised to locate the artificial course for the rowing and canoeing regattas at Königsdorf, a village south of Munich.

The two halls in the Central University Sports Facility shall temporarily be integrated into one large hall and be used for all Olympic volleyball events for men and women. The remaining part of the installation shall be at the disposal of the German Olympic Center (DOZ). A permanent warming-up hall shall be provided next to the large stadium. It is estimated that the Olympic Village will have to accommodate 12,000 persons, 9,000 of whom will be athletes.

#### January 17, 1969

The OBG and the OC signed an agreement, retroactively effective as of July 1, 1968, with the Institute for the Construction of Sports Installations of the German Sports Federation DSB/IFS in Cologne. According to the agreement the DSB/IFS was to advise the OC and the OBG, together with any planning offices commissioned by the OBG, concerning the installations to be con-

structed by the OBG for the Games of the XXth Olympiad. This advice was to embrace all technical matters with respect to sport such as the working out of proposals for building and layout programs and the coordination of buildings and spaces from the organizational aspect. This advice was to be given with a view to the suitability of the installations both for the Olympic Games and for their future use.

#### March 4, 1969

The first 44 linden trees were planted on the "Schuttberg" and the northern embankments at Oberwiesenfeld.

#### March 11, 1969

At its fourteenth meeting the Executive Board of the OC passed the following resolutions:

A new stadium with a capacity for 5,000 spectators will be built for the basketball contests.

The construction and functional plans for the volleyball and basketball halls, the cycling stadium and the Olympic Village are approved.

The equestrian events will be held at the following locations:

Dressage:	Nymphenburg
Three-Day-Event:	Riem
Individual and Three-Day-Event Jumping	
Competition:	Southern part of Oberwiesenfeld

Jumping Grand Prix

Team Competition: Olympic Stadium

The inclusion of canoe slalom as an Olympic event is recommended. Proposed sites are Munich or Augsburg.

#### March 24, 1969

In agreement with the OC, the Supervisory Board of the OBG decided on Feldmoching-Oberschleissheim as the site for the rowing and canoeing regattas. The main factor responsible for this decision was the short distance of 8 km. from Oberwiesenfeld.

#### April 15, 1969

The construction of a second harbor basin was begun in Kiel-Schilksee.

#### April 16, 1969

A consortium agreement was made between the Federal Government, the Land Schleswig-Holstein and the City of Kiel for the construction and financing of the installations for the Olympic yachting events. A special Olympic construction company was not founded in Kiel. The City of Kiel was entrusted with the responsibility for planning and constructing the buildings required for the Olympic events. A commission was set up, composed of representatives of the three consortium partners and of the OC. The chairman of this commission was Secretary of State Professor Dr. Ekkehard Geib. The purpose of the consortium commission was to establish agreement between the consortium partners in all questions of fundamental importance. The commission held a meeting at its constitutivesession.

#### April 18, 1969

The Supervisory Board of the OBG approved the construction and functional designs for the volleyball hall.

#### Captions for pages 12 and 13

*The rough landscaping of the Olympic Park has begun. From the television tower one already recognizes the large depression of the future stadium, the center and the lake shore included in the center. While the earth moving operations are still in progress, the first large trees (approximately 40-year-old lindens from the suburbs of Munich) are transplanted. The "rubble hill" is converted into an unusually appealing hill landscape.*

*The shaping of the stadium depression progresses quickly with the help of efficient earth moving machines.*

#### page 15

*The concentration of three important sports facilities in the southern area of Oberwiesenfeld gives rise to a large construction site that requires the best possible coordination. Tamperers pack down the ground for the eastern grandstands of the Stadium.*

*The following operation: 20 cm. thick concrete panels with ground anchorage are applied. Their upper surfaces form the steps for seating and standing room. The reinforcement of the steel and concrete foundations for the pylons of the acrylic glass tent roof.*

*The building site of the swimming hall during rough construction: the technical level and the pool have their forms removed, the western grandstand is under construction. In the background one sees the northern grandstand of the sports hall.*





**April 22,1969**

The OBG signed an agreement with the firm "Olympisches Dorf Maßnahmeträger GmbH & Co.", Munich, as contractors for the construction of the men's Olympic Village and the nonpublic part of the center. This company was formed by a group of independent and public utility contractors.

**April 29,1969**

The Executive Board of the OC decided on the site adjoining the Siegenburger Strasse athletic grounds, northwest of the Exhibition Park, as the location for the basketball hall.

The members of the Board approved the construction and functional plans for the Olympic Center in Kiel and the plans of architects Storch & Ehlers.

The construction and functional plans for the regatta course Feldmoching-Oberschleissheim were approved with the provision that the capacity of a total of 25,000 persons should not be exceeded. Places for 1,000 active participants were included in this figure.

**May 20,1969**

The President of the Federal Construction Authority in Berlin, Dipl.-Ing. Carl Mertz, was appointed General Manager of the OBG. He took office on June 10, 1969.

**May 30,1969**

At the seventh meeting of the OBG it was decided to make a change in the statutes regarding the management. In the future the Company was to be represented by only one General Manager, who would be vested with special and extensive powers.

**June 9,1969**

The shell construction of the stadium, the sports hall and the swimming stadium was begun at Oberwiesenfeld.

**June 27,1969**

The OBG invited fourteen architects to participate in a restricted competition for the design of the regatta installations in Feldmoching-Oberschleissheim. The main object of the competition was to find a design for the rowing and canoeing courses which would be satisfactory both from the architectural and the economic points of view.

The Executive Board of the OBG approved the construction and functional plans for the competition sites for boxing, fencing, weight-lifting, judo and wrestling. All these sports were to take place in halls situated in the Munich Exhibition Grounds - the second Olympic Center - with the exception of the hall for boxing.

**June 30,1969**

In Kiel the earth was broken for the construction of the Olympic Center.

**July 1,1969**

In Munich the construction of the Women's Olympic Village began.

**July 14,1969**

*"Foundation stone of the buildings for the Games of the XXth Olympiad 1972 in Munich, July 14, 1969".*

These words were engraved on a 90 cm. x 90 cm. symbolic corner stone laid at a

celebration at Oberwiesenfeld for the Olympic Stadium, sports hall, swimming hall, cycling stadium, volleyball hall, Olympic Village, boxing hall and riding facilities.

**July 15,1969**

The Supervisory Board of the OBG cancelled the invitation to tender for the construction of the roof over the Olympic installations, since the offers considerably exceeded the estimated costs. The Board instructed the General Manager to find a satisfactory solution by means of individual negotiations based on the cost estimate.

The statutes of the OBG were changed together with the order of business of its Supervisory Board and its commissions.

The Supervisory Board accepted the functional and construction plans for the regatta course proposed by the OC.

It has decided to build the warm-up hall next to the stadium as a permanent structure as it had been previously considered to set up a temporary building.

**August 5,1969**

In Kiel-Schilksee the clearing of sea sand for the foundations of the Olympic Center began.

**August 18,1969**

At its twelfth meeting the Supervisory Board of the OBG passed the following resolution:

The erection of the tent roof shall be carried out by three specialist groups, corresponding to the three main elements of the work, namely, structure, foundations and covering. The Management is empowered to:

1. negotiate a cost-price contract with the firm Stahlbau Arbeitsgemeinschaft,
2. award the contract for the foundations to the lowest bidder,
3. award the contract for covering the roof to the lowest bidder.

**August 20, 1969**

Work started on the buildings for the Central University Sports Facility at Oberwiesenfeld.

**September 4,1969**

Excavations for the channel of the regatta course in Feldmoching-Oberschleissheim were begun.

**September 9, 1969**

Work on the approaches and the buildings for the Men's Olympic Village began.

**October 13,1969**

The foundation stone for constructions in the Olympic Center in Kiel-Schilksee was laid by Lord Mayor Bantzer of Kiel.

**October 17, 1969**

The jury for the competition for the regatta course in Feldmoching-Oberschleissheim unanimously awarded the first prize to architects Michael Eberl & Associates and recommended that the OBG entrust the prize-winner with the execution of the project.

**November 15, 1969 to March 17, 1970**

Despite the harsh winter of 1969/1970 the basic work at Oberwiesenfeld and Kiel was

completed by appropriate winter construction methods.

**November 16, 1969**

Work was begun on the last section of the outer approaches to Oberwiesenfeld and on the traffic junction at Hanauer Strasse. The first foundations for the tent roof structure were laid at Oberwiesenfeld.

**November 21, 1969**

At its seventeenth meeting the Executive Board of the OC passed the following resolution:

Architect Walter Ruhnau, Essen, is entrusted with the planning of artistic displays and entertainment projects at Oberwiesenfeld.

The Werneckwiese in the "English Garden" was chosen as the provisional site for the archery contests, and the corresponding construction and functional plans were approved. The construction and functional plans for the shooting range at Hochbrück were approved.

**December 7,1969**

An experimental section of the roof with an area of 200 sq. meters and on a scale of 1:1 was erected at the Olympic Building Center for the purpose of studying all roofing material and drainage problems. This roof was covered with three different translucent materials: Polyester sheets reinforced with fibreglass, a fabric coated with PVC, and acrylic glass. A translucent roof for the stadium was required to meet the requirements of color television. It was necessary to avoid the heavy shadows which would be cast by strong sunlight on the playing ground and athletics arena, since it would otherwise be impossible to obtain a color television picture of good quality.

**December 17, 1969**

At a top level meeting of the consortium members representing the governments of the Federal Republic of Germany, the State of Bavaria and the City of Munich an agreement was reached on the following points:

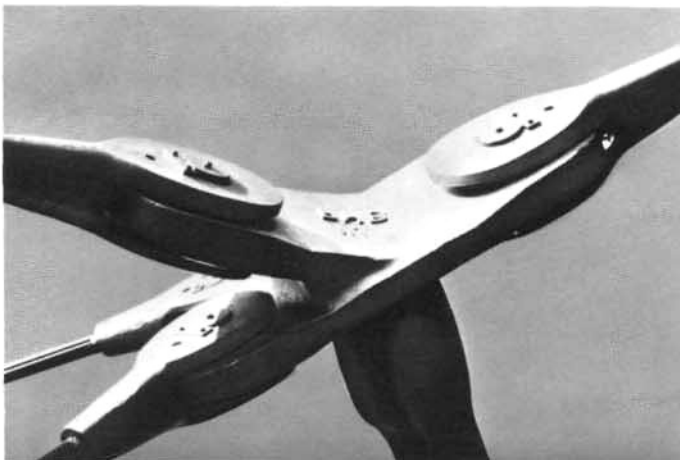
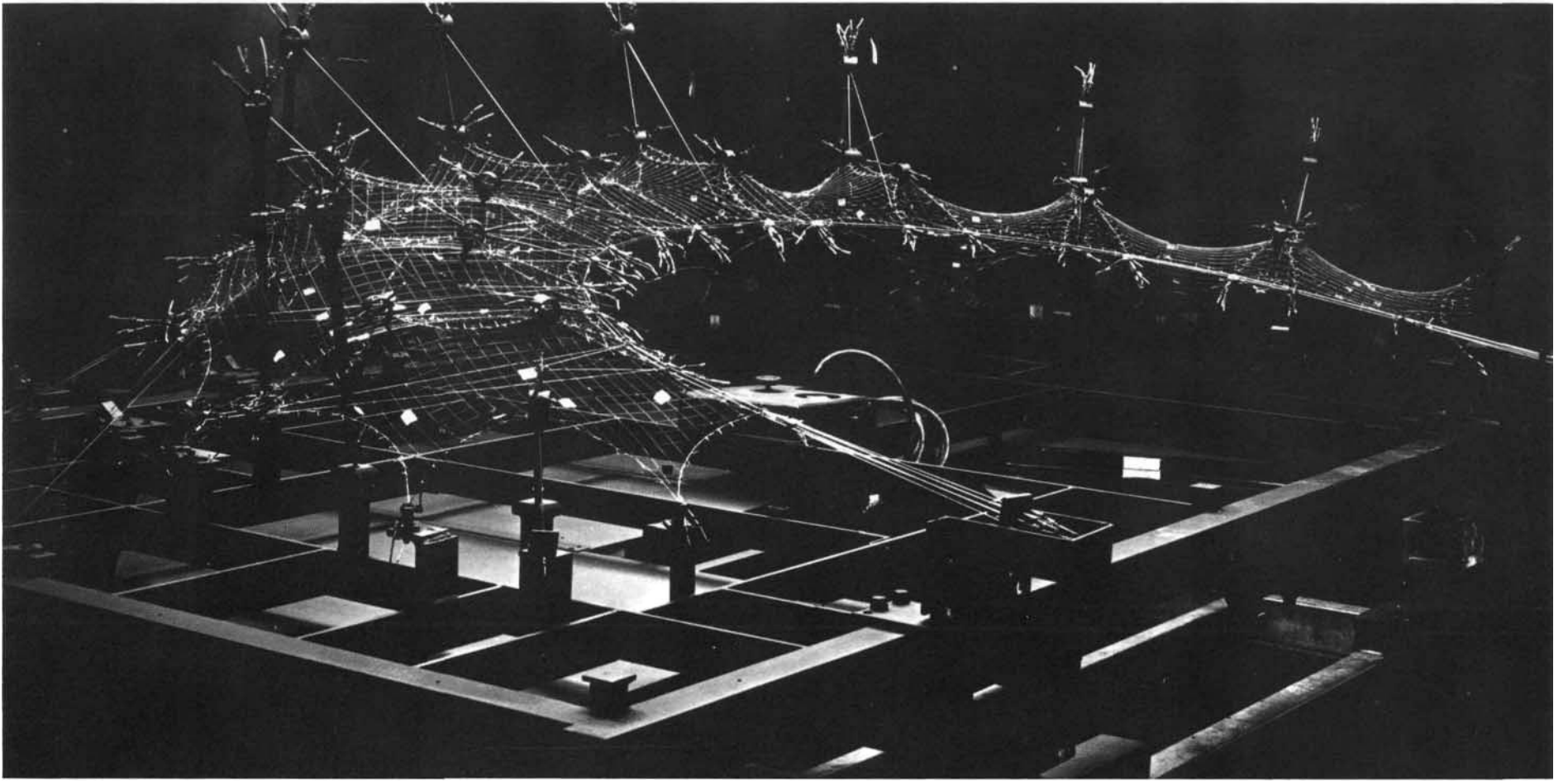
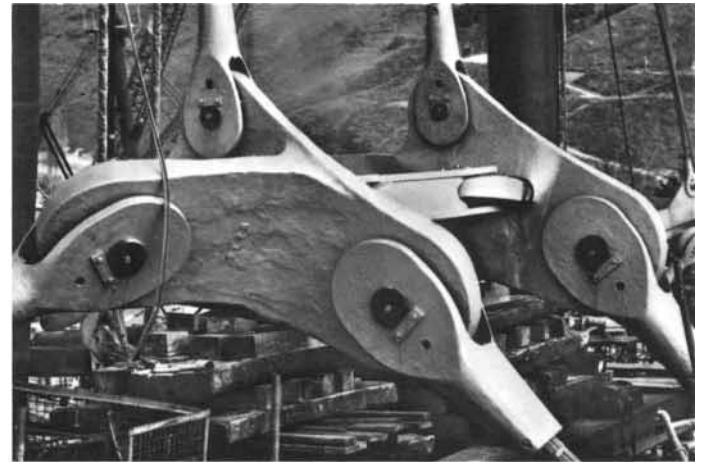
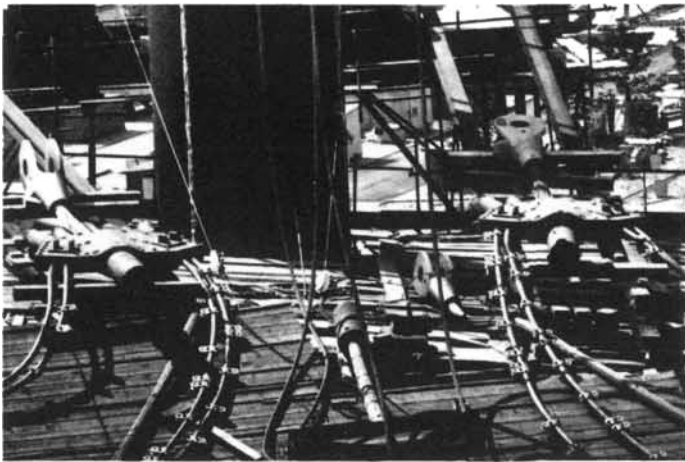
1. The previous share of costs resulting from the Olympic buildings would be altered so that the Federal Government would bear 50 % and the other two members 25 % each of the expenses which could not be covered by special financing.
- 2.

The subsequent expenses resulting from the sports facilities constructed at Oberwiesenfeld will be borne by the City of Munich in so far as they are required by local needs according to type, size, furnishings and architectural form. The Federal Government is prepared to cover its portion in one payment.

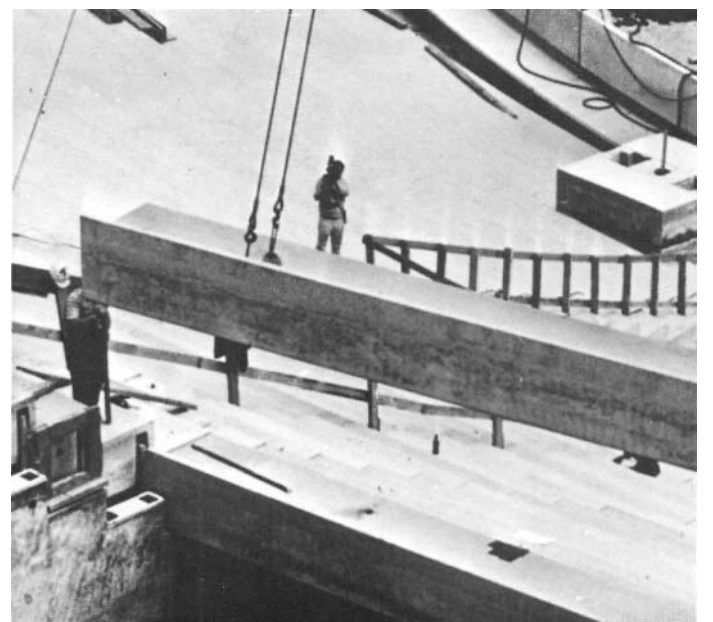
3. The City of Munich assumes the juridical responsibility for the sports facilities at Oberwiesenfeld. The State of Bavaria takes over the Central University Sports Facility. This ruling requires the agreement of the responsible decision — making boards of the consortium members.

**Page 17**

*The development and execution of the roof. The model photo in the middle of the page shows the stadium roof in a wind tunnel test. The other illustrations show some of the various phases of the construction: preparation of the cable network on the ground; various connecting points of the primary cable network construction; erection of the cable network; application of the acrylic glass (the sheets are secured to the cable network with neoprene buffers).*







## Page 18

*The concrete diagonal frames of the west grandstand, which serve as supports for the grandstand girders, are surrounded by scaffolding and covered with a shell. The prefabricated steps (form profile 80 cm x 60 cm) are lifted into place and mounted. They were produced in six West German concrete plants according to a unified process which was developed for the stadium and the sports hall.*

The new representative of the Federal Government on the Supervisory Board of the OBG, Federal Minister of Finance Alex Möller, was elected deputy chairman of the Supervisory Board. Dr. Konrad Pöhner was elected Chairman of the Supervisory Board, succeeding Federal Minister of Finances Dr. h. c. Franz-Josef Strauss.

The basketball hall project as approved, the execution of which was given to the firm Dörken & Fröhlich, Gevelsberg, in accordance with the plans of architect Flinkerbusch, Hagen.

The project for the regatta course in Feldmoching-Oberschleissheim was also approved.

The Supervisory Board also recognized that the interests of the future holders of the sports facilities at Oberwiesenfeld were to be taken over by the Munich Stadium Company, Ltd. as of January 1, 1970.

### January 1, 1970

Otto Hermann Grüneberg and Johannes Galandi assumed their duties as Business Manager and Technical Manager, respectively, of the OBG.

### January 23, 1970

At its eighteenth meeting the Executive Board of the OC approved the extended construction and functional plans for the canoe slalom course in Augsburg. The Board confirmed Augsburg as the site with the provision that the buildings for the course would be constructed according to the ideas of the international federation, and that the intended test with models should turn out satisfactorily.

The hockey tournament was scheduled to be played on a provisional field north of the grounds of the Central University Sports Facility. In agreement with the Munich Exhibition Company, a new hall with capacity for 5,000 spectators was to be built in the exhibition grounds to serve as the site for the wrestling and judo contests during the Games.

### March 15, 1970

To the west of the Olympic Stadium work was begun on the warm-up hall which was to contain a banked circular track 200 m. in length, a sprinting track and facilities for practising all jumping disciplines and shot put.

### March 16, 1970

An agreement was signed making the Munich Student Organization the building authority for the construction of the Women's Olympic Village.

### March 18, 1970

Work was begun on extending the yachting harbor at Kiel-Wik.

### April 17, 1970

At the nineteenth meeting of the Executive Board of the OC the following resolutions were passed:

The Board recommends that the OBG install Recortan artificial tracks at the competition sites and training grounds. The decision for the type of paving is the result of a year-long research by the Otto Graf Institute of the University of Stuttgart and the Institute for Sport Site Construction of the German Sport Federation.

The firms Longines, Switzerland, and Junghans, Germany, were charged with the timing of the Olympic events. Junghans was to time track and field, riding, rowing, canoeing, football, archery, hockey, volleyball, shooting and yachting. Longines was to time swimming, cycling, handball, gymnastics, wrestling, judo, weight-lifting, fencing, boxing and basketball.

The Board confirmed Augsburg as the site for the canoe slalom.

### May 12, 1970

Work commenced on preparing the grass playing field in the Olympic Stadium. For the first time in Germany a warm-water heating system was installed beneath a playing field. Topsoil for the turf was spread consisting of sand with soil improvement additives and fertilizer.

### May 13, 1970

The construction committee of the OBG approved extensions of the projects and construction and functional plans for the shooting range at Hochbruck and the equestrian installations at Riem as well as for the Dantebad in Munich.

### June 1, 1970

The shell constructions for the Olympic Center in Kiel began with the erection of the main building, 400 meters in length. During the Olympic yachting events the building was to accommodate and cater to the members of the jury and the regatta officials, and to house part of the press center.

At the same time work commenced on the high rise buildings with 120 apartments and the 32 detached houses for the competitors.

### June 15, 1970

Construction of the basketball hall in Munich was begun.

### June 30, 1970

The General Manager of the OBG issued a report on the stage reached in the planning and construction work for the Olympic buildings. State of completion of shell construction:

Stadium	80 %
Sports hall	80 %
Swimming stadium	67 %
Central University Sports Facility	85 %
The foundations for the roof between 50 and 60 %	
Olympic Village Center	25 %
Living quarters in the Village	18 %
Women's Village	80 %

Three thousand workers were employed at Oberwiesenfeld at the time of the report.

The regatta basin was 2/3 finished. The Dante Stadium was to be finished for the "Hans Braun Sport Festival" on July 12, 1970.

Work on the Post Stadium was also to have been finished on July 12. December 31, 1971 was the date named as the deadline for the completion of all buildings.

### July 1, 1970

The Executive Board of the OC approved the plans for the entertainment street in the southern section of Oberwiesenfeld.

### July 2, 1970

In Feldmoching-Oberschleissheim construction of the spectators' stands began with roofed accommodations for 8,000 and uncovered accommodations for 16,000. Work began also on the boathouses and other buildings.

### July 3, 1970

Work was begun at the shooting range at Hochbruck, 7 km. north of the Olympic grounds. This installation was designed by the architects' team Wolfgang Kleibömer, Hamburg, Erich Stein and Michael Eberl, Munich. They were a team formed from participants chosen in a limited architectural competition.

### July 7, 1970

Pre-stressed acrylic glass was chosen for covering the tent roof over the stadium, swimming hall and sports hall after the advice and suggestion of the technical consultants of the OBG against the suggestion proposed by the business management-sheeting — on account of its translucence and fireproof qualities.

### July 13, 1970

Federal Minister Lauritz Lauritzen was elected chairman of the OBG building commission by a decision of the Supervisory Board.

### July 15, 1970

The shell construction of the stands on the west side of the Olympic Stadium was finished on time by the application of modern methods, such as the utilization of minutely detailed concrete castings on location for the main structure and the use of prefabricated building elements for the grandstand steps.

### July 20, 1970

The earthworks started on the canoe slalom course in Augsburg which was planned by the team of architects R. Bockel and E. K. Müller of Augsburg. The free areas and spectator facilities were designed by G. Hansjakob, Munich.

### July 23, 1970

The shell construction of the large buildings at Oberwiesenfeld having been terminated, the topping-off ceremony was celebrated with 4,000 workmen.

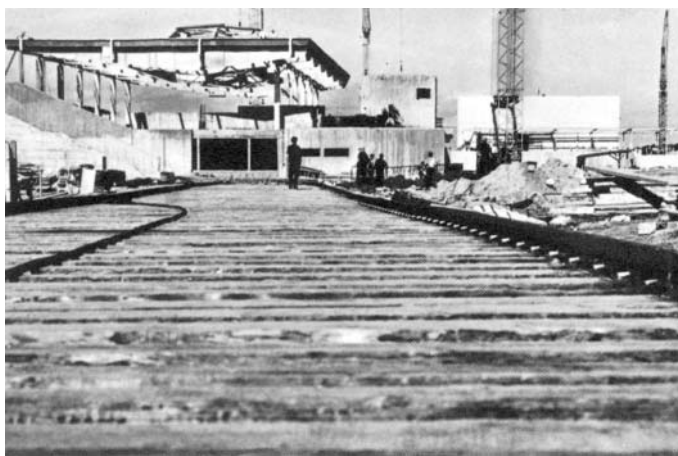
### August 1, 1970

The construction of the cycling stadium at Oberwiesenfeld was begun. This stadium was designed by architects Beier, Dahms, Grube, Harden, Kaiser and Laskowski, Braunschweig, in cooperation with architect Schürmann from Münster. The preparatory work consisted in demolishing the Federal Railway Locomotive Repair Shop North.

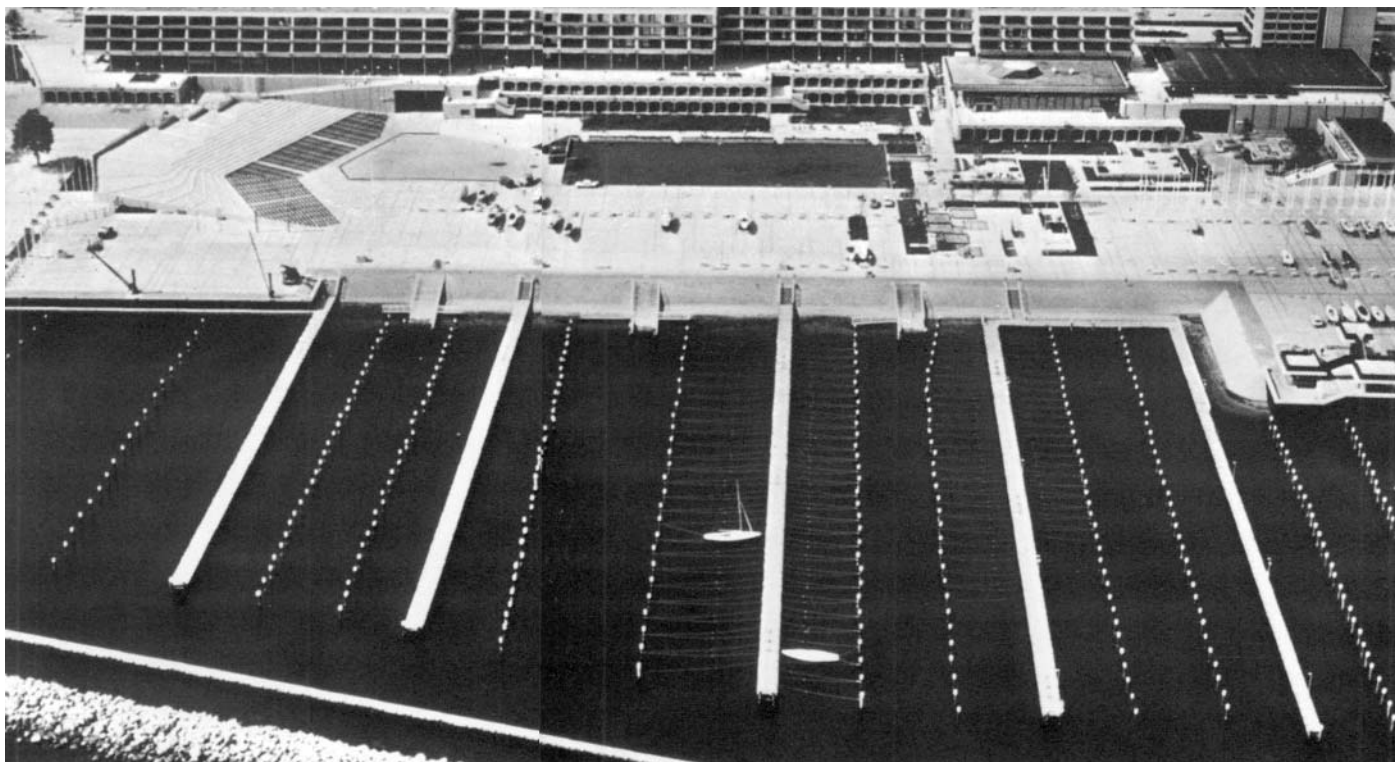
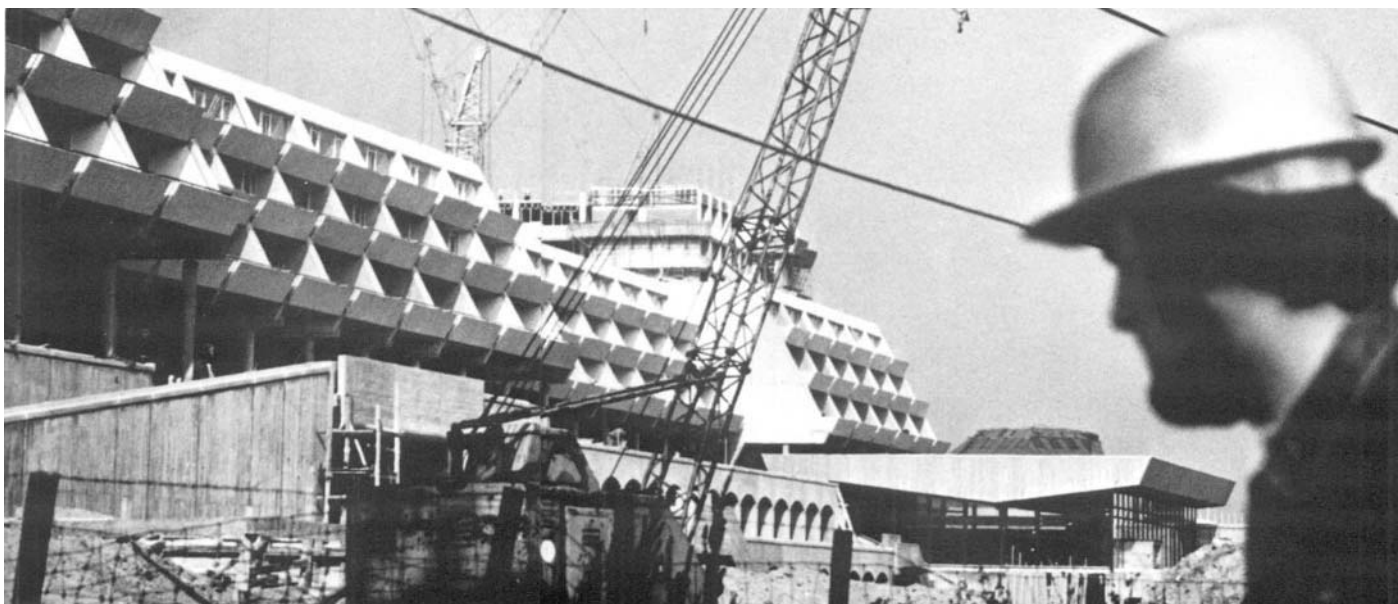
### August 6, 1970

The playing field in the Olympic Stadium was sown with grass after the installation of the heating system and the replacement of the topsoil.



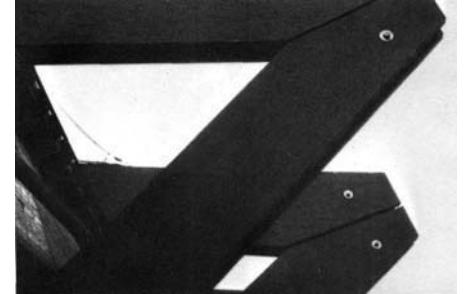
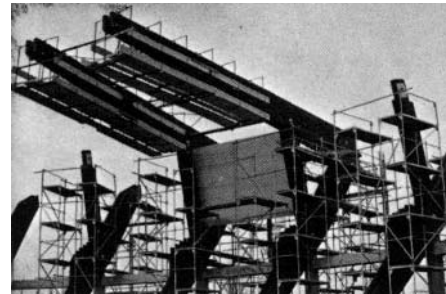


*Construction progress in Kiel:  
Pile foundation at the sandy shore area of the Kiel inlet; the terrace has been completed, the rough construction of the swimming hall — in the background, with the pool — is almost finished; unbroken progress of the rough construction on the main tract running from north to south with the boat house and swimming hall in the foreground, apartment houses in the background. One year after the laying of the cornerstone all the rough construction of the buildings of the Olympic Yachting Center was finished.*





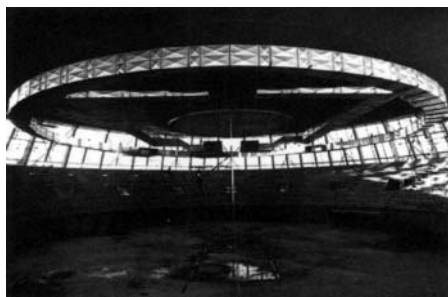
After the erection of the supports and the completion of the ring rafters, the circular basketball hall receives its conical roof of welded 4 mm thick sheet metal panels. A 90 ton slab of concrete in the center of the hall holds taut the radial cables from which the sheet metal was circularly suspended and welded. The rough construction of the hall was completed thirteen months after the beginning of the building.



The cycling stadium takes shape: the inclined wooden joists lean against an encircling girder. The rafters are put into place. The following illustration shows the tie point of the V-shaped wooden construction.

Supporting elements and connecting arches for the translucent roofing are mounted on the support pillars.

The cycling race track of African hardwood is finished: the grandstands are finished together with their seats.







## Page 22

*The swimming hall and sports hall receive a transparent, heat conserving addition made of polyester coated material with middle layers of polyvinyl-chloride material which is suspended at least 50 cm below the cable network for construction reasons.*

## August 20, 1970

The erection of the pylons for the tent roof began.

## August 27, 1970

Construction of the riding installation in Munich-Riem began with the demolition of the old riding hall.

## September 18, 1970

The number of spectators to be admitted to the opening and closing ceremonies at the Olympic Center in Kiel-Schilksee was fixed at 8,000 of which 2,500 would be seated.

## October 29, 1970

The topping-off ceremony for the sports buildings in the Olympic Center at Kiel-Schilksee was celebrated.

## December 7, 1970

After two years of planning and the investigation of numerous alternatives, the Executive Board of the OC decided that the original plan calling for accommodating the Press Center in a rented building built by independent construction companies had to be abandoned for financial reasons and instead contracted the OBG with the construction of the Press Center. The design was conceived so that the building could be used as a school after the Olympics. On about 16,000 sq. meters of usable space the four-story building would contain accreditation offices, a post office, a printing press for results, offices for news agencies and a self-service restaurant.

Work commenced on the Olympic Youth Camp at Kiel-Falkenstein.

## December 9, 1970

The section of the "Mittlerer Ring" road which connects with the approaches to the northern and southern areas of Oberwiesenfeld was opened to traffic.

## December 11, 1970

The construction of the new wrestling hall, designed by architect Peter Lanz, Munich, was begun.

## December 14, 1970

The shell construction of the installations for the regatta course at Feldmoching-Oberschleissheim having been completed, the topping-off ceremony for these buildings was celebrated.

## December 18, 1970

At its fifteenth meeting the Supervisory Board of the OBG approved a series of additional measures in the cycling stadium, the sports hall, and the swimming hall in view of their post-Olympic use.

The Supervisory Board agreed to the suggestion of the OC that the Press Center should be built on Riess Strasse by the OBG.

The Supervisory Board acknowledged and approved the artistic measures for the sports sites and the erection of a peace monument (Belin Sculpture) on the "rubble heap" by the OBG.

## January 8 to 9, 1971

At its 21st meeting the Executive Board of the OC passed the following resolutions: The Olympic boxing competitions will take place in the already existing ice skating rink at Oberwiesenfeld. Extensive alterations will be required.

Cancelling the previous resolution, the Grand Prix jumping competition individual event and the jumping competitions in the three-day-event and modern pentathlon will be held in a riding stadium at Riem which will be a permanent building.

After investigating the feasibility of the conversion of one of Munich's sports facilities to an Olympic land hockey installation (with seven plying fields and space for 20,000 to 30,000 spectators, 10,000 of these for the main field), the Executive Board of the OC decided to reject the solution and accommodate the hockey installation in the north part of the ZHS.

## January 15, 1971

The heaviest mast-head for the tent roof was fitted into place above the swimming stadium. The laying out of the cable network for the tent roof was begun.

## January 26, 1971

A test lighting of the Olympic flame was carried out on the eastern grandstand of the stadium.

## February 16, 1971

The turning loop for trams at the southern section of Oberwiesenfeld was completed.

## February 25, 1971

The topping-off ceremony was celebrated for the suburban railway station at the western boundary of the Olympic grounds.

## March 2, 1971

The athletic warm-up hall with a 200 m. long track was completed in the rough. Constructed below ground level for half of its height, the hall measured 90 m. by 48 m. and connected with the Olympic Stadium by a tunnel 50 meters in length.

## March 11, 1971

Construction of a 3.5 km. pipeline from the planned gasturbine heating plant at Freimann, which was to heat all buildings at Oberwiesenfeld, began.

## March 15, 1971

Construction of the Press Center designed by the Architekturbüro Plan GmbH was begun.

## March 16, 1971

Awards were made for the first art competition for the Olympic grounds. Artist Otto Piene, Düsseldorf, received the 1st prize for his "Light Satellite" design which was later erected in the quadrangle of the Central University Sports Facility. Piene's "Light Satellite" is an artificial star which shines by day and by night. It is composed of pieces of glass and is suspended in a steel framework 20 m. high. During the day it reflects the sunlight, while at night it is illuminated by sharply focused beams of light or by three-color laser rays. A second "star" is fixed to the ground centrally below the supporting steel structure.

## March 20, 1971

With the exception of the volleyball hall, the Central University Sports Facility was put at the disposal of the German Olympic Center (DOZ) for further equipment. This Center, established by the German Radio and Television networks ARD and ZDF, is responsible for all broadcasts and TV transmission concerning the Olympic Games.

## April 1, 1971

The construction of the basketball hall reached an important stage. A concrete slab 14 meters in diameter and weighing 90 tons was raised to a height of 12 meters and supported by scaffolding. This slab formed the middle and focal point of the cone-shaped suspended roof. Afterwards began the installation of the 4 mm. thick sheet-metal roof. The hall was to be roofed before the middle of July.

## April 7, 1971

The topping-off ceremony for the two highrise apartment houses in the Olympic Village was celebrated.

## April 29, 1971

Construction of the riding stadium in Riem began.

## May 1, 1971

The installation of the electronic computer center at the Olympic stadium was completed. Results from all competition sites were to be fed into this center. Trial runs were made with the computers to check their functioning.

## May 10, 1971

The construction of the provisional refreshment stations in the southern area of Oberwiesenfeld was begun.

Workers started raising the completed cable network for the tent roof above the swimming stadium.

## May 13, 1971

Erection of the two floodlight masts on the east side of the Olympic Stadium started.

## May 14, 1971

At its 22nd meeting the Executive Board of the OC agreed on provisions for catering facilities at Oberwiesenfeld. The OBG was commissioned to design and build the temporary refreshment stands. The site for archery in the "English Garden" was approved together with its final construction and functional plans.

## May 15, 1971

650 lamps were mounted on 23 masts along the section of the Mittlerer Ring which separates the northern and southern parts of Oberwiesenfeld. The lamps were installed according to a new system which keeps the lighting from blinding the motorists.

## May 22, 1971

Water was let into the canoe slalom course at Augsburg for the first time. Work was begun on the stands along the course, the rooms for competitors, the administrative building and the boathouses.

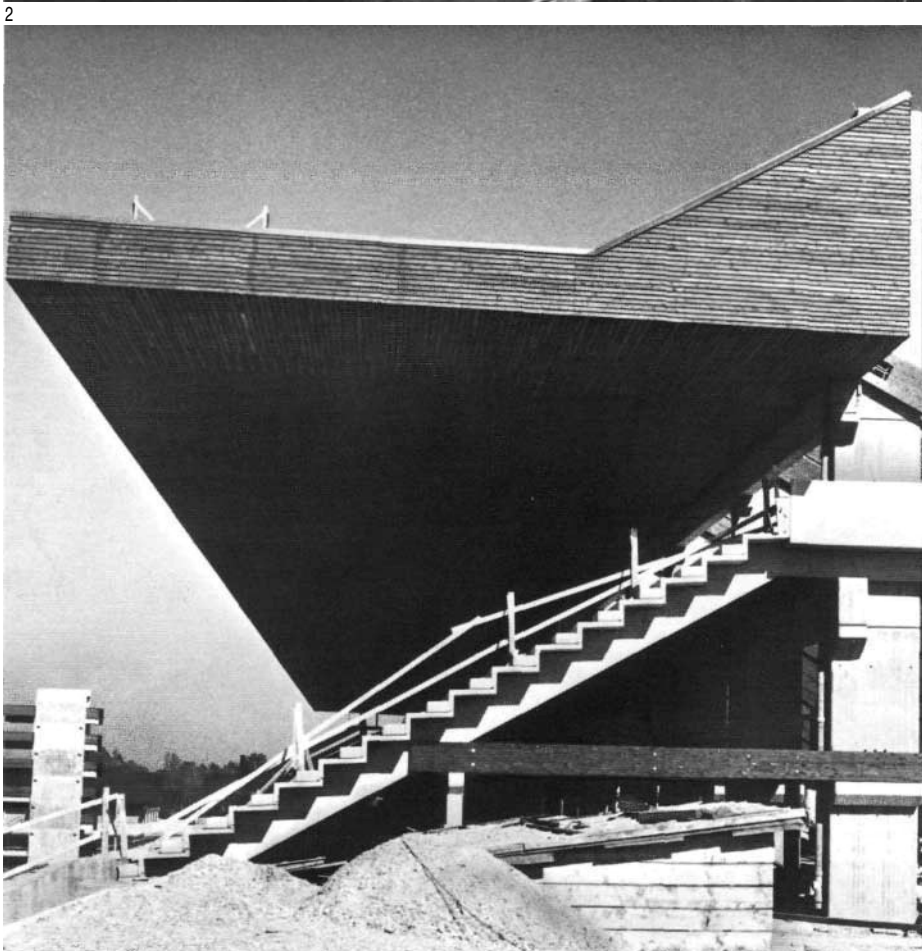
## June 9, 1971

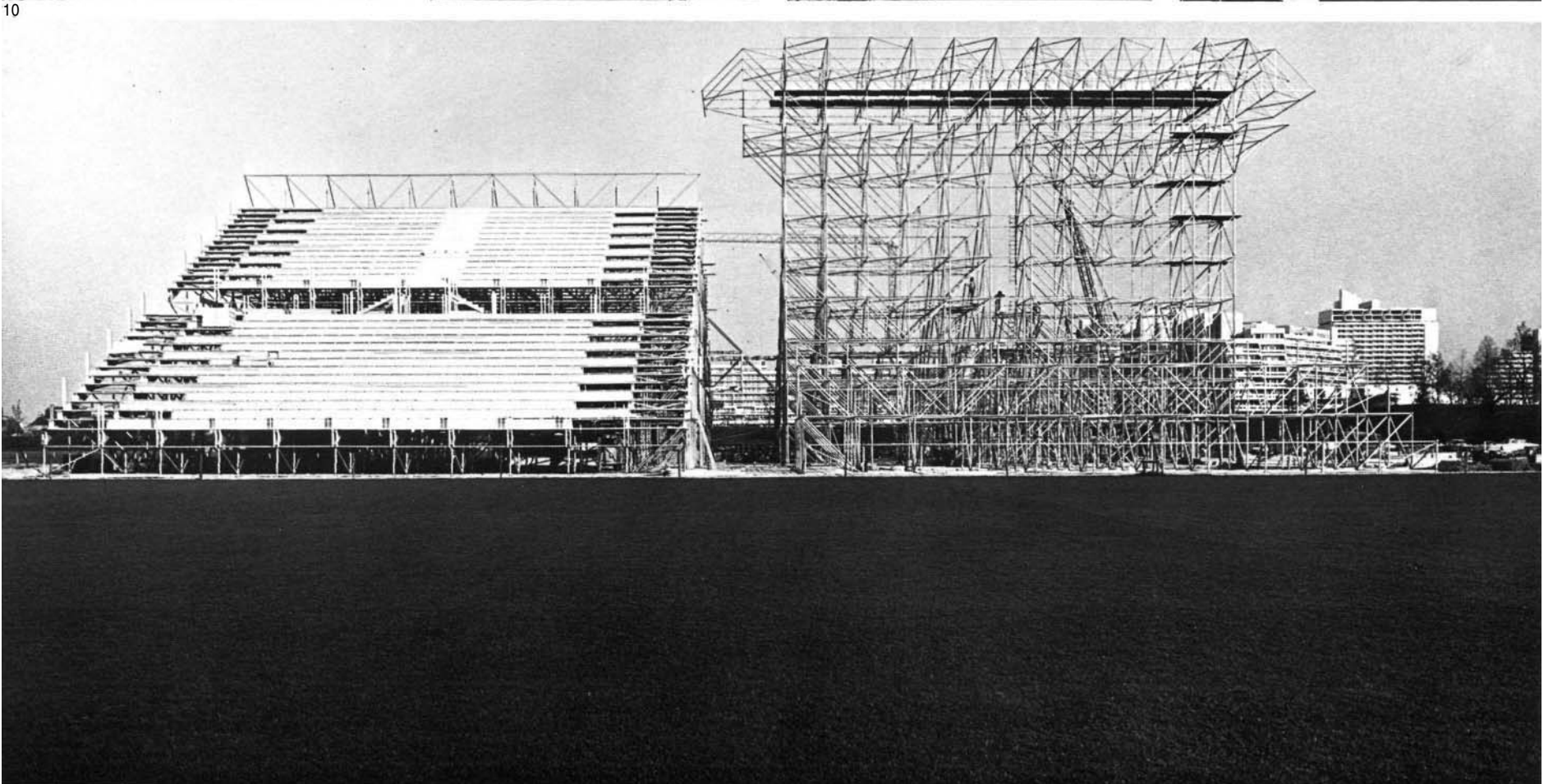
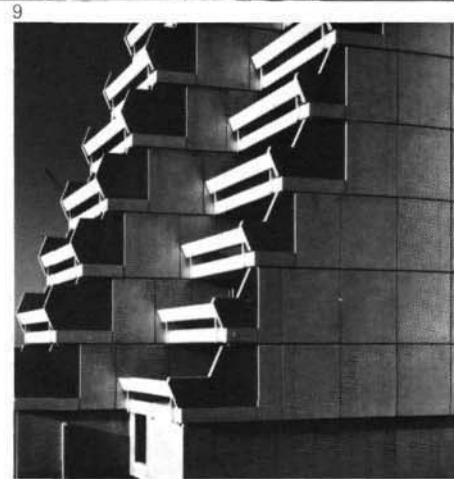
The yachting harbor for visitors' boats at Kiel-Wik was completed.

## June 14, 1971

In the course of assembling the tent roof the heads were fitted to the two 80 m. high main masts for the sports hall. The ten smaller supports and the two flying supports, together with the assembly cables, were erected around the stadium permitting the entire steel cable network with the standard mesh dimension of 75 cm. by 75 cm. to be raised on to the main supports. This phase had to be carried out centimeter by centimeter with the aid of pulley blocks.









Captions for pages 24/25

No. 1:  
*The artificial lake is filled. View of a part of the Olympic Center with the sports hall and swimming hall seen from the southern shore of the lake at the foot of the "rubble hill".*

No. 2:  
*Grandstands with seats and the finish line referee's turret at the northeast of the regatta course.*

No. 3:  
*Rough construction is finished in the warm-up hall for track and field athletes, to the west of the Stadium.*

Nos. 4 and 5:  
*Every day the construction site attracts a large number of interested people up to the "rubble hill" which is equipped with footpaths and a viewing platform.*

No. 6:  
*The construction schedule of the Olympic Village can be kept by extensive use of prefabricated elements.*

No. 7:  
*In the equestrian stadium at Riem the essential rough construction has also been completed.*

No. 8:  
*The Lecture Hall Building of the Central University Sports Facility during the interior work.*

No. 9:  
*Terraced buildings of the Olympic Village.*

No. 10:  
*The temporary bleachers of the hockey stadium are erected at the north of the Central University Sports Facility.*

**June 20, 1971**  
In the Olympic Stadium work commenced on the installation of a telephone exchange with 396 post office lines and 4,000 extensions.

**June 29, 1971**  
The shell construction of the cycling stadium was completed. The track surface made of Doussie Afzelia hardwood was almost finished after six weeks of work.

**June 30, 1971**  
A floating stage was installed on the lake in the southern part of Oberwiesenfeld. The area of this lake is 80,000 sq. meters.

**July 1, 1971**  
Construction of the provisional refreshment room in the northern section of Oberwiesenfeld commenced.

**July 2, 1971**  
The shell construction of the basketball hall was completed and the topping-off ceremony was held.

**July 16, 1971**  
The topping-off ceremony for the Munich Press City was celebrated.

**July 20, 1971**  
The suburban railroad station to the west of Oberwiesenfeld was finished.

**August 1, 1971**  
The last section of the second high bridge across the Kiel Canal at Holtenau was placed in position.

**August 2, 1971**  
The OBG reported on the stage of completion of the Olympic buildings:

Stadium . . . . .	70%
Sportshall . . . . .	70%
Swimming stadium . . . . .	65%
Roof: Stadium . . . . .	50%
Roof: Sports hall . . . . .	70%
Roof: Swimming stadium . . . . .	80%
Central University Sports Facility with volleyball hall . . . . .	75%
Regatta course at Feldmoching-Oberschleissheim . . . . .	80%
Shooting range at Hochbruck . . . . .	80%
Equestrian installation, Riem . . . . .	65%
Basketball hall . . . . .	60%
Wrestling hall . . . . .	35%
Canoe slalom course, Augsburg . . . . .	70%
Olympic Village:	
Women's Village . . . . .	70%
Men's Village (high-rise buildings) . . . . .	70%
Men's Village (low buildings) . . . . .	40%
Dining hall . . . . .	65%
Press City . . . . .	70%
Press Center . . . . .	45%
Road constructions . . . . .	70%
Dante swimming-pool . . . . .	60%
Dante stadium . . . . .	100%

**August 6, 1971**  
The topping-off ceremony for the riding stadium and equestrian installations was celebrated in Munich-Riem.

**August 16, 1971**  
Work was begun on covering the tent roof. The cable network above the sports hall and the swimming stadium had already been linked up and tensioned. Under the network of the swimming stadium an insulation layer of translucent sheeting was fitted.

3 m. x 3 m. panels of transparent acrylic glass were screwed to the upper side of the network.

**August 20, 1971**  
The basin of the rowing and canoeing regatta course at Feldmoching-Oberschleissheim was stocked with 20,000 mountain and rainbow trout. The fish keep the water clean and hinder the water plants from growing too thick.

**August 26, 1971**  
The topping-off ceremony was celebrated for the Press Center.

At this time 6,050 workmen were employed on the Olympic grounds:  
2,000 in the Olympic Village  
1,350 in the competition installations  
1,500 on underground construction  
1,200 in the Press City and the Press Center.  
In addition 1,440 workmen were engaged in construction work outside Olympic Park.

**October 7, 1971**  
The shell construction of the high-rise buildings at the canoe slalom course in Augsburg were finished. The topping-off ceremony was celebrated with great solemnity.

**November 4, 1971**  
The topping-off ceremony for the entire tent roof was celebrated earlier than planned and before ice and snow could seriously hinder construction work. This was the one of the most significant events at Oberwiesenfeld. The roof was lifted in position and was partly covered.

**November 16, 1971**  
Federal Minister Prof. Dr. Karl Schiller was elected deputy chairman of the Supervisory Board to succeed Dr. Alex Möller.

**December 15, 1971**  
The planting of trees and shrubs at the Olympic Center in Kiel-Schilksee was completed.

The lake at Oberwiesenfeld was filled by opening the gates of the supply channel near the cycling stadium.

**December 16, 1971**  
The sports facilities were inspected by the budget committee of the Bundestag and consultations were held with leading figures of the OC and OBG.

**January 10, 1972**  
The conversion of the ice sport hall near the television tower to a boxing hall commenced.

The first student apartment blocks between Winzerer and Lerchenauer Streets were handed over to the OC.

**January 12, 1972**  
The warm-up hall next to the Olympic Stadium was finished.

**January 24, 1972**  
The sea-water pool in the swimming stadium at the Olympic Center in Kiel-Schilksee was filled for the first time.

**February 4, 1972**  
Work on the tent roof had to be temporarily suspended on account of wintry weather.

**February 16, 1972**  
The first houses of the Olympic Village were ready for use and were handed over to the OC.

**March 9, 1972**  
Testing of the scoreboards began in the Olympic Stadium.

**March 15, 1972**  
Five months before the commencement of the Olympic Games, the government bill dealing with the costs of the Olympic buildings was submitted to the Sport and Budget Committees of the Bundestag. The bill stipulated that the Federal Government make a single lump-sum payment of 130 million DM to the City of Munich.

In an official ceremony the keys of the Olympic Village were handed over to its Mayor, Walther Tröger, by the "Olympisches Dorf Massnahmeträger Gesellschaft mbH & Co.", Munich. The Town Hall of the Village, a sixteen-story building, provided accommodation for the 100 officials who looked after the athletes and their 3,000 assistants, for the direction center of the OC and the 200 security officers of the Olympic Village. The Town Hall also contained weighing and medical examination rooms for wrestlers, boxers, judokas and weight-lifters, and the stores for the medical center.

**March 23, 1972**  
A fitness center with about fifty athletic appliances was opened in the administrative building of the Olympic Village.

**April 1, 1972**  
The Secretariat General of the OC submitted a report on the preparations for the Games to the Executive Board. Here are some extracts from the most important items:

*The Stadium in Olympic Park is finished and the work on the interior, including the heating and ventilation is completed. At the beginning of 1972 the installation of the scoreboards reached the stage where testing could begin.*

*The warm-up hall was finished at the end of the year and completely laid out with Recortan. The Olympic Stadium will be officially opened on May 26, 1972 with the international football match between Germany and the U. S. S. R.*

*The shell construction of the sports hall in Olympic Park is finished. At the present time the landing areas in the interior are under construction. Hitherto it has been possible to adhere to all completion dates for the installation of the control room, control desks and the scoreboards, and for the work in the warm-up hall, the gymnasium and conditioning room. The roofing of the sports hall was finished on January 31, 1972.*

*Rental agreements have been concluded with the proprietors of the competition sites for handball (Augsburg, Göppingen, Böblingen, Ulm) situated outside Munich. Every hall concerned will be provided with new lighting equipment with an illuminating power of 1,875 lux (new value) as demanded by the German Olympic Center.*

*The competition pools in the swimming stadium have been tiled. The changing-*

rooms, showers and sanitary cabins in front of them are nearly completed; the rooms for the competition management on the pool floor level, the offices of the International Swimming Federation (FINA), the German Swimming Federation, the OC and the stadium management, the massage and rest rooms need only technical equipment and furniture.

The completion dates involved in the construction of the cycling stadium were kept. The competitors' quarters and the covered store in the interior are completed, the lighting equipment has been installed. The conversion of the ice stadium into a boxing stadium was started on January 10, 1972. The improved lighting installation is 80% completed, the construction of the tubular steel grandstands is finished. The referees' changing rooms and lounges are in course of reconstruction.

Work on the volleyball hall is proceeding according to schedule. The shell construction was finished at the end of 1970 and now the work on the interior is 80% completed. The elastic floor with a PVC surface has already been laid in the warm-up hall. The supporting structure for the elastic floor has been installed in the competition arena. Work will be continued after a further series of tests for the choice of color and the determination of the slip resistance of the PVC surface. The seating in the grandstands is completely finished.

The Executive Board of the OC has accepted badminton and water skiing as demonstration sports.

The demonstration competitions in badminton will be divided into three sections and held in the volleyball hall on September 4, 1972.

There will be a water-skiing demonstration on September 1 and 2, 1972 at the Hindenburgufer in Kiel.

All six hockey competition fields are ready for play. Additional grandstands providing standing room for 2,000 spectators have been erected between fields 4 and 5. All roads to the hockey grounds, together with the parking lots, will be completed by April, 1972. The basin of the regatta course channel in Feldmoching-Oberschleissheim was completed in August, 1971. The technical equipment is installed. The whole course will be ready for use in April, 1972; it will be available for training as of August 1, 1972. The technical equipment will then be adjusted for rowing, since the Olympic rowing events will start on August 27, 1972. Two of the six lanes will be reserved for canoeists, the two fields of activity being separated from each other by a wave-breaking barrier.

The shell construction of the wrestling and judo hall at the Exhibition Grounds was completed and the topping-off ceremony celebrated on November 25, 1971. The date for starting the reconstruction of the training hall for judo, Hall 18 at the Exhibition Ground has been fixed by the OBG for April 26, 1972. Interior work in the fencing halls 1 and 2 in these grounds will begin at the end of April, 1972. The competition course for canoe slalom at Augsburg is completed. Interior work on the building has begun. In the riding stadium at Munich-Riem

the shell construction of the covered grandstands has advanced to the stage where interior work can start. The administrative area which will be used only for the contests during the Olympic Games will, for reasons of economy, be a provisional installation incorporated with the grandstands. The turf was laid in the autumn. Three of the new Olympia-type stables have been completed; the interior work on the other two is now in progress. The grass seed for the turf on the training grounds was sown in autumn, 1971. The sand areas will be finished in the spring of 1972.

The planning of the building work for the dressage events in Nymphenburg Park is completed; building will begin in April, 1972.

The shooting range at Hochbrück is 90% completed and work has now begun on the interior of the administrative building and the restaurant. The technical equipment for shooting is being tested at the present time.

The section of the Munich-Lindau motorway intended for the 100 km. team road race has been completed as far as Schäftlarn. The overpasses for pedestrians have been prepared and can be put in place shortly before the event.

Structural alternations to the course for the individual road race, with start and finish in Grünwald, were made in accordance with the suggestions of the International Amateur Cyclists Federation.

The earth work for the archery competition site in the "English Garden" is finished. The competitions in riding, fencing, shooting and swimming for the modern pentathlon will take place on sites suited to these special disciplines. An area must still be found, however, for the 4,000 meter cross-country running contest. Since the Olympic hill best meets the requirements for this event, the Olympic Stadium was chosen as the starting and finishing point.

#### April 21, 1972

The last of the acrylic glass panels, each 9 sq. m. in size, was attached to the roof of the Olympic Stadium.

#### April 22, 1972

The installation of the electrical equipment in the interior of the Olympic Stadium for the information of spectators and athletes was completed.

A cluster of 80 loudspeakers situated under the roof above the western grandstand was arranged so that all grandstands received a uniform level of sound. The spectators sitting directly below this cluster were served by an additional row of loudspeakers located at the edge of the arena. Sixteen rows of loudspeakers placed around the track were reserved exclusively for musical entertainments.

The loudspeaker cluster, which weighs 500 kg., is composed of 26 pressure chambers and 54 cone loudspeakers, operated from the control room situated above the grandstands. This room contains 15 amplifiers of 100 watts output each, two tape recorders and two record players.

A total of 20 microphones are distributed between the announcer's cubicle, the

competition management office, the presidential box, the sound and technical room and the sport direction room. Ten additional microphone connections are located in the reporters' dug-out between the track and the grandstands. They enable official announcements to be made directly from the arena.

#### April 25, 1972

The memorial stone from the ruins of Olympia, which was taken from the 2,700 year-old Echo Hall, was placed in its position in the Forum of the Olympic Men's Village.

#### May 2, 1972

The basketball hall was completed after about two years' building time.

The building company "Neue Heimat", Hamburg, completed the principal building of the Olympic Center in Kiel containing administrative offices and apartments, together with a promenade. The Company handed over the building to the City of Kiel, and some departments of the OC moved in.

#### May 8, 1972

The Munich municipal transport organization opened subway line No. 3 running from Goetheplatz to the Olympic Center.

Work was started on laying the Recortan track over a total area of 6,900 sq.m. For putting down this surfacing material the outdoor temperature must be over 12° centigrade and the atmospheric humidity less than 70%.

#### May 13, 1972

An agreement was signed between the OC and an electrical manufacturer for the supply of 8,636 television sets. These were used for live transmissions in the Olympic Village and at various competition sites.

#### May 26, 1972

The Olympic Stadium was inaugurated with an international football championship match between Germany and the U.S.S.R. All administrative and security arrangements for the filling and emptying of the stadium and for the transportation of the spectators after the match proved satisfactory.

The illumination by the 550 high-efficiency lamps on the floodlighting masts satisfied the requirements of sport and of television. Halogen metal-vapor lamps were used. They provided an illumination similar to daylight and received special praise from the players.

During this game wind velocities of 6 and 10 were recorded at Oberwiesefeld but the wind force was considerably less at the playing level. Practical experience thus agreed with the tests carried out on models in a wind tunnel.

#### June 22, 1972

Europe's first pneumatic refuse disposal installation was put into operation in the Olympic Village.

#### June 25, 1972

The official acceptance of the Olympic buildings and their transfer from the OBG to the OC was begun and continued until July 31. In the case of certain provisional installations, such as at Nymphenburg and the exhibition ground the transfers did not take place until August 25.

#### June 29, 1972

In the Pavilion of the Olympic Building Center, Federal Minister of the Interior Hans-Dietrich Genscher, State Minister of Finance Dr. Ludwig Huber and Lord Mayor Dr. Hans-Jochen Vogel, signed a new consortium agreement concerning the construction, financing, responsibility for and costs of the buildings and equipment for the Olympic Games. According to this agreement, the Federal Government undertook to finance 50% of the total cost that was not covered by funds from outside sources, while the Bavarian Free State and the City of Munich each contributed 25% of this sum (See Vol. 1). On the same day, in the presence of Federal Chancellor Dr. h.c. Willy Brandt and many guests of honor, a symbolic ceremony took place in the sports hall at which all completed sports installations for the Olympic Games were formally handed over by the General Manager of the OBG, Dipl.-Ing. Carl Mertz to the President of the OC, Herr Willi Daume.

#### July 2, 1972

The Olympic Center in Kiel-Schilksee was officially handed over to the OC. Mayor Gunther Bantzer symbolically presented a key to the Chairman of the Committee for the Olympic Yachting Events Kiel 1972, Berthold Beitz.

#### July 12, 1972

The park paths in Munich which would be used for the Olympic walking and marathon events, were sprayed with a plastic substance to bind the fine loose gravel.

#### July 12, 1972

The Olympic flame was lighted in a try-out on top of the three-step structure in the harbor of the Olympic Center at Kiel-Schilksee.

#### July 14, 1972

After a construction period of two years the South Restaurant was opened as the first of four restaurants for visitors to the Olympic Park.

#### July 21, 1972

The buildings for the Olympic Youth Camp in Munich were completed.

#### August 1, 1972

The Olympic Village and the Press City were opened for Olympic use.

#### August 10, 1972

The Press Center in Kiel was opened.

#### August 26, 1972

The Games of the XXth Olympiad were opened in the Olympic Stadium.

#### August 28, 1972

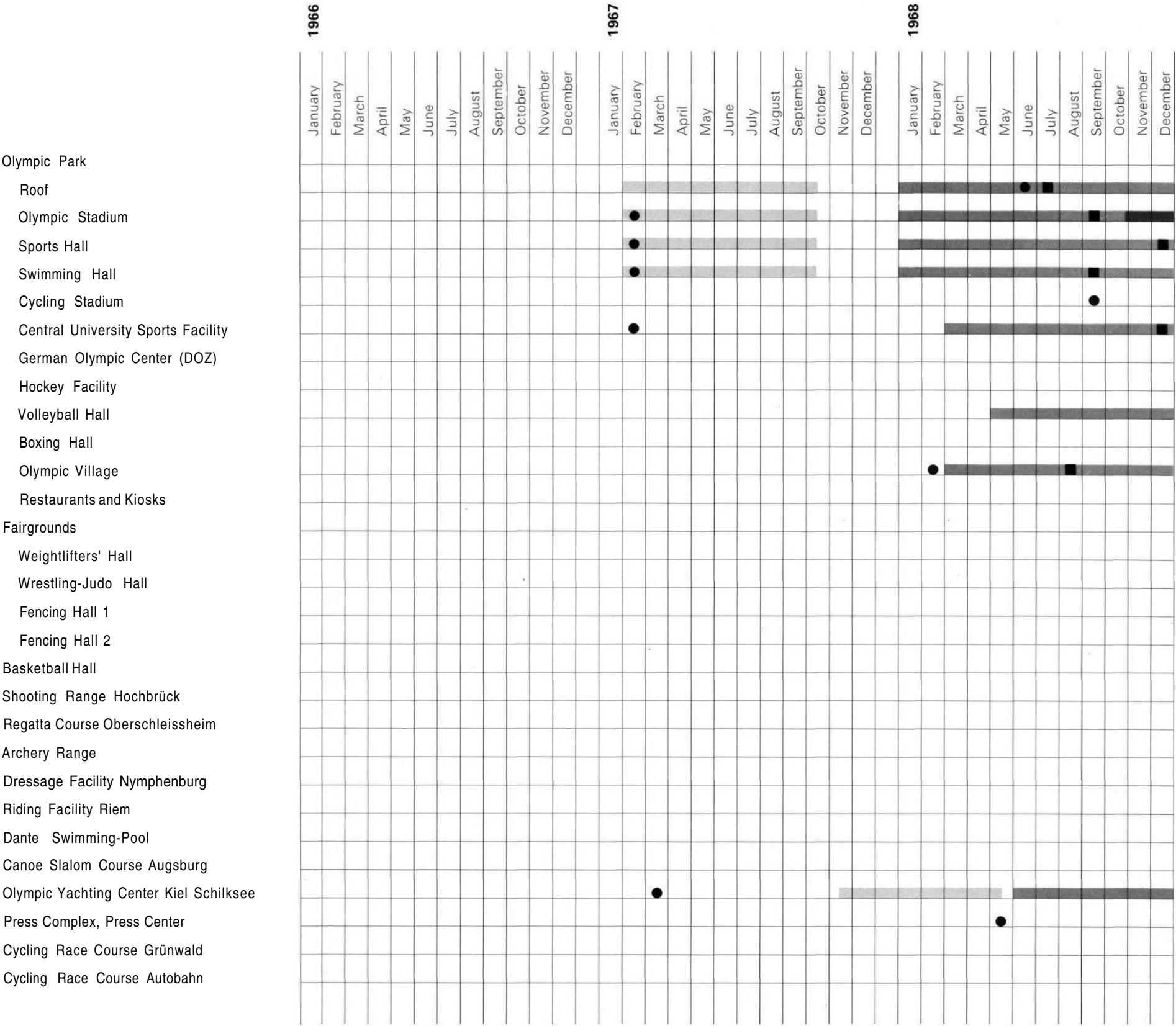
The opening ceremony for the Olympic yachting events took place in the Olympic Center at Kiel-Schilksee.

#### September 16, 1972

The OBG handed the Olympic hall as the first sport site over to its future holders, the Munich Olympia Park Co. Ltd. The greater part of the sports facilities were transferred before October 1, 1972. The final transfer followed the completion of the cafeteria at the end of November, 1973.



Schedule of the  
planning and construction



Organizing  
Committee  
Board  
Decision

Competition

Planning

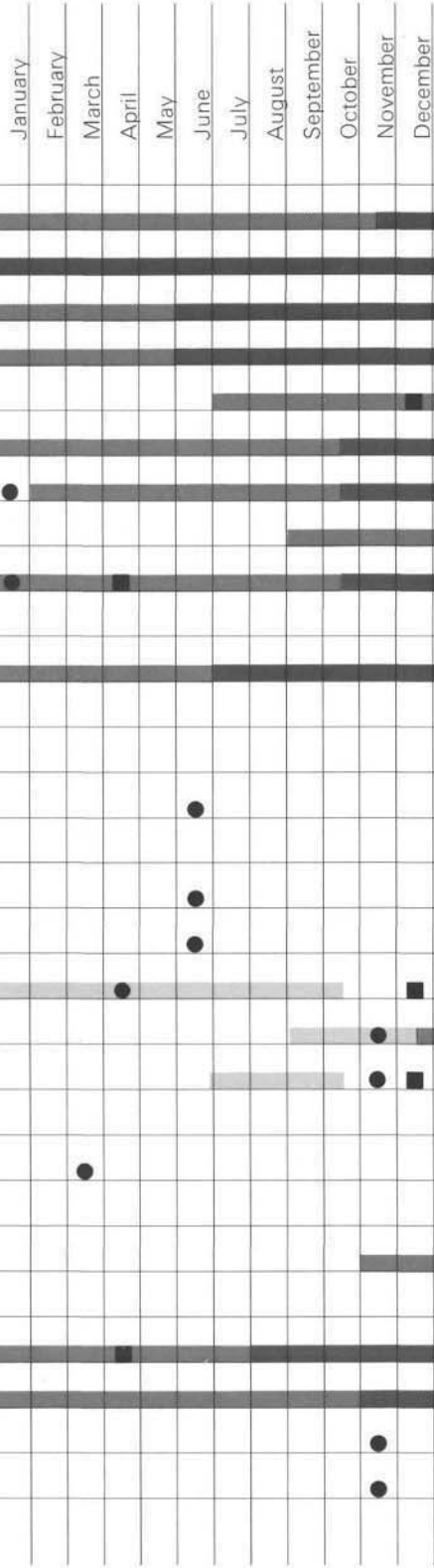
Project Approval  
by either  
the OBG or  
the Organizing  
Committee

Basic  
Construction

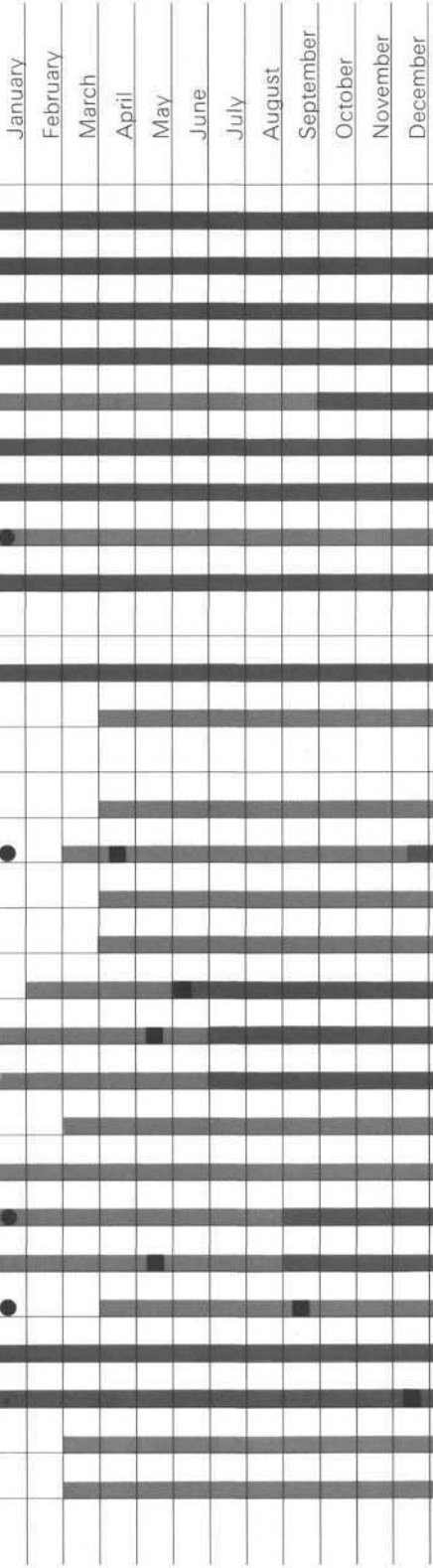
Completion



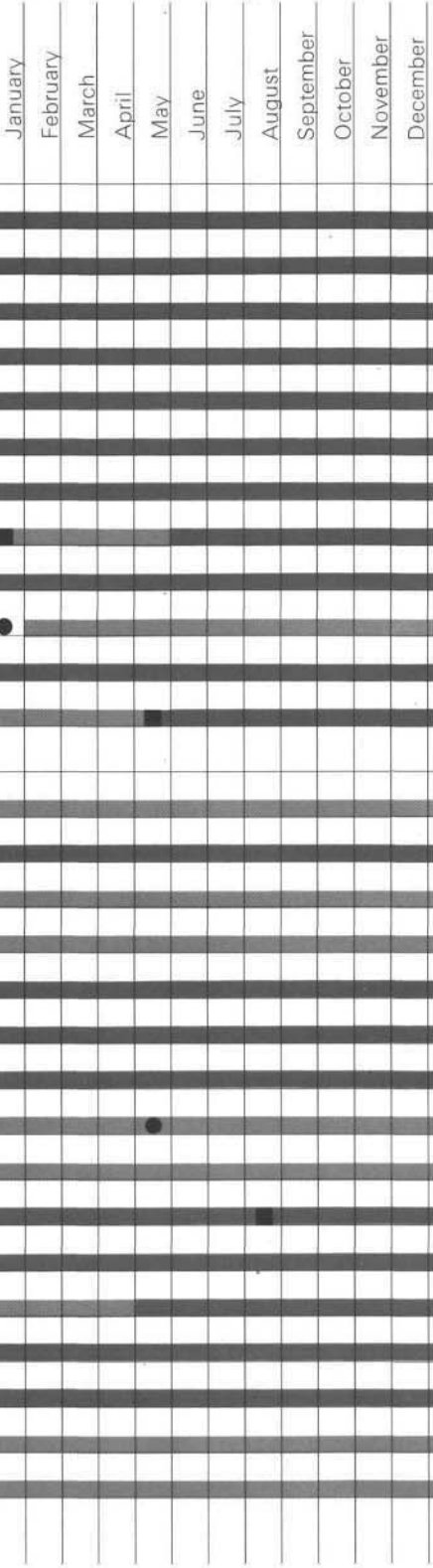
1969



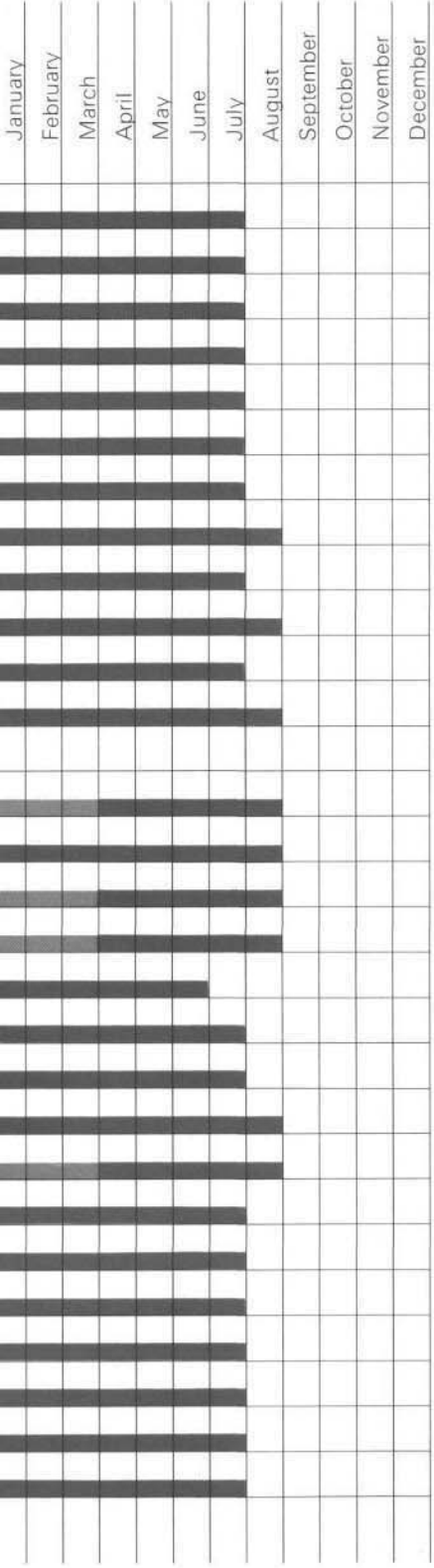
1970



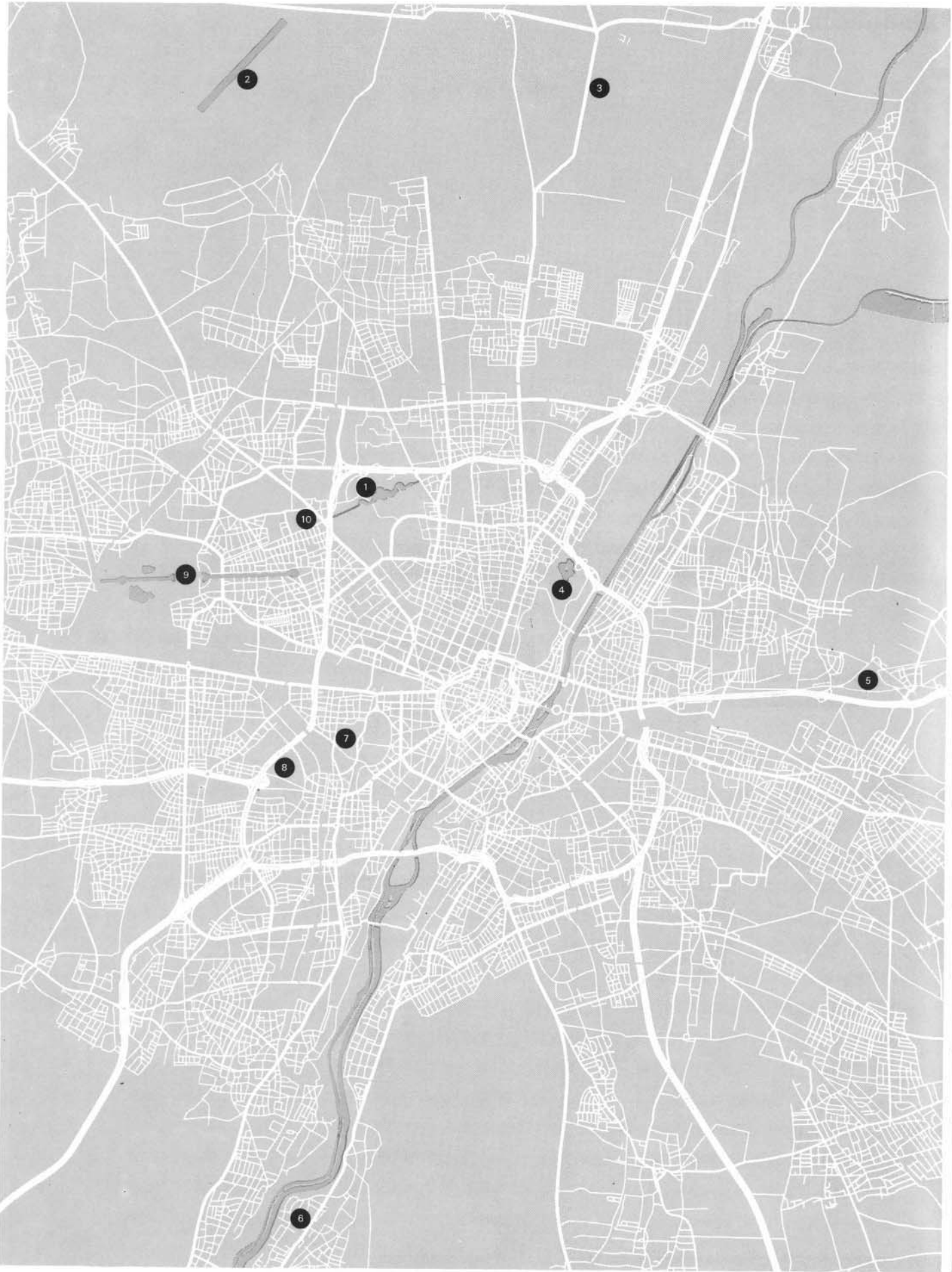
1971



1972







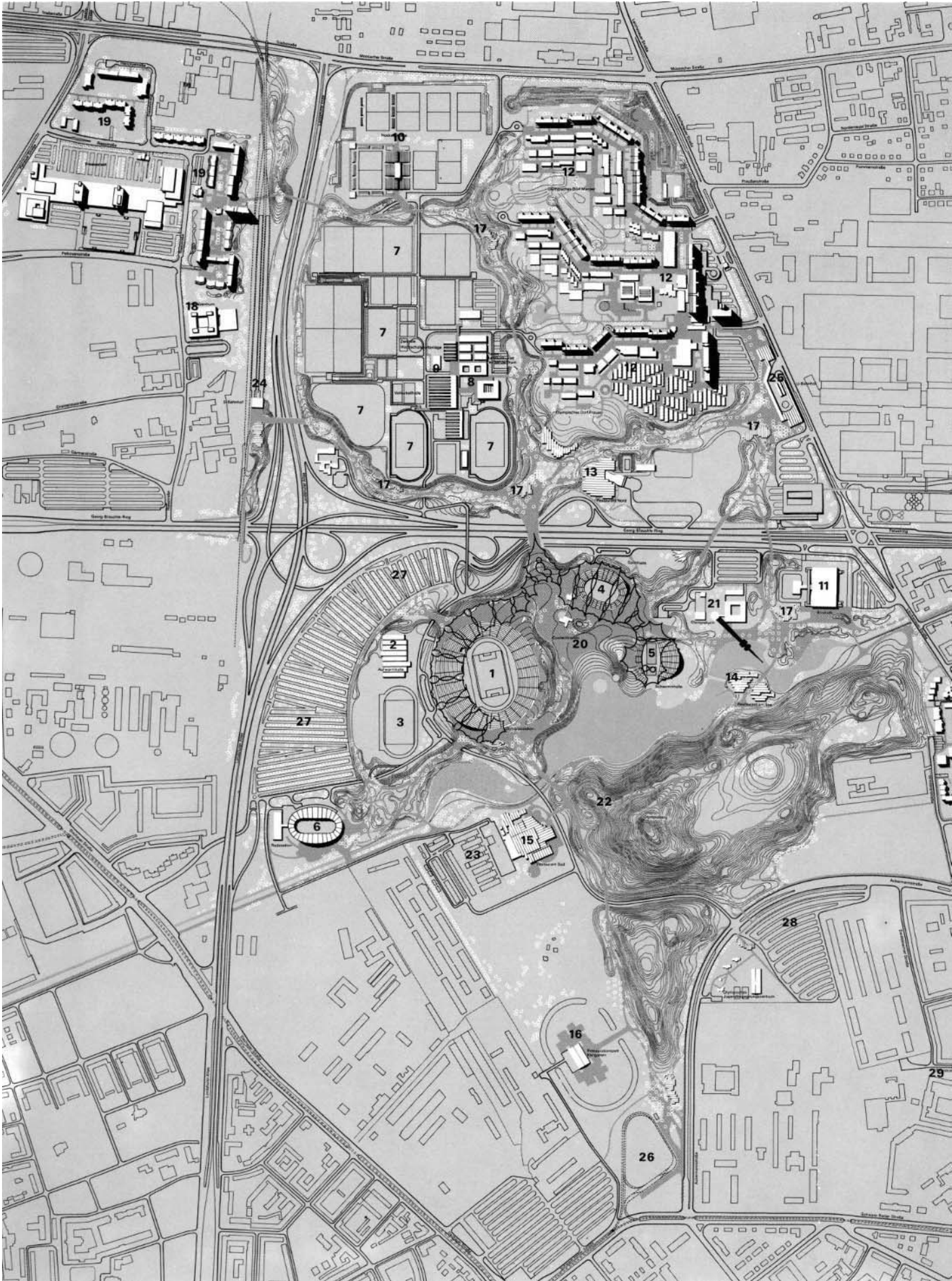
	page	
1 Olympic Park	32	179
The Roof	42	180
2 Regatta Course		
Oberschleissheim	136	204
3 Shooting Range		
Hochbruck	132	203
4 Archery Range		
English Garden	142	205
5 Riding Facility		
in Riem	150	207
6 Cycling Course		
for the Individual		
Road Race		
7 Fair Grounds	118	197
Weightlifters' Hall	120	198
Wrestling/Judo Hall	122	199
Fencing Hall 1	124	200
Fencing Hall 2	126	201
8 Basketball Hall		
Siegenburger Strasse	128	201
9 Dressage Facility		
Nymphenburg	146	206
10 Dante Swimming-Pool	176	212

Sports Sites outside Munich

Canoe Slalom Course		
Augsburg	154	208
Olympic Yachting		
Center Kiel-Schilksee	160	209

Sports Sites in Olympic Park

	page	
1 Olympic Stadium	48	180
2 Warm-up Hall	56	
3 Warm-up Area	56	
4 Sports Hall	58	182
5 Swimming Hall	66	184
6 Cycling Stadium	74	187
7 Central University Sports Facility (ZHS)	78	188
8 German Olympic Center (DOZ)	82	
9 Volleyball Hall	86	191
10 Hockey Facility	90	192
11 Boxing Hall	94	193
12 Olympic Village	98	194
13 Restaurant North	112	196
14 Restaurant on the Lake	112	197
15 Restaurant South	112	197
16 Country Dining Places	112	197
17 Kiosks	112	197
18 Press Center	168	211
19 Press Complex	172	
20 Center (Coubertin Platz) with the "Theatron am See"		
21 Television Tower		
22 Olympiaberg (former Schuttberg)		
23 Olympic Construction Company (OBG)		
24 Rapid Transit Station (S-Bahn) Olympic Center		
25 Subway Station (U-Bahn) Olympic Center		
26 Streetcar Loop Ackermann Strasse		
27 Private Parking Lot		
28 Parking Area for Visitors' Buses		
29 Organizing Committee (OC)		





**Olympic Park**  
Architects:  
Behnisch and Associates,  
Munich/Stuttgart  
Günter Behnisch, Fritz Auer, Winfried

Büxel, Erhard Tränkner, Karlheinz Weber,  
Jürgen Joedicke  
Landscaping  
Günter Grzimek, Kassel





The themes proposed in connection with Munich's application to sponsor the games of the XXth Olympiad of 1972, i.e. "Olympia, Festival of Muses and Sports" "Averdant Olympia" "Olympia of short paths" were important factors for the IOC in comparing the candidates. They had a considerable influence on the positive decision for Munich. These themes were realized on a broad scale by the first prize winner in the architectural competition for the structures at Oberwiesenfeld. Despite the huge dimensions of the competition facilities intended for large numbers of spectators, the multiple training facilities for the participants, the installations for handling traffic, and a city for athletes that can only be called a "village" because of the historical development of the term, the design was dominated, nevertheless, by a human scale. The idea was to provide facilities which could provide the setting for a cheerful, relaxed atmosphere. This atmosphere was intended to prevail not only during the relatively short period of the Games, but also during the long period of usage after the Olympics. This plan was supposed to be just as significant for the citizens of Munich in regard to culture and city planning as are the English Garden or Nymphenburg Park.

Out of these considerations arose a form for the facility that excluded every pretension to monumentality. It is most accurately described by the terms "molded landscape" and "architectural landscape." The program of the competition, which involved extensive areas and volumes, and in which the sports structures were dominant — as indeed they had to be — was transformed into a conception that made the congestion and concentration, which were to be expected according to the program as inevitable, no longer noticeable at all. This was accomplished by locating the main sports facilities in the south of Oberwiesenfeld, by making the elements already present (i.e., the "Rubble Hill," Nymphenburg Canal and the television tower) a part of the conception, and by grouping the competition facilities together to form a central area. The stadium, the sports hall and the swimming hall were turned into important components of the grounds by landscaping a totally flat area. The character of the "Rubble Hill," the formation of the artificial lake, the relation of the main sports facilities to the elevated center, the common roof covering all main sports structures and extending to the northern part of the grounds, as well as the extension of the spectators' plateau in the north of Oberwiesenfeld are all elements of an impressive design, a harmony of hill, dams, plateaus and water with open-air and indoor sports facilities.

The stadium, sports hall and swimming hall are located at the crucial point of the traffic flow. By their relative orientation, they form a center which serves as an assembly and meeting point for spectators and provides access to the competition facilities. This forum is open to the south, toward the lake and toward the "Rubble Hill," while the sports facilities in the north, east and west shield it from the traffic. The competition program required the clear separation of the access roads for the spectators, athletes, VIPs, officials and







reporters. This was best realized in Olympic Park. A system of order that judged the traffic patterns correctly, and hence made the optimal solution possible, contributed greatly to this accomplishment, even though the streets and paths were seemingly layed out only according to considerations of design.

Prior to its modification into an Olympic facility, Oberwiesenfeld, only four km. from the center of Munich, had served as a parade ground, airfield, a dumping site for rubble, and in part as fairgrounds. In the city development plan, it was identified as a green area which was to be conceived of as a juncture point of a radial green wedge, running in a north-south direction, and the park system running in an east-west direction along the Isar. This wedge will connect the heart of the city with the green region of northern Munich, the Lerchenauer Lake and the adjoining wooded areas. The second diagonal green strip, at a right angle to the latter, is the canal running from Nymphenburg to the English Garden. Viewed in this direction, Oberwiesenfeld is located midway between the Nymphenburger Lake and the Kleinhesseloher Lake.

The area of approximately 280 hectares is surrounded by main thoroughfares in the north, east and west, and is bisected by the Middle Ring Expressway at about the middle of its longest stretch. One of the essential jobs of planning, therefore, was to provide the right tie-ins and access to the whole complex, to overcome the obstacle of the Middle Ring and to separate the streams of pedestrians from motor traffic within Oberwiesenfeld.

Most important for public transport were the subway in the northeast (connected with a bus station for the lines serving north Munich) and the rapid transit station (S-Bahn) in the northwest of Oberwiesenfeld. Finally, the streetcar station in the south brought this mode of transportation also into consideration. Spectators walked from these installations to Olympic Park along causeways 8 to 9 meters high and across pedestrian bridges.

A pedestrian path, running more or less in an east-west direction, connects the subway station with the rapid transit station. The main overpass that leads over the Middle Ring into the center of the main sports facilities is located at the point where the east-west path intersects the causeway coming from the north. An additional causeway running in a northeast to southwest direction connects the subway station to the sports hall-swimming hall complex, also via an overpass across the expressway. The most important pedestrian access paths in the southern area of Olympic Park are the approach that runs about parallel to the lake and passes the television tower and the ice stadium, and the connecting path from the streetcar stop, that runs along the "Rubble Hill."

The elevation of the paths gives visitors to Olympic Park a good view over it. This view allows them to catch glimpses of the various zones of activity, of life and action by the lake, the show place, the center, of the athletes' training facilities and of the green areas between the dwellings of the Olympic Village. Pedestrians thus reach the competition facilities through

a landscape with constantly changing scenes. Without having to overcome great differences in elevation, they approach the center on this common access level which leads from the forum into the foyers of the sports hall and swimming hall and up to the east edge of the stadium. Pedestrians can also go around the western area of the stadium at about half the height of the stands.

The solution of using the approaches and embankments as elements of the landscaping is especially pleasing in a case where a conflict situation arises for the planners: such as when a recreation area is involved, in which large sections have to fulfill certain technical or safety requirements. During the Olympic Games, the planners had to take into consideration the crowd turnover between the afternoon and evening activities, as well as the normal spectator capacities of the seven competition facilities in Olympic Park (bicycle stadium, boxing hall, hockey field and volleyball hall in addition to the three main competition sites). At that time, more than 250,000 visitors were expected to be in the complex simultaneously. The results of these calculations required arrival and departure footpaths up to 40 meters wide. Despite their significance during such events as the Olympic Games, these paths were not given the character of parade streets. The planners also considered the situation that would prevail most of the time, when only a small number of people seeking recreation would be present in the entire open area of approximately 140 hectares. They also had to be provided with paths of appropriate width. The paths for this individual usage had to be pleasant to walk on, and had to lead to interesting views or activity areas, play areas, camping grounds, etc. The division of the broad connecting paths into a network of paths of varying widths developed primarily from these considerations. It proved to be advantageous to lay out the paths on embankments. This clearly determined the direction of the paths. The green islands of grass lying in the network of paths were made so that people walk on them during times of heavy traffic without causing any permanent damage. Thus, the demands of the traffic experts could be met, while a variety of pathways for normal use were created at the same time.

Individual transportation was of only slight significance in comparison to travel by public transit. Only one, large, radial parking lot was located at the west side of the Olympic Stadium. During the Olympic Games, it was reserved for guests of honor, administrators and the press, as were two smaller parking lots and a parking deck in the eastern area.

The job to be done was clearly formulated in the competition: the Olympic Games were to take up their original constitutive elements, and also to be the "verdant Olympic Games" and the "Games of the short paths." In view of the quantitative prerequisites of accommodating 12,000 athletes, offering adequate competition facilities and providing for the spectators, this was an extraordinarily difficult undertaking.







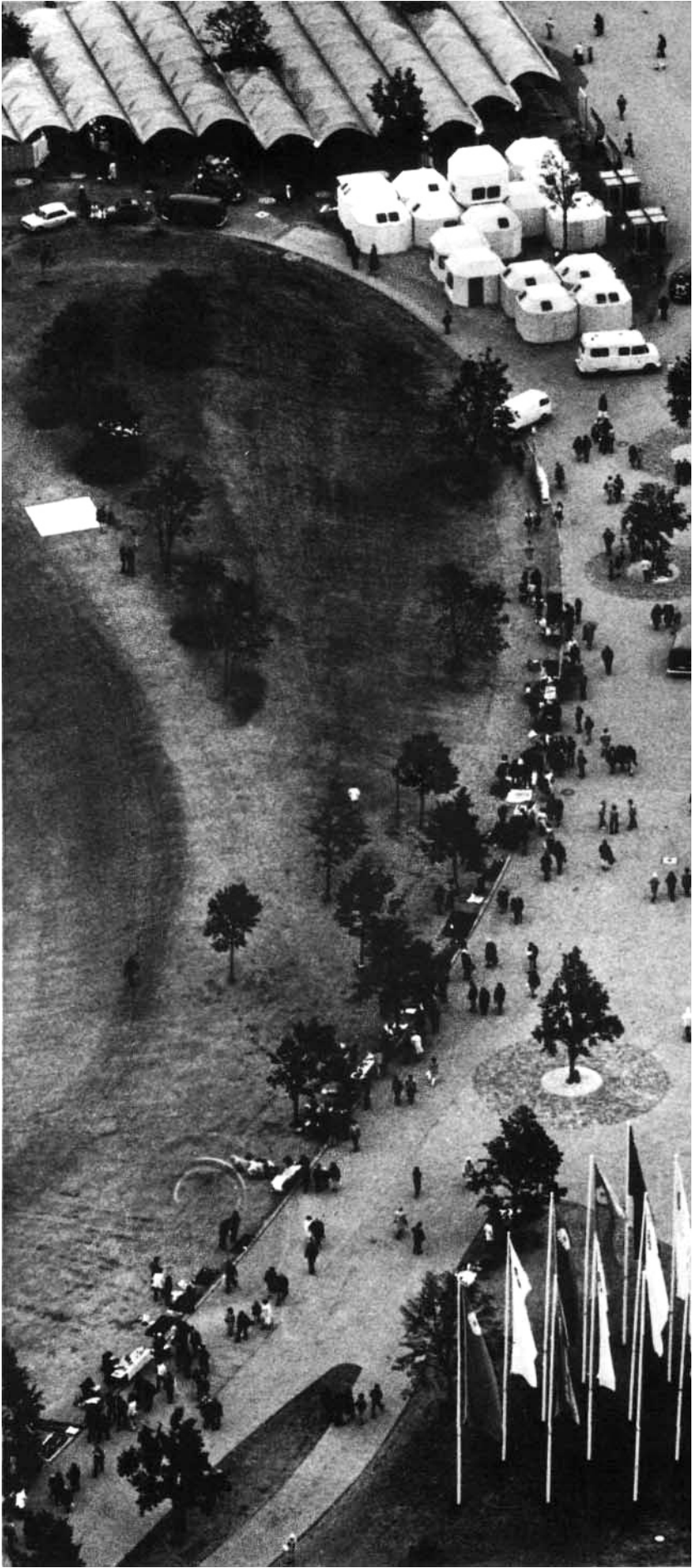
The planners, therefore, established an opposing qualitative pole: openness, simplicity and comprehensibility. This synthesis was created by linking the "Rubble Hill," the lake, the forum, the sports sites and the embankments, and by constructing the main sports facilities with the major part of their spectator facilities below ground. Instead of monumental sports architecture, the result was an interesting, markedly subdivided sports and recreation landscape that is always offering a variety of new aspects. That the intended goal has been realized is due, in the southern part, to having superimposed two systems of configuration. Abstractly considered, these are, first of all, the system of ground configuration with sports sites partially embedded in the ground, and secondly, the system of the roof form that extends over the main sports sites. It is not merely the sum of the individual roofs of the stadium, sports hall and swimming hall; rather it is one roofing structure that lets the area be seen in relation to the landscape. The spatial divisions of the individual parts thus fade into the background.



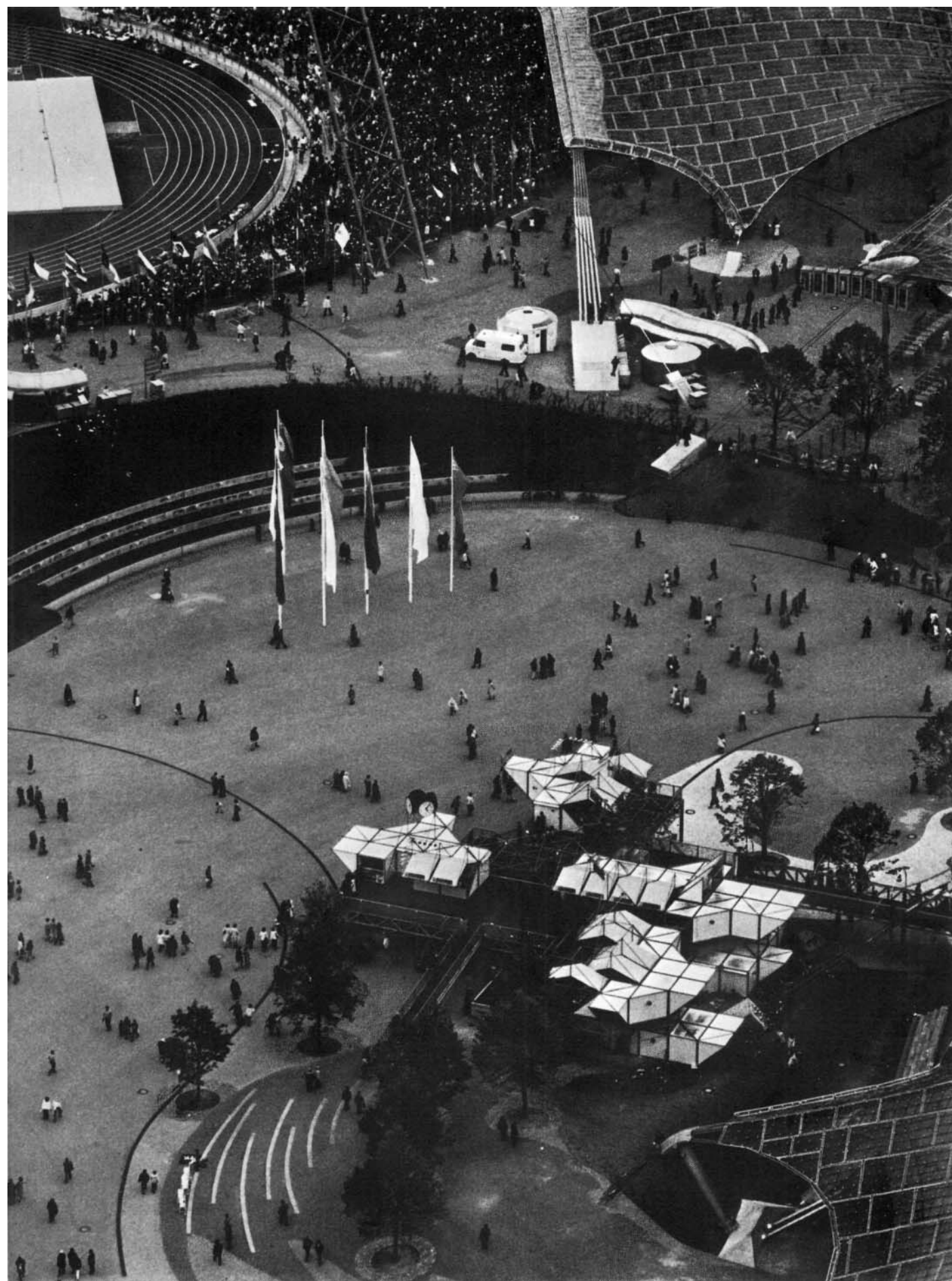




















A hill, a lake, paths, trees, meadows, lawns, activities — these are the essential elements of the landscaping architecture which characterize Olympic Park. Who can still picture, behind all these images of lively or contemplative activity, the flat and bleak Oberwiesenfeld described in the "Construction Chronicle" the way it presented itself just four years before the Olympic Games?

The "Rubble Hill" had indeed already been developed as a green landscape before Olympic planning started, but the shape of the hill was later altered and the possibilities of its usage were thereby increased. Depressions and knolls were formed on the steep slopes to provide shelter from the wind, places to lean against, privacy and viewing points. The planting of the hill was reduced to just a few different varieties.

The lake is an artificial basin sealed with asphalt concrete. It lies three meters above the level of the playing field of the Olympic Stadium. Reed-mace, water iris, water lilies and a marshy area on the south shore give it the character of a natural lake. Wooden bridges and platforms lead down to the water; old trees stand on an island; and the water falls over a spillway down into the lower lake.

The shoreline is lined with white willows. Linden were chosen as the principal trees for the approach paths. They were planted in such a way as to create axes of view that direct the eye towards points within the grounds that are especially worth seeing, and towards the cultivated area around the edges. More than 3,000 trees were planted. These previously stood in Munich's parks and avenues, or they came from nurseries. They were up to 16 meters high at the time of planting, and some trees were as much as 60 years old. Besides the lindens, prominent individual trees were planted, such as oaks, pines and others. These also served as additional aids to orientation.

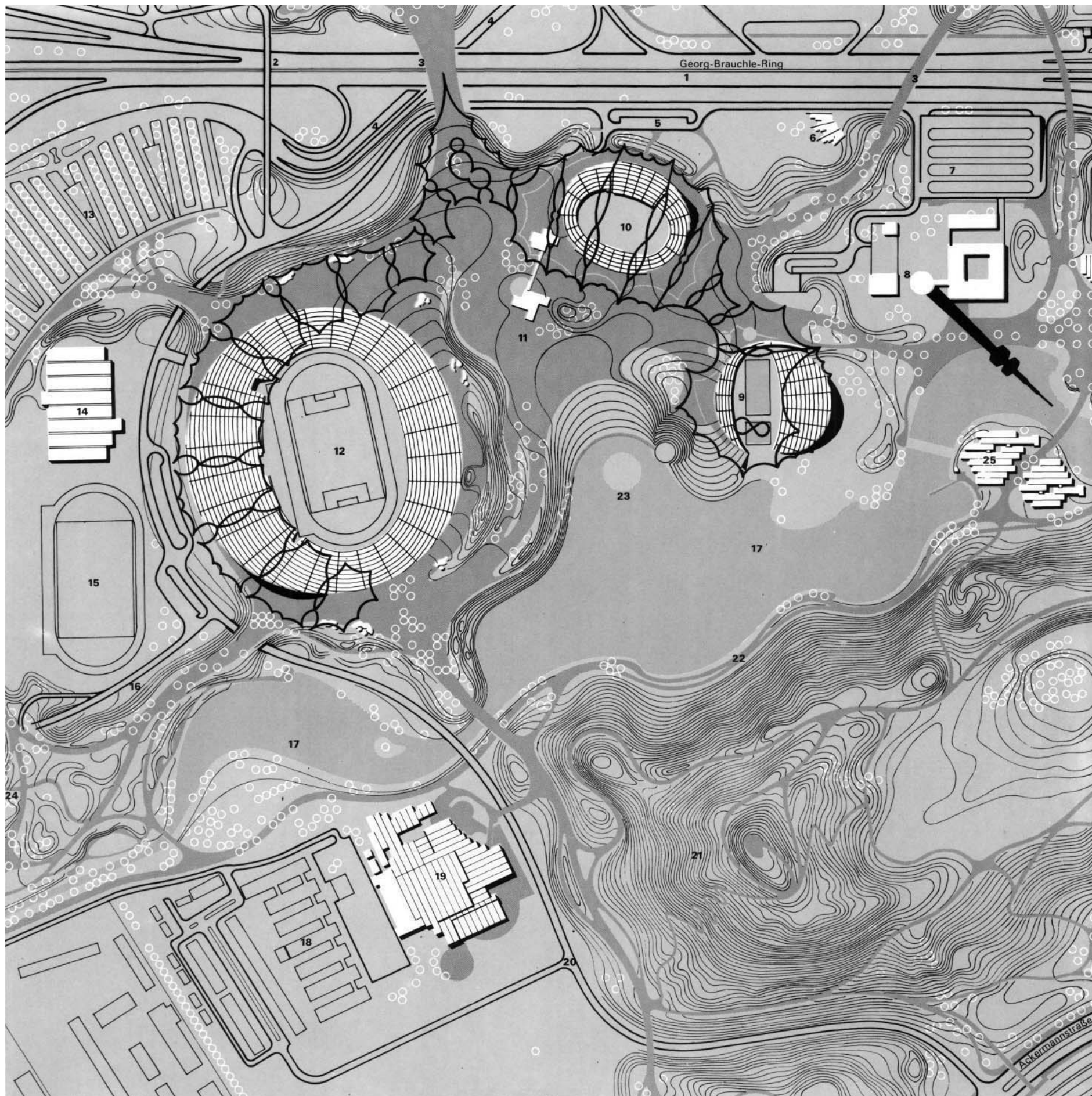
In Olympic Park, on the "Rubble Hill" and on both sides of the pedestrian causeways bloom sage, chrysanthemum, kidney vetch, mullein and many other varieties of flowers. This was in accordance with the planners' desire to integrate the landscape into the city by creating flower meadows with many different species instead of conventional, well ordered flower beds.

Ultimately, it is man who gives life to the greens and recreation areas by his activities. In the park area, which is always freely accessible, summer activities worthy of mention are hiking, strolling, chess and boccie games, picnics, flying model planes, boating and flying kites. There are also playgrounds, playing fields and water sports facilities for children and youths.

In the winter, park visitors may hike, ski cross-country and downhill, toboggan, ice skate and curl.



**The Roof**  
Architects  
Behnisch and Associates:  
Munich/Stuttgart  
Günter Behnisch, Fritz Auer, Winfried  
Büxel, Erhard Tränkner, Karlheinz Weber



**Olympic Park,  
Cut of layout design**

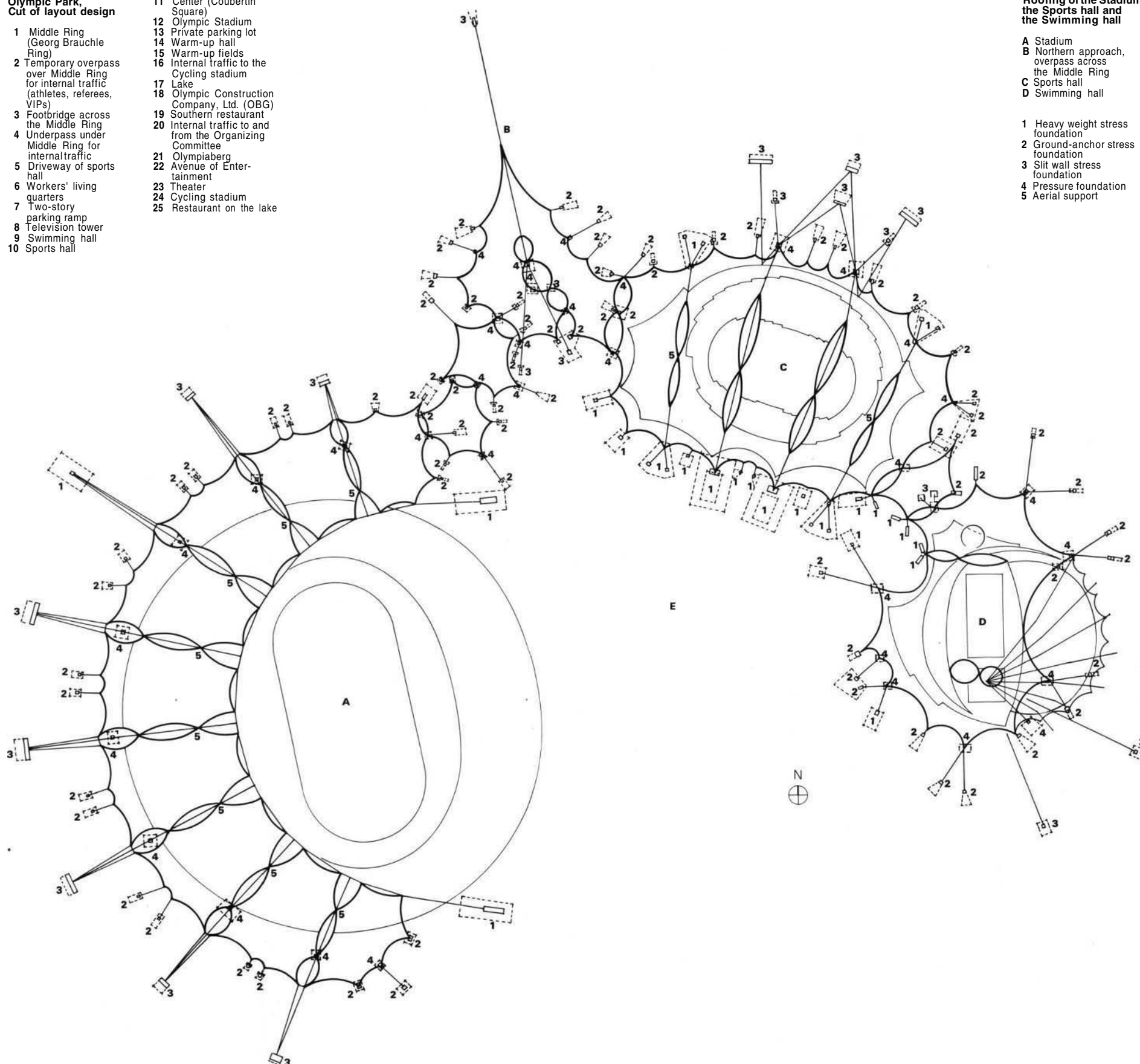
- 1 Middle Ring  
(Georg Brauchle  
Ring)
- 2 Temporary overpass  
over Middle Ring  
for internal traffic  
(athletes, referees,  
VIPs)
- 3 Footbridge across  
the Middle Ring
- 4 Underpass under  
Middle Ring for  
internal traffic
- 5 Driveway of sports  
hall
- 6 Workers' living  
quarters
- 7 Two-story  
parking ramp
- 8 Television tower
- 9 Swimming hall
- 10 Sports hall

- 11 Center (Coubertin  
Square)
- 12 Olympic Stadium
- 13 Private parking lot
- 14 Warm-up hall
- 15 Warm-up fields
- 16 Internal traffic to the  
Cycling stadium
- 17 Lake
- 18 Olympic Construction  
Company, Ltd. (OBG)
- 19 Southern restaurant
- 20 Internal traffic to and  
from the Organizing  
Committee
- 21 Olympiaberg
- 22 Avenue of Enter-  
tainment
- 23 Theater
- 24 Cycling stadium
- 25 Restaurant on the lake

**Roofing of the Stadium,  
the Sports hall and  
the Swimming hall**

- A Stadium  
B Northern approach,  
overpass across the  
Middle Ring  
C Sports hall  
D Swimming hall

- 1 Heavy weight stress  
foundation
- 2 Ground-anchor stress  
foundation
- 3 Slit wall stress  
foundation
- 4 Pressure foundation
- 5 Aerial support







The formal and functional significance of the roof for the total concept of the Olympic Park has been treated in the previous section. The basic principle of construction will be handled here.

The reader of the "Construction Chronicle" will remember that the jury for the architectural competition for Oberwiesenfeld was not in a position to comment on the feasibility of the roof.

The doubts which arose in the first discussions multiplied. Comparative studies with other roof forms were made. Experts were asked about their views in regard to characteristics of technique and materials and functionality for sports. Opinions for and against the roof were collected, discussed, weighed, rejected. Finally dead-lines forced a decision. Despite all the technical difficulties, this decision was prepared by the planners, made by the authorities, and singlemindedly carried out by the construction engineers. At the beginning of the actual planning work, after the acceptance of the tent idea, a cantilever roof was considered.

This would have necessitated a heavy roof covering as a permanent support to prevent distortion from snow and wind.

The requirement of color television that the covering of the west stadium stands be as free from shadows as possible, ruled out this conception. The basic idea of the planners, namely, to provide a roof surface that would give a light and airy impression despite its 75,000 sq.m. could be realized only in the form of a pre-stressed cable network construction. Professor Leonhardt said on the occasion of the "topping off" ceremony for the roof on November 12, 1971: "The competition idea had to be further developed into a workable form, by no means a simple task, considering the large areas which had to be covered without supports. The father of modern cantilever and tent roofs, Professor Frei Otto, made a considerable contribution to the solution, in that he showed how the necessary curvature of the large cable network surface could be achieved by the incorporation of so-called air supports, which are supported by main

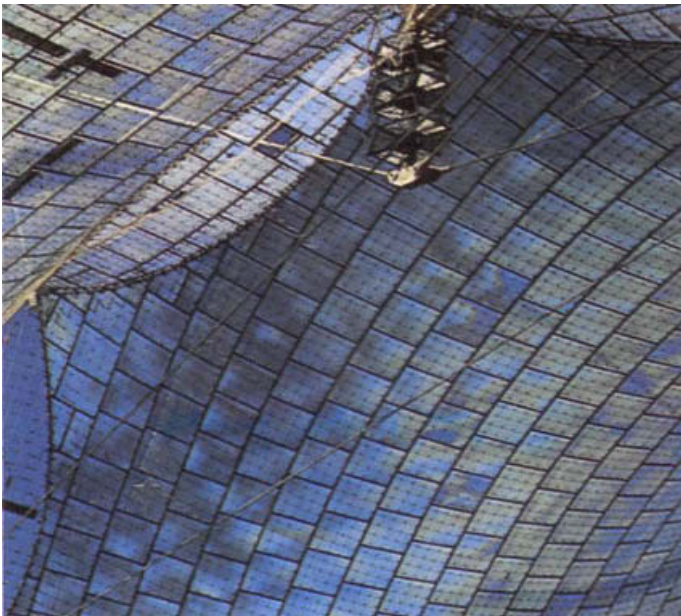
or primary cables from the high masts and which swing in the air on these cables. Thus a good solution for the stadium and the sports hall was born. For the smaller swimming hall it was sufficient to suspend the network from a high mast and stretch it to the edges.

The cable network surfaces had to be curved in saddle-shape in two directions in order to render them with a workable amount of pre-stressing stiff enough to prevent flapping in the wind and sagging from snow."

The Engineering Office of Leonhardt and Andrä, Stuttgart, found in a study that a comparison between pre-stressed cable network roofs and pure hanging roofs hardly showed any economic advantage of one over the other, any more than "one can generally say that one can build more economically with cable network construction than with rigid materials or with shells. On the other hand, cable network construction can hardly be excelled for its versatility and ability to span large areas.

Any desired roof form can be produced. No other method could have achieved such a complete adaption of the roof forms to the diversity of the landscape or buildings as was possible with the Olympic roof." The stress carrying steel cable, which was of very solid composition became the basis of construction. A pre-stressed cable network construction, which consists of cable groups curved and spanned in two directions, conducts the load of the roof surface — that is, its own weight plus snow and wind—together with the pre-stressing load to the edge cables. These again collect the forces of the network and conduct them to the junction knots, which are either stretched with cables directly to stress foundations or are supported by masts standing on pressure foundations. The network is provided with the necessary pre-stressing and stability by the balance of forces, which are transmitted to pressure and stress foundations in the ground via pylons 12 to 81 meters high as well as via the edge cable. The stadium roof has nine continuous sections. The sports hall has five. Each of









these sections is framed by an edge cable, which in the case of the stadium edge cable is anchored directly in the foundation. Otherwise they are suspended from mast-heads or end in corner points, high points or low points. The roof surface of the swimming hall, on the other hand, is supported chiefly by one 81 meter mast.

A roof of this type and size is without precedent and the engineers stood before unexplored territory. It is relatively easy, as Professor Leonhardt emphasized in his "topping off" speech, to calculate the forces for the measurement of the cables and the net. It is much more difficult, however, to determine the exact lengths of the cables. Only the correct proportions could guarantee that the cable network would assume its predetermined form and tensions. Several groups of engineers, therefore, worked in the planning phase. Some examined blueprint data from models, with geodetic error-balancing calculations, others chose the way of purely mathematical treatment using the finite element methods. The roofs for the stadium

and swimming hall were built with blueprints which resulted from the measurement of models. In the case of the sports hall, calculations were accomplished with the help of high performance calculators. Around 2,000 blueprint plans were electronically drawn.

New paths were trod in the construction phase too. Cables had to be developed which had greater tensile strength than previously available. The great forces demanded newly designed extruded steel components and new welding methods. Three types of foundations were used to conduct the forces to the ground:

- "slit wall" foundations working on the principle of a tent peg,
- heavy duty foundations which counteract stress by its own weight and that of the earth above it,
- ground anchor foundations, by which a heavy ground component was attached to the stress cable by means of drilled and pre-stressed anchors.

The construction components were prefabricated by a group of steel companies and

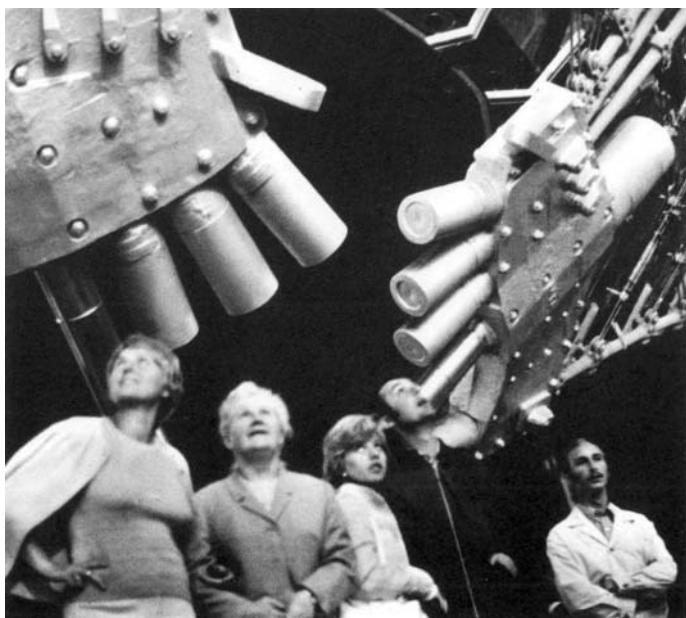
mounted. Except for the edge cable of the stadium, which was assembled on a bridge, all the cables and networks of the roof surfaces were laid out and mounted on the ground. 500,000 knots and 4,000 tiles had to be mounted in their proper positions on the grid. No unplanned snags could be tolerated during the raising of the roof.

The cable network has square segments with a distance of 75 m. between knots. The edge cables have a diameter of 80 mm. and a maximum tensile strength of 300 mp. Cables were coupled together in cases of greater loads. The main cables had to be highly stretch-resistant to prevent any misshaping of the roof, which would otherwise have been probable. Therefore parallel strands were bundled to form stronger cables.

The masts have diameters up to 3.5 meters and are up to 70 mm. thick. They can bear loads of up to 5,000 mp. and stand on rubber grommets which can shift in any direction, and on concrete foundations. Ball bearings were installed under the

bearings to provide for the necessary turning of the masts during the erection of the roof (up to 30°). These were enclosed in concrete after the pylons assumed their permanent positions.

Stretched acrylic glass in the sheets measuring 3 m. x 3 m. was chosen for the roof covering. The plates transmit pressure and suction forces which result from wind, from snow, from the weight of persons on it, and from its own weight, to the fastening points at 75 cm. intervals. For this purpose so-called metal swing buffers were developed, which ensure enough play for the plates. Their return pressure always pushes the plates back to their original positions. The joints between the plates are kept flexible, so that expansion and contraction due to temperature changes can be absorbed without damage. The plates are connected to each other by flexible chloroprene strips. Each joint forms a trough about 5 cm. deep and 1.4 cm. wide. This simultaneously prevents rain water from running all over the roof and overflowing the gutters along the roof edge.



For physical reasons (outside the responsibility of the builders), the sports hall and the swimming hall were provided with inner roofs of overlapping transparent PVC sheets. An air space for cross ventilation was left between the acrylic glass roof and heat retarding, yet moisture proof layer. That the roof has been damaged by excessive heat, however, showed that the inner roof has not lived up to expectations. Even before the Olympic Games there were areas that were discoloring, a fact which led to considerations of replacing the entire ceiling. However, this is the only serious constructional error which has cropped up in the Olympic buildings despite their not inconsiderable dimensions, deadline pressures, and the multitude of new developments.



## **Olympic Stadium**

*Architects:*

*Behnisch and Associates,*

*Munich/Stuttgart*

*Günter Behnisch, Fritz Auer, Winfried*

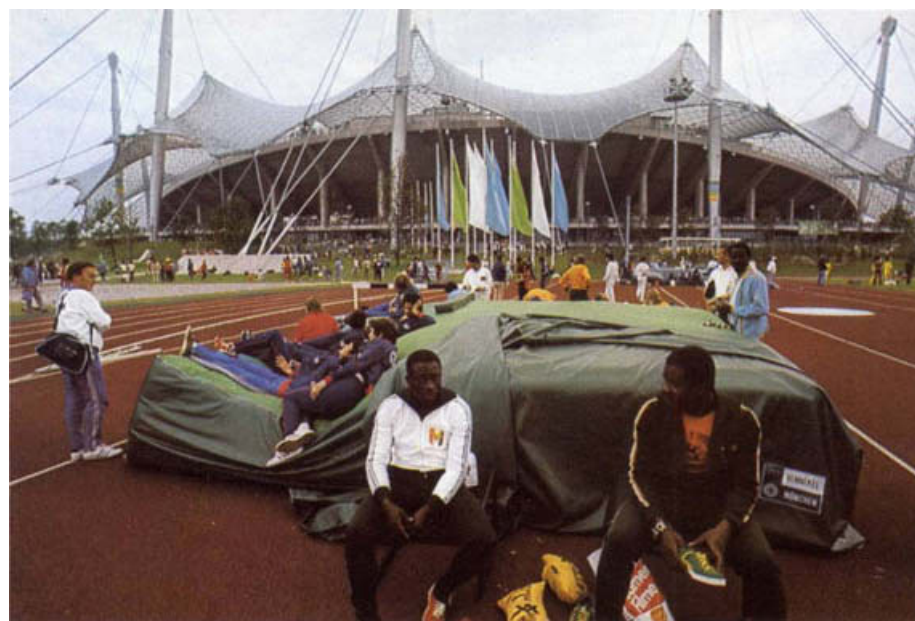
*Büxel, Erhard Tränkner, Karlheinz Weber*



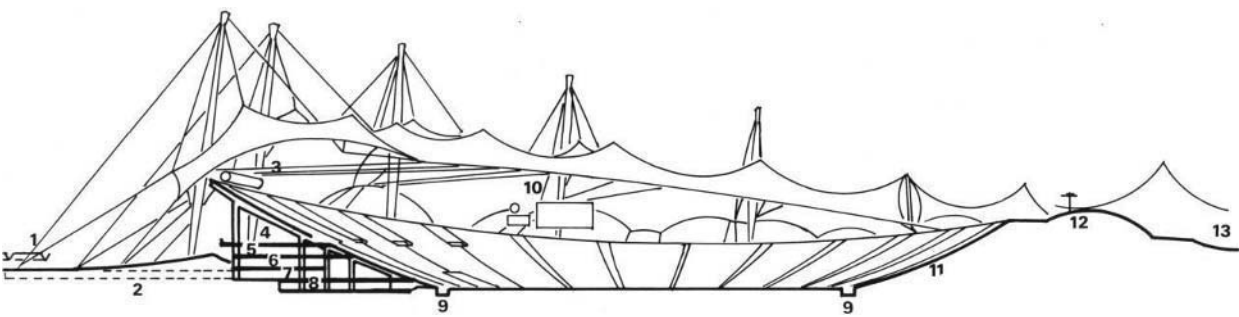


The arena was sold out for almost every occasion, whether it was for the opening ceremony, the athletic events, the football games, the Grand Prix Team Competition or the closing ceremony.

On the training ground opposite the west grandstands the athletes are making their final preparations for the forthcoming contests. Spectators are filling the last of the 80,000 places in the stadium.







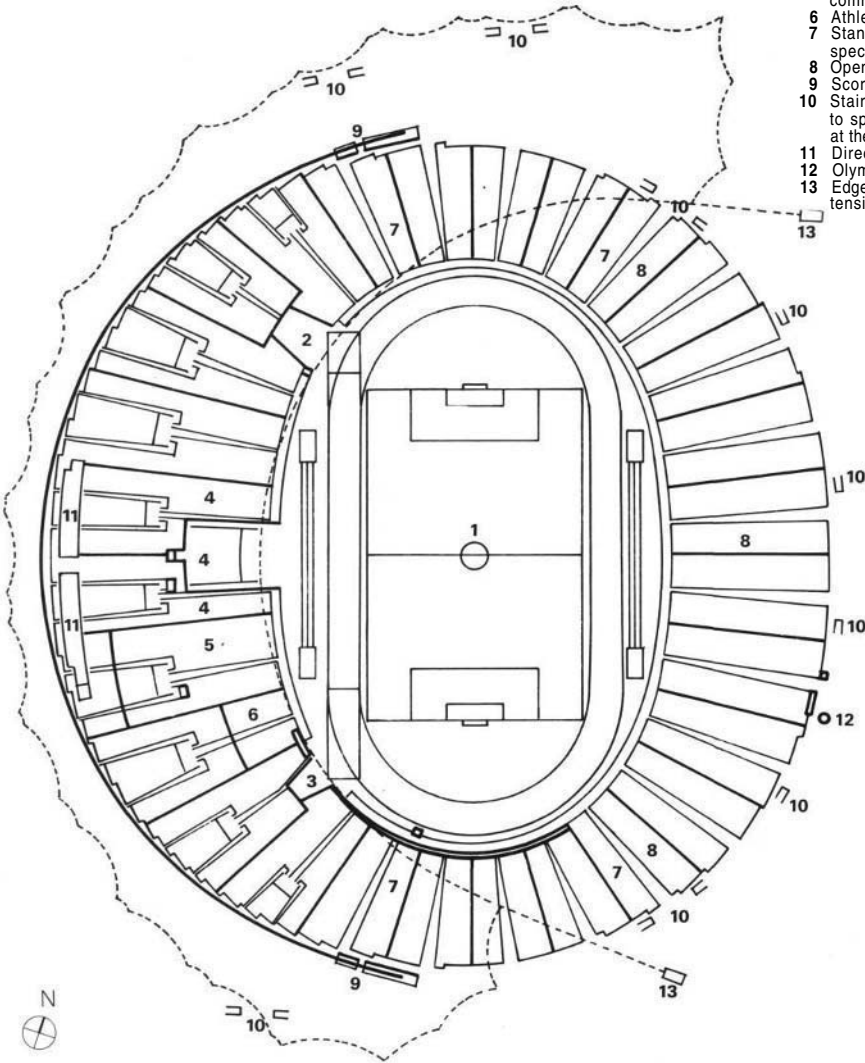
Stadium cross section

- 1 Athletics warm-up hall
- 2 Corridor from warm-up hall to stadium
- 3 Directors' center
- 4 Elevation O-spectators' entrance

- 5 Floor plan level No. 1
- 6 Floor plan level No. 2
- 7 Floor plan level No. 3
- 8 Floor plan level No. 4
- 9 Reporters' pit
- 10 Score board
- 11 Eastern stand
- 12 Olympic flame
- 13 Olympic Center

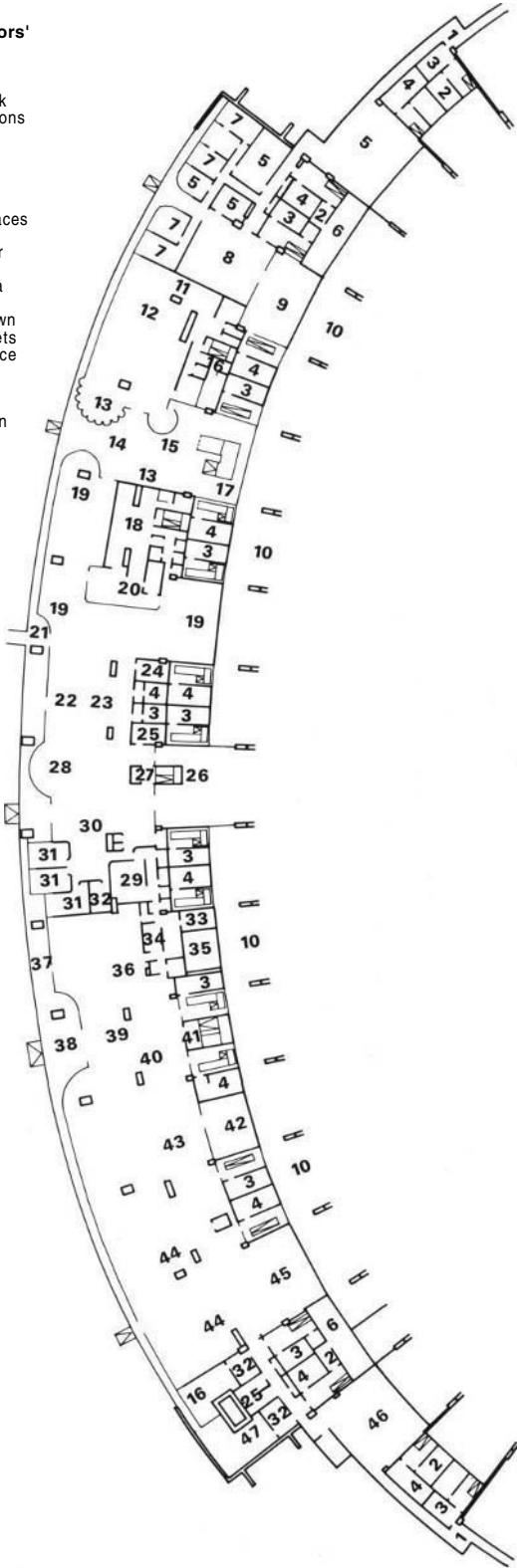
Cross section, Floor plan, spectators' level

- 1 Interior of the Stadium with track and field installations and playing field
- 2 Marathon gate
- 3 Service entrance
- 4 VIP grandstand
- 5 Press and commentators' places
- 6 Athletes' seats
- 7 Standing room for spectators
- 8 Open seating area
- 9 Scoreboard
- 10 Stairs leading down to spectators' toilets at the circumference
- 11 Director's cubicle
- 12 Olympic flame
- 13 Edge cable with tension foundation



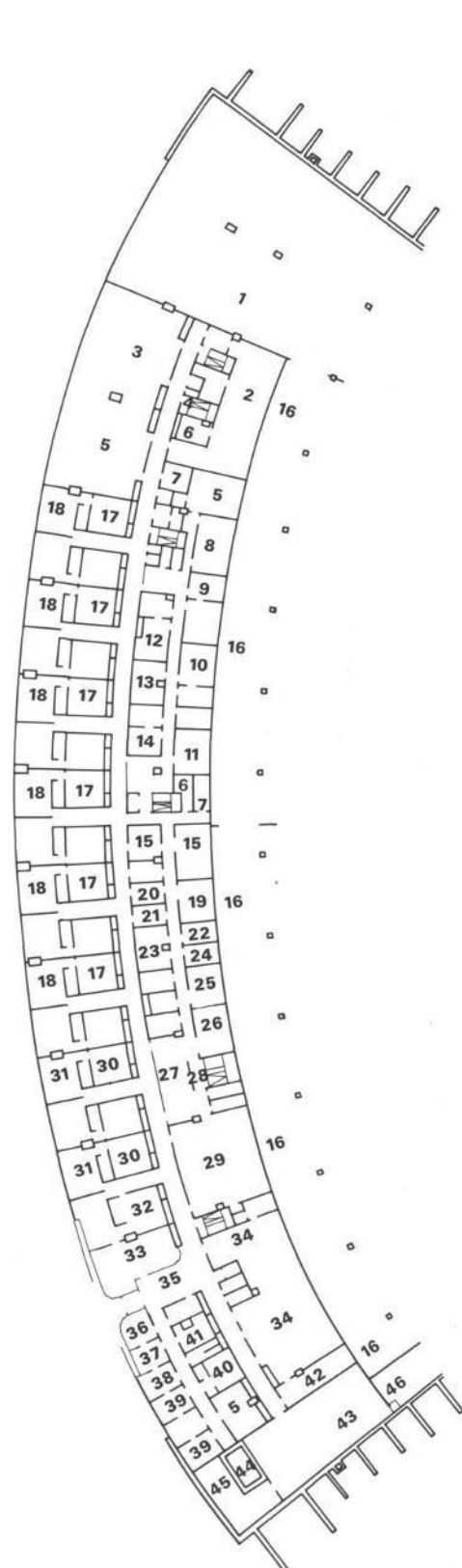
Western stands, Diagram elevation No. 1

- 1 (Installation) hallway to the toilet facilities
- 2 Beverage store room
- 3 Women's toilets
- 4 Men's toilets
- 5 Lounge for short term personnel
- 6 Store room
- 7 Office OC technical
- 8 Canteen for short term personnel
- 9 Inner courtyard
- 10 Air space service access level
- 11 Post office side room
- 12 Special post office
- 13 Telephone exchange and booths for spectators
- 14 Hall special post office
- 15 Information
- 16 Lounge for Post office employees
- 17 Connecting stairway spectators level/post office
- 18 Restaurant-kitchen
- 19 Restaurant
- 20 Food distribution and waiters' passage
- 21 Entrance to the terrace
- 22 VIP Lounge
- 23 Bar
- 24 Supply control
- 25 Hygiene room
- 26 Entry to the VIP area in the stadium
- 27 Stairwell and elevator for VIPs
- 28 Conference room
- 29 Hostesses' lounge
- 30 Information
- 31 Stadium-administration
- 32 Hat and coat check
- 33 Store room for daily supply kitchen
- 34 Kitchen
- 35 Air space studio
- 36 Snack bar for the press
- 37 Terrace
- 38 Entrance to press area
- 39 Press area hall
- 40 Information center
- 41 Entry up to the press seats
- 42 Hostesses' lounge
- 43 Press writing room
- 44 Telephone exchange and booths for the press
- 45 Teletype room
- 46 Print shop
- 47 Press personnel room



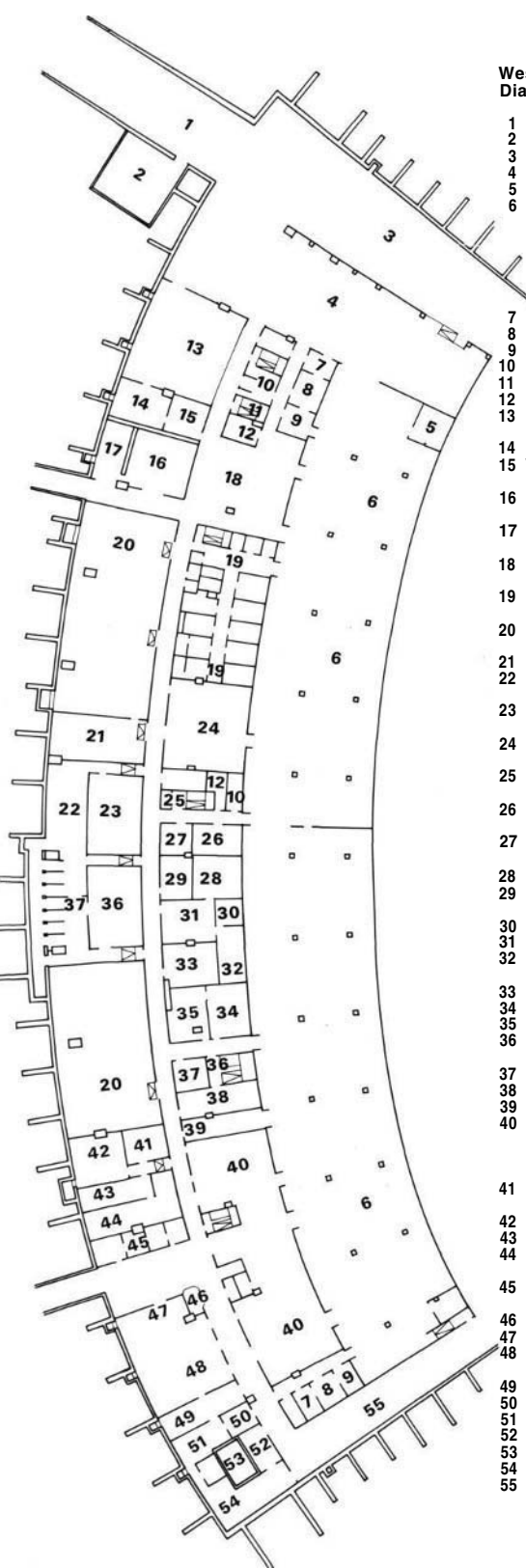
The ground covered by the eastern part of the stadium was excavated in such a way that on this side the stadium is embedded in a hollow for about  $\frac{2}{3}$  of its area. The superstructure on the west side of the oval consists of grandstands for the spectators. The service facilities,

situated mainly on three levels, are only partly above the original level of Oberwiesenfeld. Level 1 is above the approach roads to the full extent of its height. Level 2 is a basement with daylight illumination from the west. Level 3 is completely below street level.



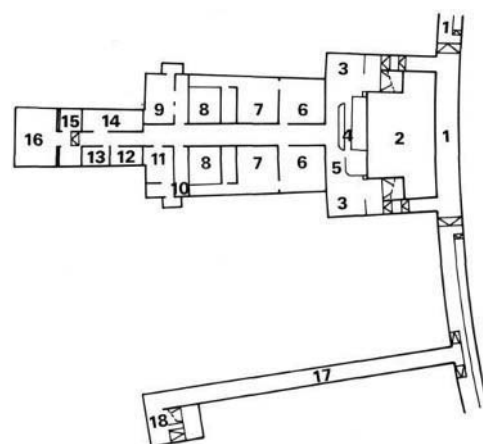
**Western stand,  
Diagram elevation No. 2**

- 1 Air space Marathon gate
- 2 Security stand-by room
- 3 Coat room for employees
- 4 Stairway for athletes
- 5 Massage and lounge
- 6 Toilets
- 7 Copying room
- 8 Conference room
- 9 Office of the International Amateur Athletic Federation (IAAF)
- 10 Office of the German Athletics Association (DLV)
- 11 Hostesses' lounge
- 12 Office of the German Football Association (DFB)
- 13 Lounge
- 14 Office of the International Football Association (FIFA)
- 15 Subcenter of the American Broadcasting Company (ABC)
- 16 Air space service access level
- 17 Athletes' shower and wash room
- 18 Athletes' locker and massage rooms
- 19 Subcenter of the German Olympia Center (DOZ)
- 20 Radio recording studio
- 21 Equipment room
- 22 Radio receiving room
- 23 Personnel lounge
- 24 Control room
- 25 Studio
- 26 Directors' room
- 27 Athletes' waiting room
- 28 Stairway connecting the press seats
- 29 Interview room
- 30 Referees' shower and wash room
- 31 Referees' locker room
- 32 Referees' lounge
- 33 Referees' stand-by room
- 34 Central telephone exchange
- 35 Athletes' entrance
- 36 Waiting room
- 37 Reception room
- 38 Doctors' room
- 39 Treatment room
- 40 X-ray room
- 41 Laboratory
- 42 Main dispensary station
- 43 Telephone exchange-Olympia Information
- 44 Pylon foundation
- 45 Coat check room
- 46 Air space of smaller Marathon gate



**Western Stand,  
Diagram elevation No. 3**

- 1 Entry
- 2 Rubbish storage area
- 3 Marathon gate
- 4 Entry to service level
- 5 Air exhaust equipment
- 6 Service level
- 7 Hygiene room
- 8 Doctors' office
- 9 Sick bay
- 10 Women's toilet
- 11 Athletes' stairway
- 12 Men's toilet
- 13 Data processing installation
- 14 Technicians' room
- 15 Visitors' room-data processing
- 16 Side room-data processing
- 17 Air conditioning equipment
- 18 Athletes' readying room
- 19 Side rooms of the restaurant
- 20 Heating and ventilation center
- 21 Cleaning rooms
- 22 High voltage installation-power plant
- 23 High voltage installation pickup
- 24 Central electronic data processing
- 25 VIP stairway and elevator
- 26 Equipment to increase water pressure
- 27 Connection room main water pipe
- 28 Relay station
- 29 Mail office storage room
- 30 Oil storage room
- 31 Equipment room
- 32 Emergency current generator
- 33 Battery room
- 34 Police
- 35 Fire department
- 36 Stairway for press and reporters
- 37 Post office employees
- 38 Lounge, medical staff
- 39 Fertilizer storage
- 40 Storage space for large sport equipment and grounds maintenance equipment
- 41 Radio interference elimination room
- 42 Mail transfer room
- 43 Coupling room
- 44 Mechanical and control room
- 45 Employees' locker and shower/wash room
- 46 Doorman
- 47 Work hall
- 48 Room for technical equipment store board
- 49 Masons
- 50 Timing device storage
- 51 Painters' storage
- 52 Electricians' storage
- 53 Pylon foundation
- 54 Lumber storage
- 55 Small Marathon gate



**Western stand,  
Diagram elevation No. 4**

- 1 Sunken reporters' dug-out
- 2 Ready area at field level
- 3 Foyer
- 4 Contest Office
- 5 Lottery and lineup room
- 6 Locker and massage room
- 7 Shower and washroom
- 8 Relaxing pool
- 9 Physicians' office and treatment room (During the Olympics, it served as the winners' preparation room.)
- 10 Timing
- 11 Judges' locker room
- 12 Women's toilet
- 13 Men's toilet
- 14 Elevator
- 15 Machinery room
- 16 Rain water cistern
- 17 Entry to reporters' pits
- 18 Press and reporters' stairway



Interval between the morning and afternoon events. At the apex of the northern curve of the arena the bandstand for the musicians who play at the prize-giving ceremonies is still unoccupied. A number of spectators are enjoying a peaceful rest during the lunch-hour after the exciting events of the morning. The open-air seats for spectators on the east grandstand are opposite those for athletes, the press and guests of honor in the south-west and west. Standing room segments have been inserted in the north and south curves. The reporters' dug-out separates the arena from the spectators' stands for the greater part of its circumference. Access to it can only be gained through the Marathon Gate, the stand for guests of honor and a service entrance. A single layer of solid polyurethane plastic material was used to surface the eight-lane track, the long-jump runways situated in front of the west and east grandstands, the segments of the curves with the installations for the high jump, the javelin, discus and hammer throw, and the water jumps for the hurdle race. This surface ensures equal chances on all tracks. The playing field in the stadium is equipped with a fully automatic watering system. A warm-water heating installation, with plastic pipes laid 25 cm. below the surface of the field, guarantees that it will be free of snow and ice even under the worst weather conditions.







The athletic events are sold out; there is nobody in attendance at the ticket-offices situated at the spectators' main entrances. At this time they are rarely in use, thanks to the extraordinarily large demand for advance tickets for all the events of the Olympic Games. The number of ticket offices was determined primarily in view of the requirements after the Olympics.

Under the west grandstand, on level 1 a special post office is accessible from the spectators' area. Apart from providing normal postal services, it meets the large demand for the special Olympic stamps and postmarks.

In the Press Center, from which there is direct access to the seats for the press on the west grandstand. One hundred desks, together with telephone and telex connections and television programs from the various competition sites, ensure excellent working conditions and the necessary flow of information.

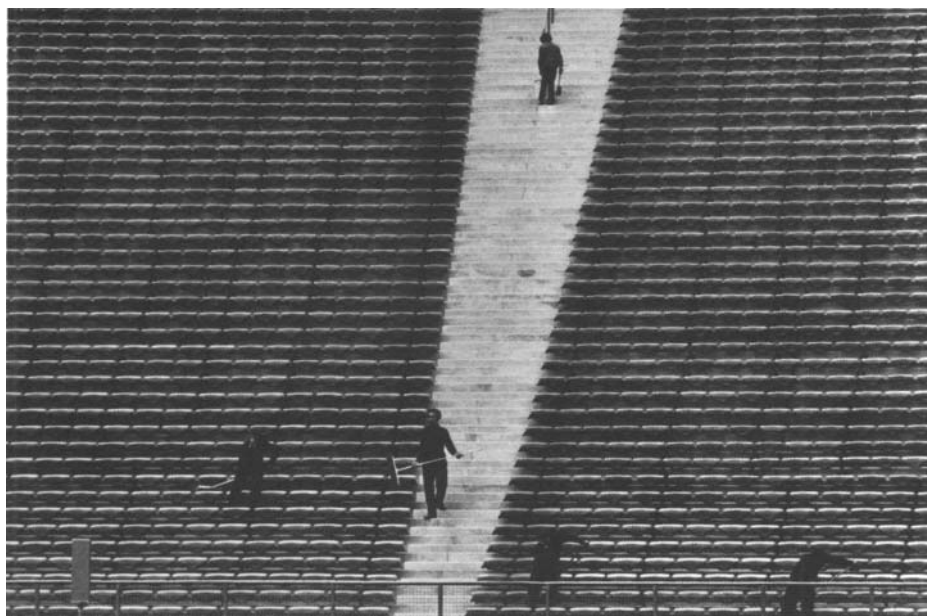
Each of the 1,700 places for the press in the stadium is equipped with a monitor and a telephone. The schedule for the places of work was drawn up in conjunction with the International Sports Press Association (AIPS) and is identical in all competition sites.

The interviewing rooms, the lounges for guests of honor, athletes and judges, the changing-rooms and sanitary facilities, the rooms for the press and the competition organization are all air-conditioned. Ventilation units provide an unvarying air temperature and humidity, thus ensuring good and pleasant working and resting conditions.

Located immediately behind the grandstand for guests of honor with its 300 seats, are a restaurant, a bar, lounges and offices for the International Olympic Committee, the Organizing Committee and for guests of honor from all over the world.







The oblique concrete frames with fixed ends, cast on location, carry pre-cast concrete steps in the form of box girders with a span of up to 15 m. The ceilings of the four floors (levels), also cast on location, are suspended between these frames.

The area above level 1, the top floor, is reserved for spectators, who arrive at the stadium from the parking places and the terminals of the public transport services by way of bridges, embankments and the plateau of Olympic Park. After passing the ticket offices and a ticket control, they enter the gallery in the north and south of the stadium at the top level of the grandstands. Besides giving access to the spectators' seats, the gallery in the west grandstand also serves as a foyer and contains kiosks for the sale of fruit, drinks, food and souvenirs. The toilet facilities are situated at the west side on the next floor down, level 1. In the case of the embankment grandstand they are located underground, under the gallery.



The east grandstand: The planning of all Olympic competition sites was guided by the principle of offering the spectator a good view from every seat and providing an adequate area of movement for the filling and emptying of the grandstands, thus providing comfort and fulfilling the demands of security. The determination of the line of sight—which directs the eyes of each spectator in the stadium to a point 8.80 m. in front of the first row of the grandstand (about the middle of the long jump from the straight sections, or the middle of the 6th lane from the curves)—resulted in a parabolically sloped grandstand. The tiers have a seat depth of 80 cm., their height is 21 cm. in the lower part and 48 cm. in the upper part of the grandstands. The highest point above the level of the playing field is 29 m. in the east; the lowest points, 14 m. above the field level, are in the north and south.

Spectators enter the embankment grandstand from a gallery which extends around the top. The west grandstand has ten

gates half way up the tiers. From the gates the spectators can proceed upwards or downwards to their seats. The dimensions of the stairs, openings, passages, and doors are large enough that the stadium can be emptied within 10 minutes.

After modeling the terrain of the embankment grandstand, the concrete work for the seating and standing areas was completed on the spot. The area is made up of 10 m. x 10 m. slabs, separated by expansion joints. They are anchored to the ground by plugged steel piling, 3 m. in length, in order to prevent them from sliding as a result of movements caused by material or temperature changes. The slabs carry the step-like terraces for seats and standing-room. In the seating area the seats are attached to uprights. The seats are anatomically designed and are made of flame-resistant plastic. Their supports are of metal, and are bolted to a continuous metal tube.





Guests of honor, reporters, organizers and assistants enter the west side of the stadium through lower passages to which spectators have no access. On level 1, they find a floor which lies approximately at the original level of Oberwiesenfeld and is well illuminated by windows to the west. Here, in a spacious and integrated arrangement, are a special post office, the lounge and restaurant for guests of honor, offices and a snack bar for the press, and offices and rest rooms for members of the Organizing Committee and the sport federations participating in the Games.

Level 2 can also be entered directly from the street. It contains the rooms for athletes and judges, as well as the corresponding service rooms (changing, medical, massage and rest rooms). On the side facing the arena there are studios and interviewing rooms and also the telephone exchange for all Olympic sports sites in Munich and the Olympic Village. Level 3, bounded by the Marathon Gate in the north-west and the arena's

service entrance in the south-west, contains the heating, ventilation and electrical installations. Cool or warm air is distributed from here to the four floors of the stadium. The extensive store-room for sports equipment, the workshops, and the central data processing equipment for the Olympic Games are also situated on this level. The remaining space is used for parking the mobile television units, fire engines and ambulances.

A small annex housing additional changing and medical rooms for football teams, is situated approximately on the level of the playing field at the center point of the west grandstand. The competition organization office facing the arena extends in front of these changing rooms below the parapet of the VIP stand.



A steel cabin mounted on supports on top of the west grandstand, contains the center for controlling the entire organization of events. This cabin gives the impression of being a piece of technical apparatus rather than a building.

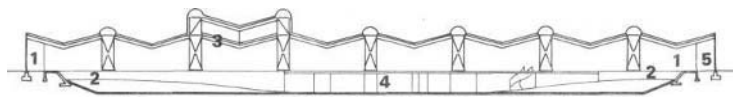
The northern section contains rooms for preparing the release of results, for the control of the scoreboards, for making announcements over the public address system, for the electronic measuring equipment employed for the throwing events and, in a gondola suspended underneath the cabin at the south end, rooms for electronic and photographic timing instruments. The southern part accommodates twenty commentators' cabins with the corresponding technical control rooms.

The floodlighting installation consists of a four-point system with a vertical illumination power of 1,800 lux. There are two batteries of floodlights mounted on inclined lattice masts on the east grandstand, two batteries attached to the

peripheral cable of the roof, and supplementary lighting platforms below the roof for illuminating the west grandstand and the home stretch of the track.

The two systems for indicating the results of the competitions are situated above the north and south curves. Each consists of an score board measuring 18 m. x 8 m., a 7 m. x 3 m. timer and a clock. The indicator boards carry a grid of light bulbs with which letters of different sizes and types can be formed. By feeding in the appropriate control card, symbols and horizontally or vertically moving lines of words can be displayed. This written information is supplemented by announcements made over a public address system, consisting of a cluster of loud-speakers suspended at a height of 35 m. from the front edge of the roof in conjunction with other loudspeakers located along the reporters' dug-out which encircles the arena.





**Longitudinal section**

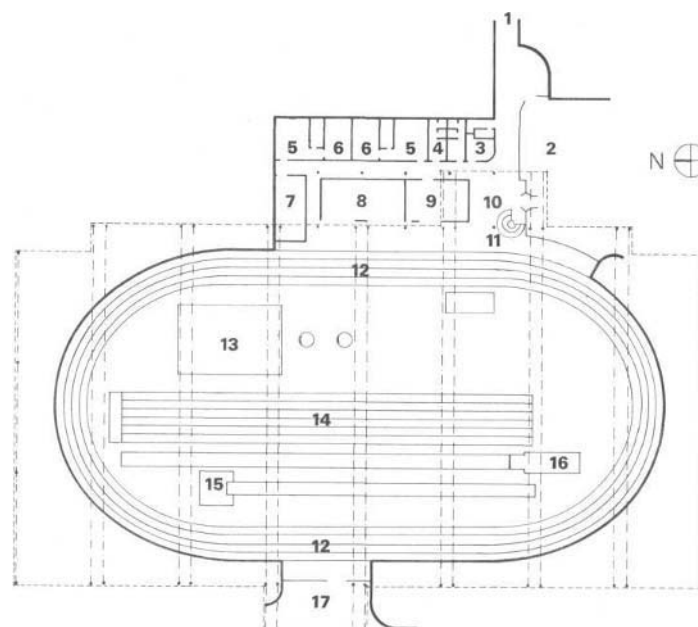
- 1 Upper passageway
- 2 Banked curve
- 3 Vertical extension of hall in pole vaulting area
- 4 Warm-up hall, in back-ground the auxiliary wing
- 5 Level of the warm-up field

A warm-up gymnasium with a 200 m. track is situated west of the stadium, adjacent to the open-air training ground. It is built below ground level for half of its height.

The curves of the track are banked. Jumping installations, a short track and a pitch for shot put are accommodated in the inner area in such a way that the athletes can practise for various athletic events under undisturbed conditions. The floor of this gymnasium, like the other training and competition sites, is surfaced with a solid plastic material. Thus all locations have the same conditions for training and competition.

The gymnasium and the open-air training ground are connected to the stadium by a tunnel. This leads to the stand-by room from which the athletes go through the Marathon Gate into the arena. After their participation in an event they return to their changing-rooms through the south service entrance.



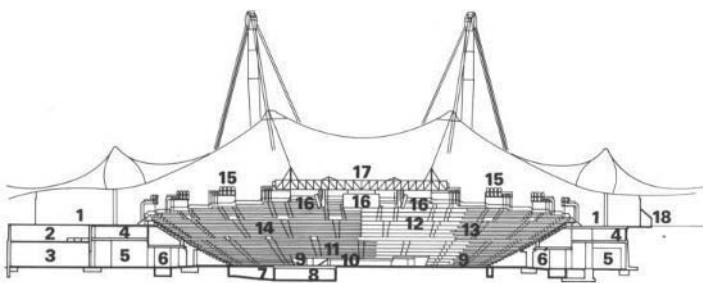


**Lower level diagram**

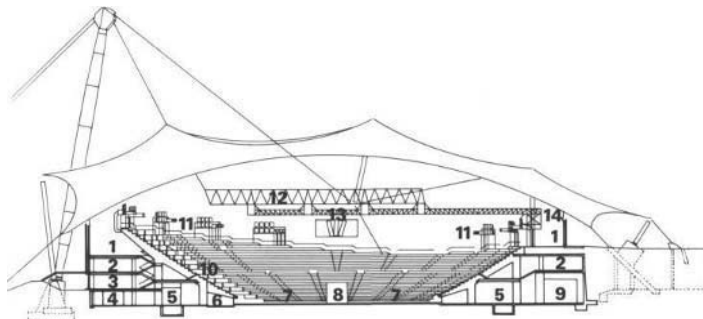
- 1 Tunnel leading to western grandstand
- 2 Entrance and lobby for warm-up area
- 3 First-aid room
- 4 Trainers' room
- 5 Dressing room
- 6 Showers and washroom
- 7 Technical apparatus
- 8 Equipment room
- 9 Conditioning and exercise room
- 10 Entrance hall
- 11 Stairway to gallery
- 12 200 m. track with banked curves
- 13 Shotput trench
- 14 60 m. sprinting track
- 15 Pole vaulting area
- 16 Broadjump area
- 17 Emergency exit



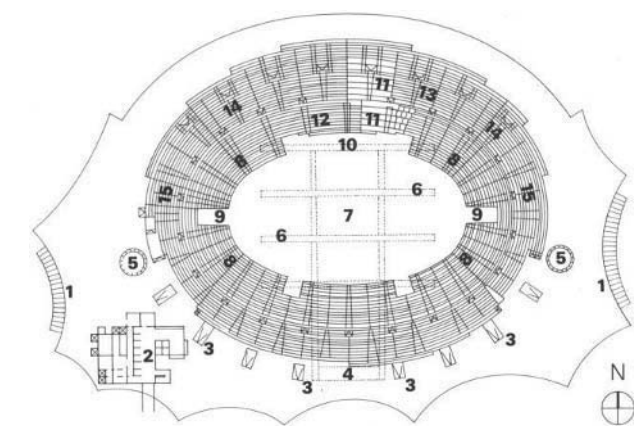
**Sports Hall Olympic Park**  
*Architects:*  
*Behnisch and Associates,*  
*Munich/Stuttgart*  
*Günter Behnisch, Fritz Auer, Winfried*  
*Büxel, Erhard Tränkner, Karlheinz Weber*



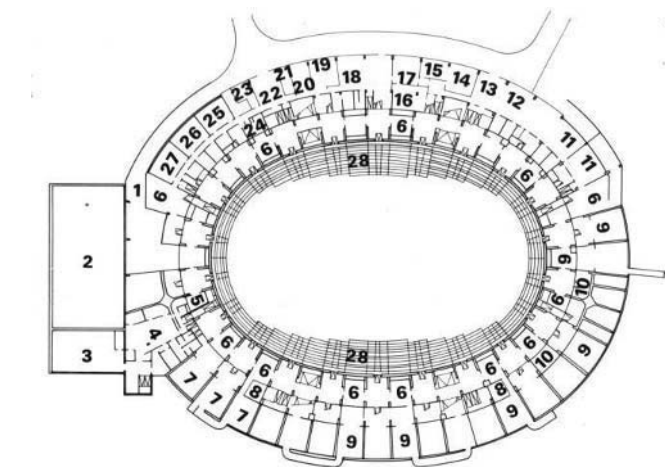
- Longitudinal section**
- 1 Entrance floor
  - 2 Bowling alley and restaurant
  - 3 Warm-up hall (small gym)
  - 4 Foyer level
  - 5 Drive and entrance into the arena or storeroom
  - 6 Ring Strasse-service road
  - 7 Spectator tunnel
  - 8 Pit under the shot put area
  - 9 Collapsible grandstands
  - 10 Direction
  - 11 Seats for guests of honor
  - 12 Seats for television commentators
  - 13 Seats for the press
  - 14 Seats for spectators
  - 15 Floodlight batteries, heating and ventilation installations
  - 16 Score board
  - 17 Lighting platform
  - 18 Vestibule and ticket inspection



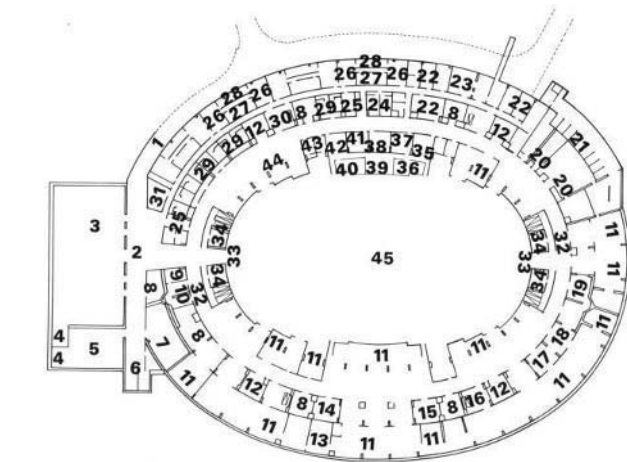
- Cross section**
- 1 Entrance level
  - 2 Foyer level
  - 3 Administration level
  - 4 Arena level
  - 5 Ring Strasse-service road
  - 6 Central direction booth
  - 7 Collapsible grandstands
  - 8 Ramp to the arena
  - 9 Storeroom
  - 10 Seats for the television commentators
  - 11 Floodlight batteries, heating and ventilation
  - 12 Lighting platform
  - 13 Score board
  - 14 Direction booth



- Floor plan level 1 Grandstand level**
- 1 Vestibule and ticket inspection
  - 2 Branch post office
  - 3 Stairway down to foyer level
  - 4 Stairs up to direction booth and to the lighting platform
  - 5 Lowest point of the roof
  - 6 Lighting platform
  - 7 Air space over the arena
  - 8 Collapsible grandstand in the area of the Cycling track and athletics track
  - 9 Connection ramp to Ring Strasse
  - 10 Landing, direction center
  - 11 Places for TV commentators
  - 12 Places for guests of honor
  - 13 Press
  - 14 Seats for spectators
  - 15 Standing room for spectators



- Floor plan level 3 Administration level**
- 1 Service driveway
  - 2 Air space of warm-up hall (small gym)
  - 3 Pantry of restaurant
  - 4 Kitchen of restaurant
  - 5 Technical workshop
  - 6 Ventilation
  - 7 Air space, technical room
  - 8 Air space, garbage room
  - 9 Air space, storeroom
  - 10 Workshop storeroom
  - 11 Teletype and telephone
  - 12 Writing room
  - 13 Entrance hall for the press
  - 14 Cafeteria
  - 15 Office for the architect, OBG (Olympic Construction Co.) and engineers
  - 16 Television subcenter
  - 17 Office of Organizing Committee
  - 18 Entrance hall for guests of honor
  - 19 Office of sports hall supervisor
  - 20 Office of technical supervisor
  - 21 Information
  - 22 Entrance for athletes, service personnel and security units
  - 23 Traffic supervisor
  - 24 Stand-by room for police
  - 25 Locker room for ticket takers
  - 26 Locker room for female personnel
  - 27 Locker room for male personnel
  - 28 Permanent grandstands

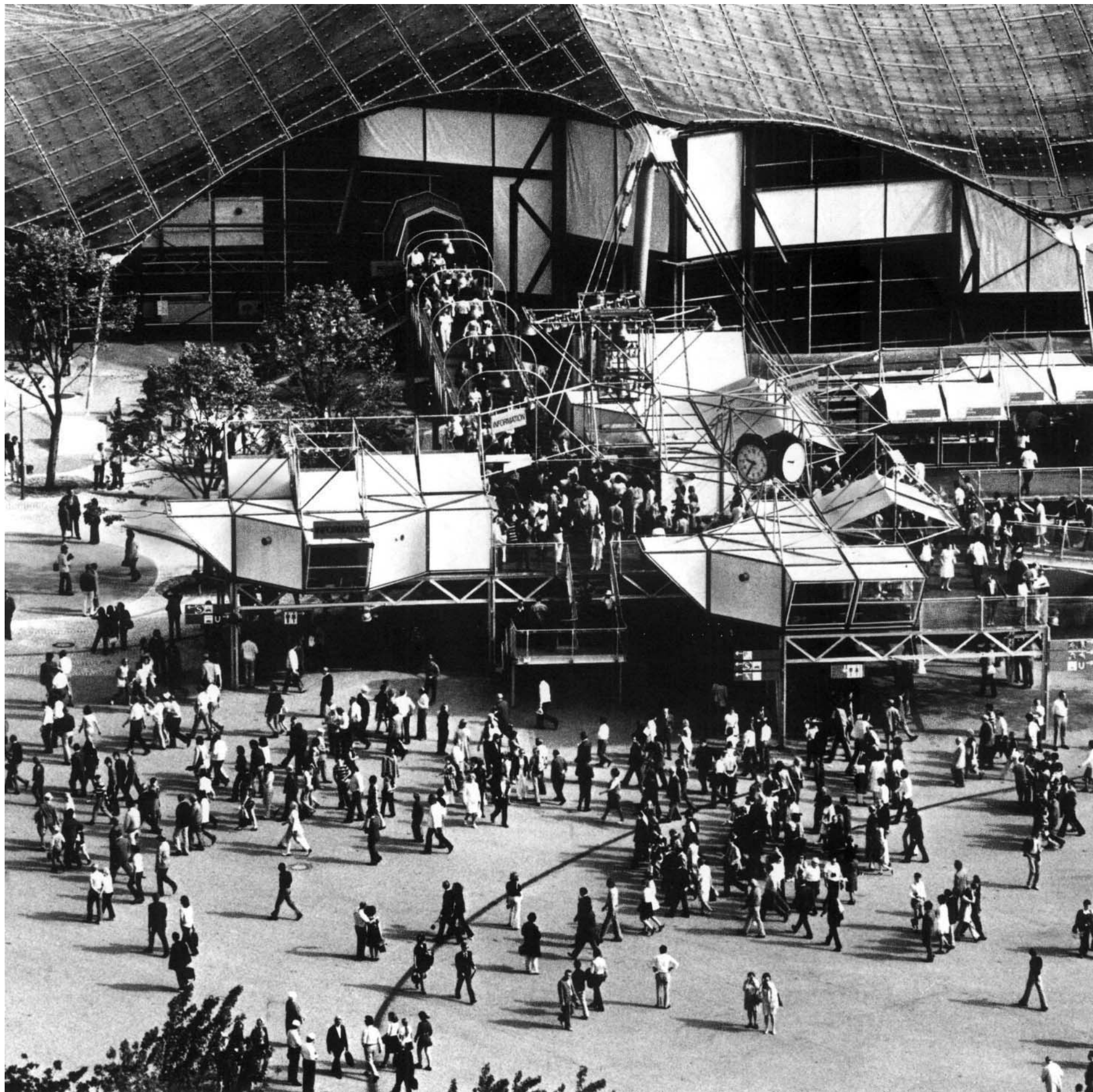


- Floor plan level 4 Arena**
- 1 Service driveway
  - 2 Approach and entrance into the arena
  - 3 Warm-up hall (small gym)
  - 4 Apparatus
  - 5 Calisthenics hall
  - 6 Freight elevator and stairs up to the kitchen, pantry, bowling alley and foyer
  - 7 Work out room
  - 8 Ventilation facilities
  - 9 Control room
  - 10 Waiting room
  - 11 Storeroom
  - 12 Garbage room
  - 13 Cold storage
  - 14 Painters' workshop
  - 15 Workshop for PA system
  - 16 Stairs for personnel
  - 17 Metal working shop
  - 18 Carpentry workshop
  - 19 Electrical workshop
  - 20 Energy transfer station
  - 21 Transformer station
  - 22 Television studios
  - 23 Interview room
  - 24 Referees' room
  - 25 Health room
  - 26 Locker room
  - 27 Showers and washroom
  - 28 Massage room
  - 29 Performers' cloak room
  - 30 Stairs for athletes
  - 31 Boiler room
  - 32 Ring Strasse - service road
  - 33 Ramp to the arena
  - 34 Toilets
  - 35 Waiting room for interviews
  - 36 Statistics analysis
  - 37 Printing and mimeographing
  - 38 Competitions office
  - 39 Direction
  - 40 Referees' room
  - 41 Low voltage equipment
  - 42 Waiting room for ceremonies honoring winners
  - 43 Doping control
  - 44 Storeroom for sports equipment
  - 45 Arena

The sports hall is the connecting link between the Olympic Stadium to the west and the swimming stadium to the east. It borders the Olympic Center in the north and at the same time shields it from the "Mittlerer Ring" road. As in the case of the Olympic Stadium and the swimming stadium, it was not desired that the sports hall appear grandiose. It is therefore embedded in a hollow of the terrain. Viewed from the access level for spectators, the interior appears as an arena; on the other hand, the purpose of modelling it in this way was to reduce the visual impression of the expansion of the arena necessitated by the variety of its uses — after all, a volume of 427,300 cubic meters is enclosed. This gives the entire structure an acceptable dimension.

The longitudinal axis of the arena runs approximately from east to west. The entrances for spectators are located at the eastern end (accessible from the subway) and western end (accessible from the suburban railway, tramway and the stadium). Near the west entrance there is a platform with a post office, a cafeteria and kiosks. It is connected by a footbridge with another platform inside the Olympic Center, on which there are information kiosks and a carillon.

During the Olympic Games the hall was used for gymnastics and handball. It was, however, designed as a multi-purpose building in which many other kinds of sports and exhibitions, meetings and shows can also be held. The layout of the grandstands is determined by the shape of a 200 meter cycling track and an athletics track of equal length. The interior area available for sports events measures 100 m. at its greatest length and 50 m. at its greatest width. The hall itself is 200 m. long and 120 m. wide along its two axes. Its maximum height is 35 m.

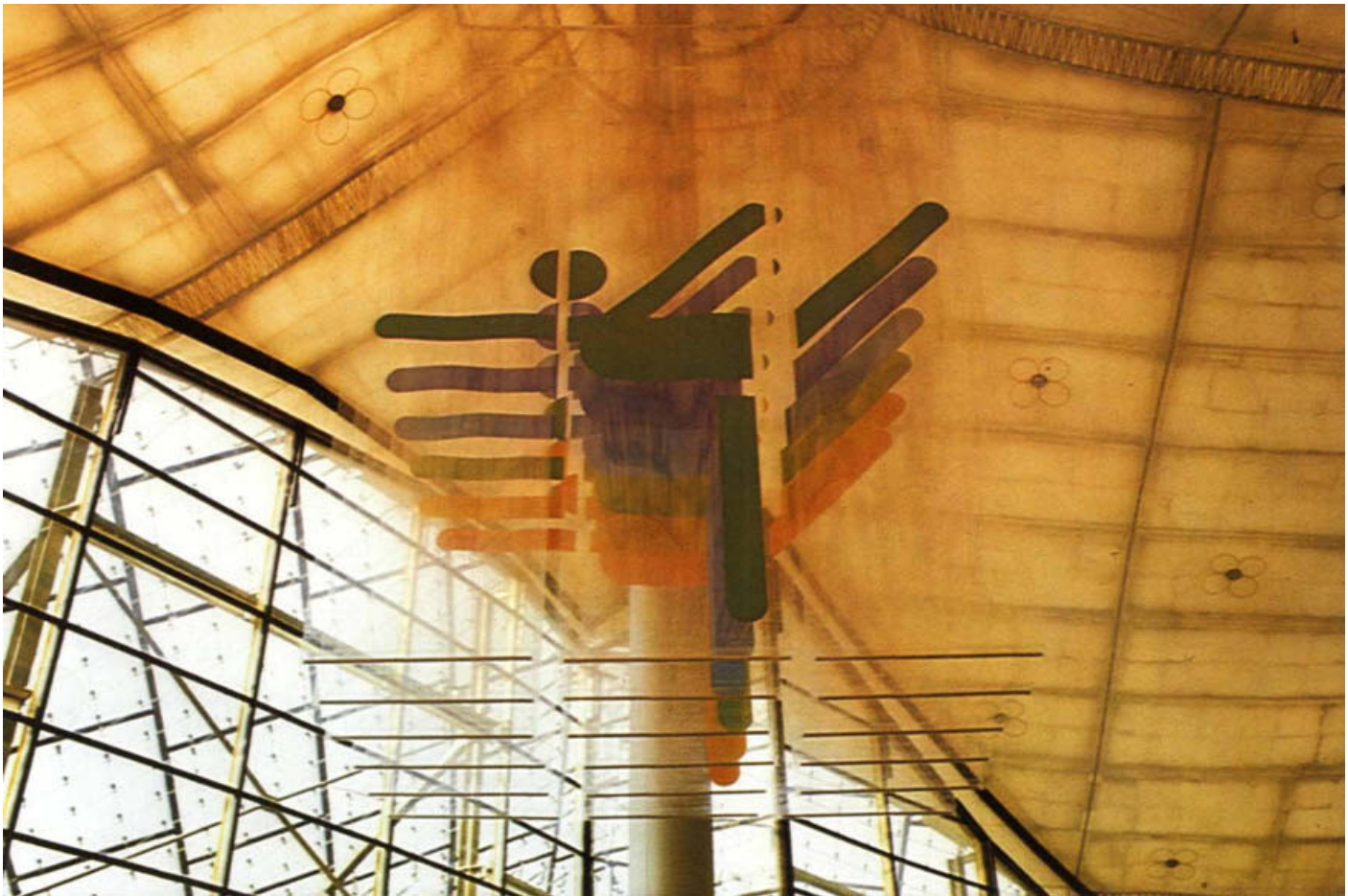




The service rooms are located on three floors below the access corridor for spectators. The amphitheatrical arrangement of the tiers in the form of a continuously terraced stadium with a parabolic slope ensures optimum viewing conditions. The grandstands were planned in accordance with the same considerations that determined the design of those in the Olympic Stadium. All seats are of the tip-up type, permitting a depth of 90 cm. for the tiers. The height of the tiers varies between 38 and 62 cm. The bowl of the arena is formed by pre-cast concrete box girders supported on 44 oblique concrete frames cast on location. The floors are constructed of hollow sections with a thickness of 60 cm.

The form of the facade, the choice of material, and the shaping of the ground in the access area combine to give smooth transitions between the interior and the exterior. The interior of the hall has thus become an integral part of the "Olympic landscape".

The foyer is on the same level as the central forum and encircles the whole arena. It gives direct access to the seats in the upper half of the grandstands. The seats in the lower half are reached by flights of stairs which also lead to the floor below the foyer, where check-rooms and toilets are located. To comply with security requirements, this level also serves the emergency exits. All emergency exits, with a total width of 106 m. lead from here directly into the open. There are also a six-lane bowling alley, a restaurant seating about 300 persons, and a bar on this level. They are built on the roof of the warm-up hall and gymnasium and are reached from the arena level.







The second level provides accommodation for the hall maintenance staff, the fire department, police, guests of honor and offices for radio, television and press reporters. They all reach their rooms without using the passages reserved for the public.

Finally, there are the athletes' changing-rooms, the technical installations, workshops and storage accommodation on the arena level. The latter will be needed particularly after the Olympic Games for the material and equipment required in connection with cycling, equestrian and athletic events. Access to all these rooms is provided by a circular service road.

Spectators enter the arena from this level. During cycle racing or athletic events, when the corresponding tracks are in place, spectators and participants will enter through tunnels under the tracks.

Athletes can prepare for contests in underground exercise halls below the central plateau, near the western curve of the arena. These consist of a warm-up hall 22 m. x 44 m. x 7 m., a gymnasium 12 m. x 16 m. x 7 m. and a conditioning room with an area of about 140 sq.m. On the same level at the north of the arena, with a view of the interior, the rooms for the central control of lighting, the public address system and the scoreboards are located. A duplicate control desk for the same functions is suspended from the lighting platform above the south foyer.

To meet the demand for a vertical illumination power of 1,875 lux for the arena, batteries of floodlights were installed around the top edge of the grandstands. Further floodlights were mounted on a large lighting platform to provide supplementary illumination for the spectators' area, the cycling track, the athletics track, and for stage lighting when required. Four lattice girders are suspended from the roof network in the direction of the longitudinal axis of the hall with cross connections at two points. The loudspeakers and four scoreboards are also mounted on this platform. One grillage carries the machinery for shifting scenes in theatrical performances. Eighteen sets of machinery can move the curtains, cyclorama, wings and other pieces of scenery.

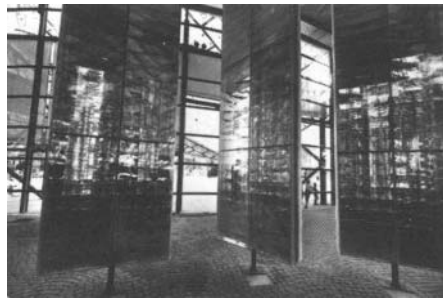






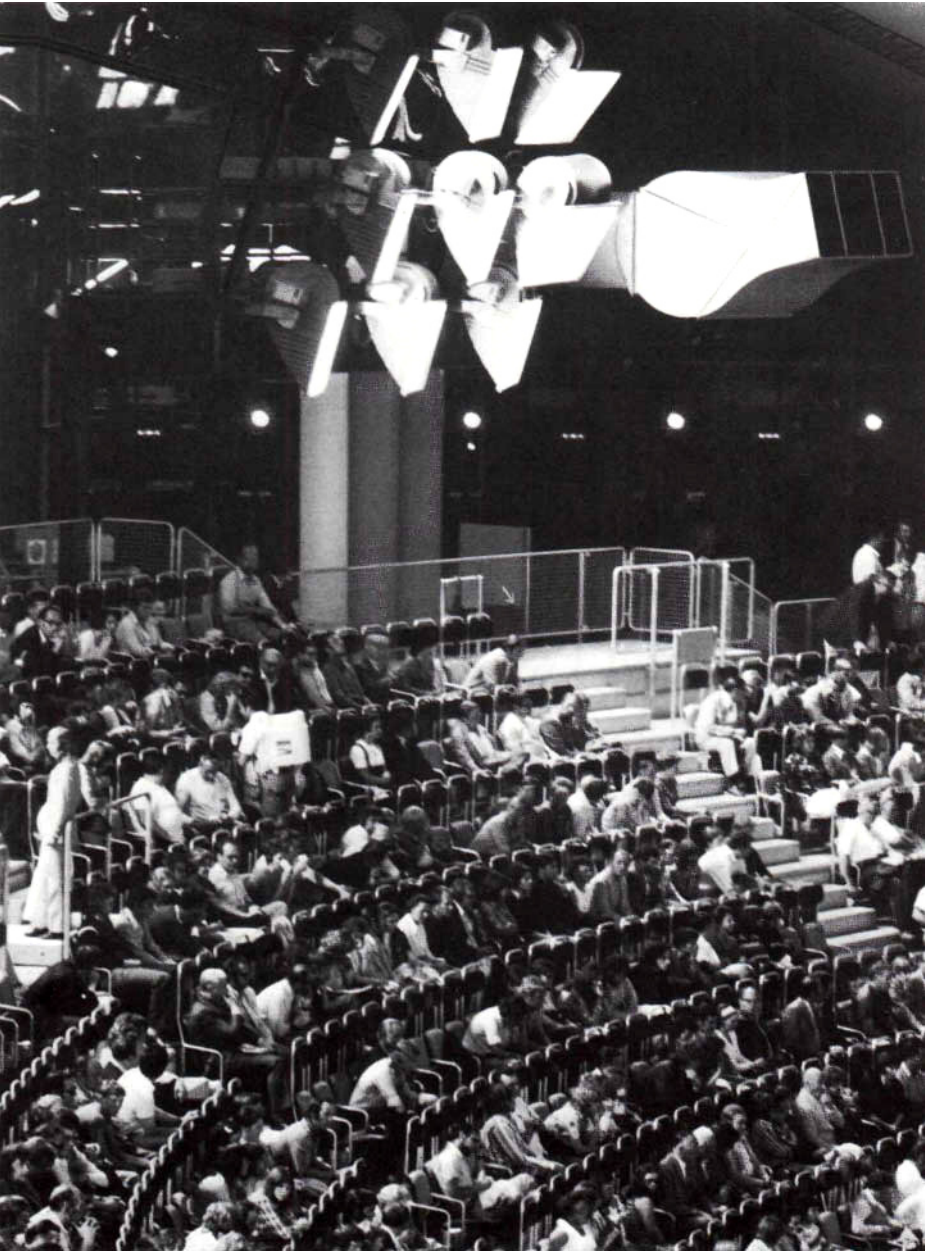
The steel and glass facade is anchored into the ground. It is a statically independent structure without any rigid connection to the roof. It can join up with the roof by means of a telescopic part that extends in all directions. The struts for reinforcing the facade are on the outside, in order not to obstruct movement in the foyer.

During the Olympic Games the hall could accommodate 10,500 ticket-holders, 200 guests of honor, 100 radio and television reporters, 300 press reporters and 400 participants. The lower rows of spectators' seats have been constructed in such a way that they can be quickly dismantled, so that the seating capacity and size of the arena can be changed. For boxing events the capacity can be enlarged to accommodate 14,000 spectators, partly by transforming seating-room for 2,000 persons into standing-room for 4,000. The spectator capacity for cycling, equestrian or athletic events is 8,000, while stage shows can play to an audience of 5,000.

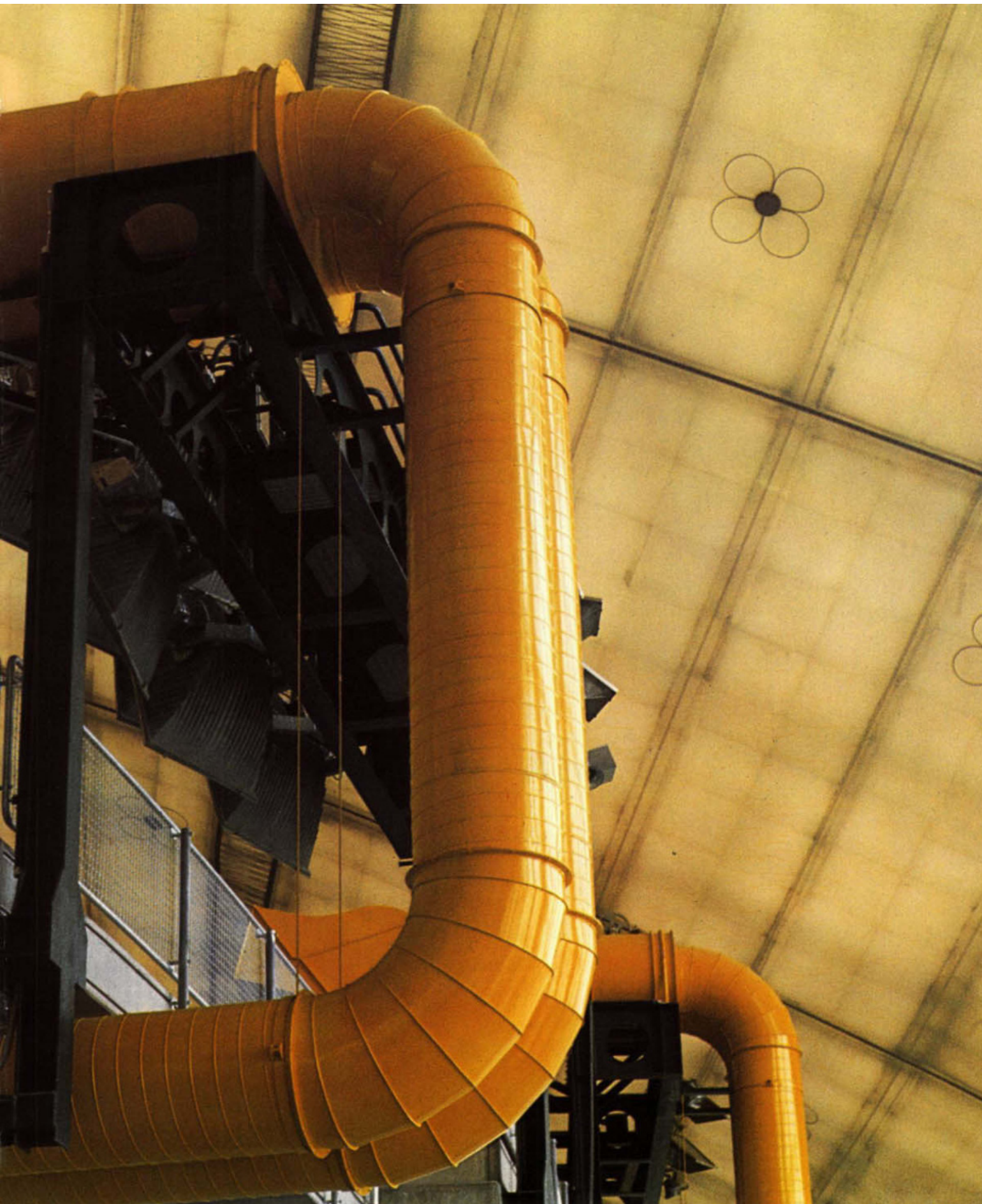












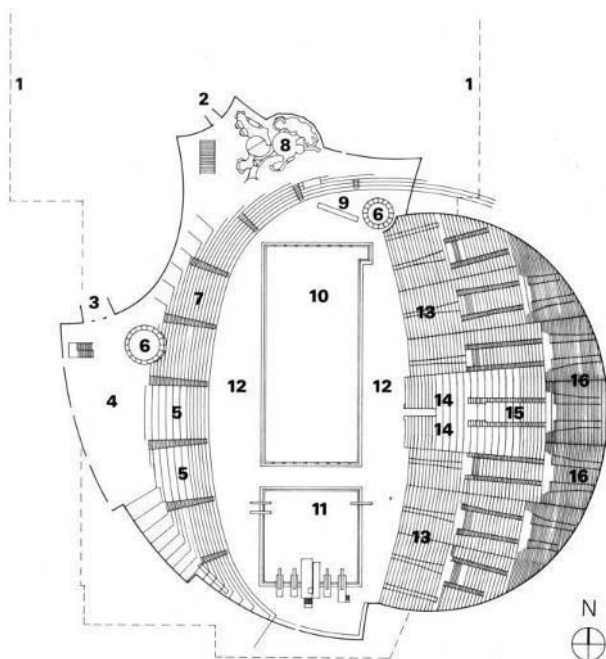
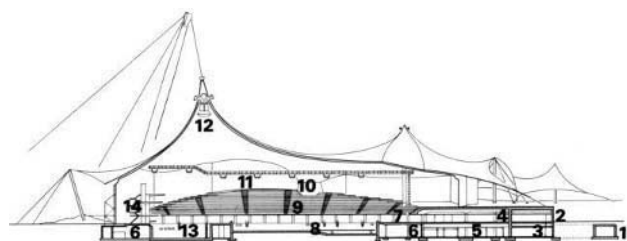
Structural considerations and the requirements of lighting, heating and ventilation cause a large part of the technical installations to be visible to the public. The upper rim of the arena is lined with batteries of lights and exhaust air ducts which surround the spectators' area.

Fresh warm or cold air is forced into the interior of the arena through a system of visible ducts which have sound conditioned movable vents. Stale air is removed from under the seats and the floor of the arena. This system is supplemented by additional ventilators suspended from the highest points of the roof. Fresh air is drawn in through intakes along the facade and then filtered. Hotwater heaters warm the incoming air to temperatures between 26° and 30°C. Water air coolers can reduce the temperature in the hall to 17°C. The stale air is collected into a circular duct and forced out into the open at two points in the northern part of the hall.



## Swimming Hall Olympic Park

Architects:  
Behnisch and Associates,  
Munich/Stuttgart  
Günter Behnisch, Fritz Auer, Winfried  
Büxel, Erhard Tränkner, Karlheinz Weber,  
Jörg Bauer

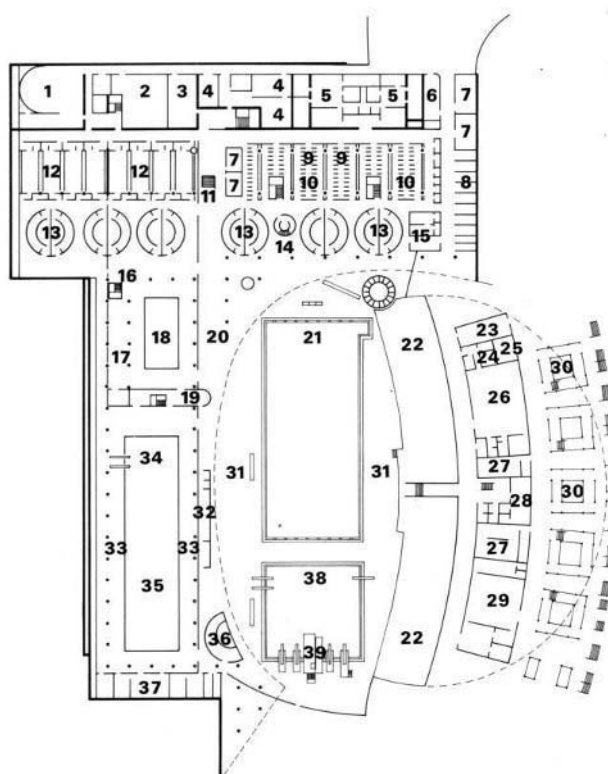


### Floor plan of the visitors' level

- 1 Basement foundation
- 2 Entrance for swimmers
- 3 Entrance for visitors, permanent stands
- 4 Foyer
- 5 Commentators' places
- 6 Lowest point of roof
- 7 Seats, permanent stands
- 8 Pavilion
- 9 Scoreboard
- 10 Swimming pool
- 11 Diving pool
- 12 Passage around pools
- 13 Seats, temporary stands
- 14 VIP stands
- 15 Press stands
- 16 Standing room, temporary stands

### Longitudinal section

- 1 Ramp
- 2 Press, radio, TV, sauna
- 3 Electrical center
- 4 Changing room, showers and toilets
- 5 Lounges and massage rooms, work areas for the Organizing Committee
- 6 Utilities
- 7 Passage around pool
- 8 Swimming pool with partially adjustable bottom
- 9 Permanent stands
- 10 Lowest point of roof
- 11 Lighting platform
- 12 Ventilator
- 13 Diving pool
- 14 Diving tower



### Diagram of the swimming hall and locker rooms

- 1 DOZ telephone and teletype room
- 2 Press writing room
- 3 Press interview room
- 4 Teletype areas
- 5 Double sauna
- 6 Information
- 7 Business areas
- 8 Transformer areas
- 9 Changing cubicles and lockers
- 10 Exit to technical level
- 11 Entry to entrance level
- 12 General changing room and lockers
- 13 Showers and toilets
- 14 Passage connecting kitchen and pantries
- 15 Doping control

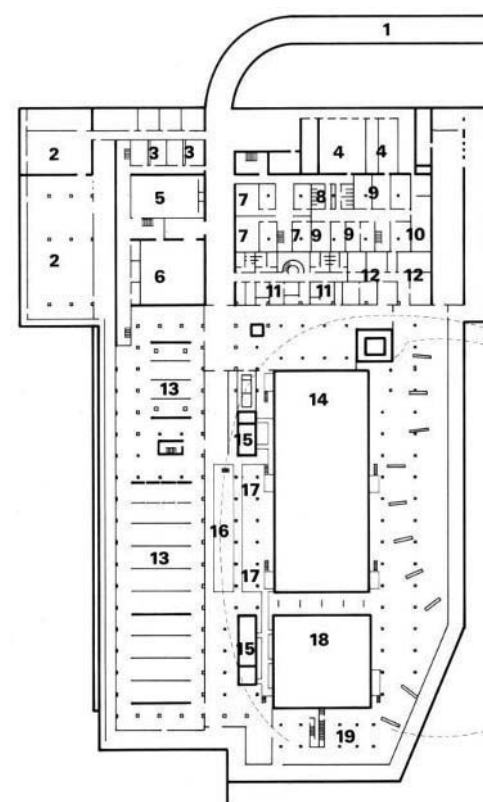
In London, Helsinki and Rome the Olympic swimming competitions took place in outdoor swimming-pools. Since Tokyo (1964) swimming, diving and some of the water polo events have moved indoors. Kenzo Tang's building in Tokyo set a high standard of construction. The swimming stadium in Mexico was also a landmark from a functional standpoint.

The fact that seating has to be provided for such large numbers of spectators at the Olympic Games — 10,000 places were provided in Mexico — was responsible for a lot of hard thinking in Munich. Swimming as a sport attracts comparatively little interest among spectators in Germany, so that a stadium planned to accommodate 9,000 was not possible as a permanent installation.

As happened with the Olympic stadium at Helsinki where a distinction was made between the capacity during the Games

and subsequent use by the Finnish capital (the upper rows of seats all around the stadium were erected as a provisional structure). In announcing the architectural competition for the building at Oberwiesefeld it was stipulated as early as 1967 that the stands for spectators should be constructed in such a way that 7,500 of the 9,000 seats could be dismantled after the Games.

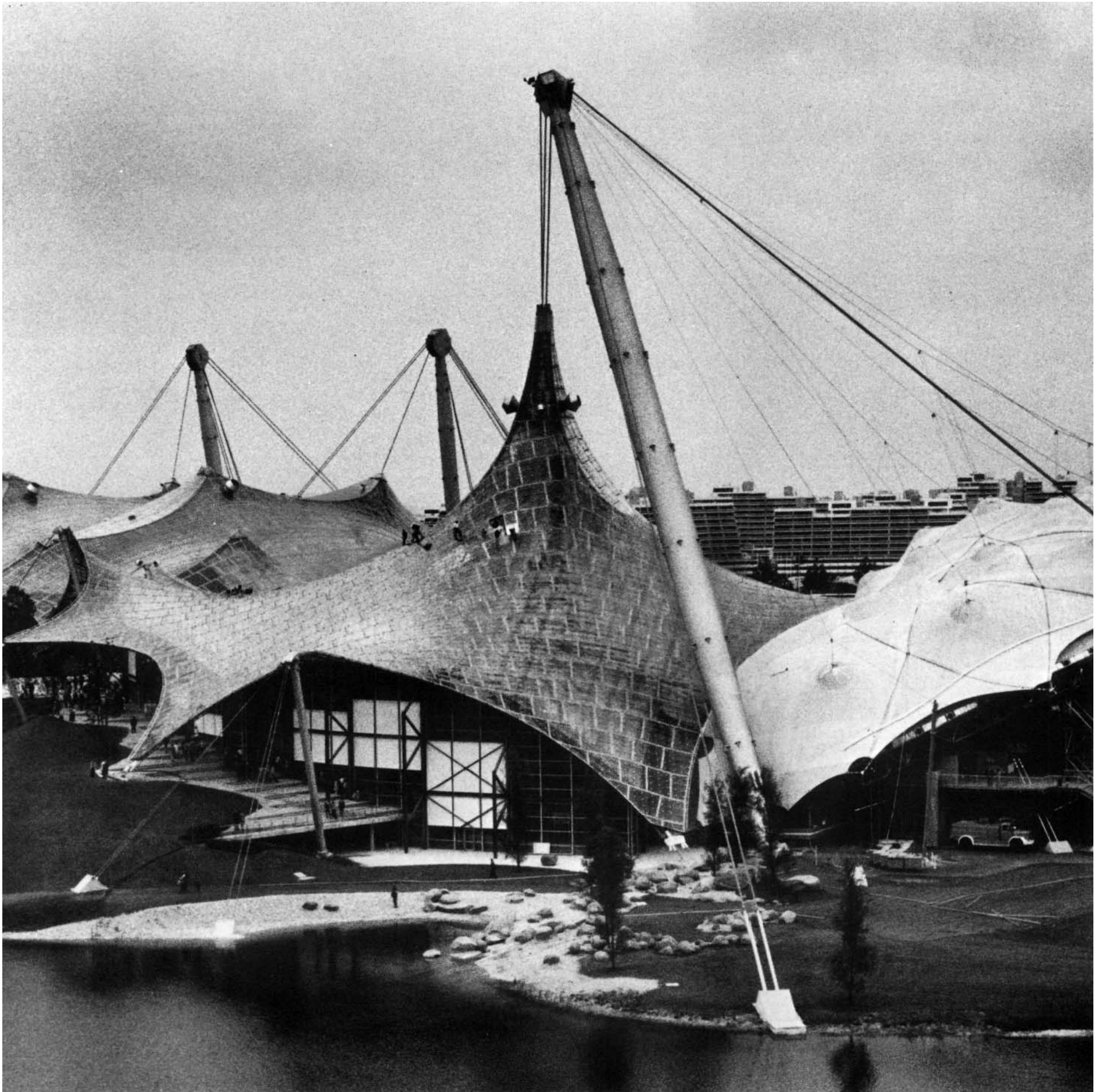
Thanks to the overall plan of the Olympic Center, allowing spectators to gain access to stadium, sports hall and swimming stadium from a common central plateau, the architect was able to find a neat solution to his problems. Ancillary installations and rooms belonging to the stadium are built into the earth mound of the Center, and are not visible to the spectator, either from outside as he is approaching, or from inside the stadium. It is only the swimmer from the surface of the water who gets an impression of part of this additional space.



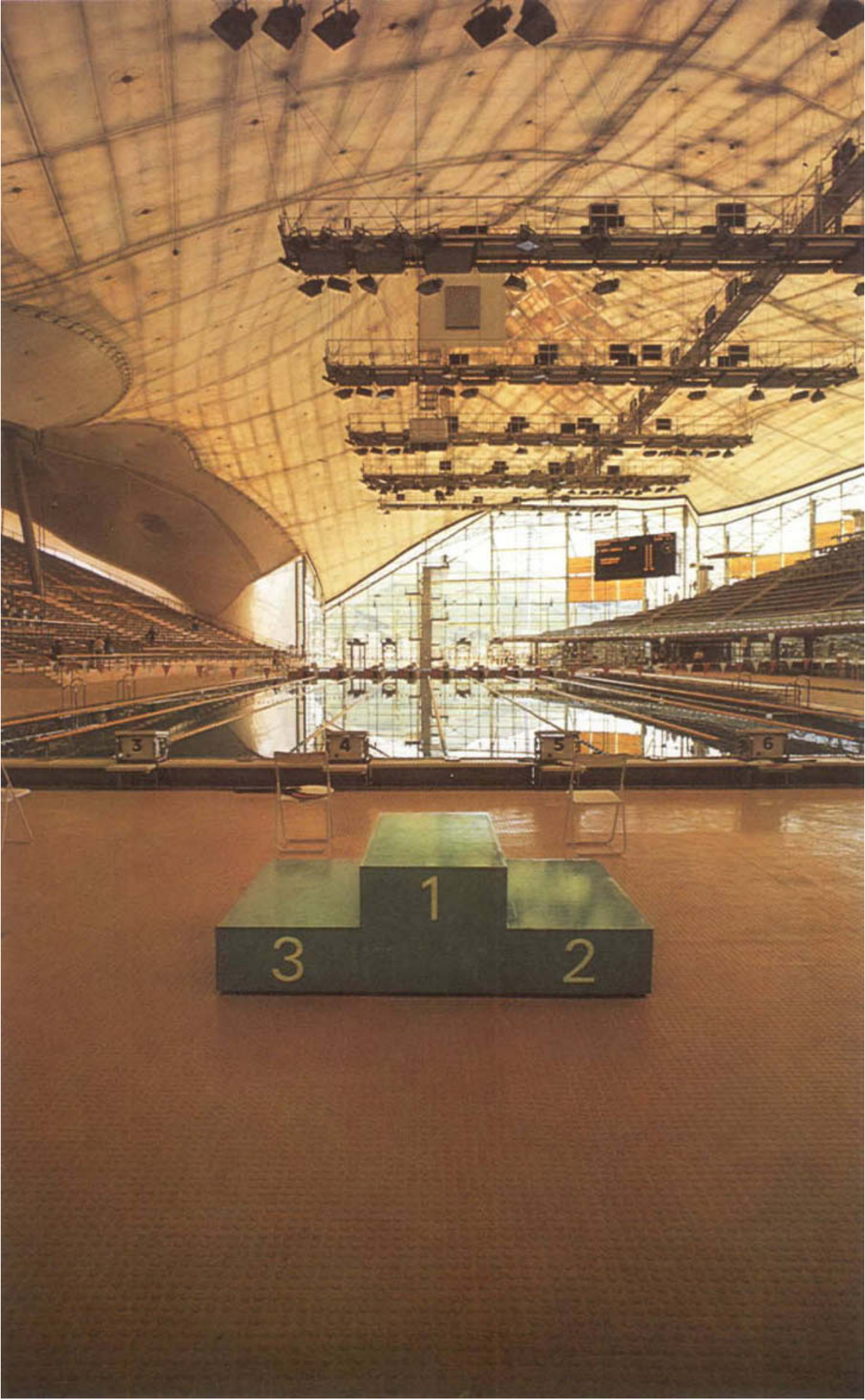
### Diagram of the technical level

- 1 Entry to technical level
- 2 Ventilation center
- 3 Massage
- 4 ELT-Station
- 5 Conditioning room
- 6 Calisthenics room
- 7 Rest and massage areas
- 8 Toilets
- 9 Studios FINA
- 10 Studios DSV
- 11 Pantries
- 12 Studios Organizing Committee
- 13 GWA-Center
- 14 Swimming pool with partially adjustable bottom
- 15 Reservoir hot water pool

- 16 Filtering system
- 17 Underwater window and camera platform
- 18 Diving pool
- 19 Diving tower foundation with elevator









Here fourteen swimming competitions for women and fifteen for men took place as well as some of the water polo, the spring-board and platform diving. These events, the preceding heats, the preparations for the competitions and some of the training were fixed according to a rigid timetable which was the basis for the calculations of areas and space. The solution found to these planning problems fulfilled all demands of the athletes and the expectations of the organizers, as the outstanding performances and the numerous world and Olympic records bore witness. The shape chosen for the pool, the special rim formation which minimized wash, and a new type of lane marking contributed to the success. The diving and swimming pools enclosed on both sides by giant curving tiers of seats during the Olympic Games. By the time this volume goes to press, spectators and swimmers will have the impression, after the dismantling of the great eastern stand, of a swimming pool merging with the lake. The flowing transition between architecture and landscape is expressed equally in the design of the spectators' foyer. The vertical walls of glass, aluminum and steel are suffused by the reflections of the floor coverings which are identical inside and out.

Under one roof are three swimming pools, each functioning separately:

1. The swimming stadium where the competitions are held: a pool for contests 50 m. x 21 m. and 2.5 m. deep (which is provided, for use after the Olympic Games, with a hydraulic intermediate floor that can be raised or lowered to give suitable depths for non-swimmers);

The diving pool, 20 m. x 21.5 m. and 5 m. deep, and the warm-up pool for divers under the permanent west stands for 1,600 spectators;

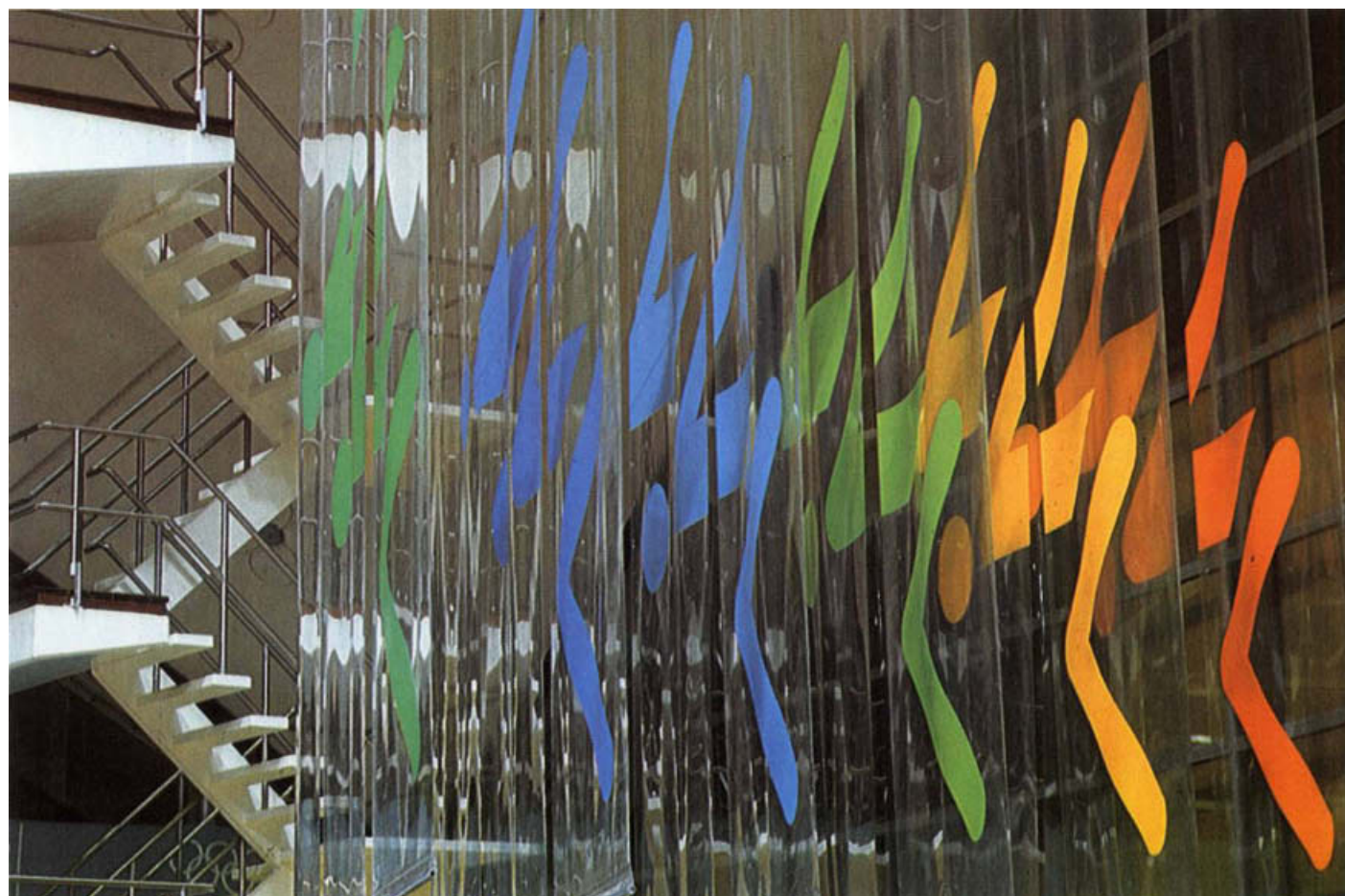
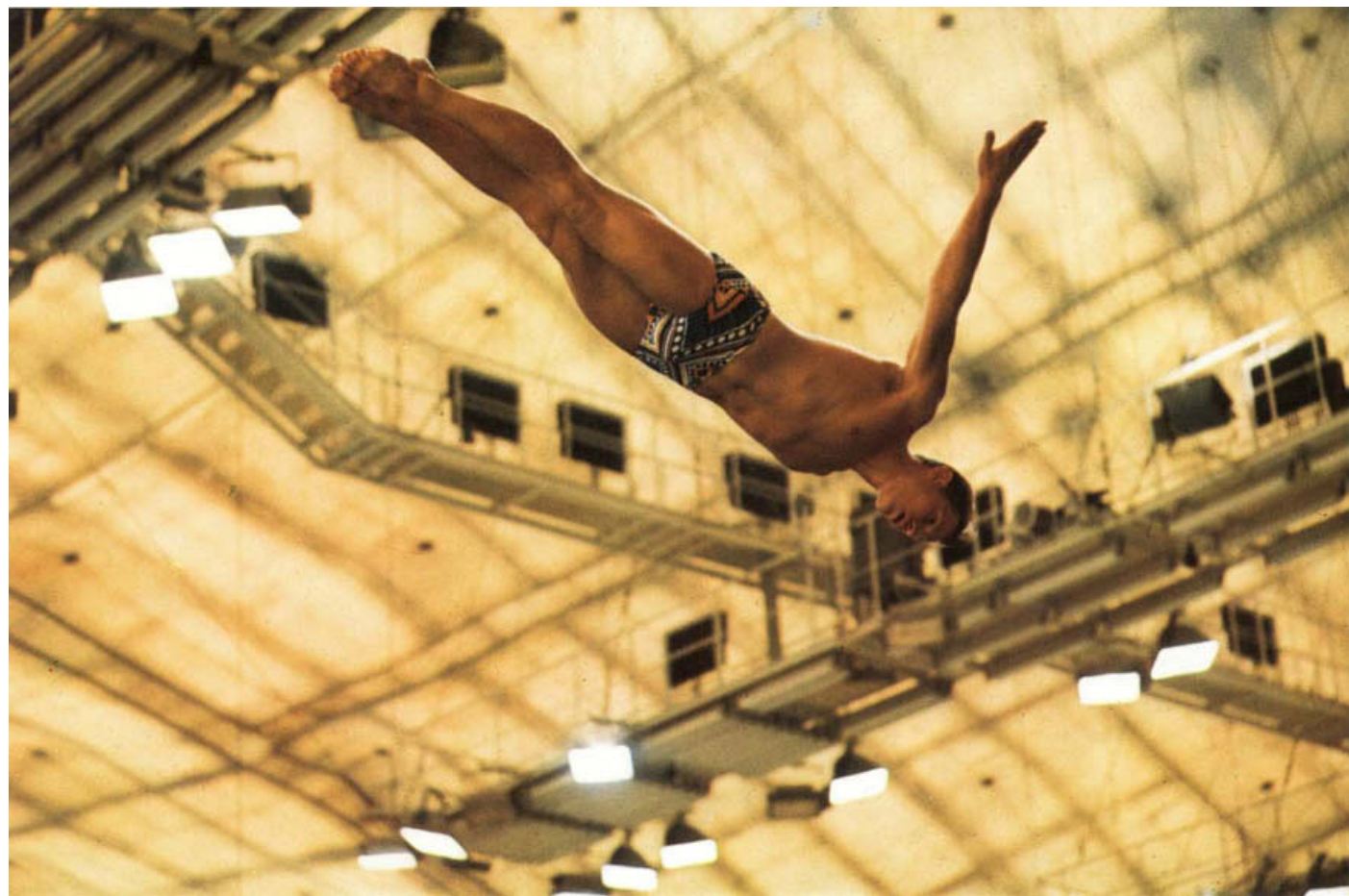
The temporary east stands with seating accommodation for 4,600 and standing room for 2,800. To this part of the swimming stadium belong 120 cabins with 400 lockers and an additional central changing-room for use in summer by 1,600 visitors.

2. The training pool, measuring 50 m. x 12 m. and 2 to 3 m. deep (four changing rooms where 200 visitors can check their clothes).

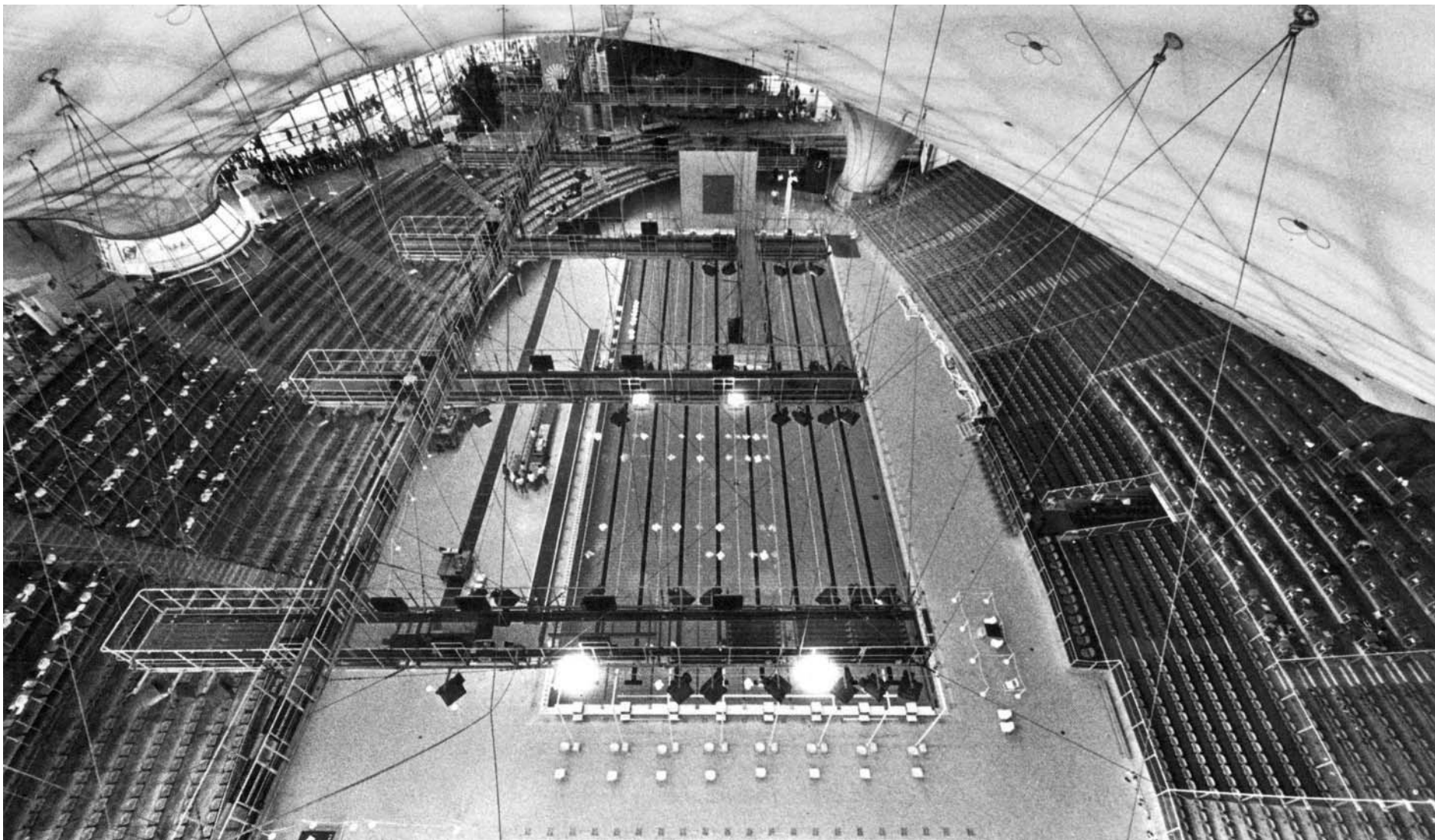
3. The instruction pool, measuring  $16\frac{2}{3}$  m. x 8 m. with a depth varying from 0.30 m. to 1.80 m. (four changing rooms where 200 visitors can check their clothes). In addition there is a restaurant to seat eighty guests, two saunas, each for forty people, press rooms, radio and television rooms as well as 5,000 sq. m. surface space for technical installations.

At the foyer level are the spectators' and swimmers' entrances, the restaurant, kiosks providing for spectators' needs, and separate entrances to the training pool and the instruction pool. At the pool level are the changing rooms, rooms for the press, radio and television, and also the entrance for journalists, guests of honor and officials.

The main plants for power supply, heating, ventilation and water treatment are housed, as well as a gymnasium and training room at a third level for technical installations.





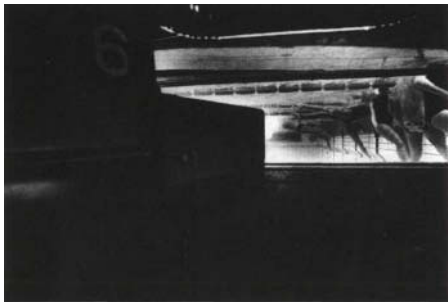
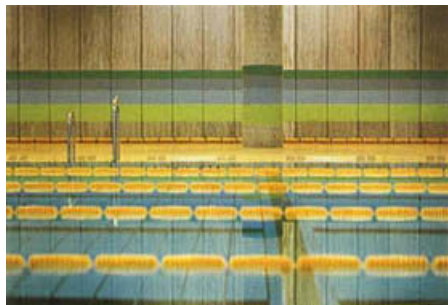


Halogen metal vapor lamps produce 4,800 lux horizontal and 1,900 lux vertical light intensity in the competition area. The permanent spectator area is illuminated at 400 lux, whereas the temporary stands were illuminated at 1,600 to 850 lux. For ordinary use and for competitions without color TV, fluorescent lamps produce 400/250 lux horizontal illumination. To supply electricity for the entire area of the swimming stadium, a whole gallery of transformers, and switchboards and distribution points on a corresponding scale to deal with a load of 2,200 kW had to be installed on the pool level. Similarly the visitor sees only a fraction of the heating and ventilation system. Heat comes from the district heating plant, which supplies a load of 6.2 million kcal/h.



The restaurant has been set in the stadium like a vast walk-in sculpture. It has two levels: area for swimmers with a selfservice counter at foyer level, and an area for guests in normal dress accessible directly from outside.





The competitor who, along with guests of honor and journalists, can enter the stadium unhindered by the streams of spectators and is able to enjoy the highest degree of hygiene and comfort. From the changing cabins, made of enamelled safety glass, he can follow the track for the barefooted, rather than the separate track for people wearing shoes, to a circle of showers built around an inner core of toilet installations. These novel sanitary arrangements serve to integrate the pool and changing room levels.

For warming up he can use either of the two pools under the stands in the west of the stadium. The 50 m. pool can be divided by a hydraulically operated separating wall creating a 25 m. swimming pool and a diving pool with two 1 m. springboards.

The divers can watch the other competitors from a warm-up pool situated immediately next to the diving pool. In this way they remain constantly in touch with both training and contests even during the waiting period.

In the story below the level of the pools there are a gymnasium and a training room which may be used by all swimmers and which are equipped with all the training apparatus necessary for their particular kind of sport. Adjoining massage and rest rooms provide for rest and relaxation in the intervals between training or competitions.

In order to ensure in the stadium, whatever the weather or time of day, a temperature that is comfortable both for athletes and spectators, water that is hygienically con-

trolled and always between 25 and 28°C, as well as to ensure adequate lighting, a great technical effort is required, of which only a minute part is apparent to the visitor.

What will strike him most are the lights which, from the foyer, he will see "hovering" over the main pool, 16 m. above the surface of the water. Mounted on a 92 m. bridge with seven transversals, each 20 m. long, are the floodlights which provide adequate illumination for color TV transmission. The loudspeakers and color TV cameras are mounted here as well. Three lighting stages have been installed to cater for different purposes: for normal use of the pool, for competitions both with and without color TV transmission.

The stadium and all the ancillary rooms are air-heated. This means that warm air is blown into the stadium through ventilation columns above the west stand and extracted through the steps. In addition, there is an air duct at the foot of the stand from which an air curtain rises and separates the spectator area with its lower temperature from the warmer area of the pool. From this duct too, air is blown over the surface of the water and the chlorine-saturated air is extracted at the edges of the pool. At the front of the building cold air is sucked in at ground level and a warm current of air is blown upwards. A cooling system was installed in the temporary stand.

The visitor sees nothing of the complexity of inward and outward air ducts, the heat exchangers for warming and cooling the air, the distribution center serving the showers and pools with cold and warm water.

The purification of the water - and with a pool content of 7,200 cu. m. every hour 1,400 of water are treated - is effected with the aid of a salt/chlorine electrolysis installation and seven sand filters.

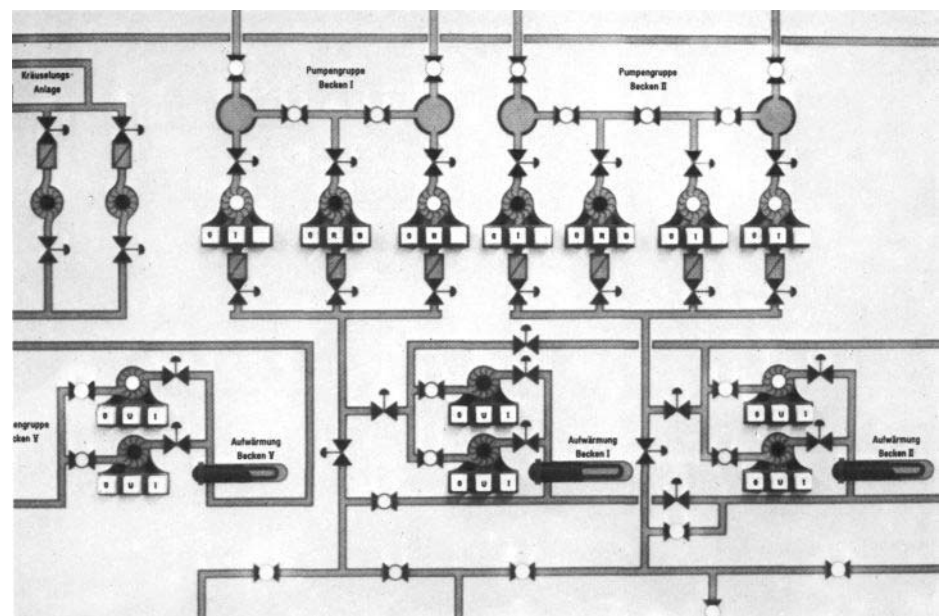
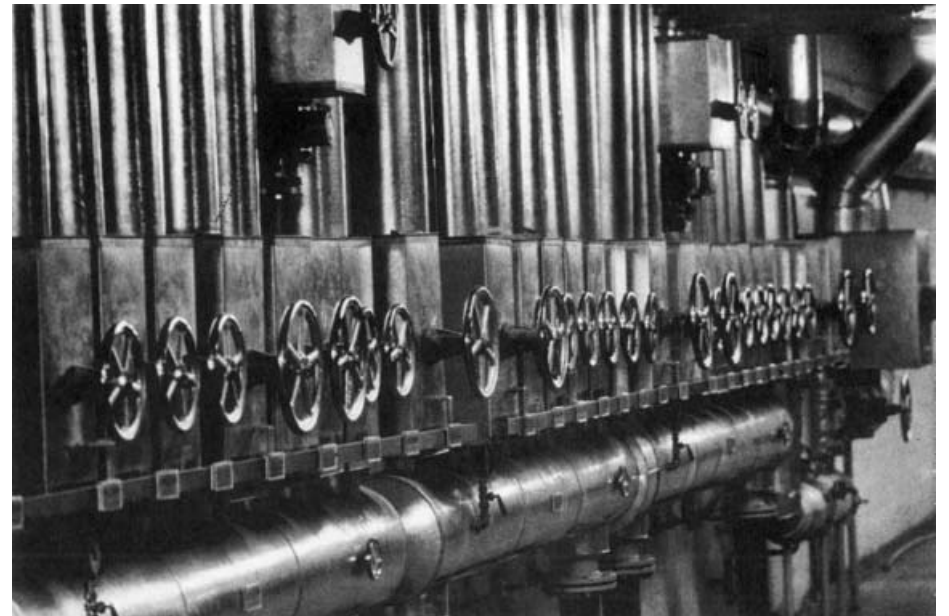
The roof, protecting the stadium from the weather, is provided, for constructional reasons, with a suspended ceiling which also serves to protect the whole network construction against the chlorine-laden air. This ceiling consists of a supporting foil, a heat insulating layer made of clear transparent hard PVC sheets of 1 cm. thickness and a protecting foil made of PVC-coated polyester fabric. Outer layer and ceiling form a fully insulated cold roof.

As supporting structure for the facade, pillars were erected at nine m. intervals, fixed into the foundations and connected with each other by horizontal bolts. According to the height of the pillars and the weight they have to support, these were either I beams or trusses. The actual glass

wall is constructed of steel pillars and girders on the outside, with aluminum sections inside, and sheets of double-pane insulating glass about 3 m. x 1.5 m. in area.

Timing for the swimming competitions was done by two systems functioning simultaneously: electronic contact pads at the finish end of the pool and television cameras, hung 4 m. above every starting block, which recorded the swimmer's touch and the time registered by the clock. These systems worked independently of each other. Times were fed into a computer on the spot, processed, shown on the scoreboard and passed on to the central data storage system in the stadium for later evaluation.

Control of the two scoreboards, evaluation of the times recorded, direction of the competitions and announcement of results were effected from the control room under the west stand.





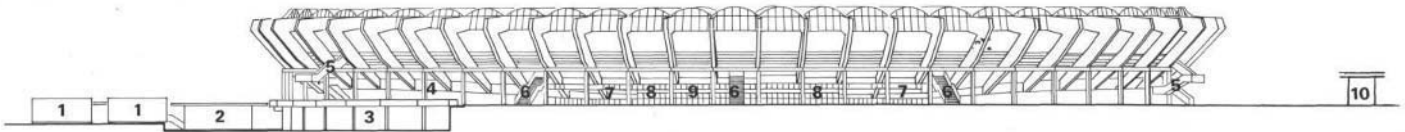
Cycling Stadium Olympic Park

Architects:  
Beier, Dahms, Grube, Harden, Kaiser,  
Laskowski, Braunschweig



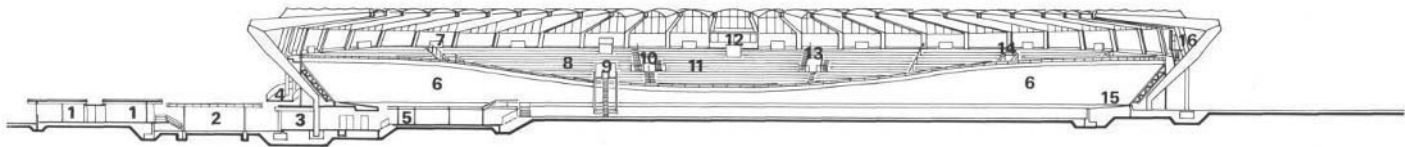
View from the south

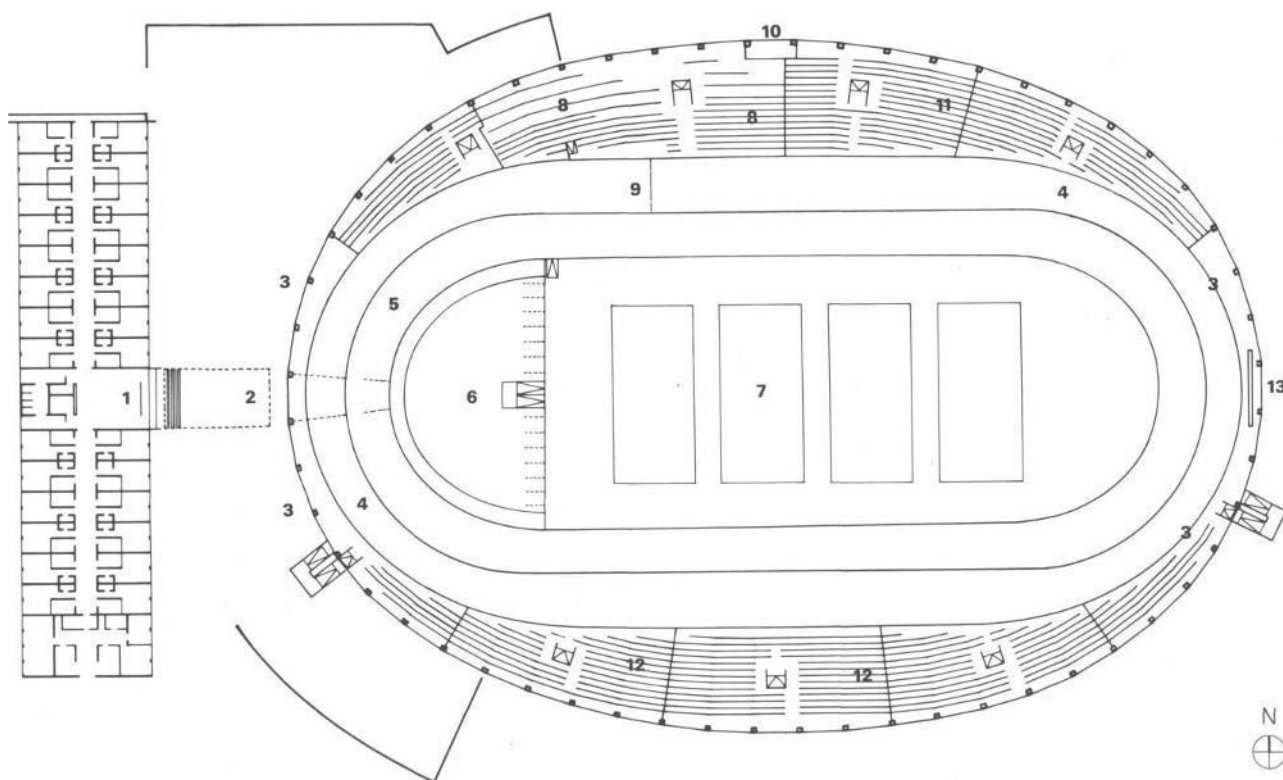
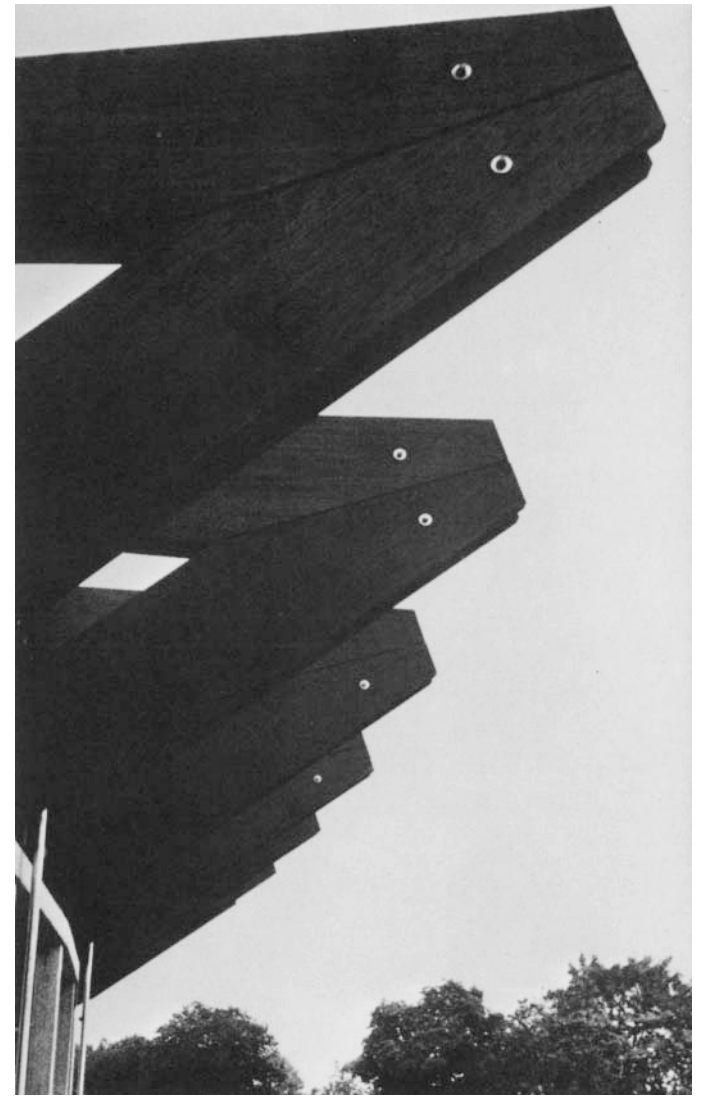
- 1 Racers' quarters
- 2 Courtyard
- 3 Outside view of work-shops
- 4 Dividing level for spectators
- 5 Entry to the standing room area
- 6 Entry to the seats of the southern stand
- 7 Kiosks
- 8 Toilets
- 9 Driveway to the track's inner area
- 10 Ticket windows



Cross section  
(west to east)

- 1 Racers' quarters
- 2 Courtyard
- 3 Tunnel
- 4 Ramp
- 5 Roofed riders' waiting area and view into the workshops underneath the track
- 6 Race track
- 7 Entrance to Block L
- 8 Press and commentators' seats
- 9 Start and finish with jury and mobile platform for timing
- 10 Entry to Block A
- 11 VIP area
- 12 Director's cubicle
- 13 Entry to Block B
- 14 Entry to Block C
- 15 Grass strips
- 16 Scoreboard





**Floorplan of the  
grandstand level**

- 1 Racers' quarters
- 2 Tunnel to the center area
- 3 Standing room
- 4 Cycling race track
- 5 Lawn strips
- 6 Covered racers' area
- 7 Open racers' area
- 8 Seats for VIPs, press and commentators
- 9 Start and finish line
- 10 Director's room
- 11 Seats, north stand
- 12 Seats, south stand
- 13 Scoreboard





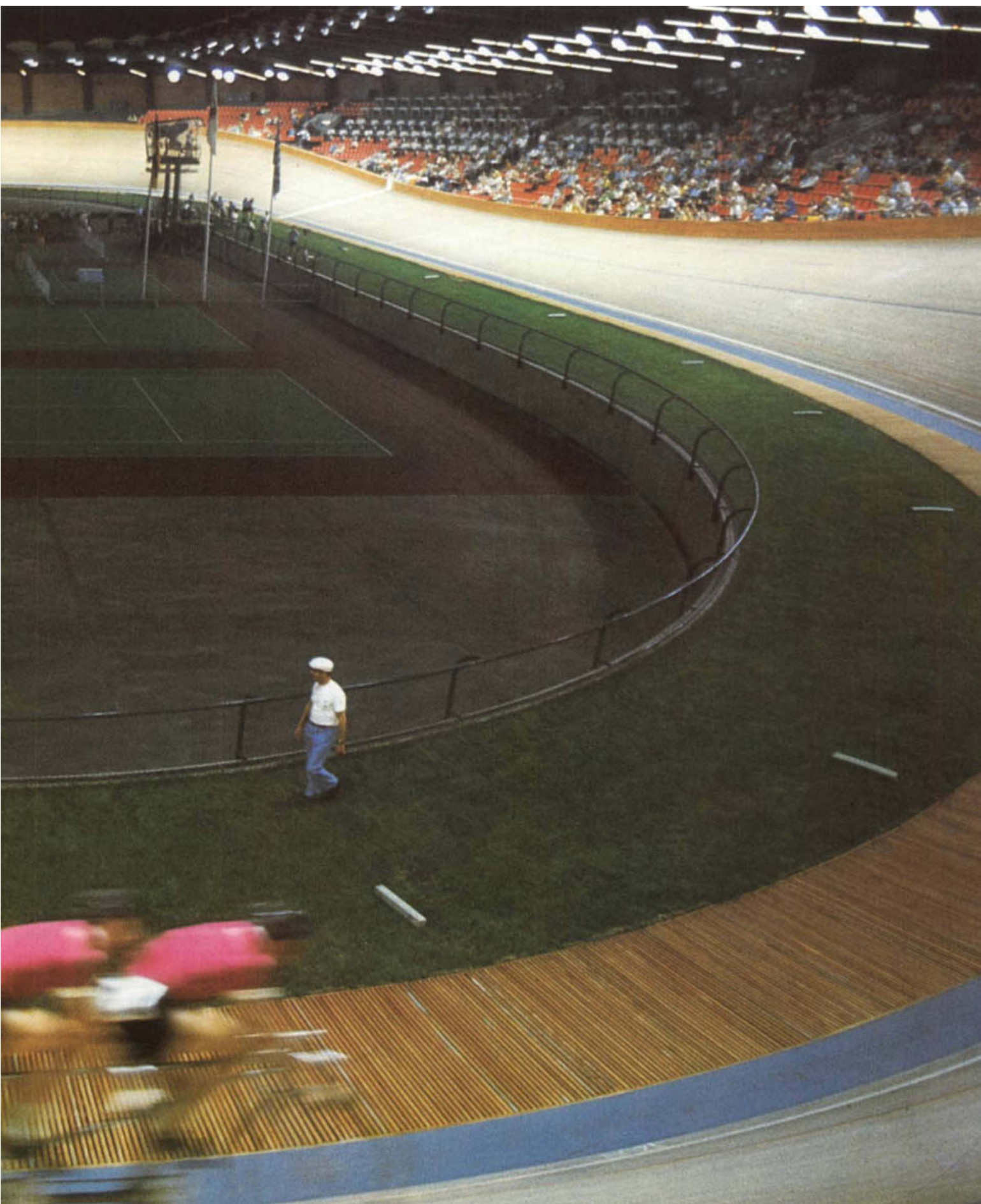
A structure that can be taken in at a glance the design reveals a sure hand in the relating of a building with its occupants. Its specifications furthered this relationship; accommodation for 5,000 spectators had to be provided round the scene of action, a track about 286 m. in length.

The impression from outside is of an oval which only emphasizes horizontal lines. The view inside the stadium then surprises the observer with the unison of the sweeping lines of the track and the harmoniously arranged spectators' stands.

The specifications called for an open-air construction, but one which should be unaffected by weather conditions as far as possible. The accommodation for spectators and the track was therefore roofed over. The grandstands and the roof are made of laminated wood. In the lower part, V-shaped frames form the slopes for the stands. In the upper part they support the roof, which projects 27 m. These frames rest on a circular beam of reinforced concrete and reinforced concrete pedestals.







Diolen of high tensional strength and coated with PVC was used as roofing material. It offered the advantages of high light transmittance, soft shadow contours and the prevention of heavy shadows being cast by the tie-beams on the track. The roof skin was stretched parabolically over tubular steel hoops.

In the first Olympic installations, the tracks were first 500 m. and later 400 m. in length. In some cases they were built around the running track in the main stadium and were made of asphalt or concrete.

The open-air tracks are made of wood and are 285 m. to 333 $\frac{1}{3}$  m. long.

Both the athletes and the spectators benefit from the advantages of a shorter track. The entire circuit is in better view, the competitors and the public are in closer contact, and the whole atmosphere of the event becomes better and more exciting through the more compact dimensions.

The employment of wood led to "faster tracks" and better results. Whereas a soft-wood track that was not weatherproof was provided for the Olympic Games in Berlin, 1936 (the track was only a provisional construction) today, tracks with a long life are made of African hardwood.

High speeds are determined by the shape of the track, the ratio between the straight and the curved sections, and the banking of the curves.

The length of the Munich track is 285.71 m. Fourteen circuits are 4,000 m. The track is 7.50 m. wide, banked at 48° in the curves and at 9° in the straight sections. It permits maximum speeds of around 90 km./h.

The best shape for the track was determined by calculation, and the concentration of the majority of the spectators along the straightaways formed the basis for the general conception of the interior. The line of sight for the spectators was determined by the inclination of the track.



**Central University Sports Facility  
- ZHS - in Olympic Park  
including its outdoor facilities  
(Volleyball Hall excluded)**

Architects:  
Heinle, Wischer and Associates,  
Stuttgart/Munich



**Olympic Use of the  
Complete Complex  
Layout diagram**

- 1 Hockey facilities
- 2 Kosoczinskidamm
- 3 Men's Olympic Village
- 4 Water-permeable playing fields
- 5 Playing fields for hockey
- 6 Playing fields for lawn games
- 7 Handball courts
- 8 All-weather area
- 9 Basketball courts
- 10 Small game fields for hockey and handball

- 11 Practice field with rocks for scaling
- 12 Volleyball courts
- 13 Throwing field and circuit training area
- 14 Competition tracktype C
- 15 Training facility for high jump, broad jump, polevault, and shotput
- 16 Competition tracktype B
- 17 Women's Olympic Village
- 18 Gardner's area



The whole northern part of Olympic Park is divided into two large areas by embankments up to 8 m. high. The eastern area is occupied by the Olympic Village, the western by the Central University Sports Facility (ZHS). The embankment which runs from south to north, branches to the west in its northern part, thus forming an enclosed area in the north which contained provisional hockey fields during the Games. The southern part was used during the Games for training and as an assembling point for the athletes before the opening and closing ceremonies.

The buildings of the ZHS are situated adjacent to the embankment which separates them from the Village. During the Games, these buildings, designed for sports instruction and practice, were utilized as the radio and television center, with the exception of two sports halls, each with an area measuring 28 m. x 56 m. and capacity for 600 spectators. For the Olympic Games, these two halls were converted for use as the volleyball hall.

The outdoor facilities, covering an area of about 25 hectares, comprise two tracks for athletic and field events, one multi-purpose field and a pitch for throwing sports, eleven large playing fields, ten small playing fields, one circuit installation, one fitness track, and an artificial rock for climbing practice. One of the tracks is incorporated into a small stadium with grandstands and floodlighting, located south of the ZHS buildings and bounded at the east and south by embankments, which also provide paths for spectators to the center in the south of Olympic Park.

In addition to the outdoor facilities mentioned above, the grounds in the north which were used as provisional hockey fields during the Games, and the tennis courts south of the Women's Village will belong to the ZHS.





The embankments which divide these areas follow a natural course. They are planted at intervals with single large trees.

The strictly formal and geometrical shape of the games and sports areas themselves is in sharp contrast to this landscape. Straight banks at right angles to each other separate the individual playing fields and training areas. Tapering or crooked banks are given additional emphasis with paving stones; at other points, they are separated by log steps. Where the banks form pyramidal plateaus they are used as assembly and outlook points. The paths are laid partly inside and partly on top of the banks. The geometrical impression is further reinforced by round-topped maples and acacias.

The grounds for athletics and the large playing fields presented a scene of animated training activity during the Olympic Games. The sport-loving public, standing on the large outer embankments, and the trainers, coaches and athletes from other sports inside the training grounds watched the progress of training with great interest. The small playing fields near the ZHS buildings were comparatively neglected. This is explained by the fact that sports such as handball, basketball and volleyball, which require only a small field, were played in indoor stadia during the Olympic Games and therefore the teams trained indoors instead of in the open. But the concrete rock for climbing practice in the center of the small playing field area soon became a landmark and focal point for the athletes. Some of them learned climbing for the first time on this artificial rock, while others mistook these clumps of concrete for a huge piece of modern sculpture.





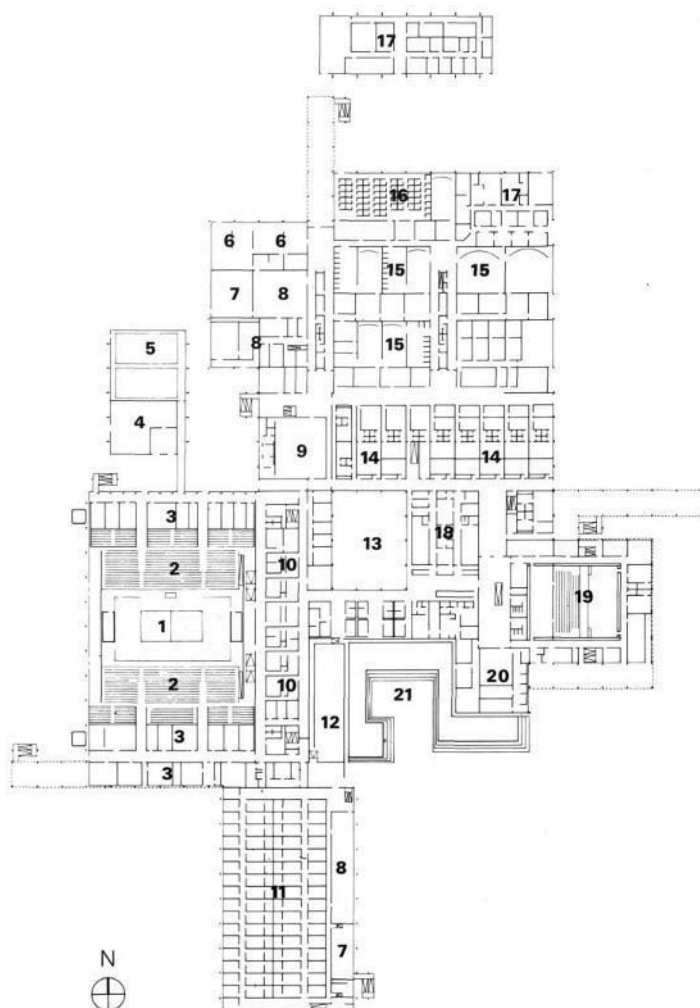
**German Olympic Center,—DOZ—  
Radio and Television Institute  
for the Games  
of the XXth Olympiad in Munich**

*Architects:  
Heinle, Wischer and Associates,  
Stuttgart/Munich  
Project Director:  
Arnold Schink*



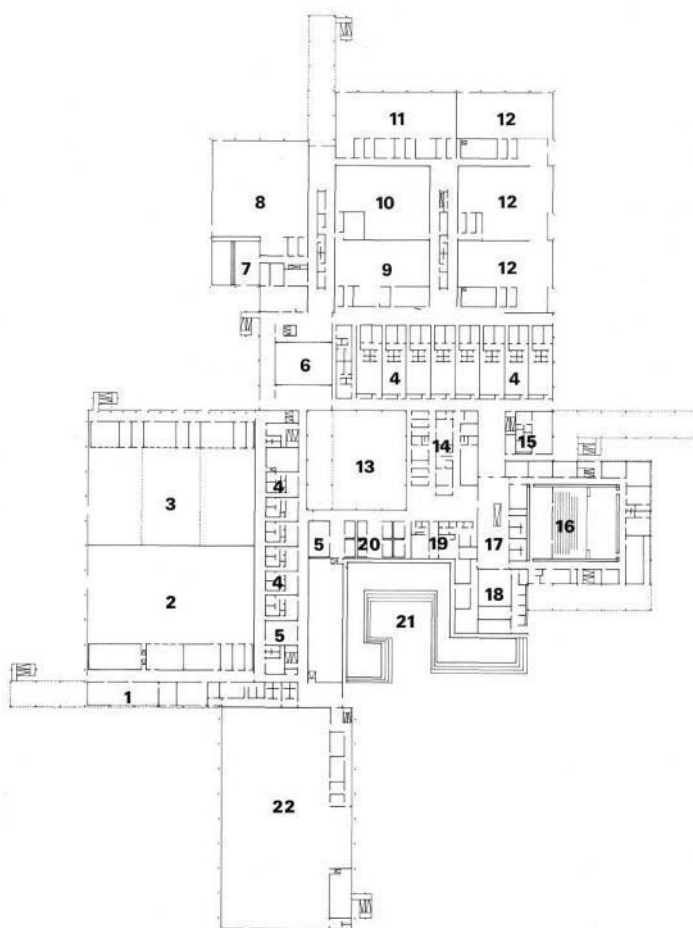
**Olympic Use of the  
Buildings Cross section  
(east-west axis)**

- 1 Volleyball hall
- 2 Athletes' dressing rooms
- 3 Entrance hall for spectators
- 4 Forum
- 5 View of the house of studies (during the Olympics: offices)
- 6 Center for information and conferences
- 7 Connecting bridge to Kosocinskidamm



**Olympic Use of the  
Buildings Ground  
floor plan**

- 1 Volleyball hall, playing fields
- 2 Temporary stands
- 3 Auxiliary rooms for organizers, the press, sports associations
- 4 Temporary air conditioning
- 5 Temporary volleyball warm-up hall
- 6 Central installation of the MAZ
- 7 Post office, picture and sound transmission
- 8 Central technical installation
- 9 Film developing
- 10 Athletes' dressing rooms
- 11 Radio studios
- 12 Ventilation facilities
- 13 Inner courtyard
- 14 Film cutting room
- 15 Television studios
- 16 Off-the-air commentators
- 17 Working rooms of the American Broadcasting Corporation (partially temporary)
- 18 First aid station
- 19 Center for information and conferences
- 20 Central electrotechnical installation
- 21 Forum



**Post-Olympic Use  
of the Buildings  
Ground floor plan**

- 1 Workshops, maintenance and storage wing
- 2 Sports hall
- 3 Sports hall (divisible into three parts)
- 4 Athletes' dressing rooms
- 5 Distribution of sports equipment and workshop
- 6 Central clothing depot
- 7 Music room
- 8 Gymnastics hall
- 9 Table tennis hall
- 10 Fencing hall
- 11 Hall for boxing, wrestling, judo
- 12 Gymnasium
- 13 Inner courtyard
- 14 Central infirmary
- 15 Rooms for personnel
- 16 Lecture hall
- 17 Lower distribution hall
- 18 Central electrotechnical installation
- 19 Sauna
- 20 Music studios
- 21 Forum
- 22 Track and field hall

During the Olympic Games the buildings of the Central University Sports Facility provided accommodation, in addition to the volleyball hall, for the German Olympic Center for Radio and Television (DOZ). A completely successful installation of radio and television equipment was carried out in these buildings, although they had been designed and constructed expressly for use as the Institute for Physical Education and Sports of the University and Technical University of Munich.

The constructional principle - a steel frame building partitioned with light-colored metal panels—was already mentioned in connection with the volleyball hall. Cor-Ten steel was used for the supporting elements. This steel does not have to be painted or galvanised to prevent it from rusting. It undergoes an external corrosion process and after two to three years it develops a protective dark-brown finish and needs no further care or maintenance.

The buildings are graded in height and are grouped around a forum, from which the small stadium in the south east with its 3,000 seats, the tent roof, and the television tower in the south of Olympic Park can be seen.







Television engineers, in what seemed like a labyrinth of rooms and passages, constructed a technical system in the future gymnasiums and athletics halls in the northern section, which enabled all events during the Games to be transmitted to television viewers in every part of the world. Eight studios of different sizes, a recording center, an off-screen room, four projection rooms, a directional radio transmitting and receiving station, fifty editing rooms and the central switchboard room were installed by the two German radio and television organisations, ARD (Association of German Broadcasting Stations) and ZDF (Second German Television Programm) in the northern section of the ZHS.

Further to the north, a temporary building was constructed along the same lines for ABC (American Broadcasting Corporation) for their sole use. It was dismantled after the Games.

In the future athletics hall, situated in the southern section, an intermediate floor was built in order to accommodate seventy studios, each with one announcer's and one technician's room, fifty editing rooms, and the central broadcasting switchboard.

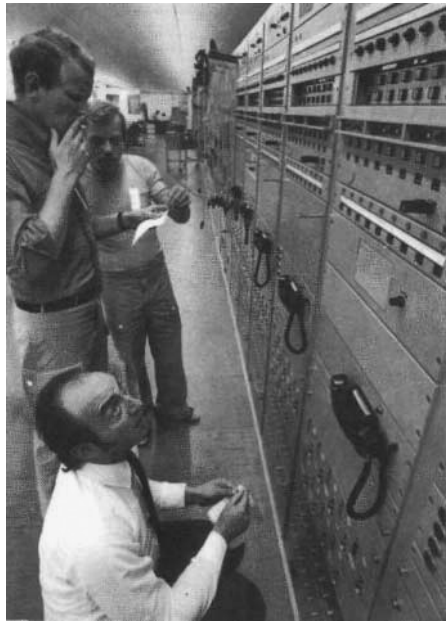
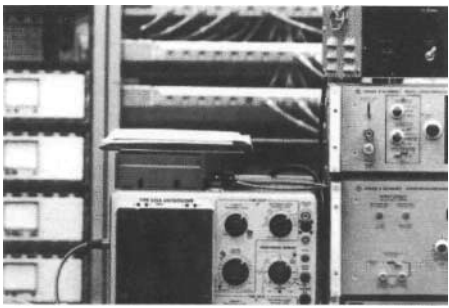
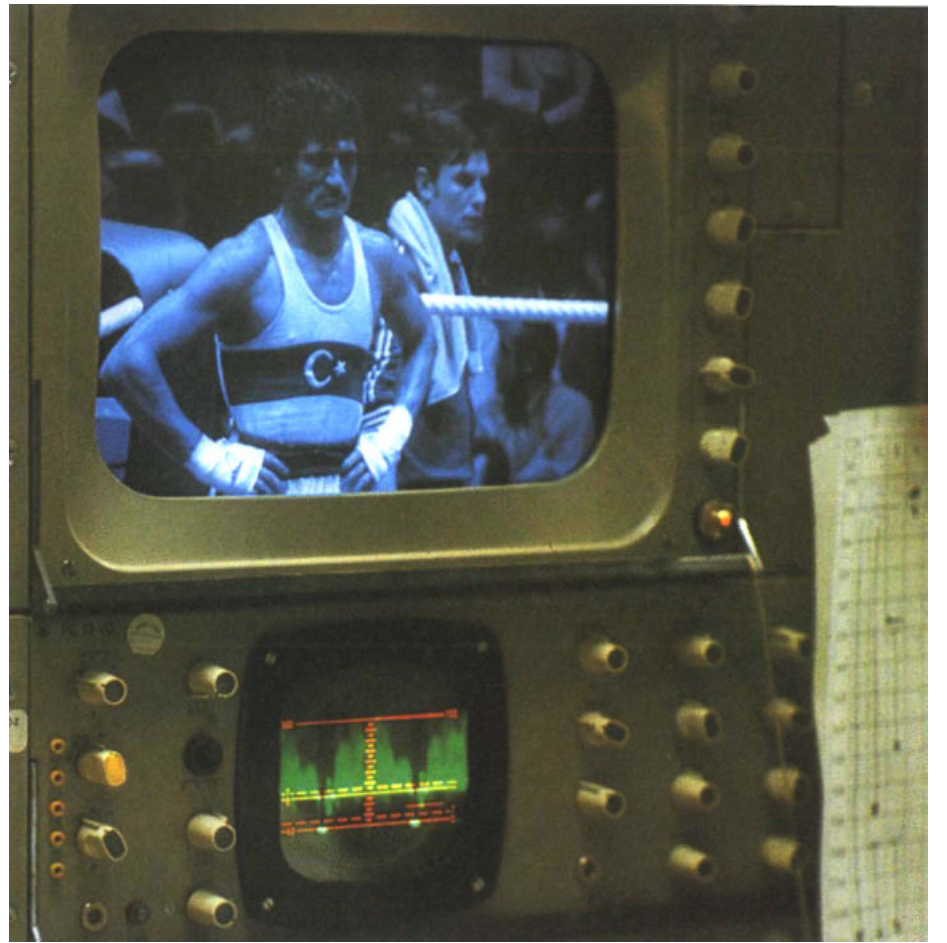
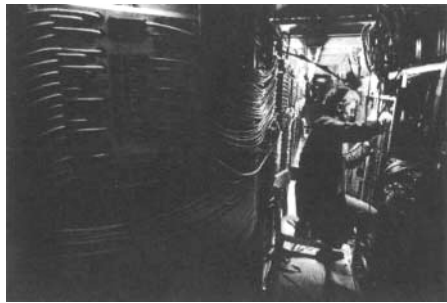
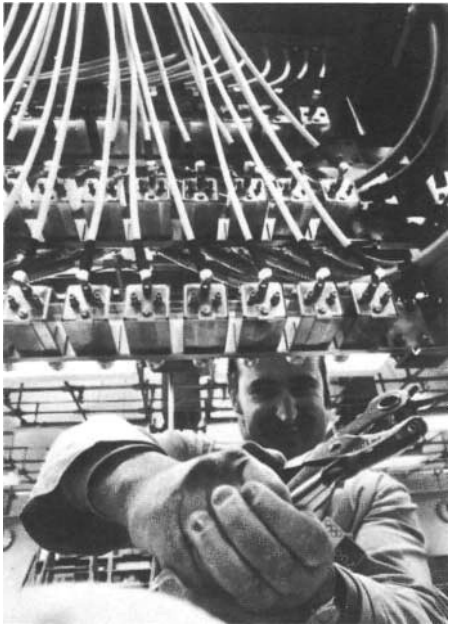
At first sight it might appear that a very elaborate space utilization program would not be required for the extensive operations of television and broadcasting. But the decisive factor in this matter was the vast amount of electronic equipment and everything connected with the technicalities of transmission which had to be included in this program. In this interim period of use as the radio and television center, moreover, the buildings had to be equipped with expensive but indispensable heating, ventilation and cooling units. As a safety measure, all cables were laid within double walls, and switches and sockets were mounted in shielded cabinets.

Naturally, this complex of electronic equipment was not required in the case of films of sports events which were not televised. Facilities for the processing, projection and storage rooms for these films were erected in the area which later would be used for the changing-rooms for students.

The only parts of the German Olympic Center which were put to the same kind of use both during and after the Olympic Games were the central administration building and the classroom building for sports students at the ZHS. Offices for accounting, information and interpreters, a cloak room, the telephone and telex exchanges, and a restaurant were installed in the administration building. The lecture hall encompassed by these rooms, seating 500 persons, was used for press conferences. The classroom building was used for the offices of television and radio technicians, producers, and editors.



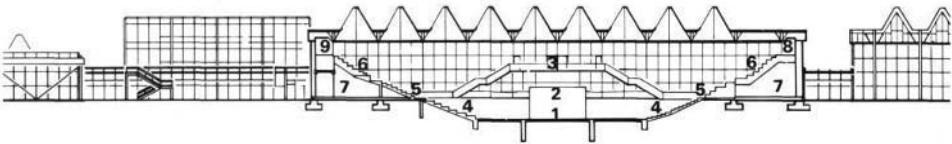






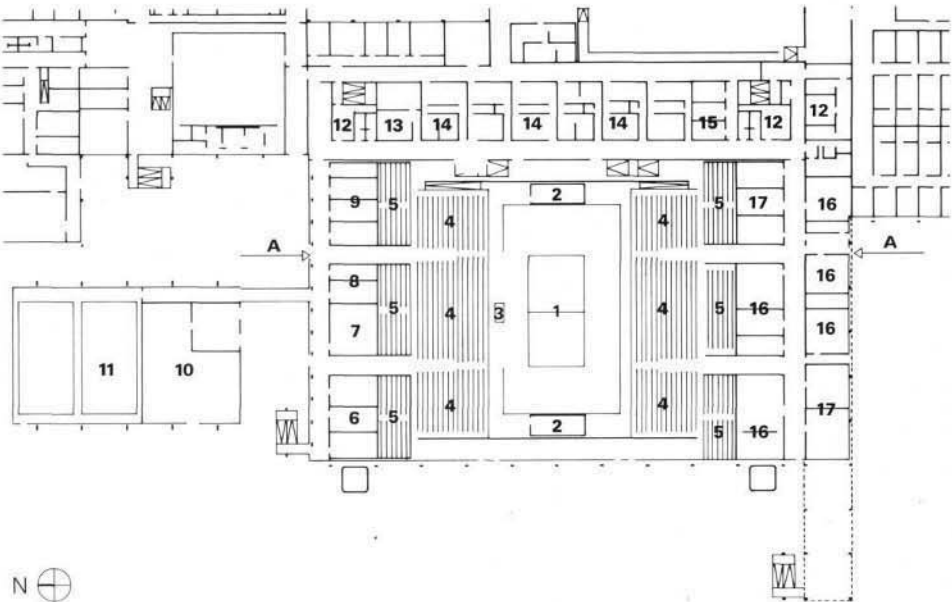
Volleyball Hall Olympic Park

Architects:  
Heinle, Wischer and Associates,  
Stuttgart/Munich  
Project Director:  
Arnold Schink



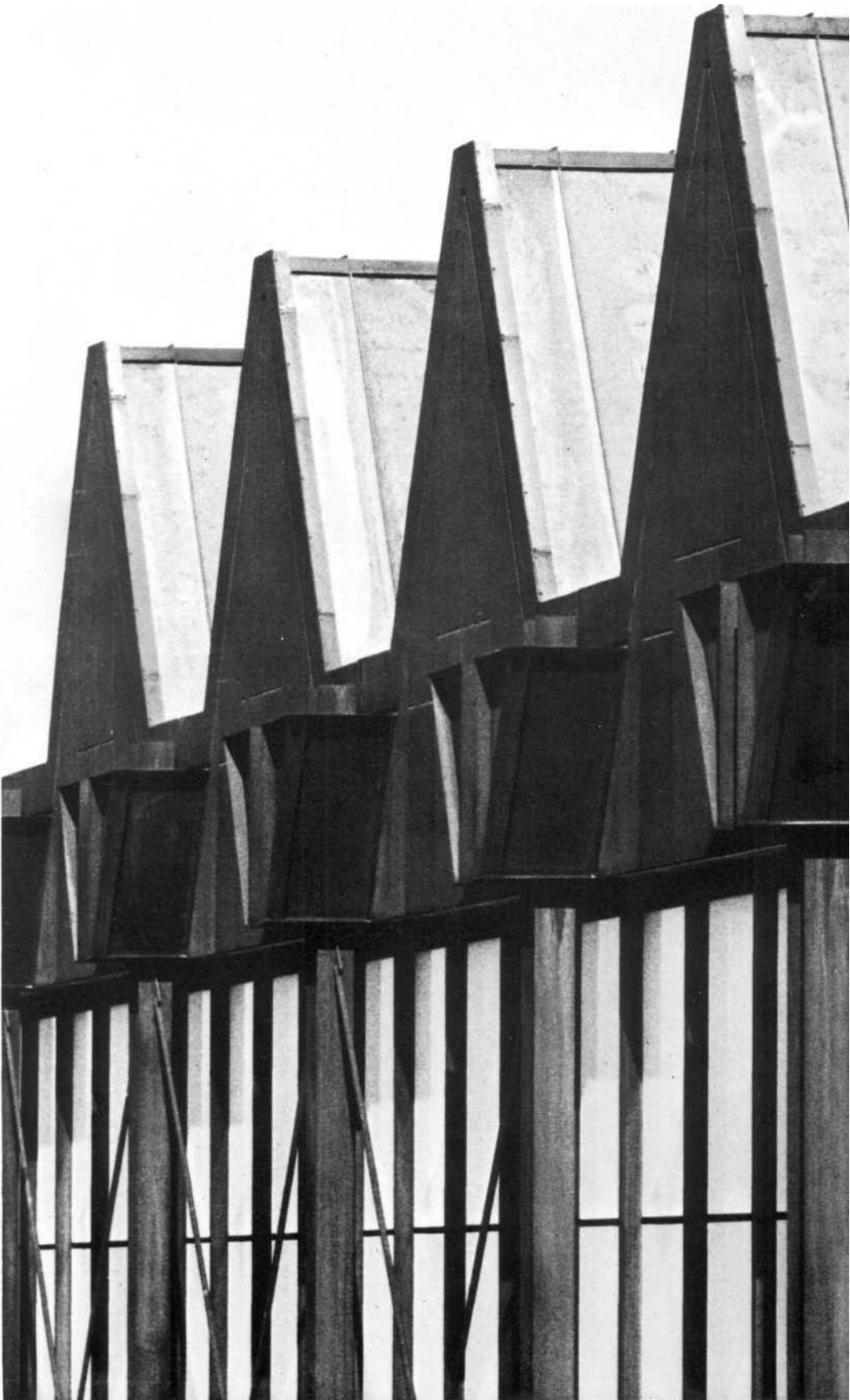
Cross section A-A

- 1 Plane of the playing area
- 2 Warm-up room
- 3 Spectators' entrance from the entry hall
- 4 Temporary sunken grandstands
- 5 Temporary grandstand on the level of the future ZHS gymnasiums
- 6 Permanent grandstand of the ZHS gymnasiums
- 7 Gymnastic apparatus rooms of the ZHS gymnasiums (during the Olympics, temporary rooms for organization and the press subcenter)
- 8 Announcers' booths
- 9 Direction booth



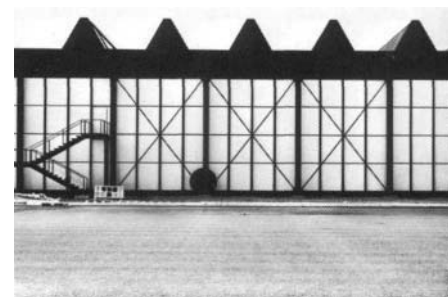
Floor plan

- 1 Playing area
- 2 Warm-up room
- 3 Scorers' table
- 4 Temporary sunken grandstands
- 5 Temporary grandstand on the level of the future ZHS gymnasiums
- 6 Offices of the International Volleyball Federation (FIVB) and of the German Volleyball Federation (DVV)
- 7 Meeting room
- 8 Hall director
- 9 Offices of the OC
- 10 Temporary air-conditioning plant
- 11 Warm-up hall
- 12 Toilets
- 13 Referees' room
- 14 Locker rooms for athletes
- 15 Security guards
- 16 Press subcenter
- 17 Doctor's office



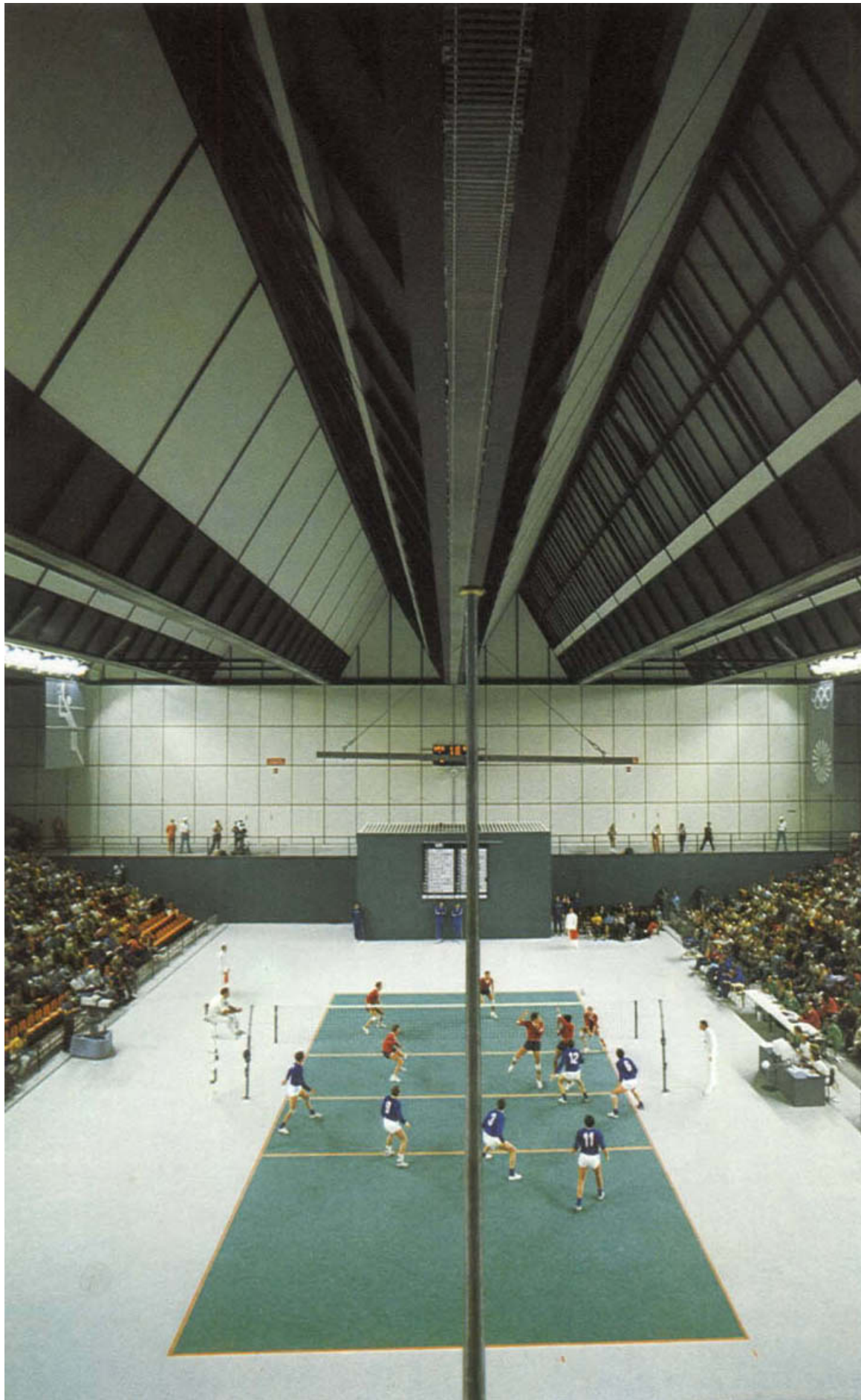


Situated to the west of the forum, the volleyball hall terminates the group of buildings comprised by the Central ZHS. The original plans provided for two halls, each 28 m. x 50 m. in area and 9 m. high, and each with seats for 600 spectators on gallery grandstands. These two halls were provisionally combined into one large hall measuring 56 m. x 50 m. The decision to adopt this solution was motivated by the recognition of the fact that a further large stadium with a capacity of about 4,000 spectators, in addition to the neighboring sports hall and the basketball hall, could not be justified on economic grounds by the number of sports events which would be held in Munich.



Like the other buildings of the ZHS, the volleyball hall is a steel frame structure. Seen from the west, it looks very impressive. The girders, with a span of 50 m., rest on steel pillars which appear slender in comparison. The spaces between the pillars are filled with flat-white metal panels.





The principles of construction used for the whole ZHS are also apparent in the interior of the volleyball hall. The symmetrical arrangement along both sides of the playing field of the grandstands, which ascend from the floor almost to the sawtooth roof, was particularly suited to the character of this sport. Whereas in post-Olympic utilization, daylight will enter through the north lights of the roof, they were obscured for the period of the Games when the stadium was artificially illuminated with an intensity of 1,875 lux. Rows of lamps mounted along the steel girders provided dazzle-free illumination of the playing field. The lighting emphasised the color contrast between the athletes in their bright jerseys and the light-green surface of the playing field, and between the enthusiastic spectators on their orange-colored seats and the dark brown of the heavy roof girders.

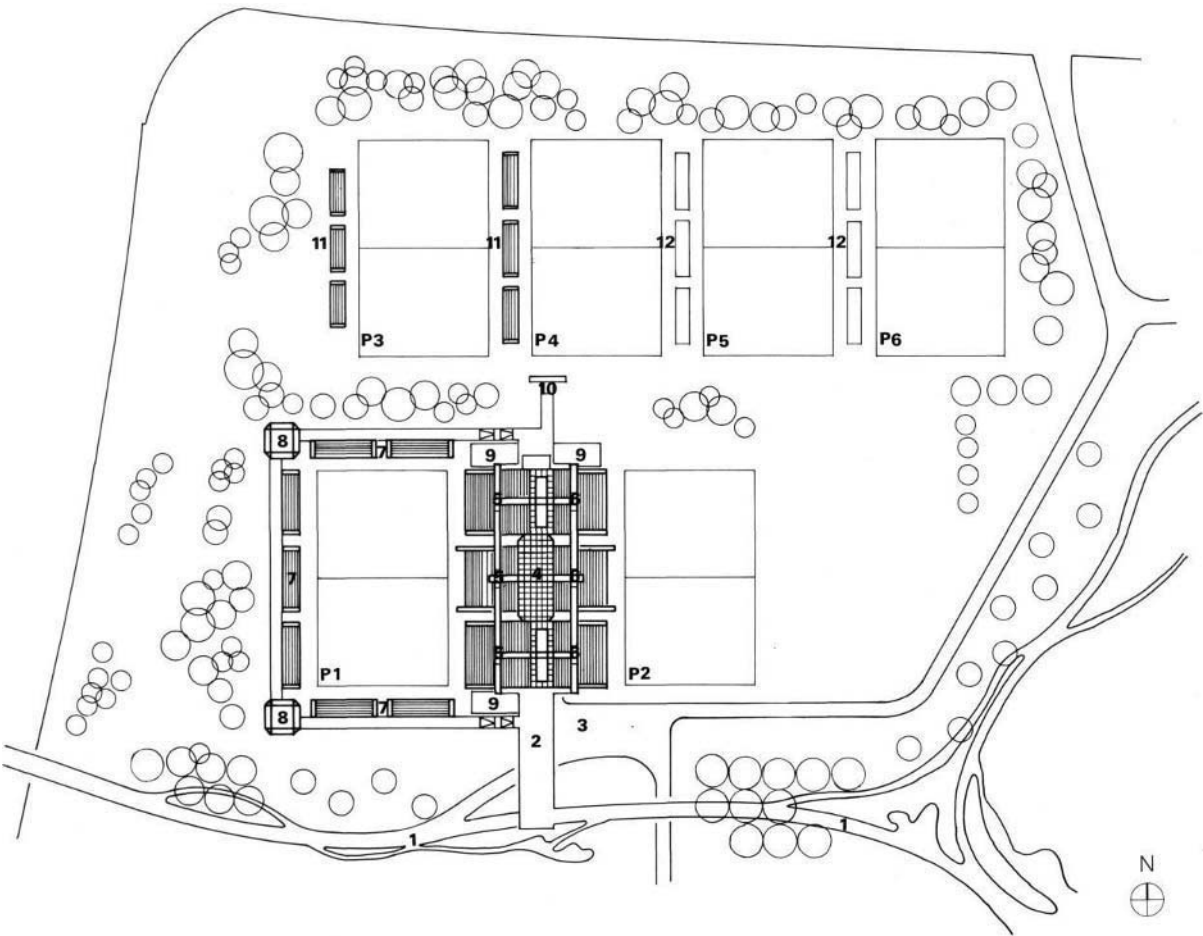
To meet the demand for a clear inside height of 12.5 m. above the playing field, a part of the floor of the combined hall was sunk by about 3.5 m. This provided room for provisional grandstands on both sides of the length of the playing field. Together with the permanent grandstands for post-Olympic utilization, the stadium then had a capacity for 3,700 spectators, including the commentators, the press, guests of honor and athletes. After the Games, the floor was raised again to the originally planned level for post-Olympic use.

Despite the provisional character of this hall, it was possible to arrange complete separation of the areas used by different groups of visitors such as spectators, guests of honor, reporters and the participating athletes.

A warm-up hall, also a provisional structure, with two playing fields and direct access to the competition area, was erected in the northern part of the volleyball hall.







At first it was intended to convert one of the existing Munich sports grounds to meet the requirements of the hockey tournament, but after due consideration, and in agreement with the sport federations concerned, the Organizing Committee decided on a solution more in keeping with the slogan: "The Olympics with short distances". Provision had been made for seven grass playing fields in the north-western part of the grounds of the ZHS. This site offered an ideal situation for the erection of temporary grandstands and the service rooms for the organizers. This also meant that the accommodations for sports spectators in Munich after the Games, already too large, could be reduced by about 20,000 seats. The site was also ideal in the way it is subdivided; the terrain is enclosed by natural high embankments and plantings so that games are not disturbed by noise from the environment.

Six of these fields were sufficient to ensure the smooth functioning of the Olympic hockey tournament. The capacity of the grandstands varied. The stand on the main field accommodated 10,000 spectators, that on the second field 5,000, that on the third field 3,000, while those on the fourth, fifth and sixth fields each had a capacity of 2,000 spectators.

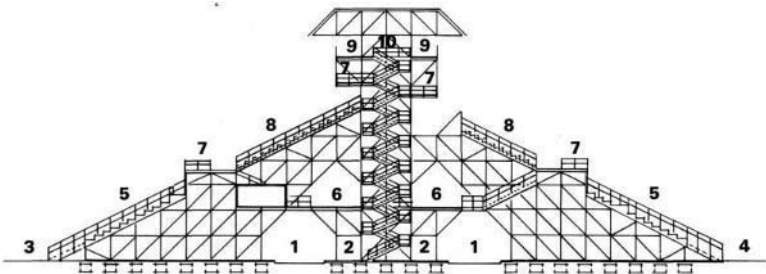
The area is bounded at the south by the Kusoczninskidamm, which runs from west to east and connects the Press Complex to Olympic Park. The main grandstand, situated between fields 1 and 2, was built at right angles to this embankment. Spectators entered it at its second level from the pathway along the top of the embankment. The lower level was reserved for players and officials. Low stands constructed of steel tubing were erected in blocks along the western side and at both ends of the main playing field (field 1), while on the eastern side, the main stand rose to a height of 25 m. Its rear tiers provided the spectator accommodation for field 2.

**Layout diagram**

- 1 Kusoczninskidamm
- 2 Spectators' entrance
- 3 Entrance for athletes and organizational personnel
- 4 Grandstand structure
- 5 Main grandstand for Field 1
- 6 Main grandstand for Field 2
- 7 Grandstand for standing room
- 8 Toilets
- 9 Parking place for mobile transmission unit
- 10 Spectators' entrance to Fields 3-6
- 11 Multi-use collapsible grandstands
- 12 Area for the collapsible grandstands
- P Field

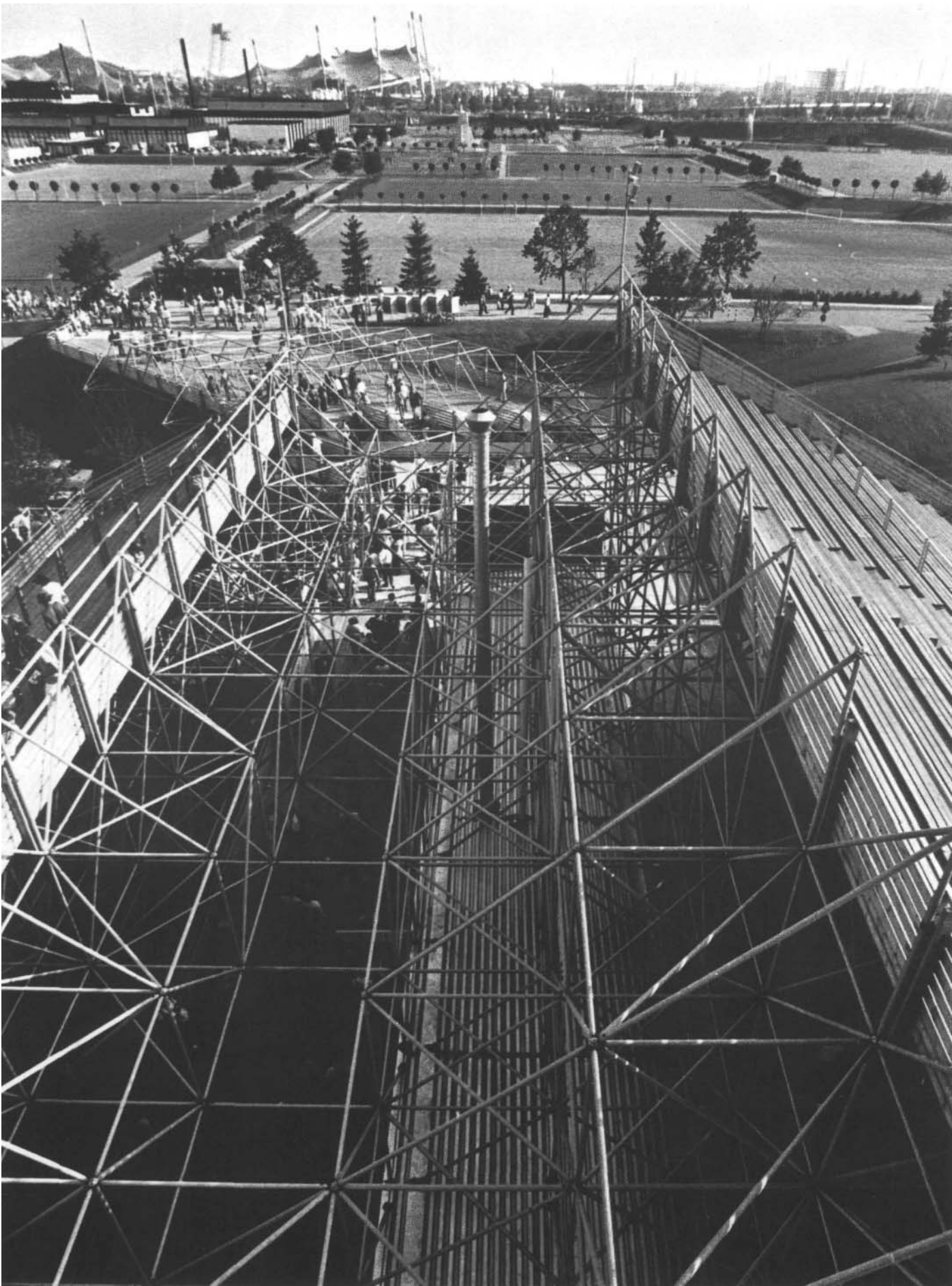
**Grandstands in cross section**

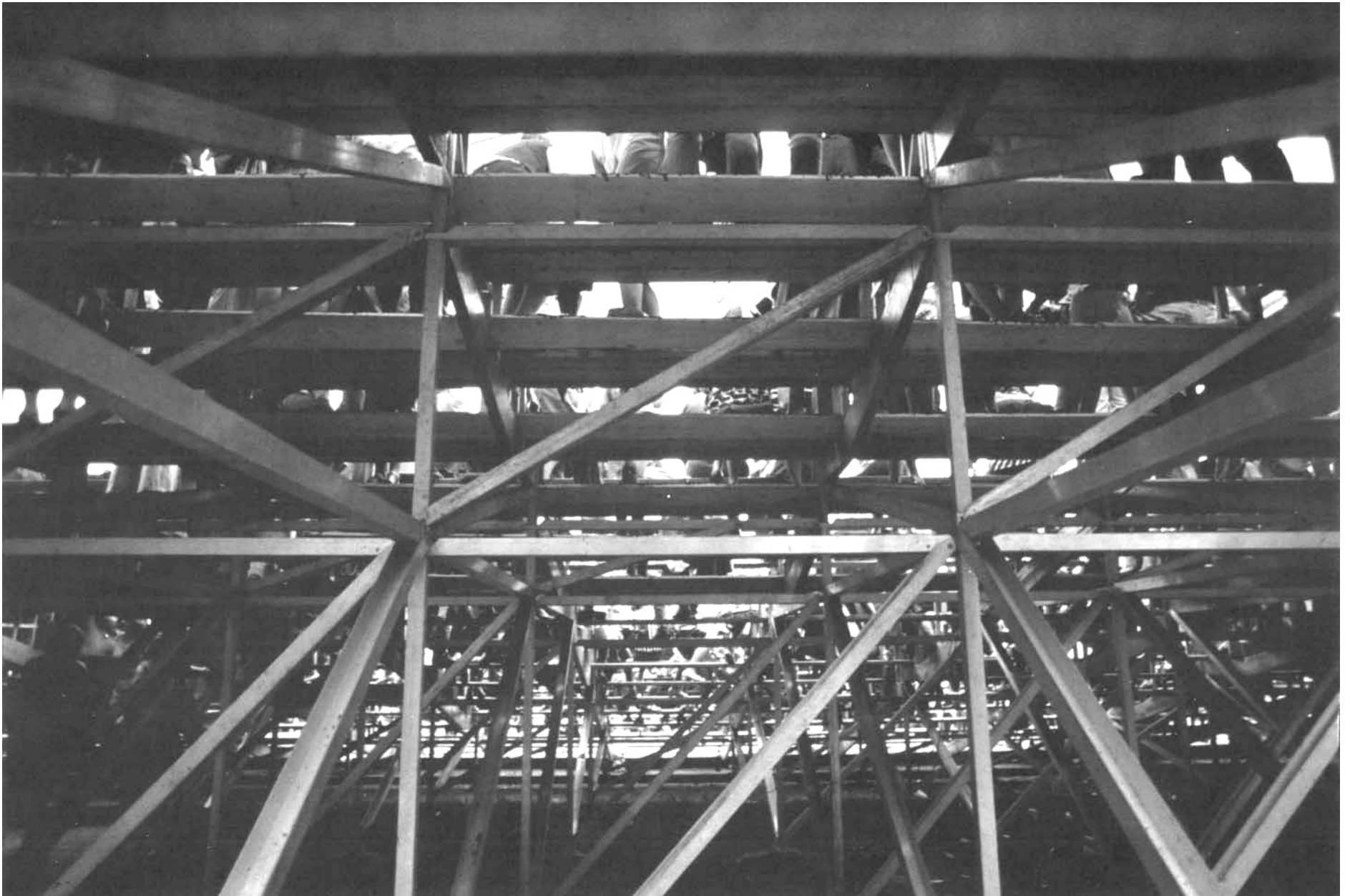
- 1 Driveway
- 2 Athletes' and organizational area
- 3 Field 1
- 4 Field 2
- 5 Grandstand with seats
- 6 Level of spectator dispersion, toilets and press information
- 7 Camera stand
- 8 Grandstand for standing room
- 9 Places for commentators
- 10 Central direction booth











Spectator accesses, platforms, stairs, steps in the seating and standing room areas as well as the barriers at the edges of the grandstands, were made of wood. This did not, however, detract from the general impression of transparency caused by the steel tube structure.

The main grandstand was constructed of light steel tubing and its trapezoidal roof was covered with metal foil. Thus the stand could be immediately recognized by every visitor as a temporary installation in the open landscape.

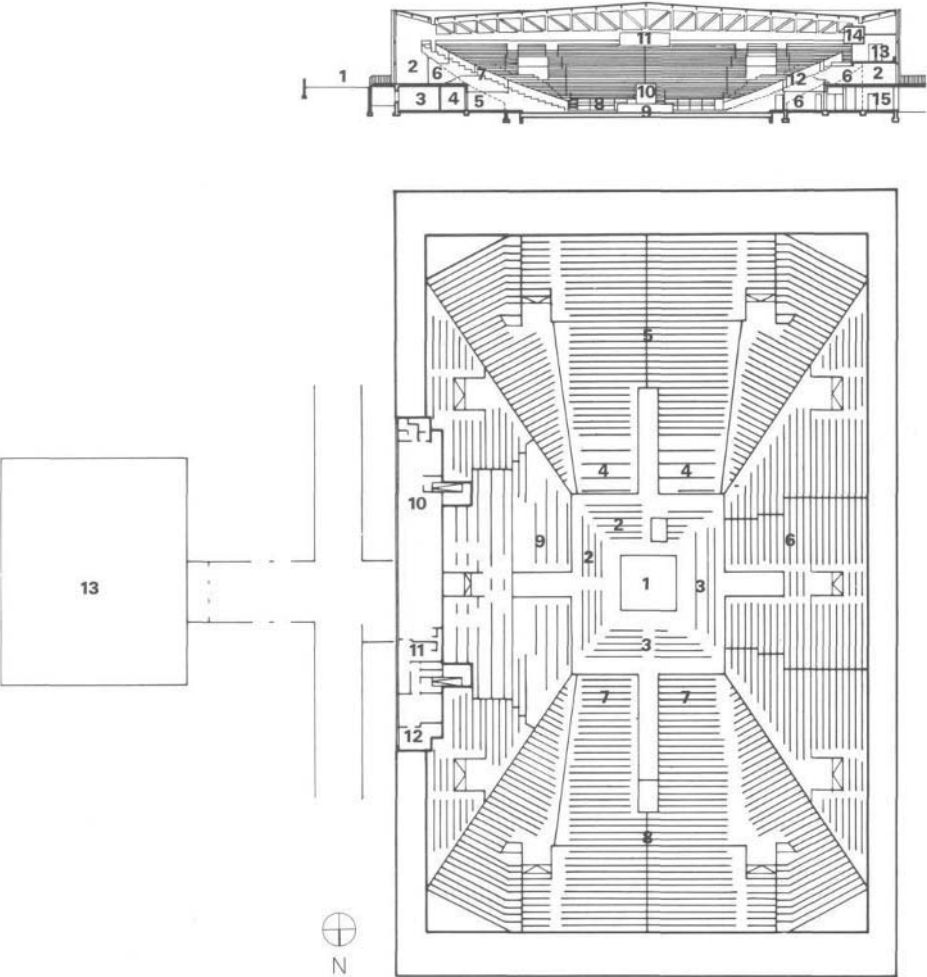
The principle of construction used for the framework of the grandstand made it possible to leave spaces open for the accommodation of offices for the organizers, changing-rooms and rooms for the press, radio and television reporters and technical services, and also enabled large areas to be spanned. Steel tubes of uniform length were assembled with the use of 16-faced screw couplings, to form cubes of the same size, and these cubes were put together to make larger units. The sup-

porting elements could easily be picked out through the larger number of bracing cross members.

The tiers of the grandstand were not constructed in the same way. Although the principle employed was similar to that described above, this quick assembly system used, instead of steel tubing, steel U-sections which were bolted directly together at intersecting points.



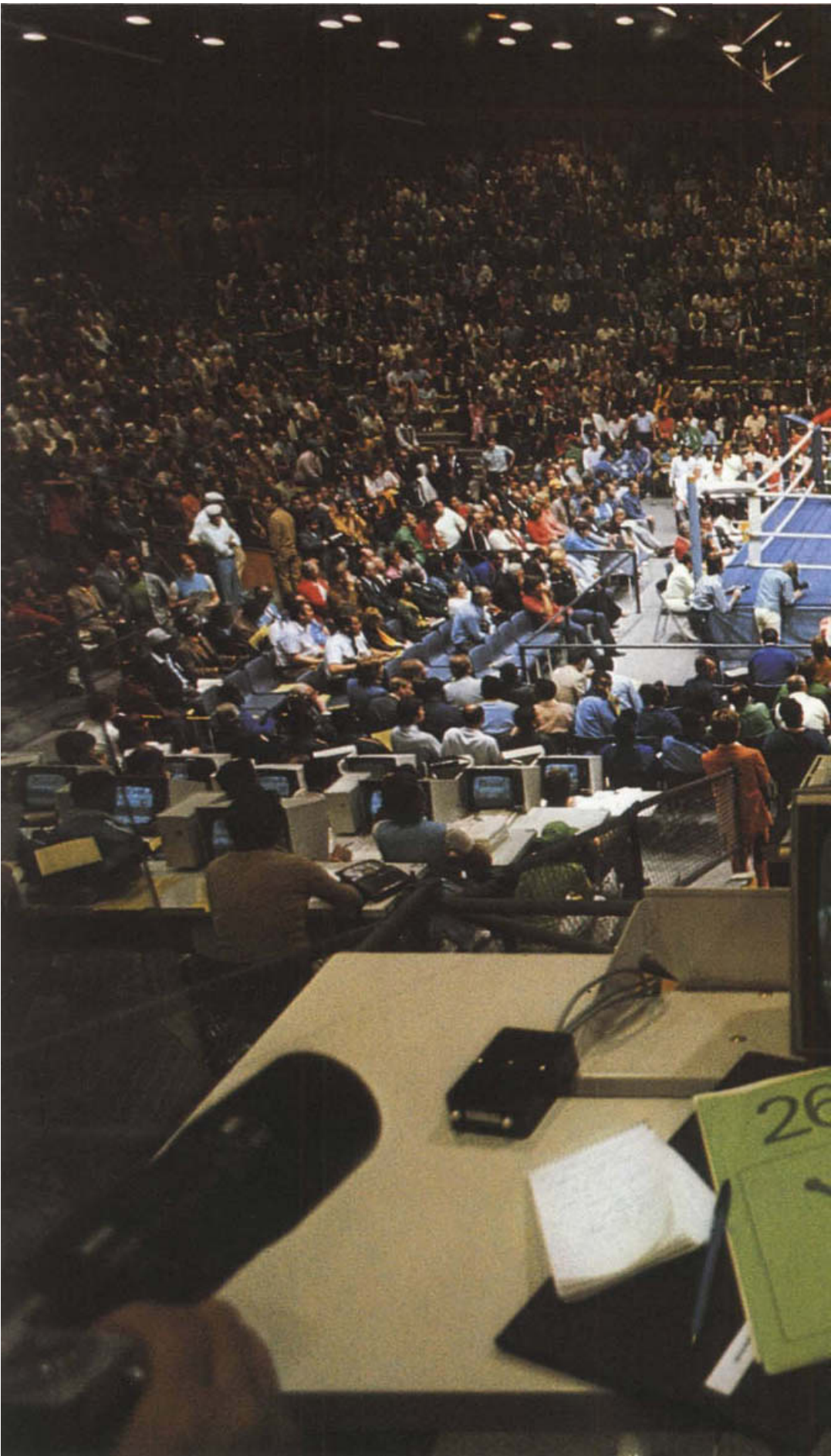
**Boxing Hall Olympic Park**  
*Architect:*  
*Rolf Schütze, Munich*



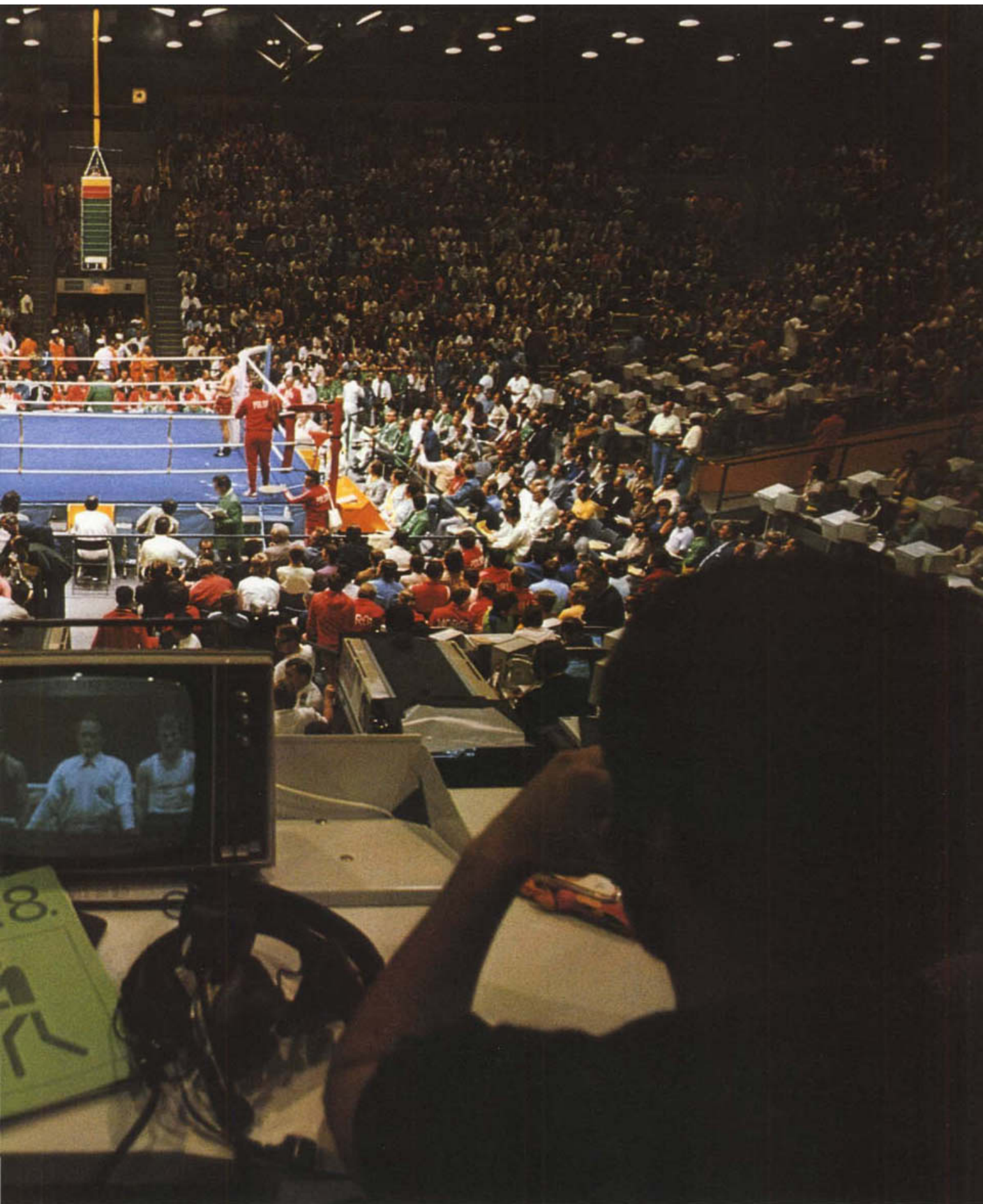
- Cross section  
(East to West)**

  - 1 Ramp to the spectators' entrance
  - 2 Passage around stands
  - 3 Athletes' locker room
  - 4 Distributing passage
  - 5 Store room
  - 6 Permanent stand (built-over) stands
  - 7 Eastern temporary stand
  - 8 Chairs near the ring
  - 9 Boxing ring
  - 10 Camera stand
  - 11 Scoreboard
  - 12 Western temporary stand with press and commentators' seats
  - 13 Restaurant
  - 14 Director's cubicle
  - 15 Organization offices
  - 16 Garage
- Diagram of the grandstand floor**

  - 1 Boxing ring
  - 2 Ringside seats for the press
  - 3 Ringside seats for the jury, doctor, judges and sport league functionaries
  - 4 Press seats
  - 5 South stand with seats
  - 6 East stand with seats
  - 7 VIP seats
  - 8 North stand with seats
  - 9 Seats for the press and radio announcers
  - 10 Restaurant
  - 11 Kitchen
  - 12 Director's areas
  - 13 Press subcenter







One of the assets which Munich could include in its candidature documents for the Games of the XXth Olympiad which it submitted to the International Olympic Committee, was the ice stadium at Oberwiesenfeld at the foot of the television tower. It was also listed as "an item in stock" in the architectural competition for the creation of the Olympic complex. It was earmarked for the Olympic boxing event, but was also used one day for the judo finals after the exact timetable of events and the schedule for their allocation to the competition sites had been completed.

The ice stadium, comprised of an open-air skating rink 45 m. x 60 m. in size adjacent to a covered rink measuring 30 m. x 60 m., was opened in the winter of 1966/67. The hall has seating accommodation for about 2,100 spectators and standing room for 5,100.

The interior had to be completely rebuilt for the Olympic Games because the scene of action viewed by spectators at boxing matches is fifty times smaller than at skating events. After detailed studies the Organizing Committee decided to follow the recommendations of the Institute for the Construction of Sports Installations of the German Sport Federation and to provide the provisional installation with a range of view for the spectators equally as good as in the other Olympic sites. The structure therefore had to be altered in order to give the required range of view and also to conform with the security regulations for the filling and emptying of the grandstands. This meant the erection of removable grandstands over the existing ones.

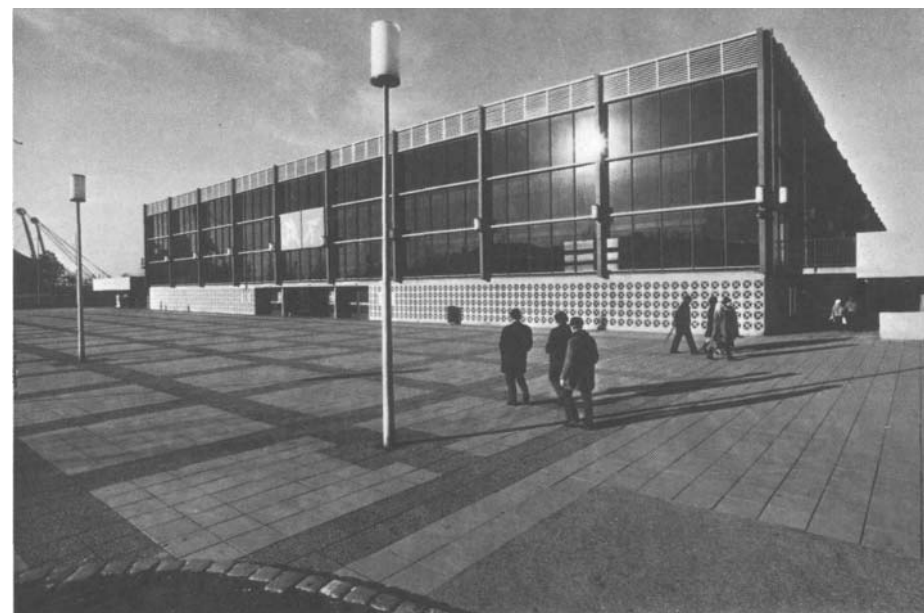
The only permanent structure was the restaurant on the west side above the covered and open-air rinks. On this side the seats for the press (260) and radio and television commentators (120) ascend from the ringside seats. Eighteen cubicles for reporters are situated above the restaurant.

Seating accommodation was provided for 6,000 spectators in addition to the seats for guests of honor, referees, sports officials and participants.

Indicator boards measuring 2 m. x 6 m. stood at each end of the hall, giving spectators and the press clearly visible information about the program and the results. A clock suspended above the ring showed the duration of the rounds and the intervals.







The foundations, the base of the hall, and the fixed grandstands are made of reinforced concrete. The hall itself is constructed of steel uprights and tubular steel lattice beams with a span of 53 m. The roof consists of steel purlins carrying trapezoid aluminum sheets on sound and heat insulating material.

Honeycombed concrete blocks are positioned in front of the foundation base. The facade above this floor is a steel construction with grey, pretensioned safety-glass. The upper horizontals are formed by the ventilation louver which encircles the building.



The existing service rooms below the grandstands in the ice stadium did not need much structural alteration in order to be used as changing rooms, referees' rooms, and offices for the international and national sport federations. A press subcenter — also a provisional structure — was built on a section of the open-air rink.

The adaptation of this building for its Olympic utilization was conducted from the realistic standpoint of making as small an investment as possible in a building that would be used for ice sports again after the Games, while at the same time fulfilling the requirements of boxing and judo to the maximum extent.

Through the establishment of close contact between the contestants and the spectators, reinforced by the insertion of wedge-shaped intermediate grandstands and enhanced by the creative adaptation measures of the Organizing Committee's department of "Visual Design", it was possible to transform the ice stadium into a real boxing arena.

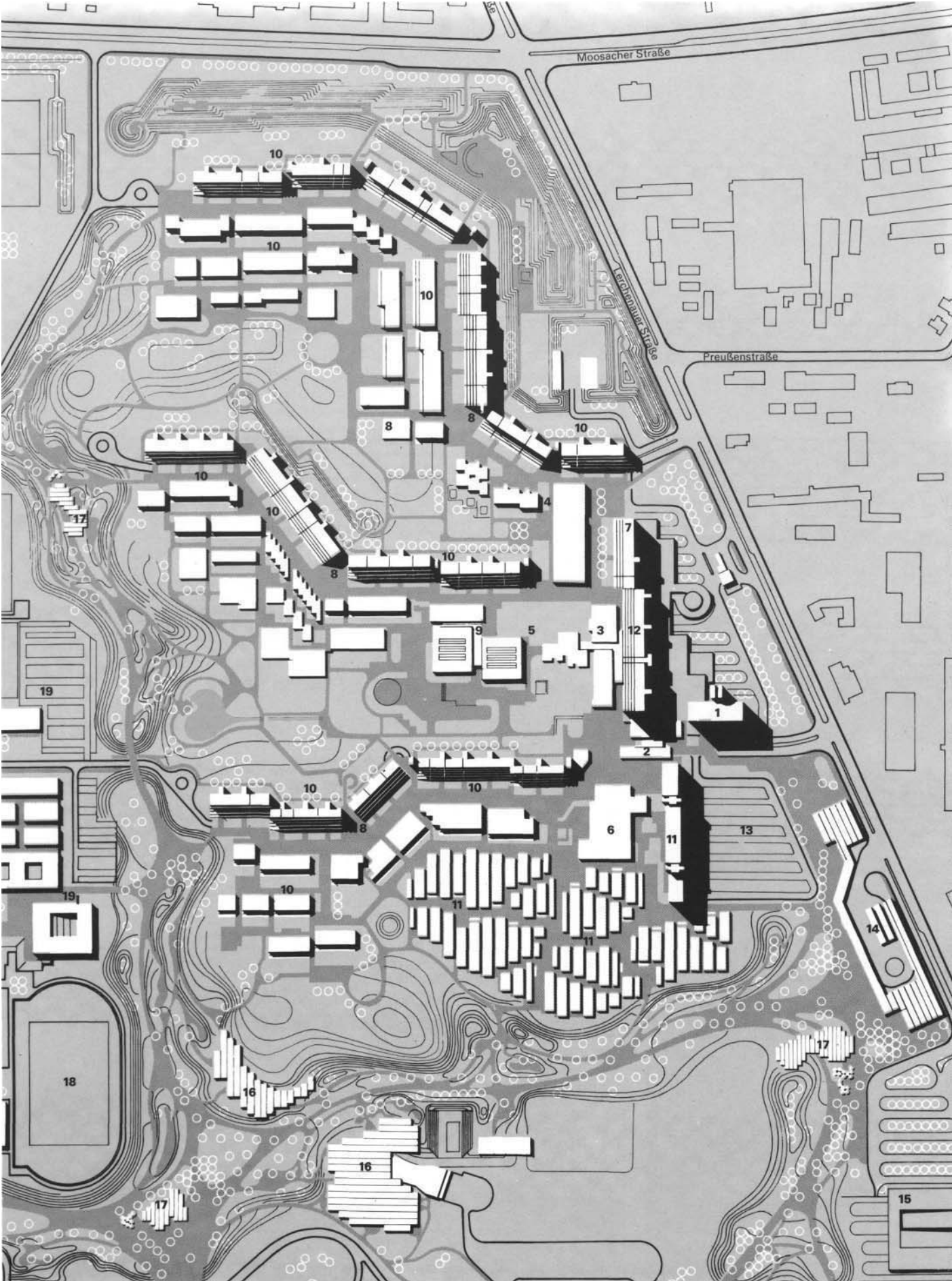


**Olympic Village**

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



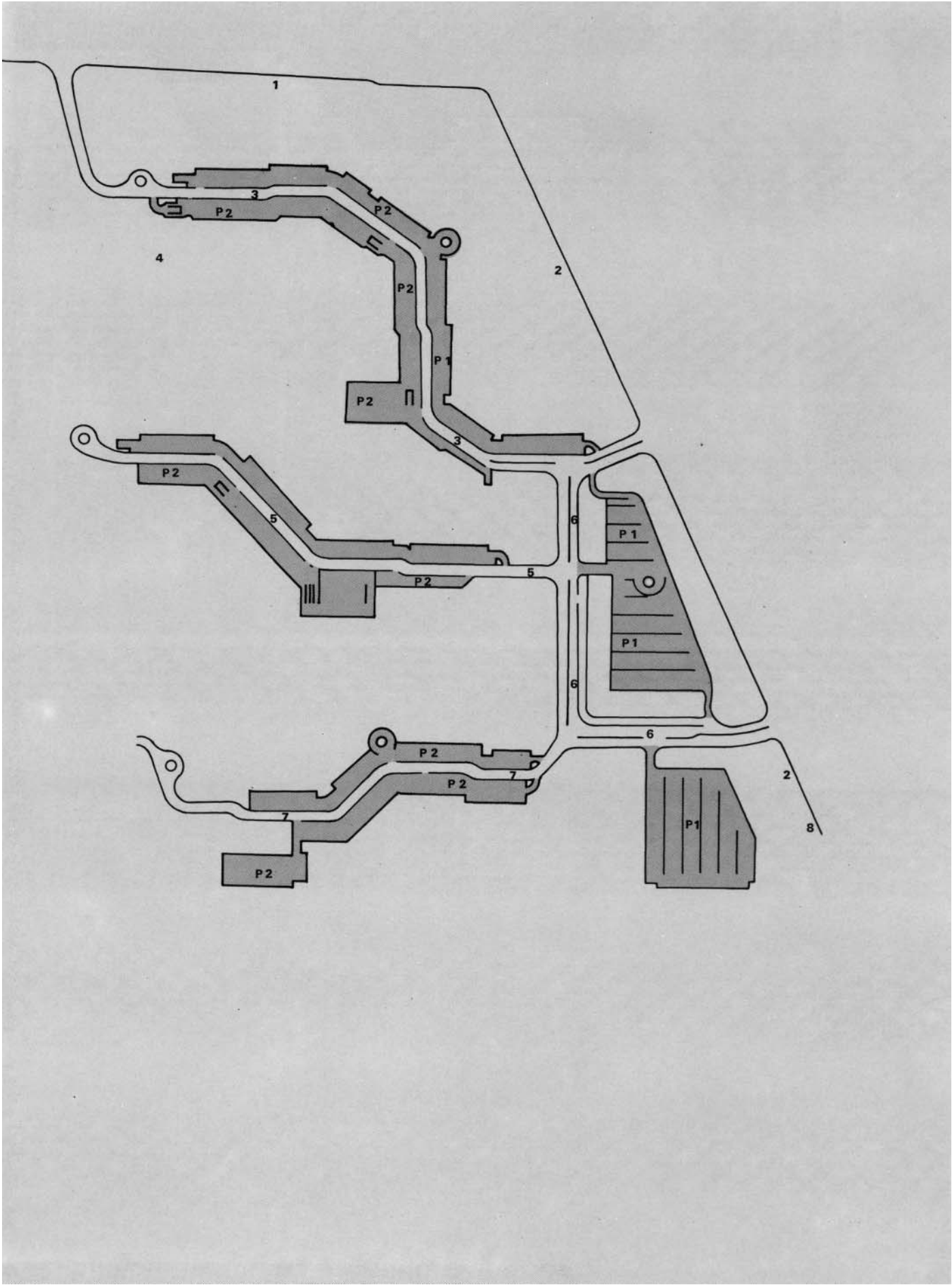
**Layout diagram**

- 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 Thoui 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 Oberwiesenfeld 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 Oberwiesenfeld even before Munich applied for the Olympics. This section was the Women's Village during the Games.

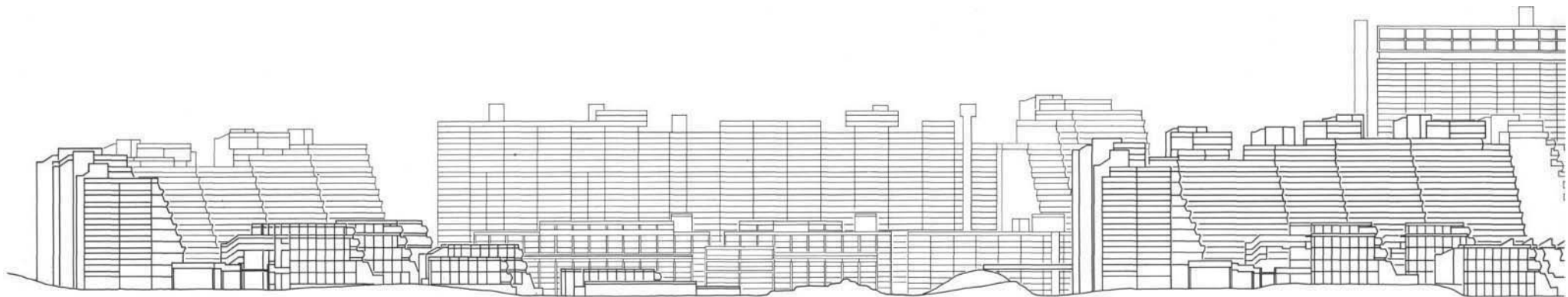
The concept of architects Behnisch and Associates was the basis of the designs for the Olympic buildings at Oberwiesenfeld. The final area and building program envisioned 5,000 apartments to house 10,000 persons after the Olympics. This apartment building program was supplemented by infrastructure measures 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 optimation", 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.

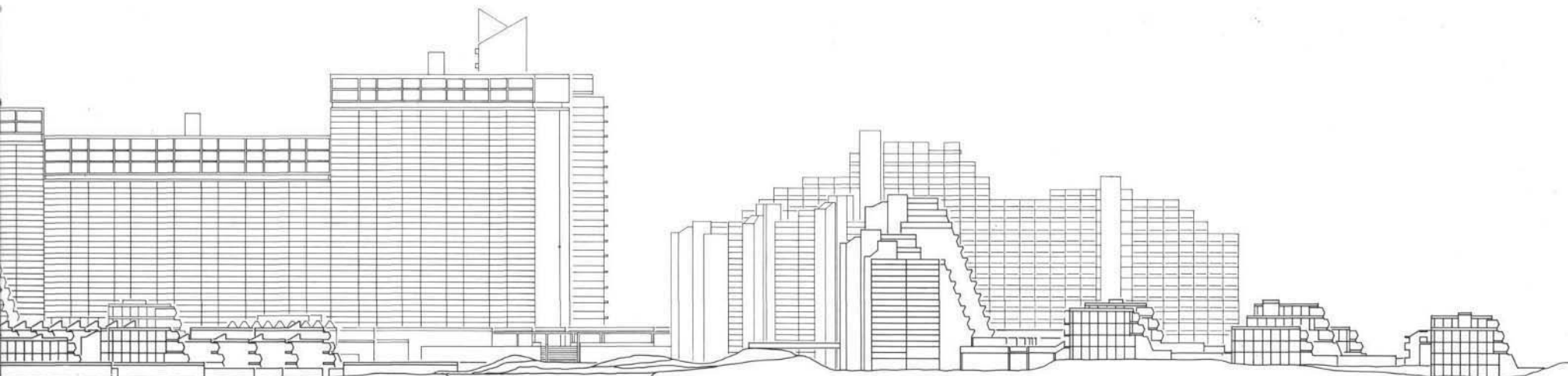
Sharing in this part of the work were Gordon Ludwig, Franz Raab, Gert Wiegand, and Wolf Zuleger of Munich as independent architects of equal rank and winners of one of the four fourth prizes in the

"Oberwiesenfeld Architectural Competition".

Either alone or in groups, 22 architects were competing in the first stages of the "optimation 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

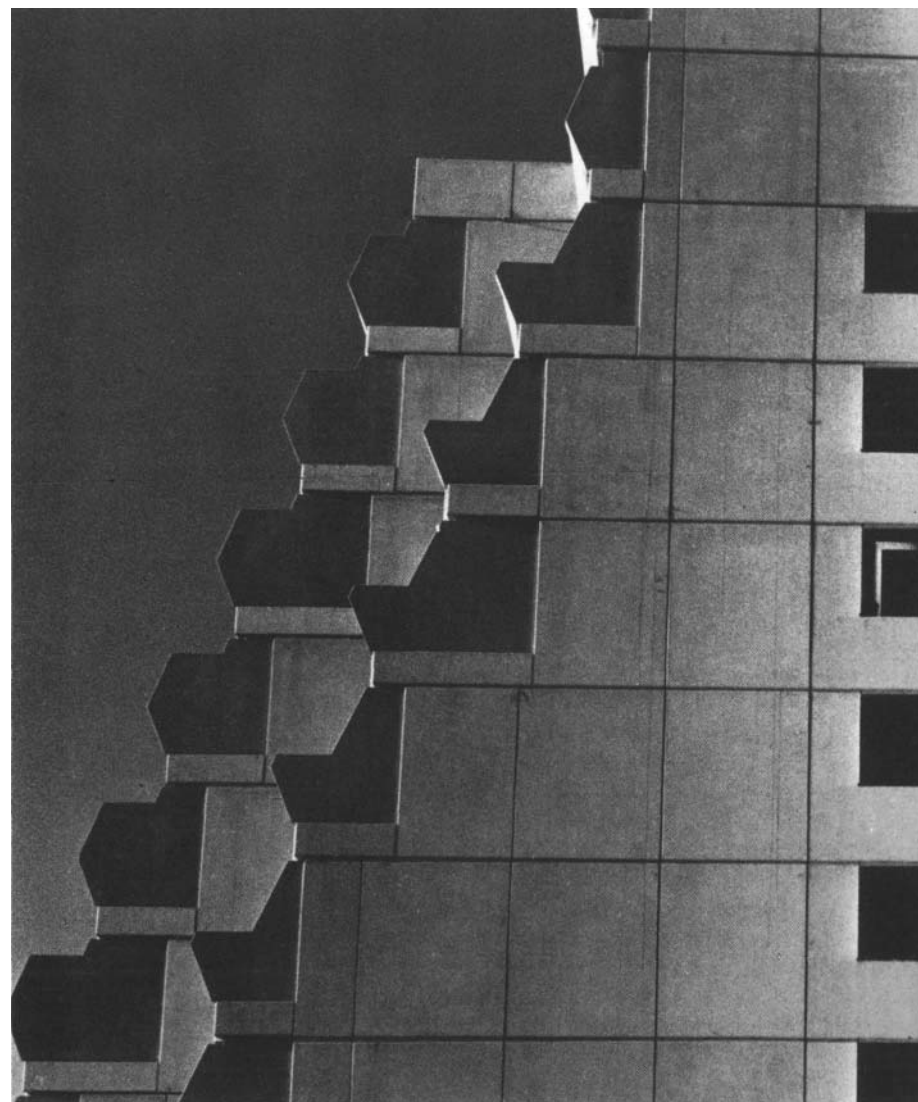
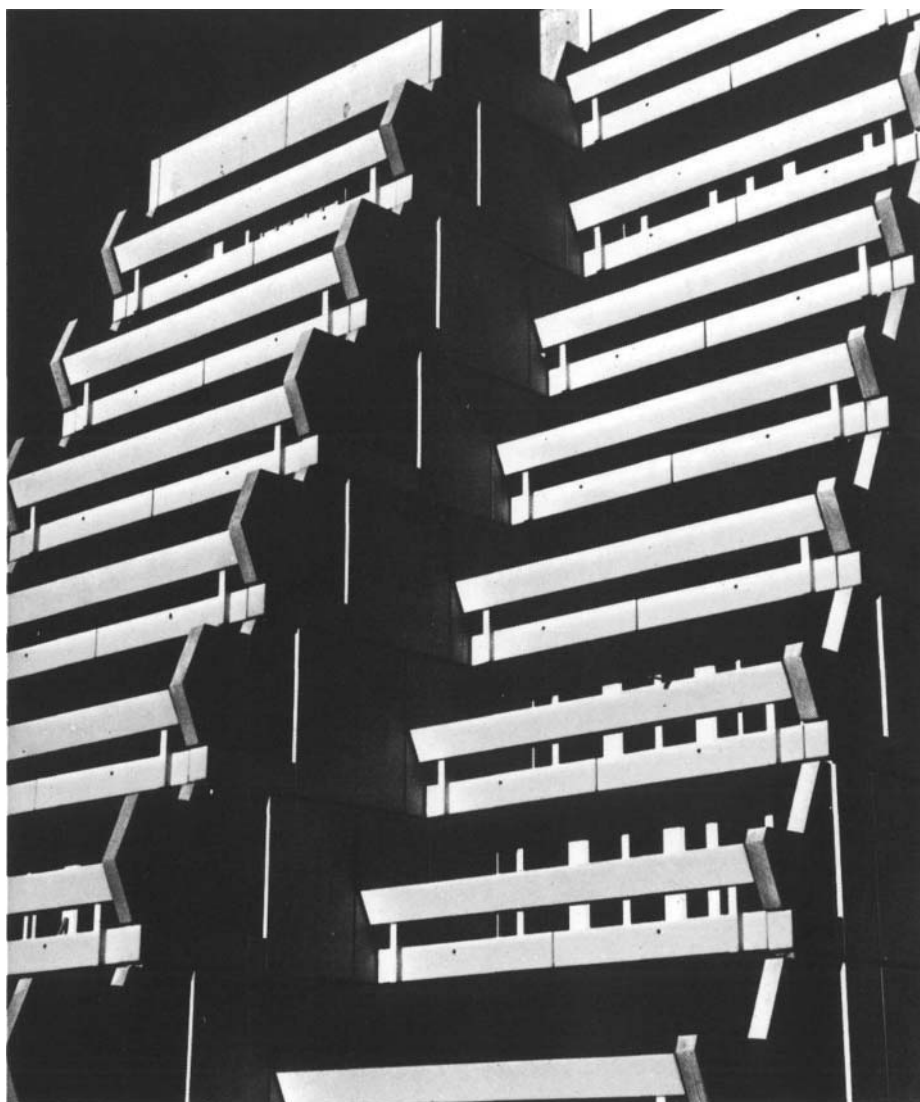
the south this village ends in rows of two-storied bungalows (ground floor with set-back upper level). Pedestrian and vehicular traffic are separated on two levels. The green zones stretch from Olympic Park through the free area between the three tracts all the way to the center.

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.

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

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.







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.

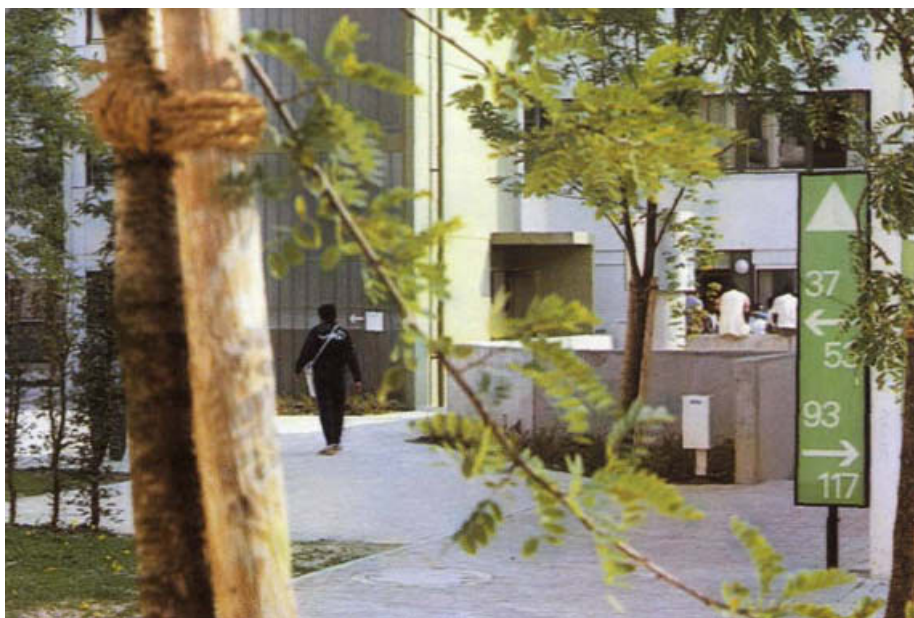
While the cafeteria was located south of the plaza the row of stores started to the right of the foot of the extensive highrise. When the Village was occupied by athletes, it seemed like an oriental bazaar. If one could speak of any place of contact, it was here.

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.









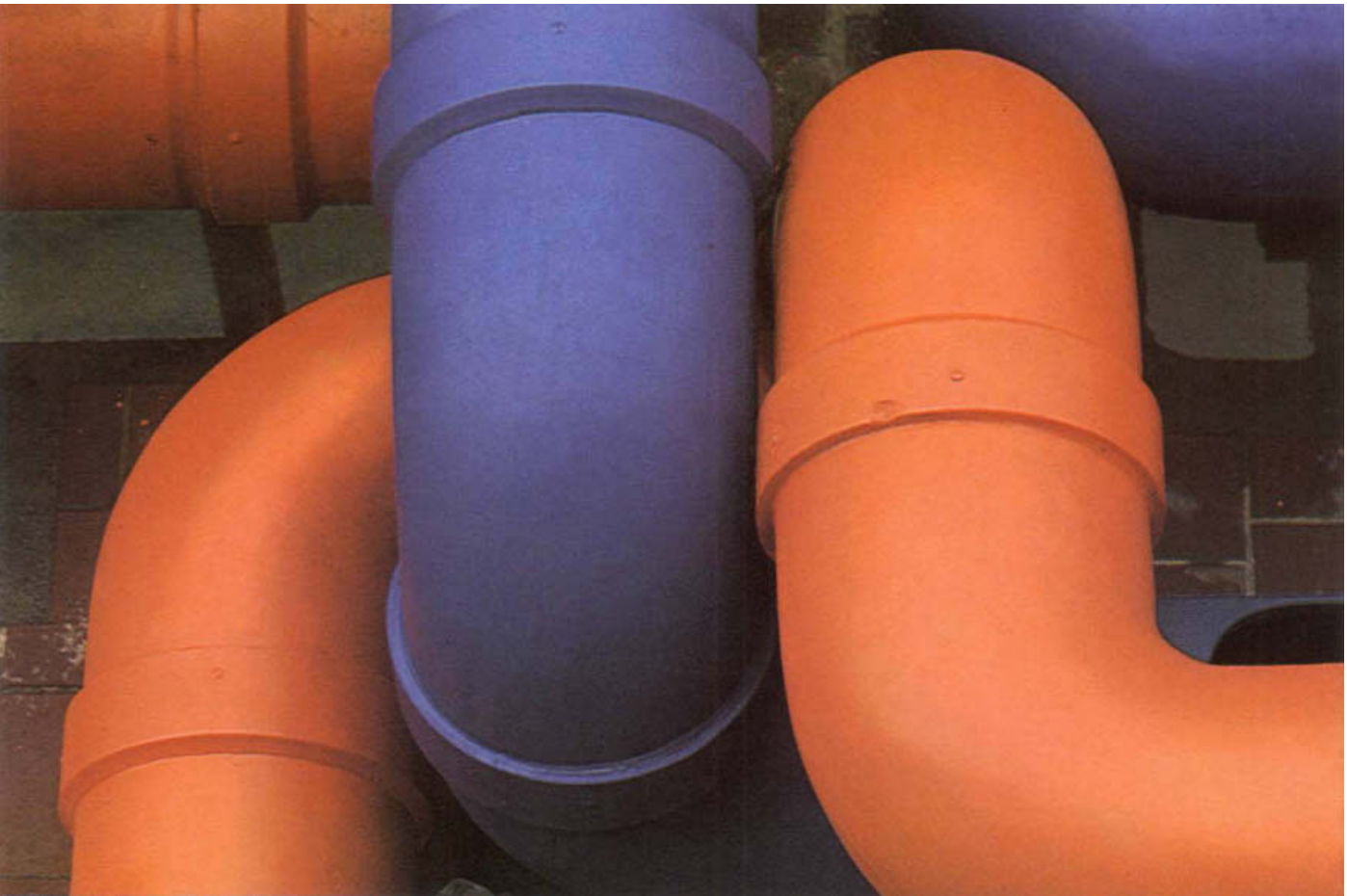
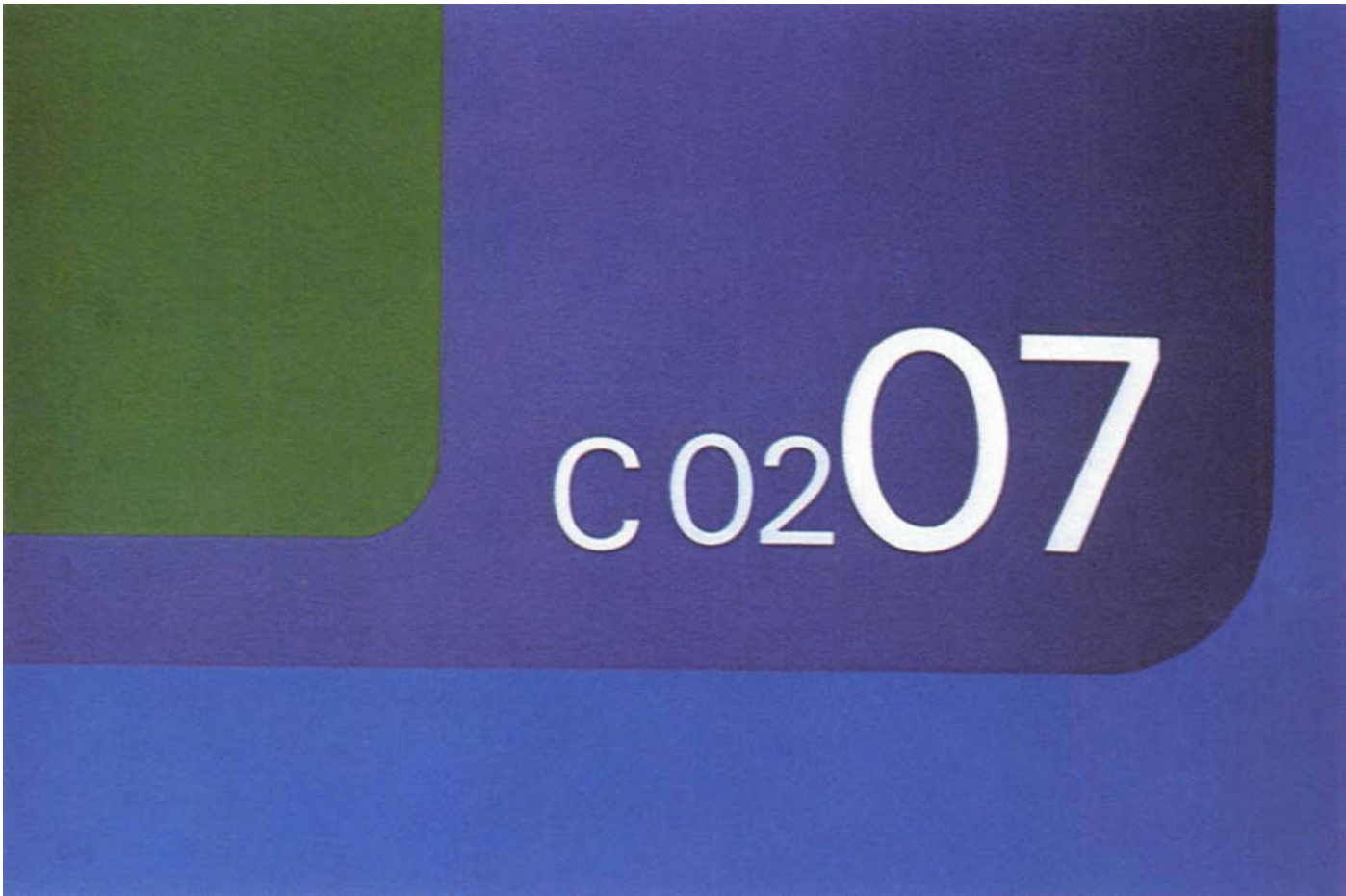
The Olympic Village is advantageously situated in relation to Munich's streets and traffic patterns. At two places, individual traffic flows in and out of Lerchenauer Strasse at the same level. Visitors and residents reach the parking spaces nearest their apartments by this drive-in system. In addition, 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 Oberwiesenfeld 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.

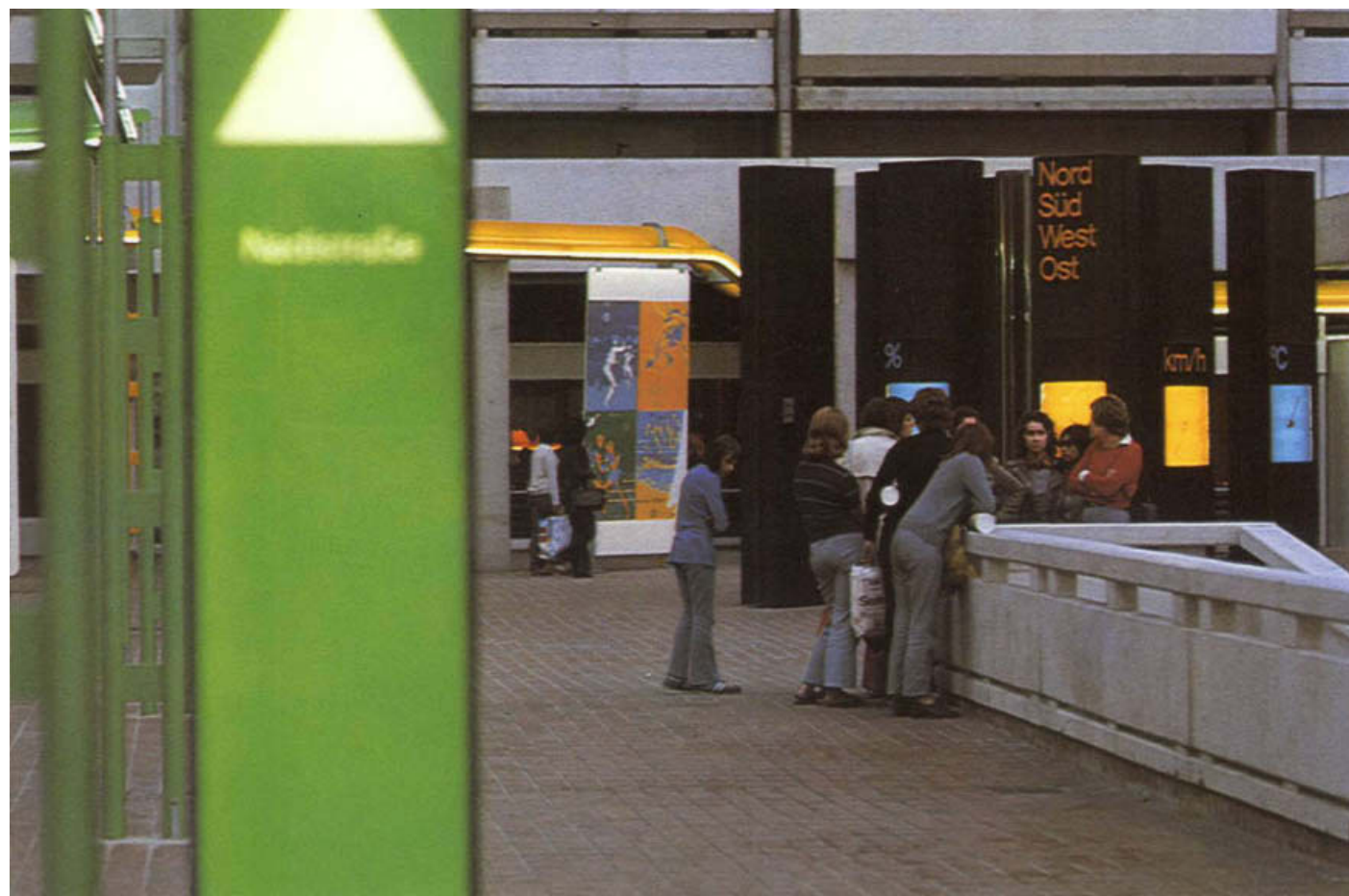








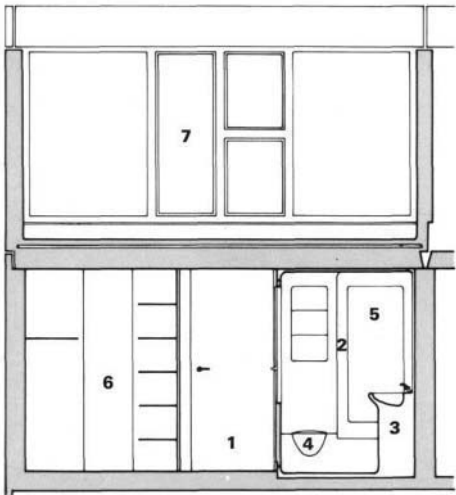
The median guidelines created by Hans Hollein of Vienna improved orientation in the pedestrian zone. These guidelines consisted of lengths of tubing on supports, which branched out to the different living areas. An easily remembered color from the Olympic spectrum was chosen for each tract. Simultaneously, 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

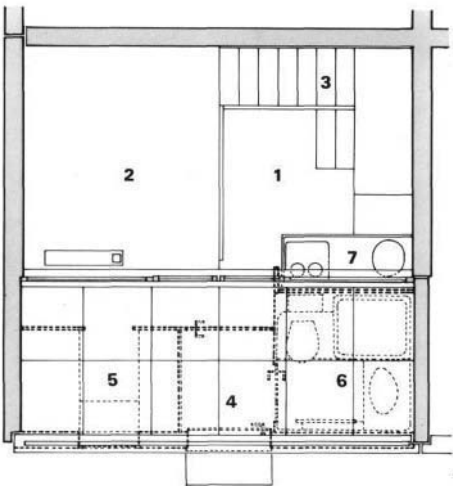
- 1 Entrance, vestibule
- 2 "Wet cell"
- 3 Wash basin
- 4 Toilet
- 5 Shower
- 6 Closet and book case
- 7 Terrace, facade, sleeping and study area, upper level



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.

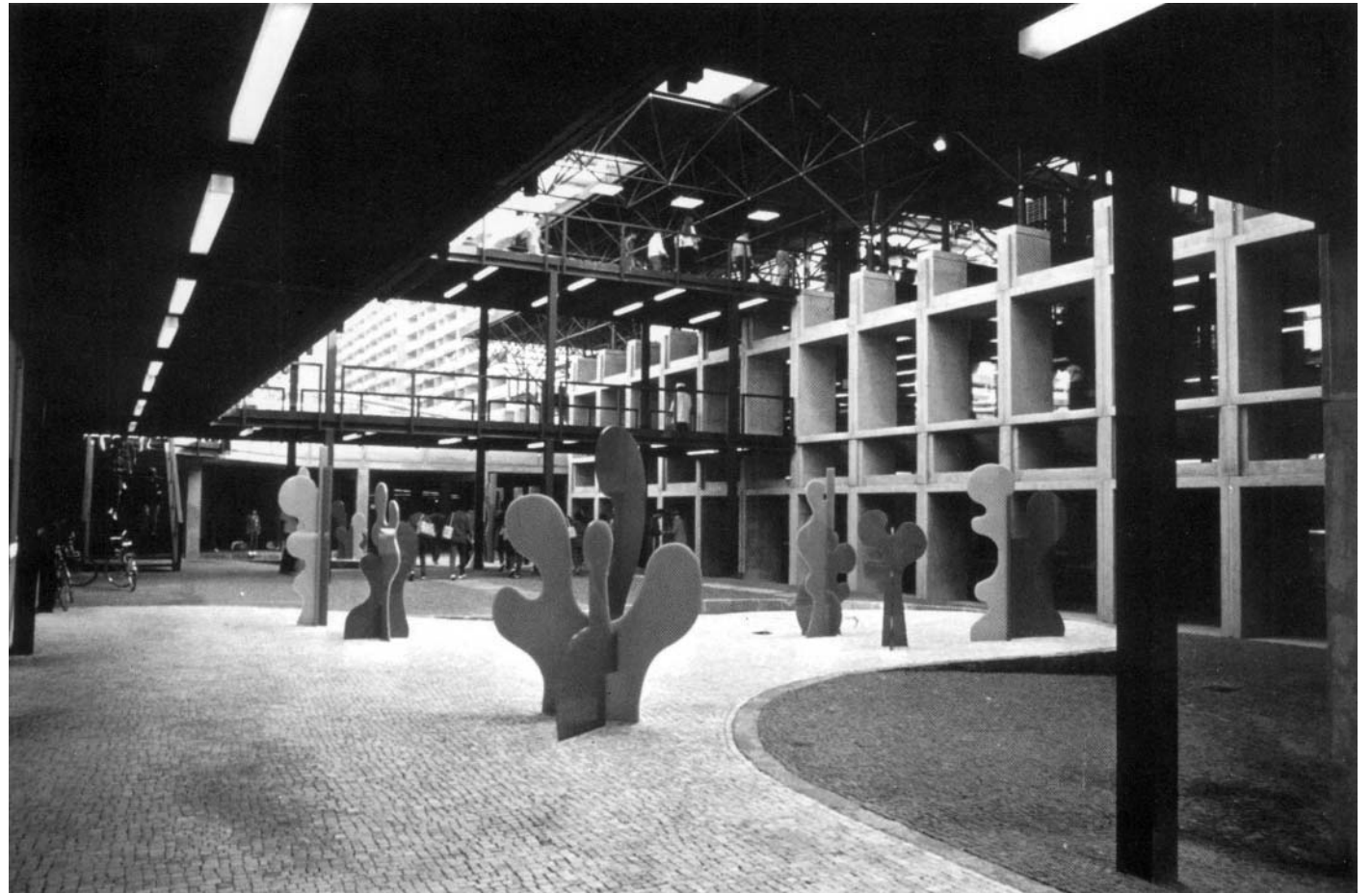
The addition of up to 800 units of this type resulted in structures with independent character, which were divided only by alleys, paths and plazas. The narrow alleys, the light-colored flat houses with their closed facades, and the high-lying balconies gave the impression of a Moorish settlement.

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.

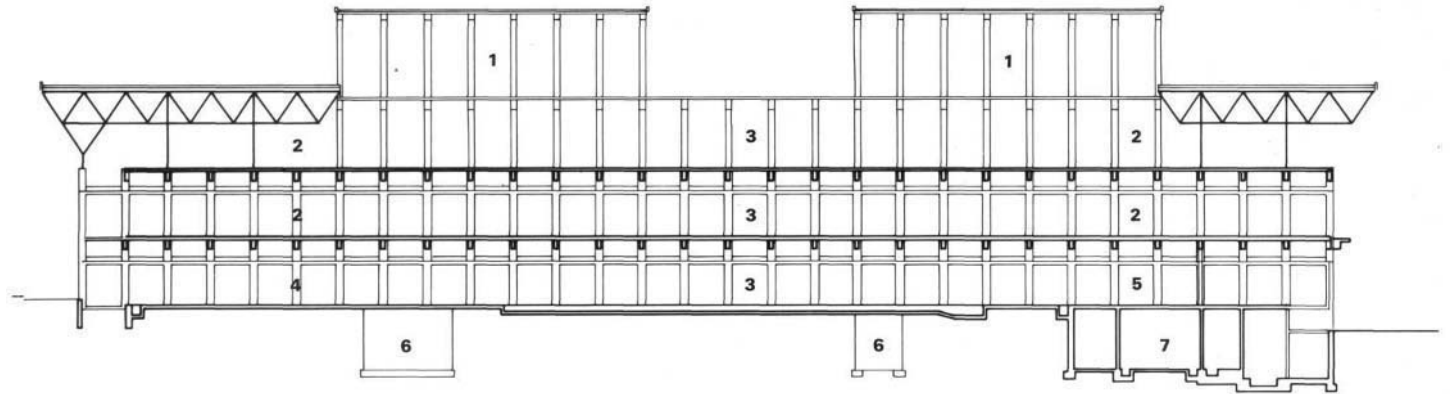




The students' cafeteria, located between the Men's and the Women's Villages, was enlarged with the help of a steel pipe frame construction in such a way that at dinner time 12,000 meals could be served within two hours.

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.

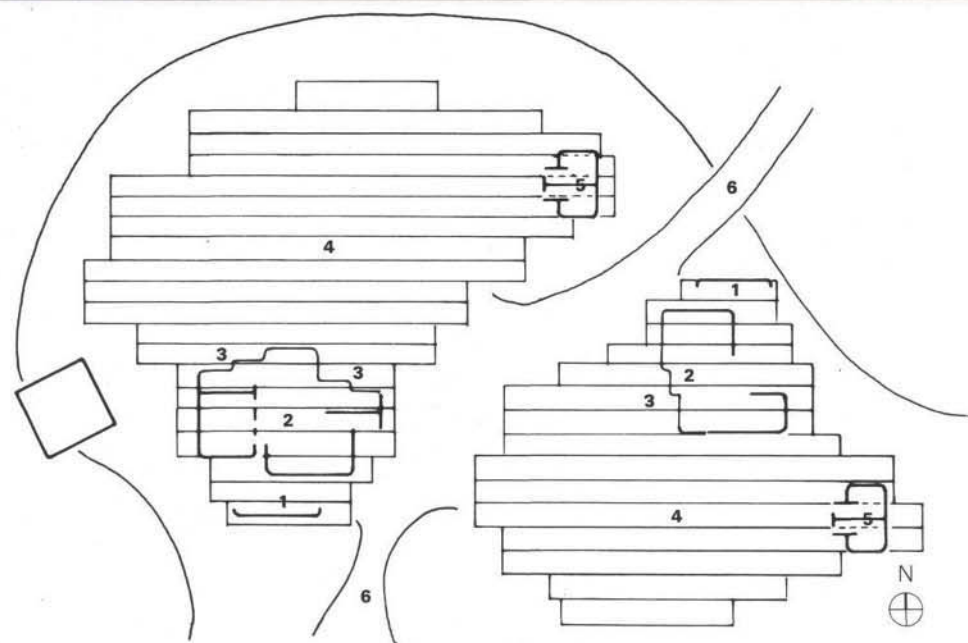
Within the structures the intersecting and overlapping parapet and floor levels, the asbestos cement walls of the kitchen area, and the distinct groups of different colored chairs divided the space into various areas for eating and drinking. This gave the structures their lively appearance. Additional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

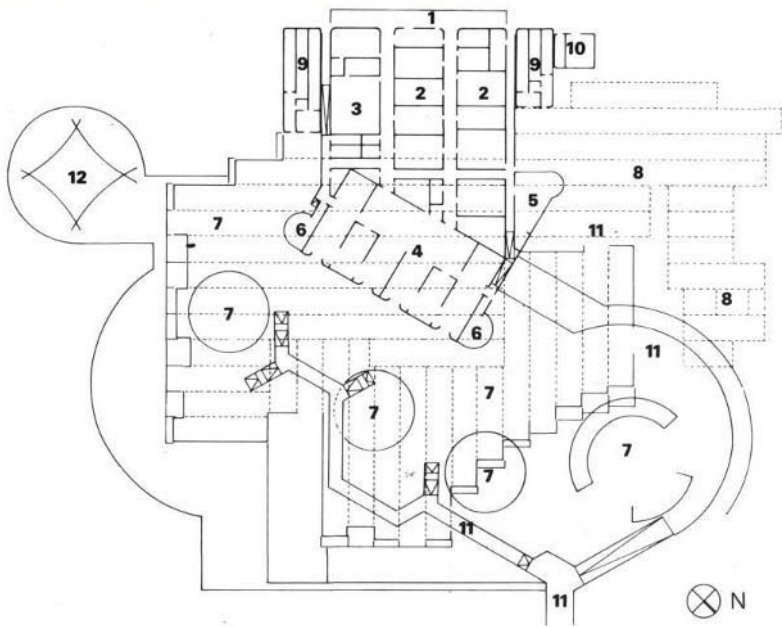




**Ground floor plan  
to the restaurant  
on the lake**

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



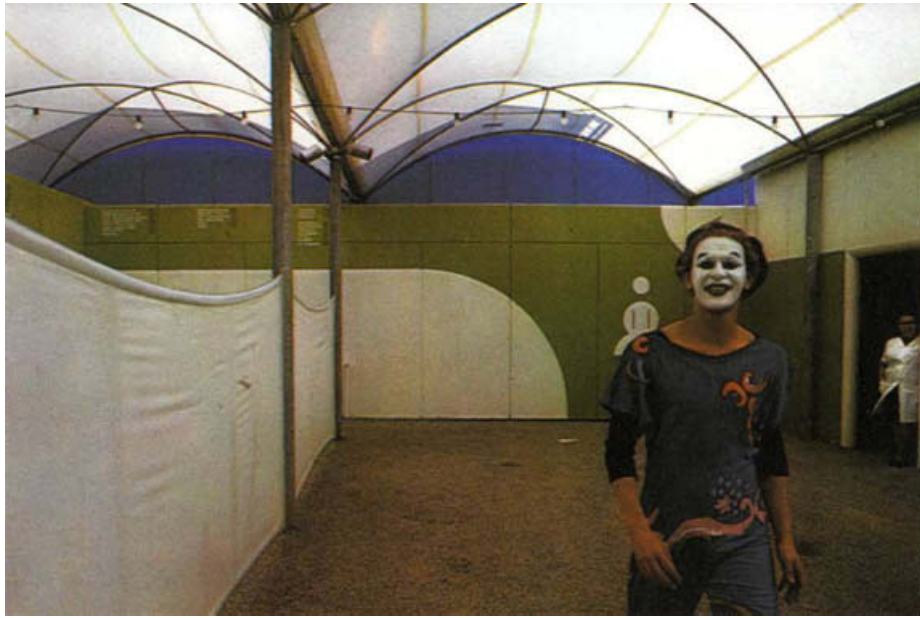


**Ground floor plan  
of the South  
Restaurant**

- 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

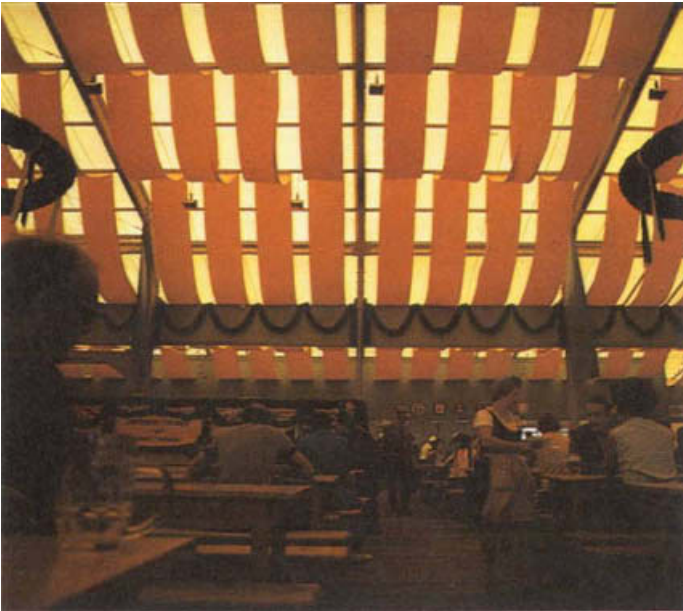
The southern restaurant, located south of the stadium and of the lake, had 3,000 places. It provided primarily for the visitors coming from the parking area for buses and from the streetcar loop on Ackermannstrasse. Finally, at the streetcar station there was a tent restaurant that could serve 1,000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





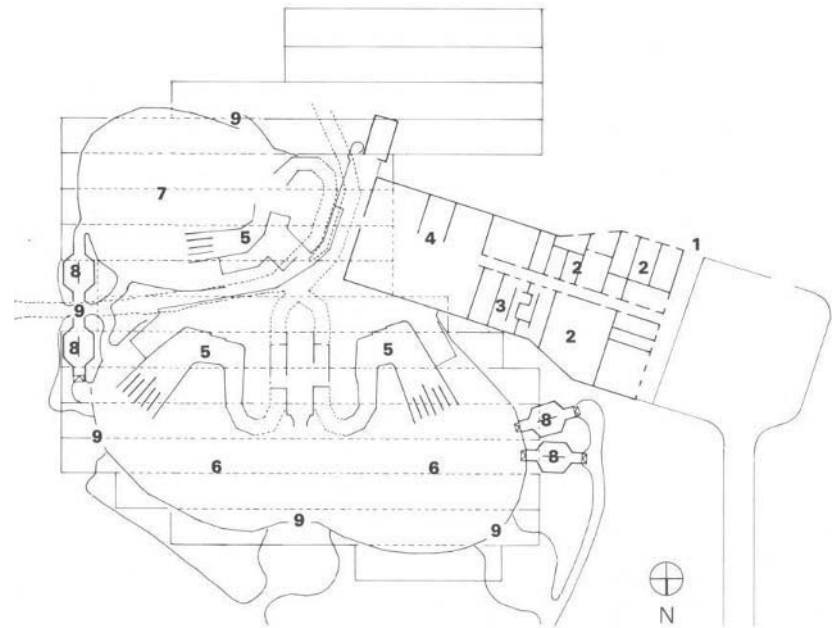
Within the individual establishments there was a difference in the design of the areas "restaurant" and "rural eating establishment". In the "restaurant", a dynamic design was the dominant theme with dining areas on various levels, lively room dividers and railings, and interesting stairways. The walls 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.





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.

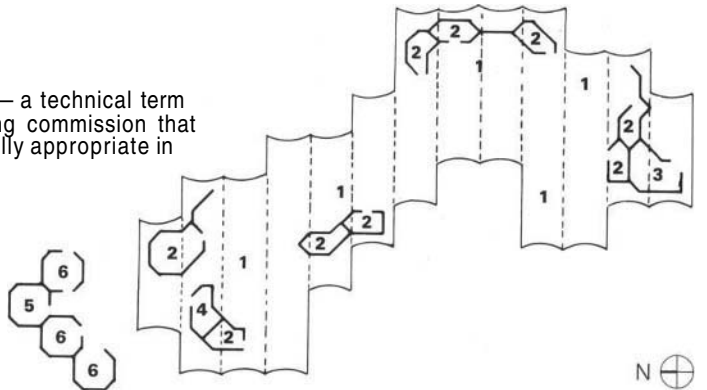
To provide restrooms for the visitors and toilet and lounge facilities for the personnel, as well as first aid stations, booths were erected in close proximity to the kiosk clusters, but not under the same roof. For the booths, simple corrugated cardboard was glued to a self-supporting three-dimensional 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  
<sup>1</sup> "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

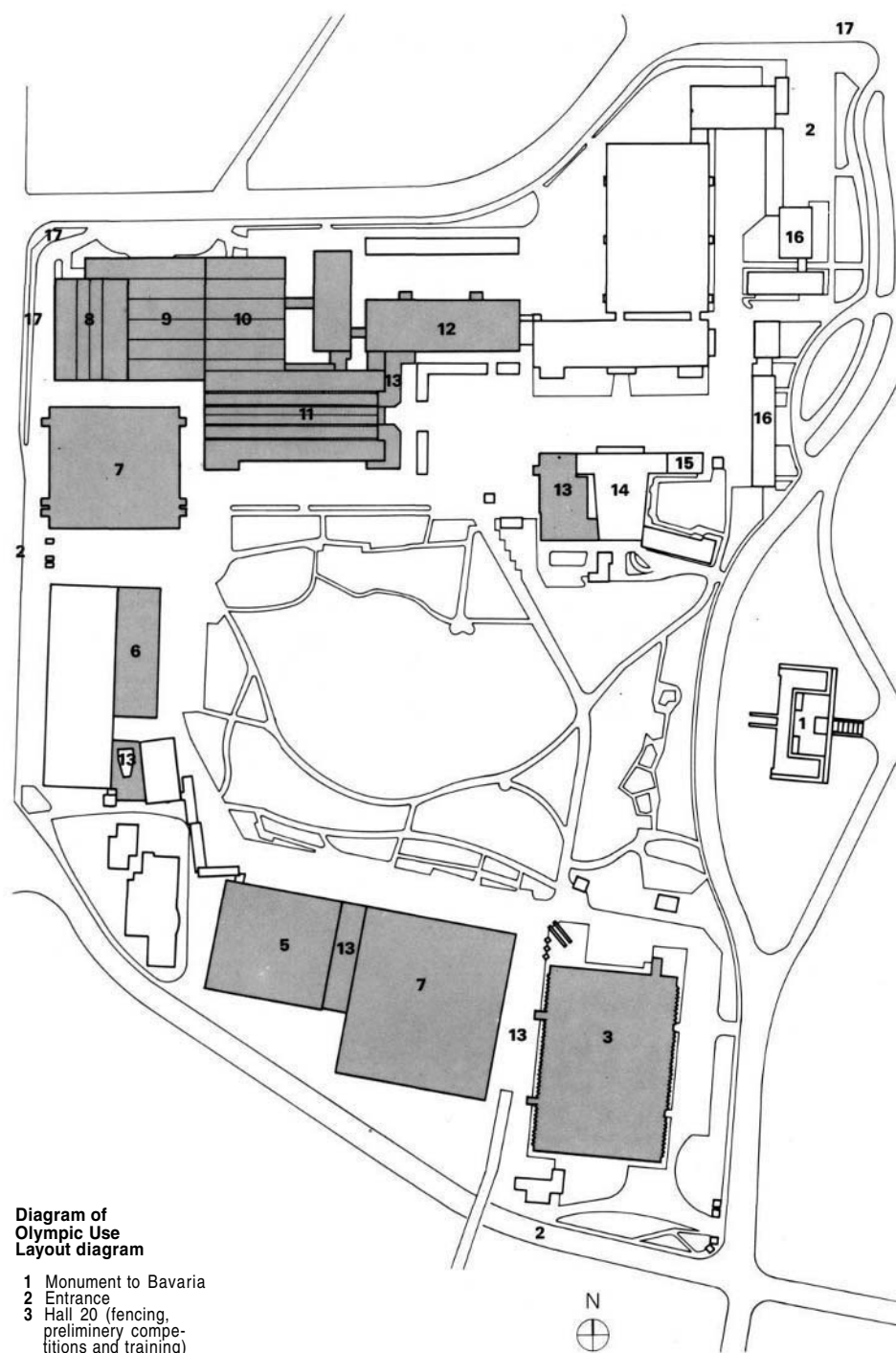


Diagram of  
Olympic Use  
Layout diagram

- 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 "Oberwiesenfeld" 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.

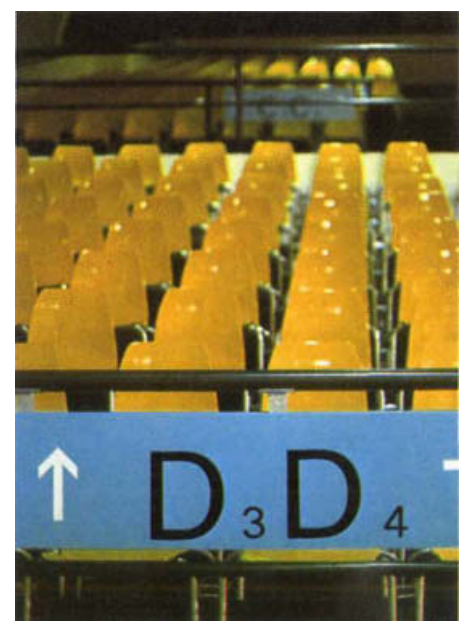
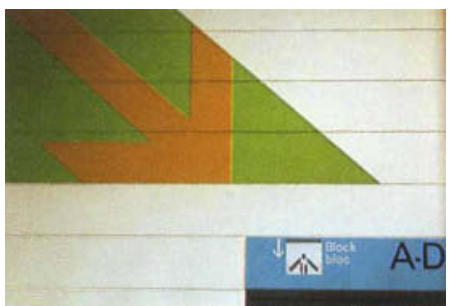
The hall in which some of the judo contests took place—the rest were in the basketball hall and the boxing hall—was converted into a two-storied exhibition hall by the construction of an intermediary floor after the Games. The judo enthusiasts trained in hall 18, the wrestlers in hall 19.

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.

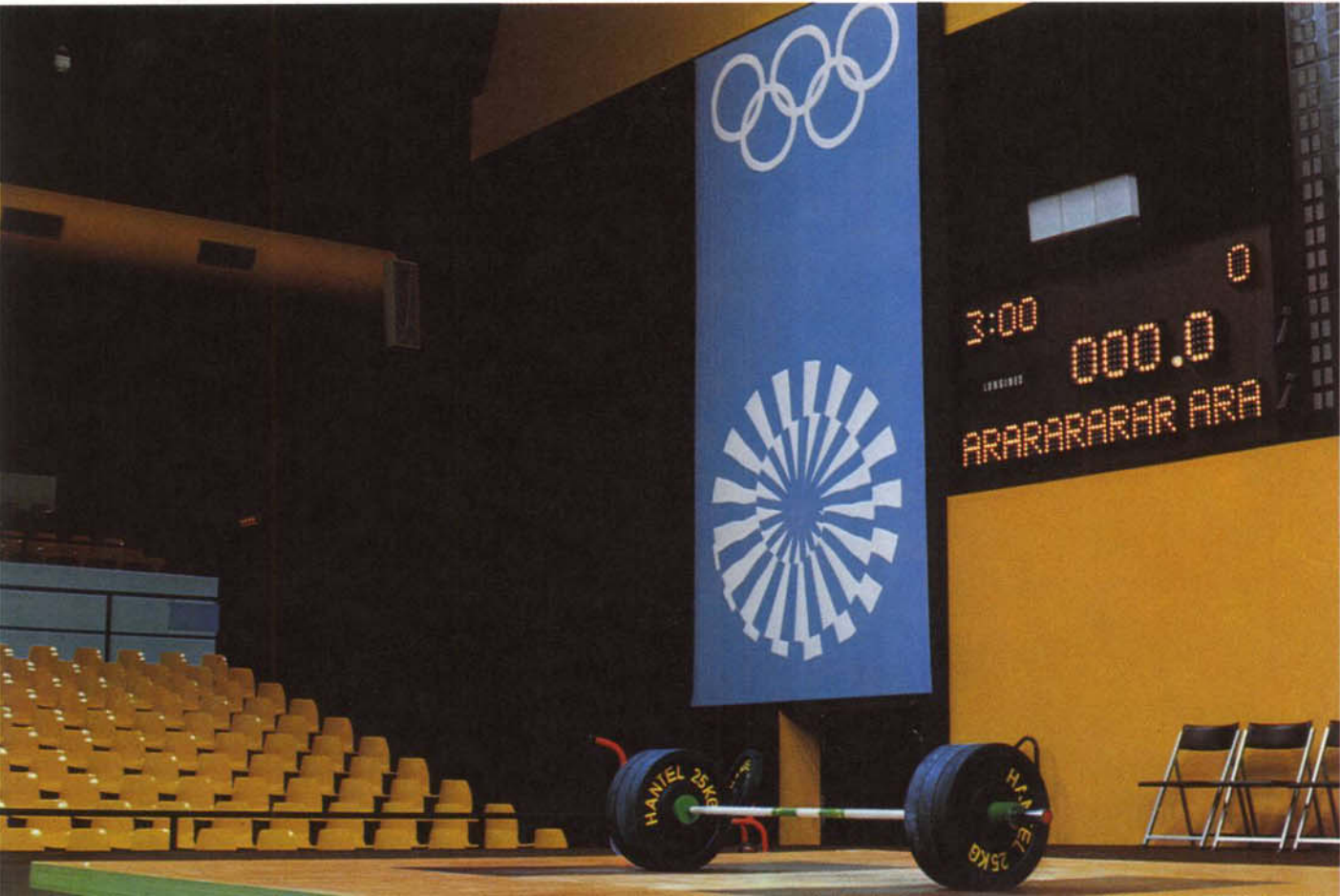
The main entrance was located on Heimeran Strasse during the Olympic Games. The contest and training halls which were arranged around a park-like green area could be easily reached from a large plaza.

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.

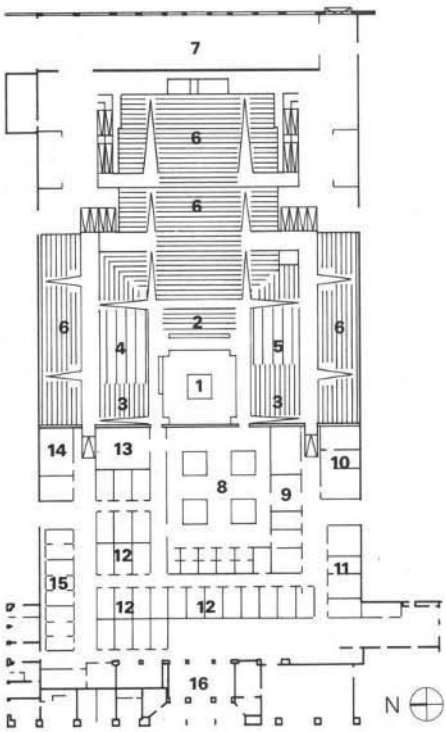




**Weightlifting Hall (Fairgrounds)**  
Architect:  
Peter Lanz, Munich

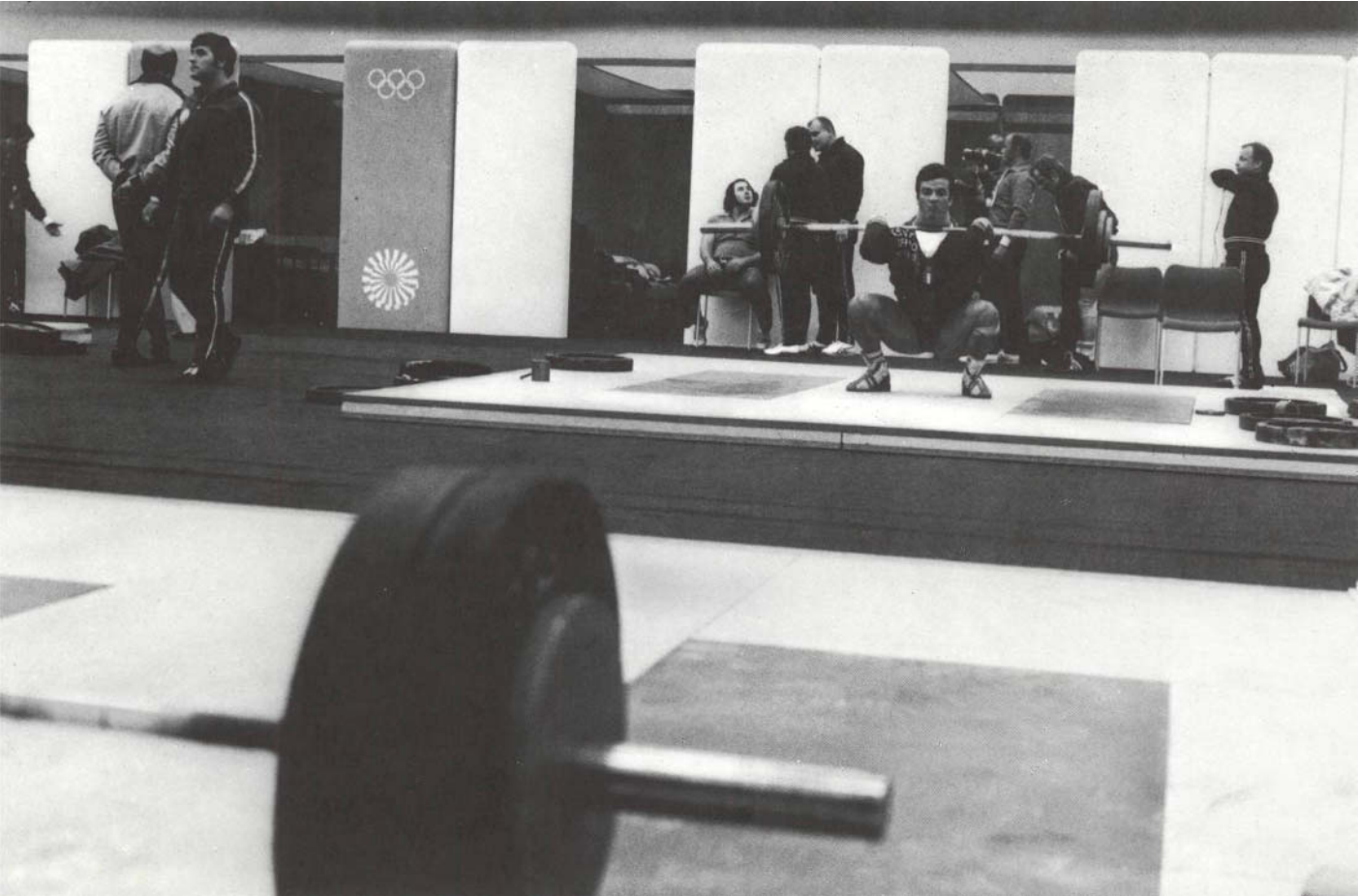


Cross section of the hall



**Weightlifting hall  
Ground floor plan**

- 1 Competition podium
- 2 VIP stands
- 3 Places for participants
- 4 Places for the press
- 5 Places for commen-  
tators
- 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 parti-  
cipants and organizers

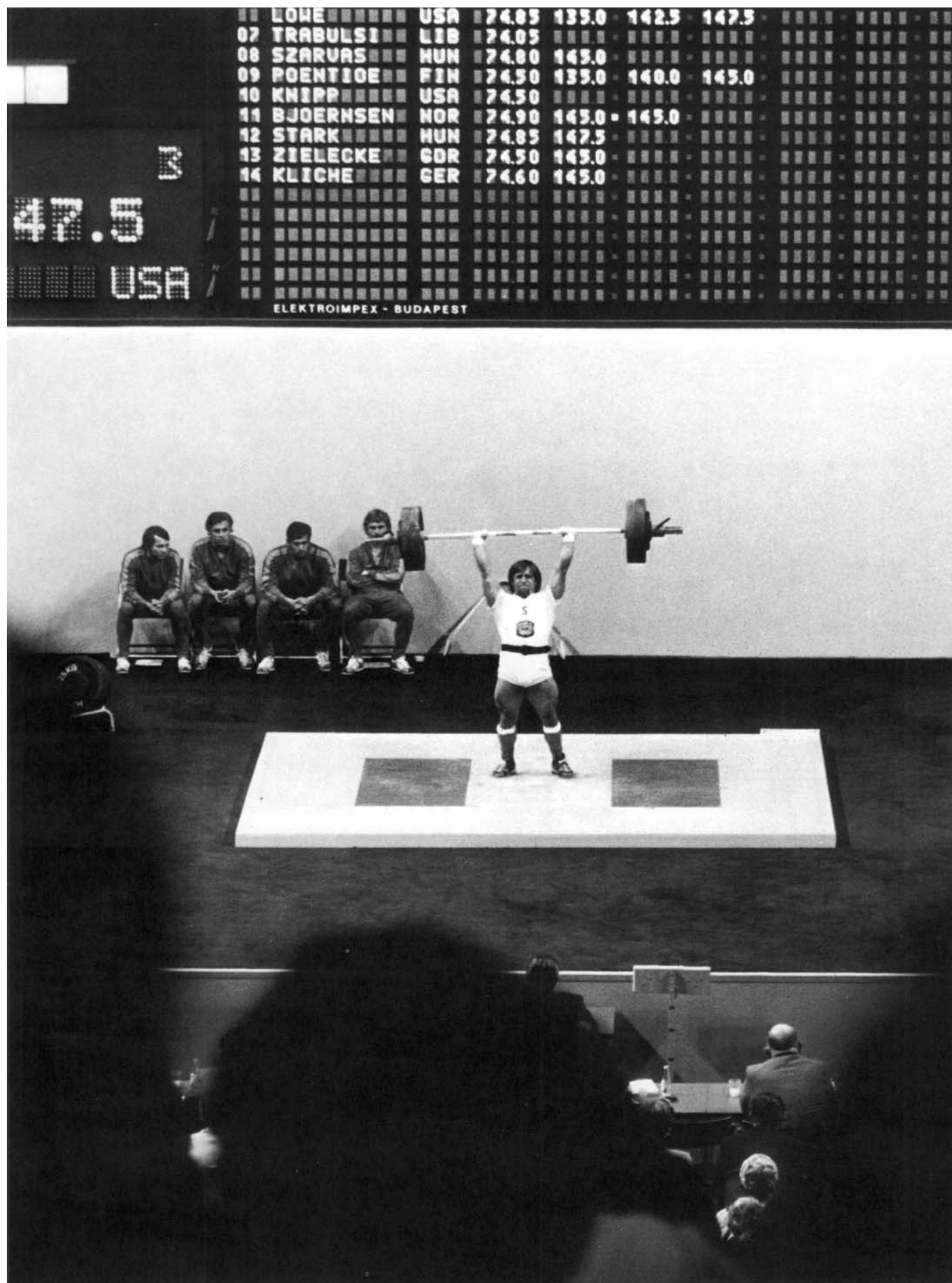


According to the rules at international competitions and at Olympic Games, weight lifting events must take place on one meter high, 12 m. x 12 m. platforms. The weight lifter faces the audience during the contest. Thus it is possible to arrange the audience's seating arrangement only on three sides of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

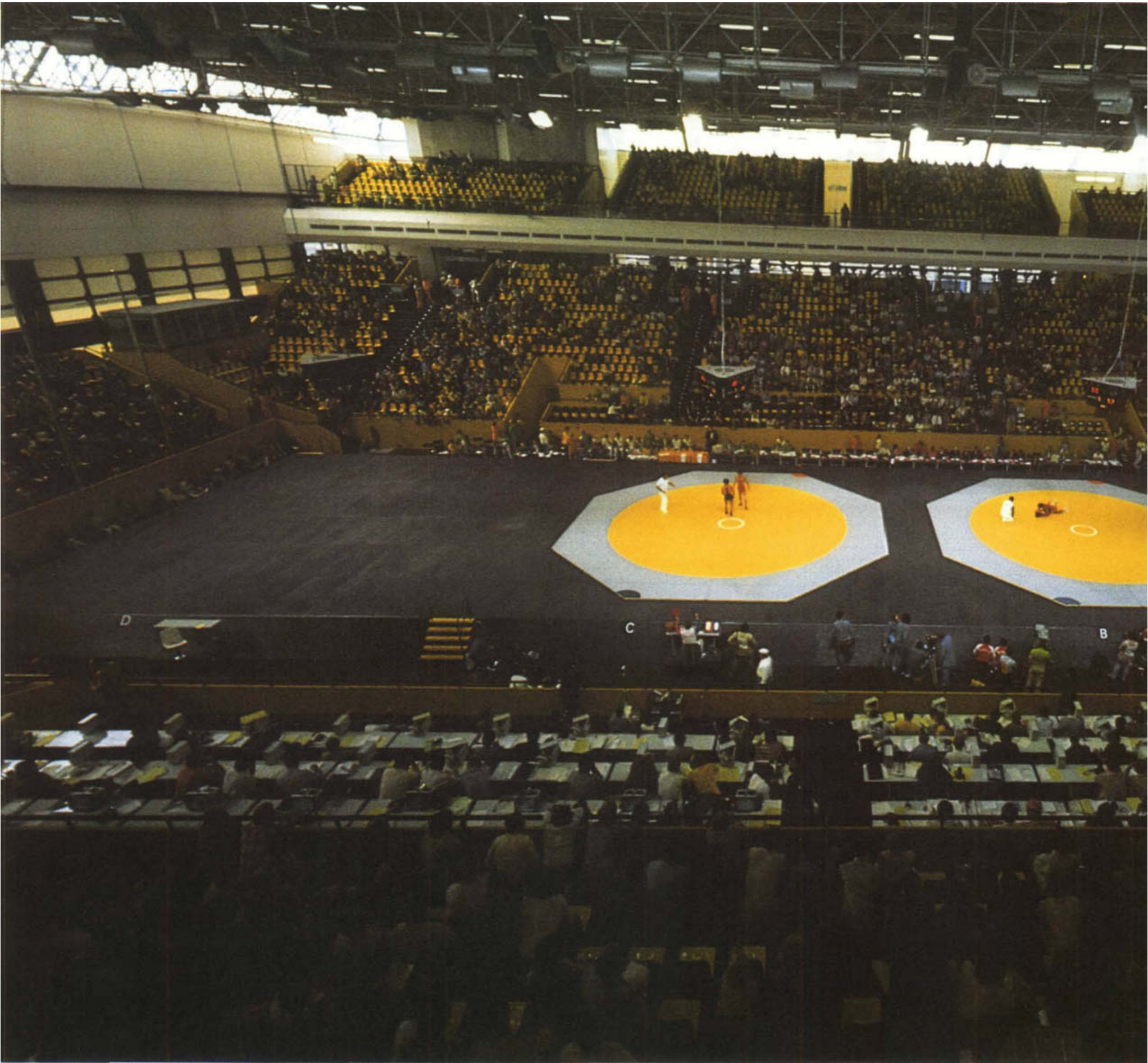
A sound absorbing wall at the rear side of the weight lifting stage separated the contest area from the readying area. The electronic scoreboard, which displayed the names, nationalities, the weights lifted in the various disciplines and the total weight, was mounted on this partition.

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.

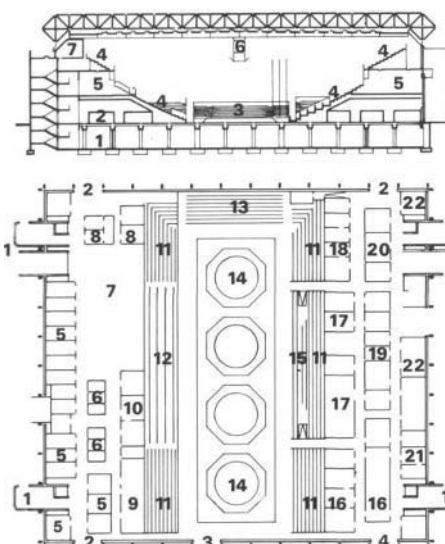
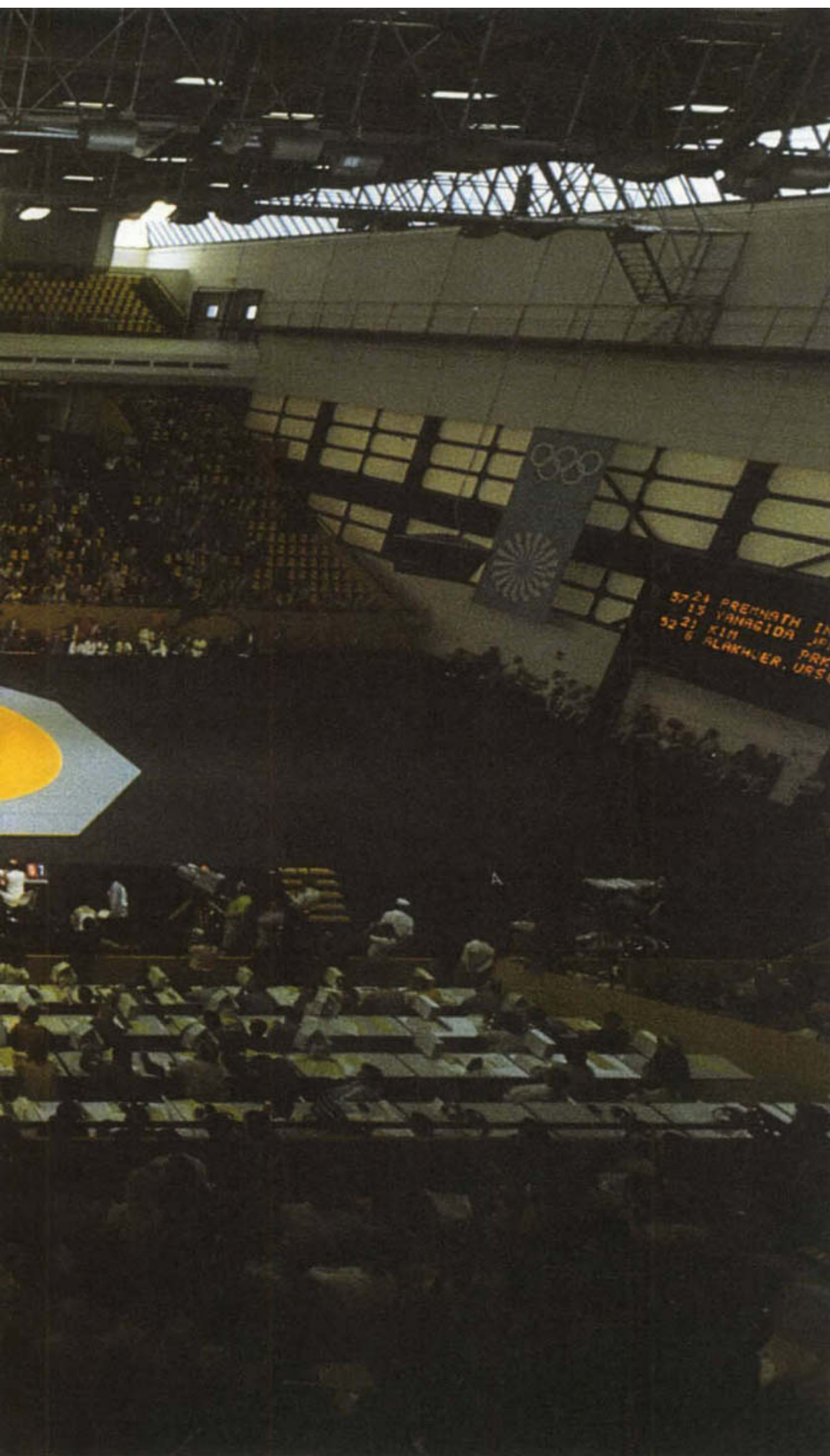




Wrestling-Judo Hall (Fairgrounds)  
Architects:  
Peter Lanz, Munich







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

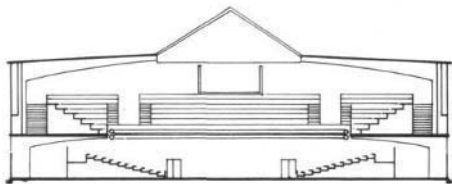
This 17 m. high steel frame building is a cube with an almost square base measuring 72 m. x 78 m. whose walls are finished with cement facing panels. The hall is covered by a supporting structure constructed of prefabricated steel pipe building elements and has no interior columns. This roof is set on 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).

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.

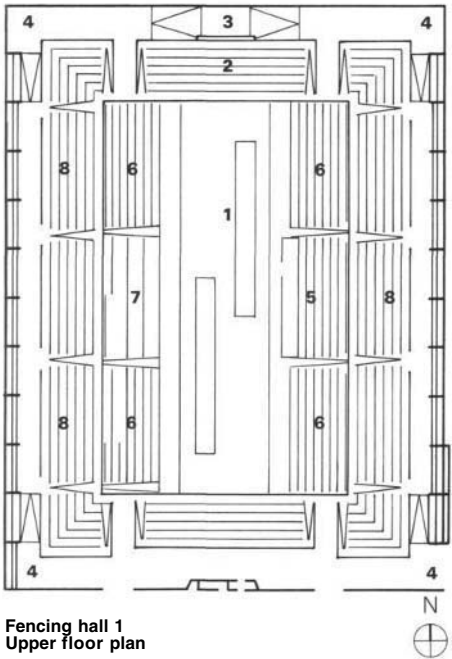
The wrestling mats were laid on a contest area 90 cm. higher than the floor of the hall. This 15 m. x 55 m. platform took up almost all of the inner area of the hall. It was sloped at the sides for the safety of the competitors. Only a narrow lane around the platform remained free for the contest jury. 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





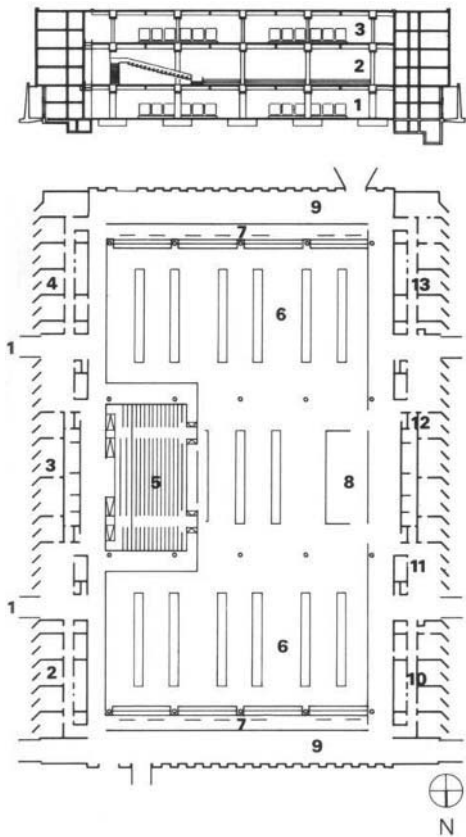
Hall 12, also known as the Bavaria Hall, was used for shows and sport events even before the Olympic Games. Hardly any remodelling was necessary in this 3,000-seat hall for the intermediate and final rounds in the fencing events.

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)



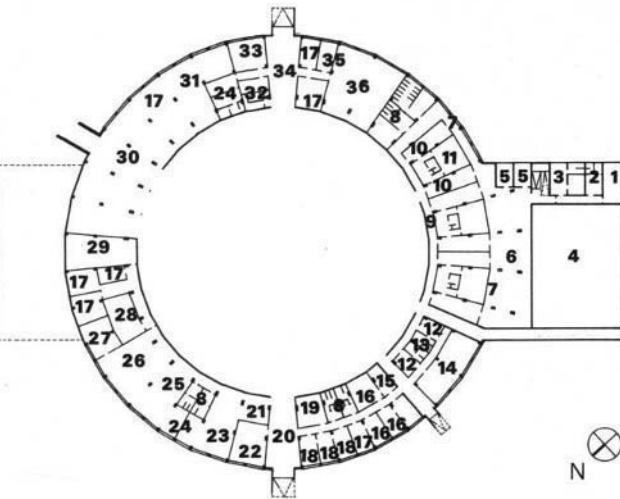
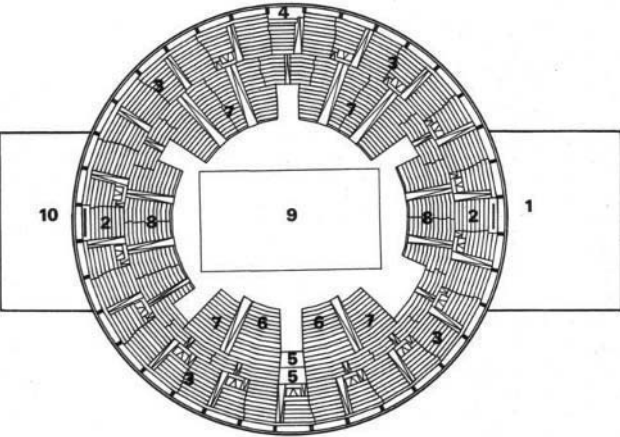
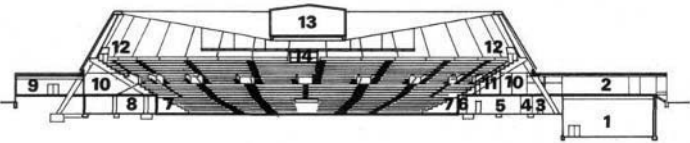




Fencers were able to train on forty strips on the lower and upper levels of hall 20. The preliminary and intermediary rounds and the sword fighting event of the modern pentathlon took place on the ground floor. Fourteen strips were available here. While the over-all lighting on this floor was set at 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

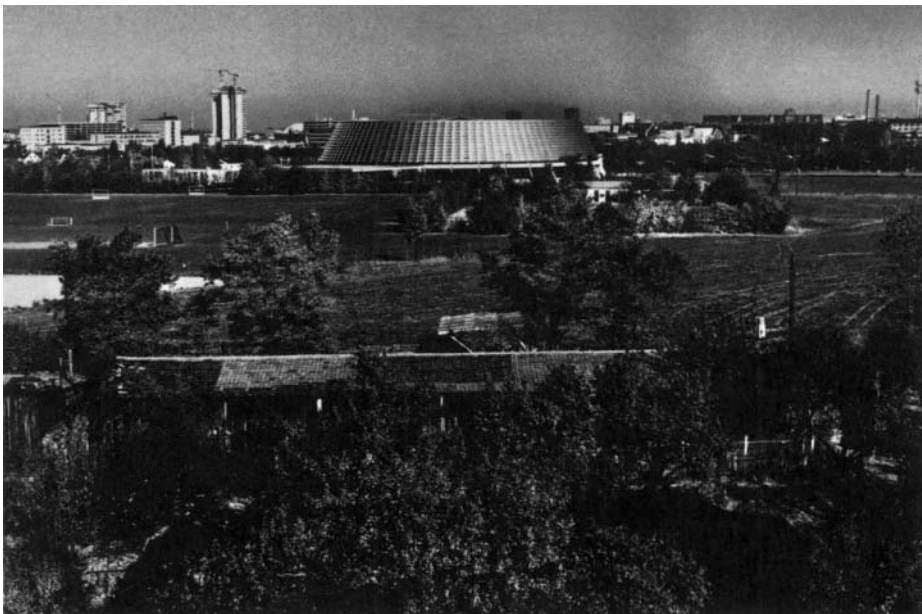
**Diagram of grandstand level**

- 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 readying 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.

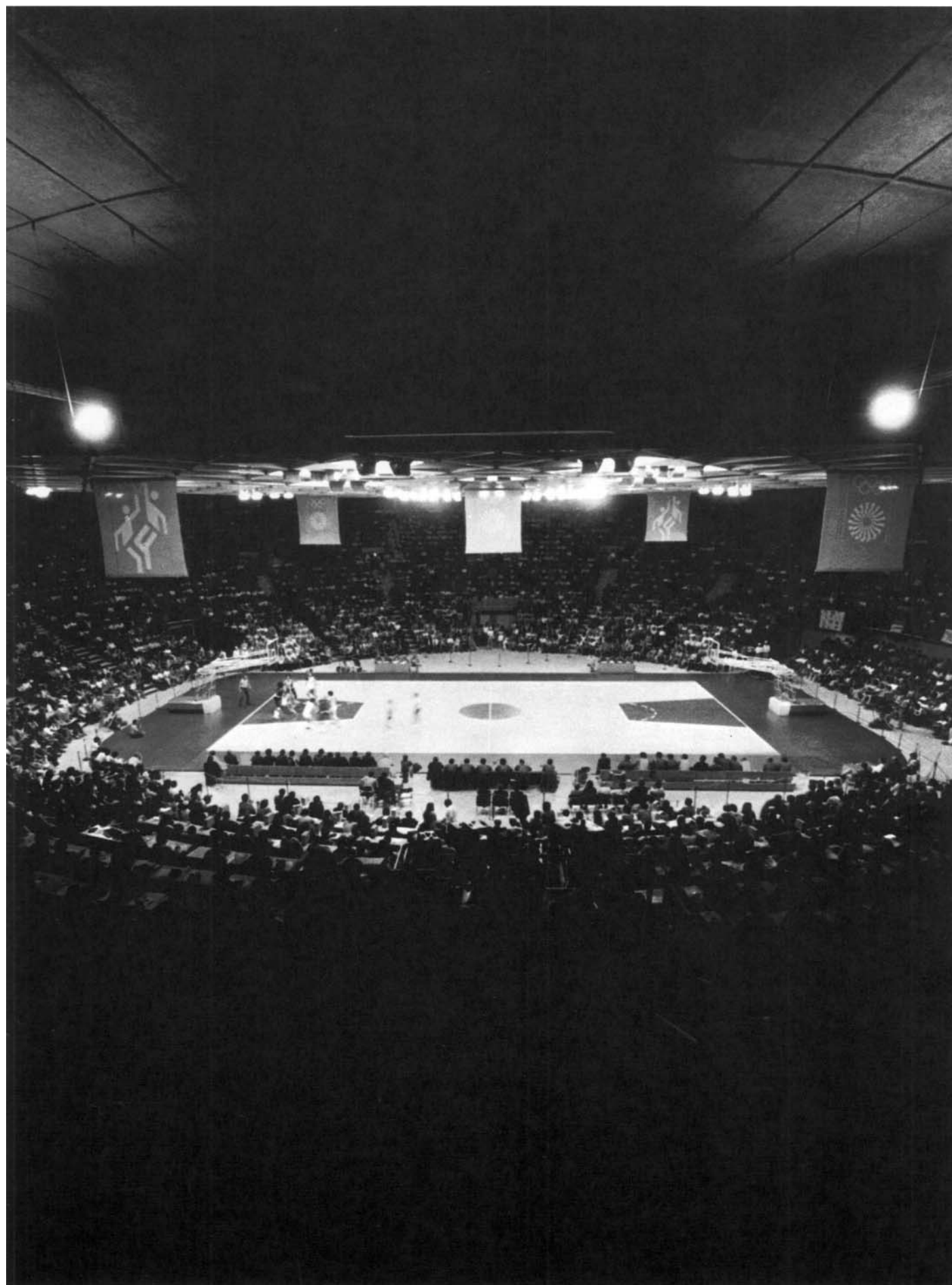


The stadium is illuminated solely by artificial light. The outer walls are constructed of hollow, aerated sections with heat insulation. Asbestos cement sheets were used for the exterior facade.

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

2 Kitchen

3 Pantry and storerooms

4 Doctors' area

5 Toilets

6 Administration rooms

7 Press subcenter

8 Rifle booths

9 Spectator seats

10 Judges' room

11 Technical equipment area

12 Toilets

13 Entry hall

14 Pistol booth

15 Service corridor and magazine
- 16 Waiting room for riflemen

17 Booths for UIT moving boar targets

18 Trial shooting range

19 Waiting room for victory celebrations

20 Room for VIPs and the press

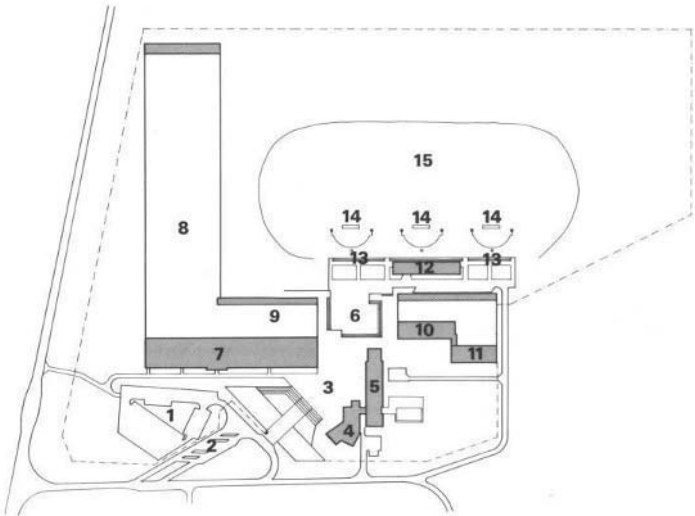
21 Roofed stands

22 Open stands

23 Range for skeet and trap shooting

24 Slit-trenches

25 Safety bunker



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

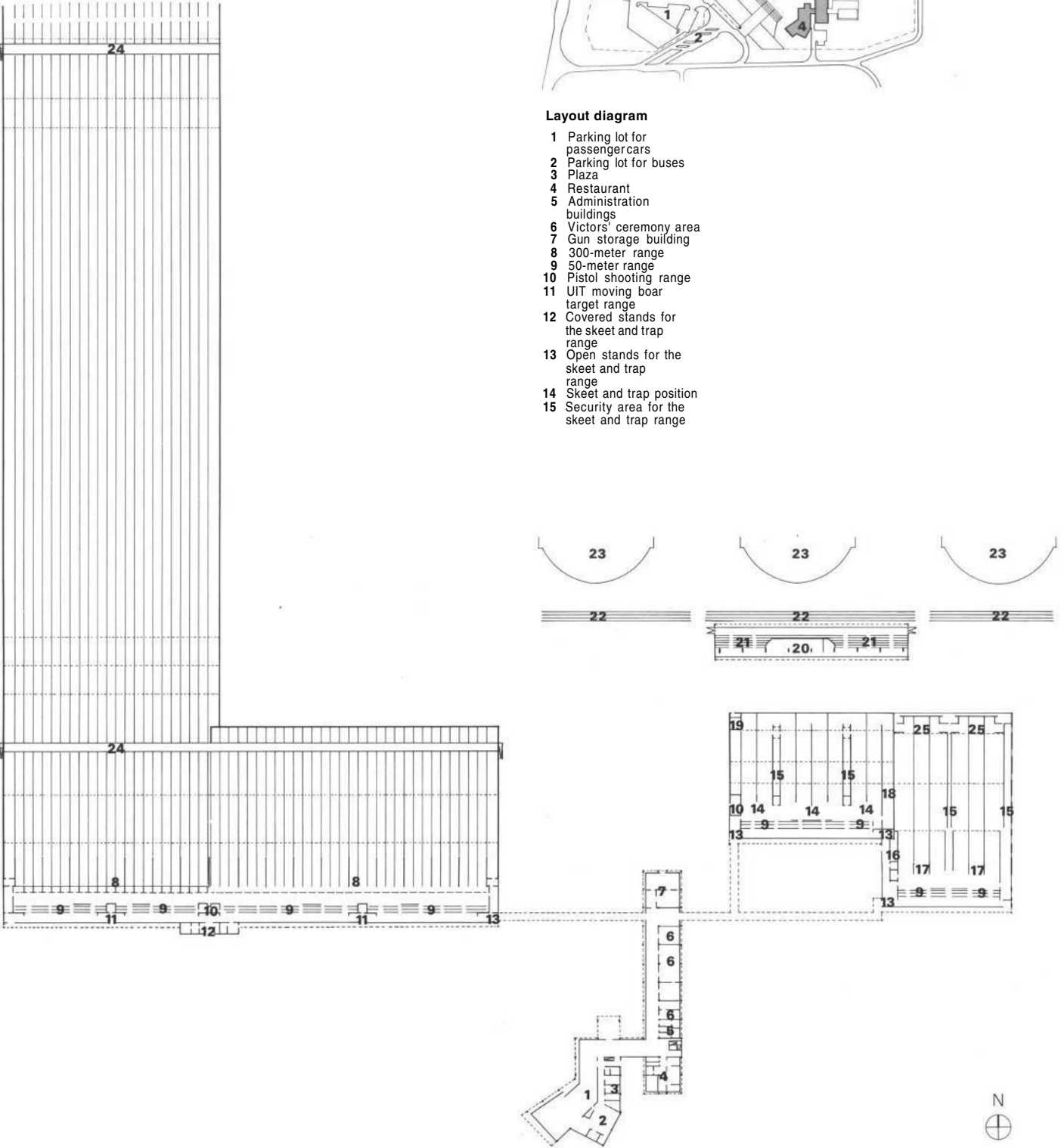
14 Skeet and trap position

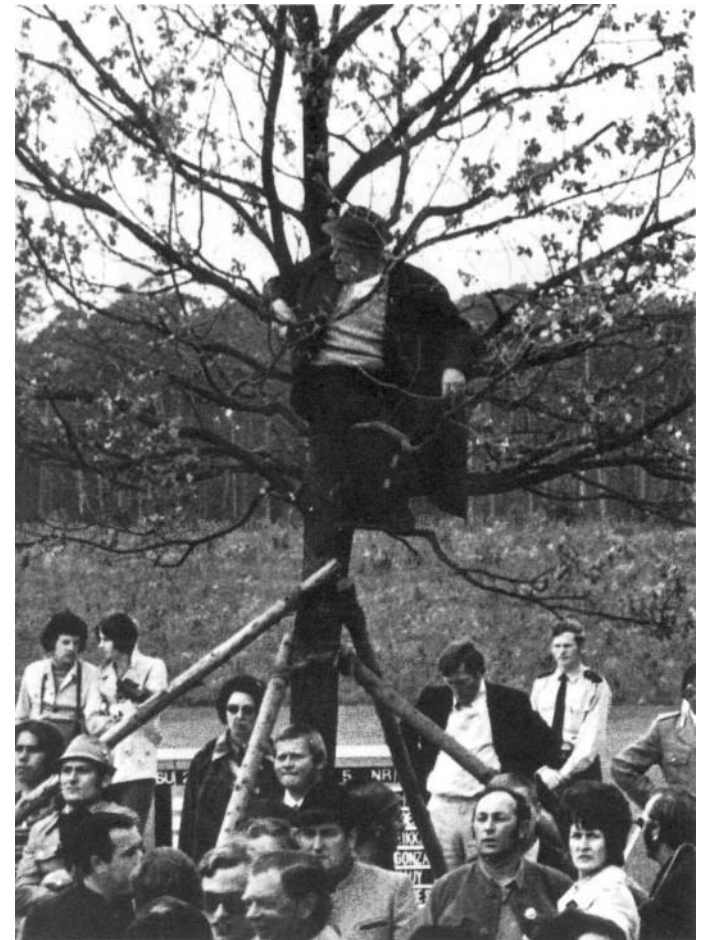
15 Security area for the skeet and trap range

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 parkinglot 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.







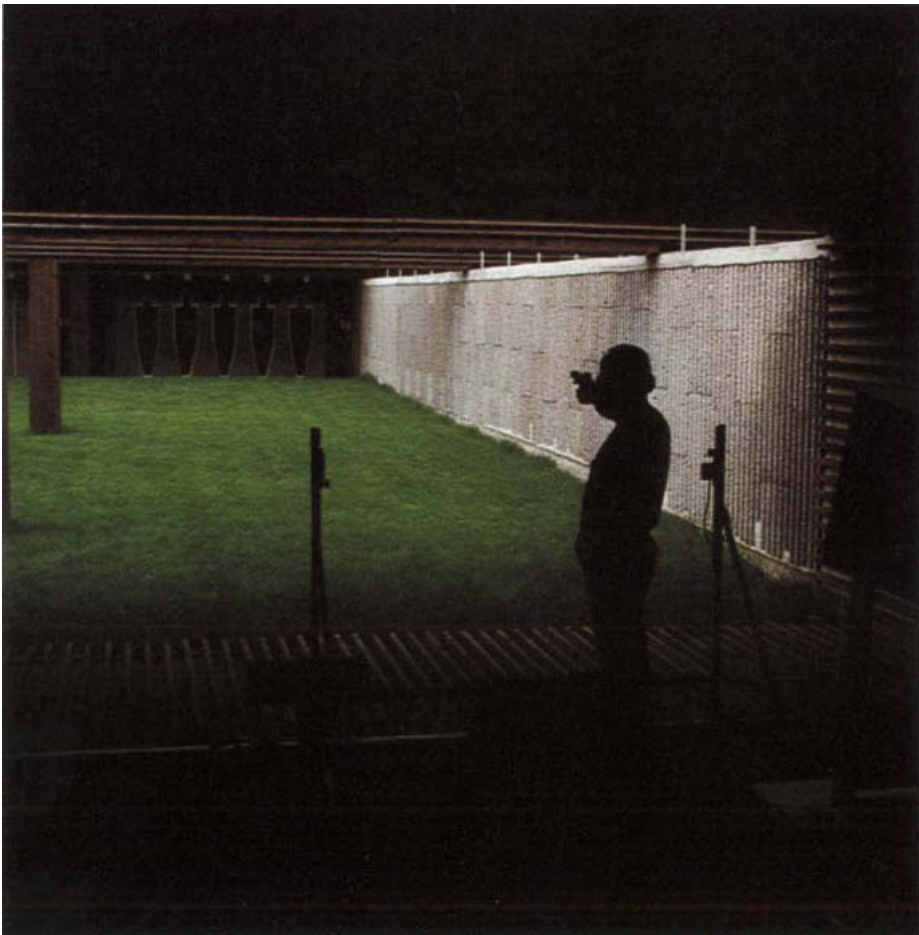
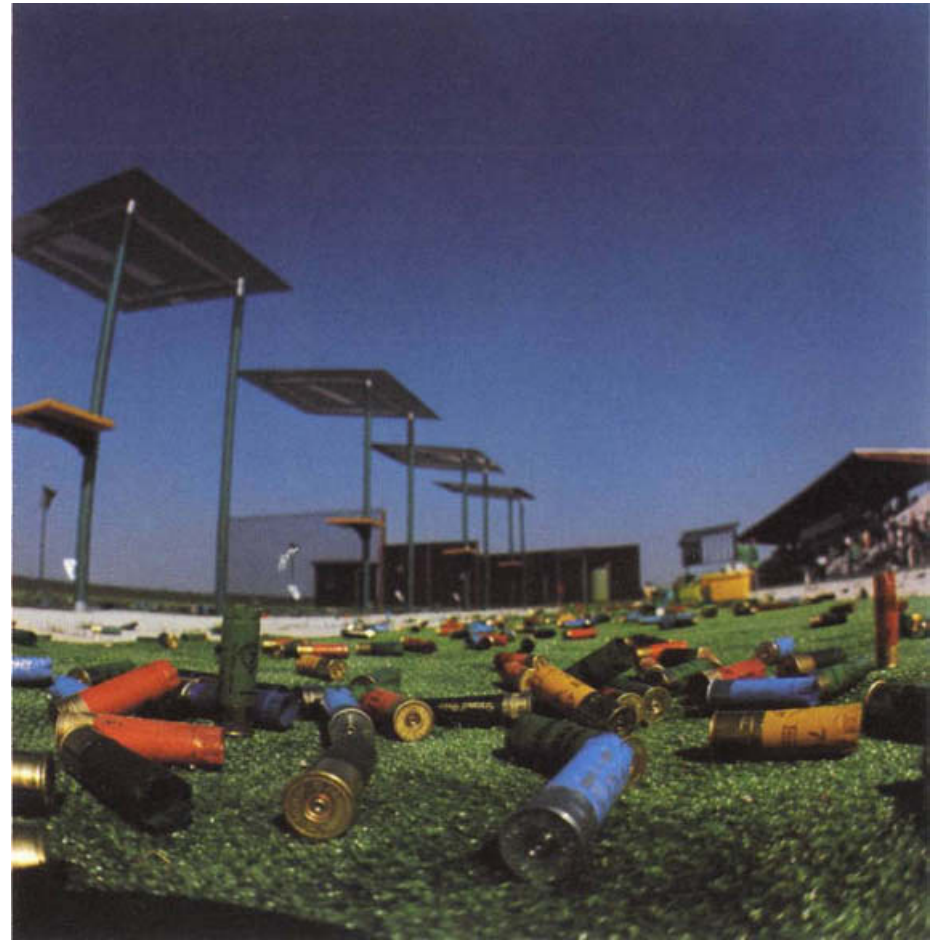
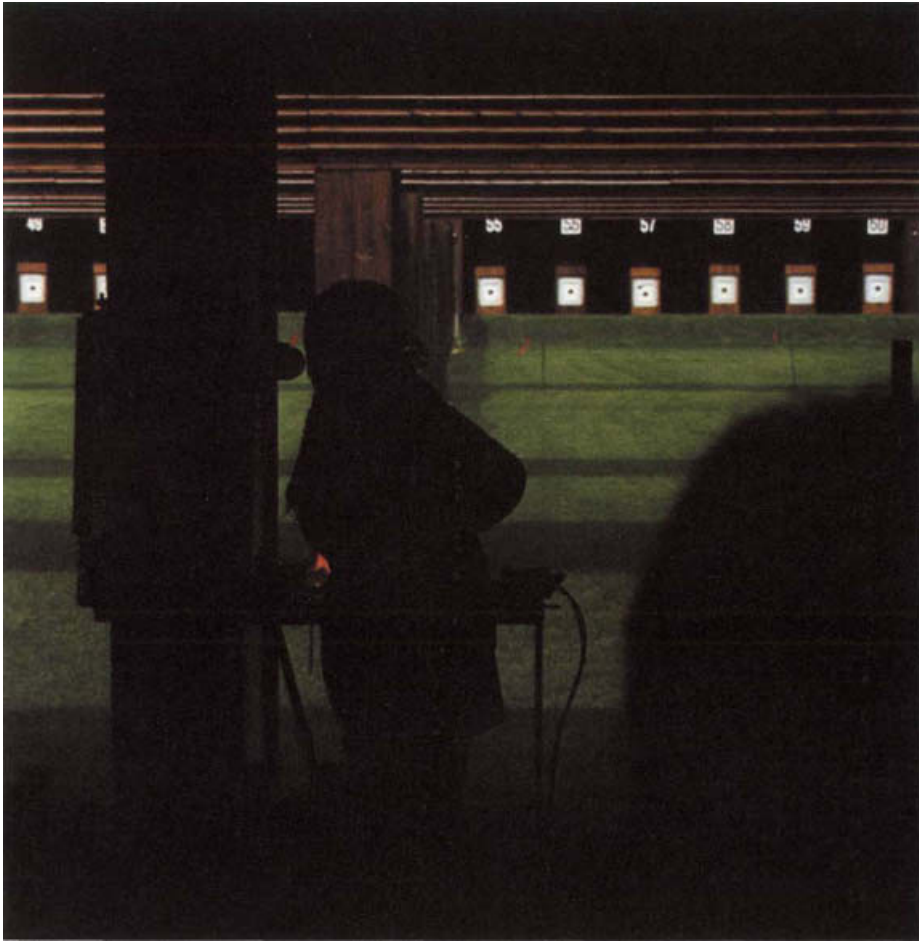


Scoring in the competition area itself was carried out manually in the case of skeet and trap shooting. In the halls for rifle, pistol and moving target shooting it was performed partly electronically and partly by telewriter. The final results were posted by hand on large scoreboards on the back wall 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.



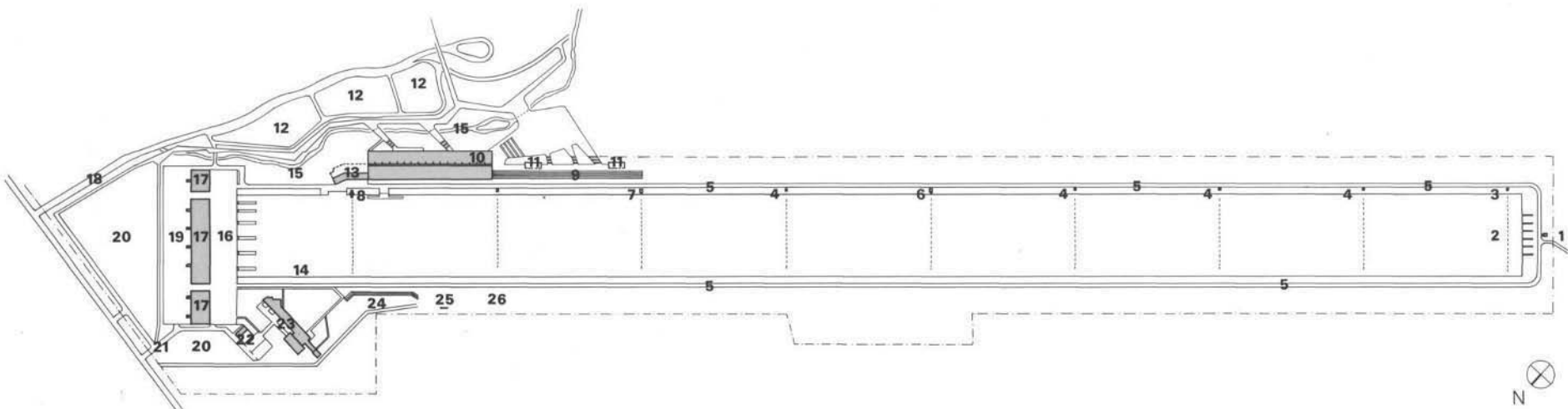




Particular attention was devoted to safety and sound proofing. German building codes require that shooting ranges must be constructed in a way which prevents unskilfully fired bullets from leaving the range. For this reason, the lawn bearing ground layer was sieved prior to sowing the grass in order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

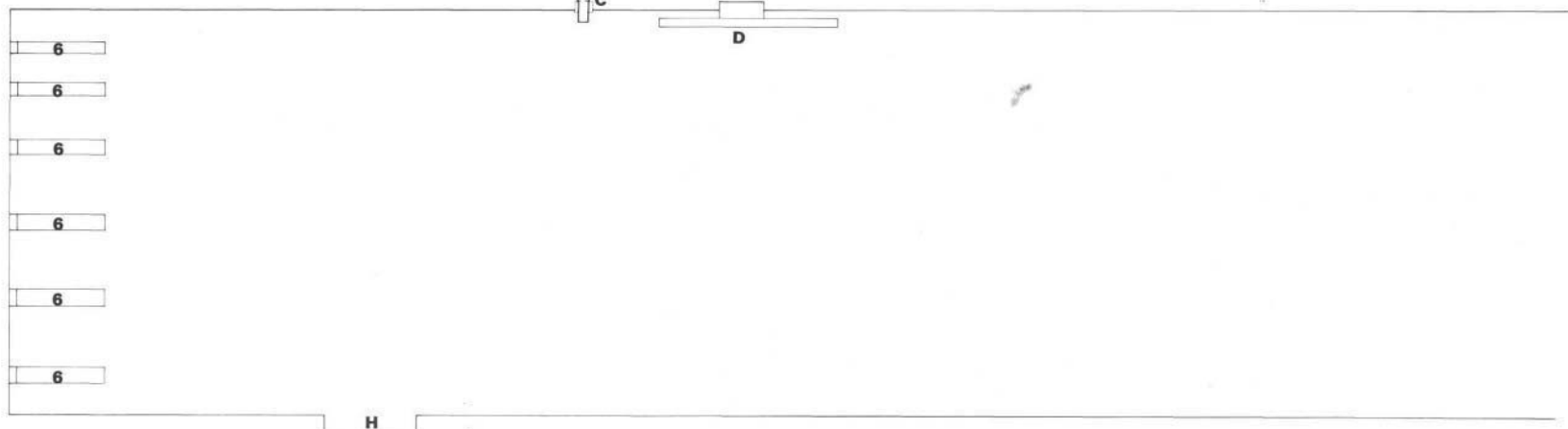
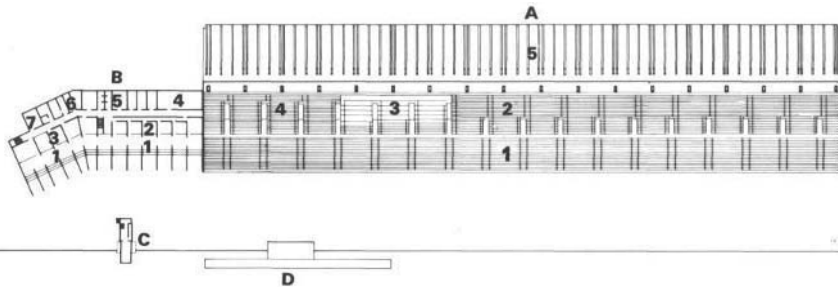
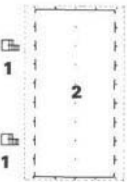
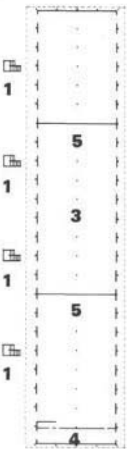
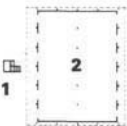
To minimize noise, the rifle halls were fitted with sound absorbing walls. In the pistol halls additional double dividing walls of sound absorbing material were installed after every second stand.





Layout diagram

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



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
- 6 Post office transmission
- 7 Personnel changing-room
- 8 Area for the fire department

C Finish Tower

D Victor's 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.

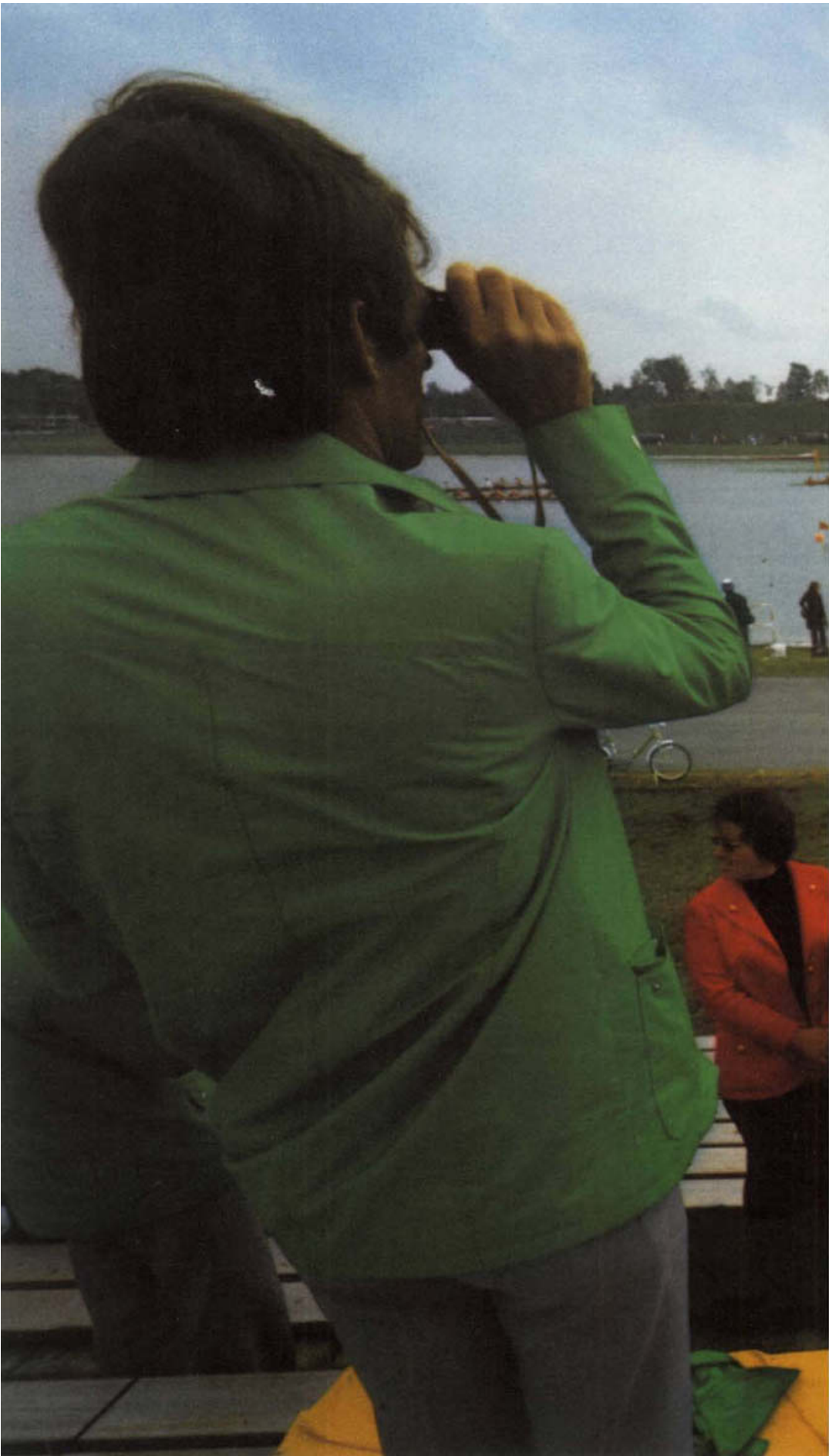






As the rowers leave the enclosing banks of the starting basin, the landscape flattens out more and more while the course continues. Nothing may be planted in a zone 65 m. wide on each side of the course, in order to ensure uniform wind conditions for all six rowing lanes. Behind these zones, at varying 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.





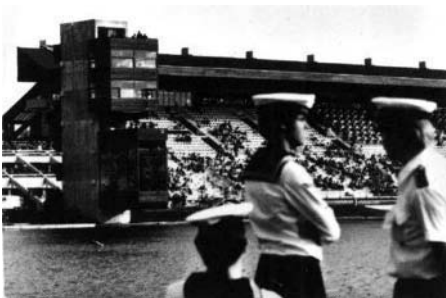




Located only 7.5 km. from Oberwiesenfeld, the site presented no traffic problems after improvements had been made at the feeder roads. A further advantage is the proximity of the suburban railway station of Oberschleissheim. The parking places are enclosed by hedges and separated from the actual regatta 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.



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

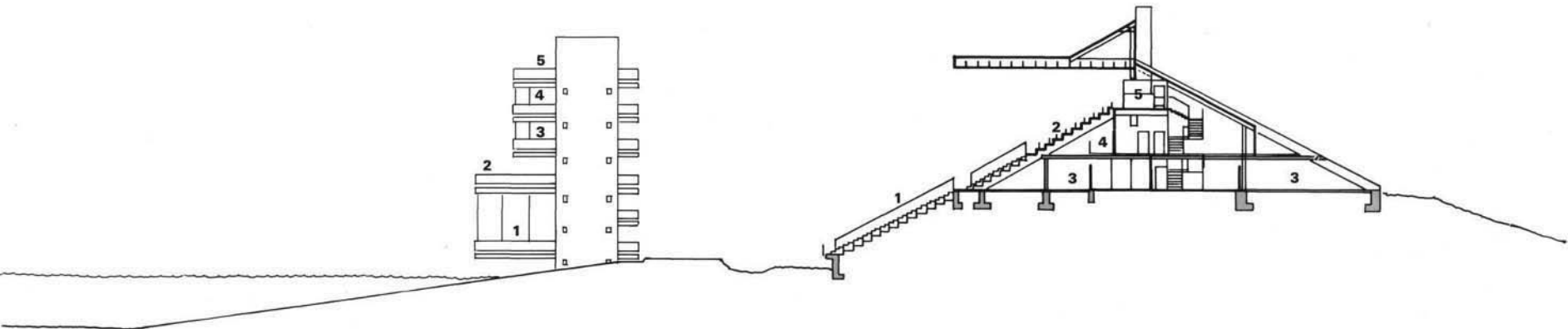


**Finish Tower, view from the southwest**

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

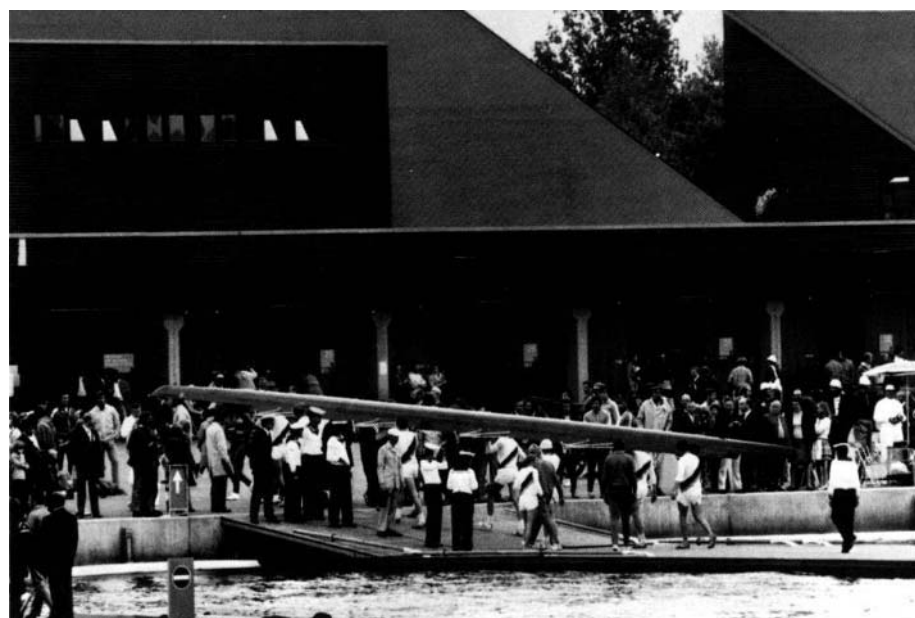
**Stands, Section Northwest Southwest**

- 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



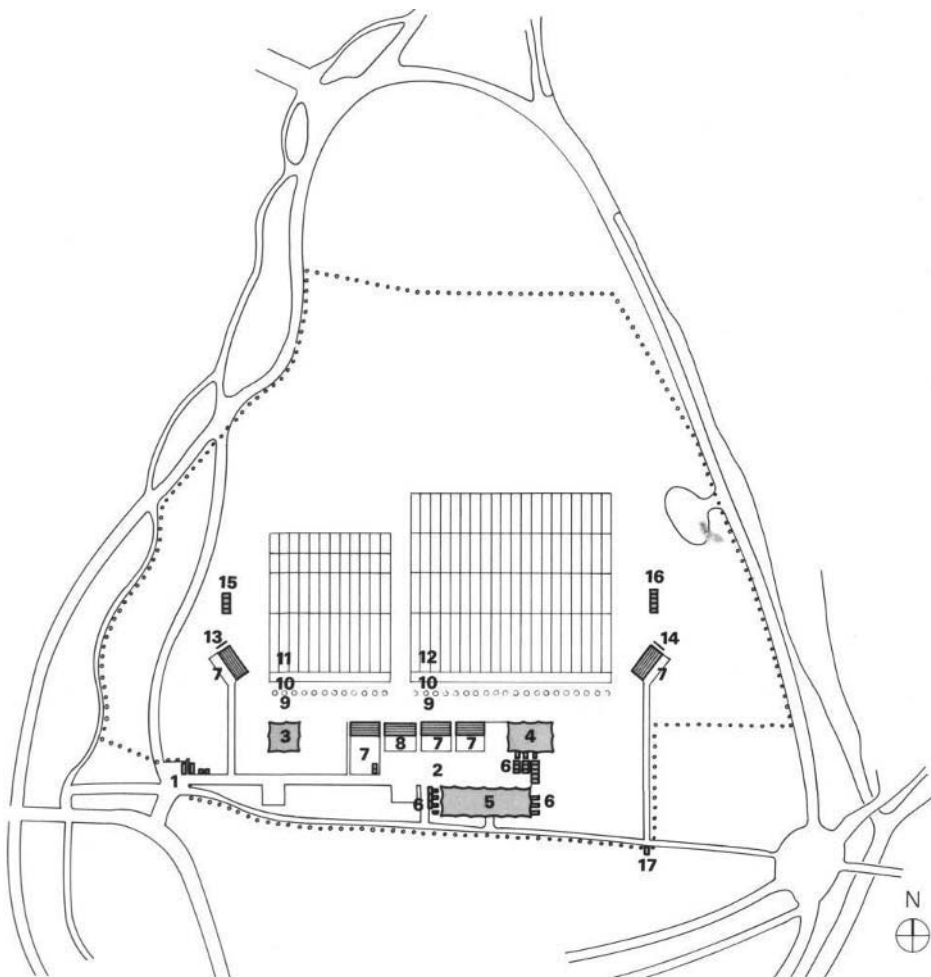
The participants' building which contains changing rooms, medical rooms, a sports hall, a conditioning hall, a sauna and several team rooms, will be used as a training center for rowing and canoeing after the Games. Between the building and the water there are a flat meadow and the athletes' grandstand 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

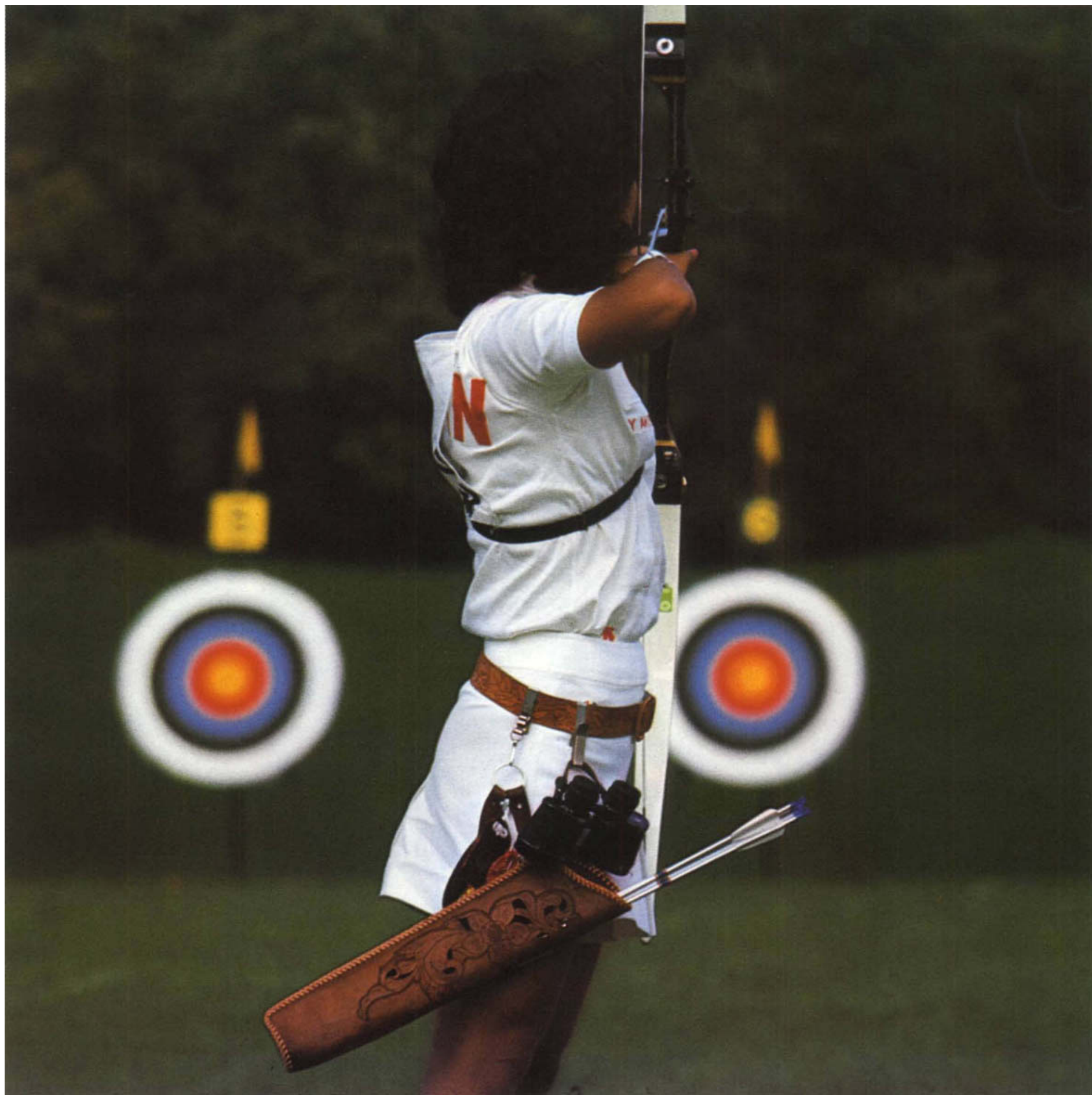
Although at first sight an English landscape garden and the sport of archery hardly seem to have anything in common, both are colored by the hue of history.

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".







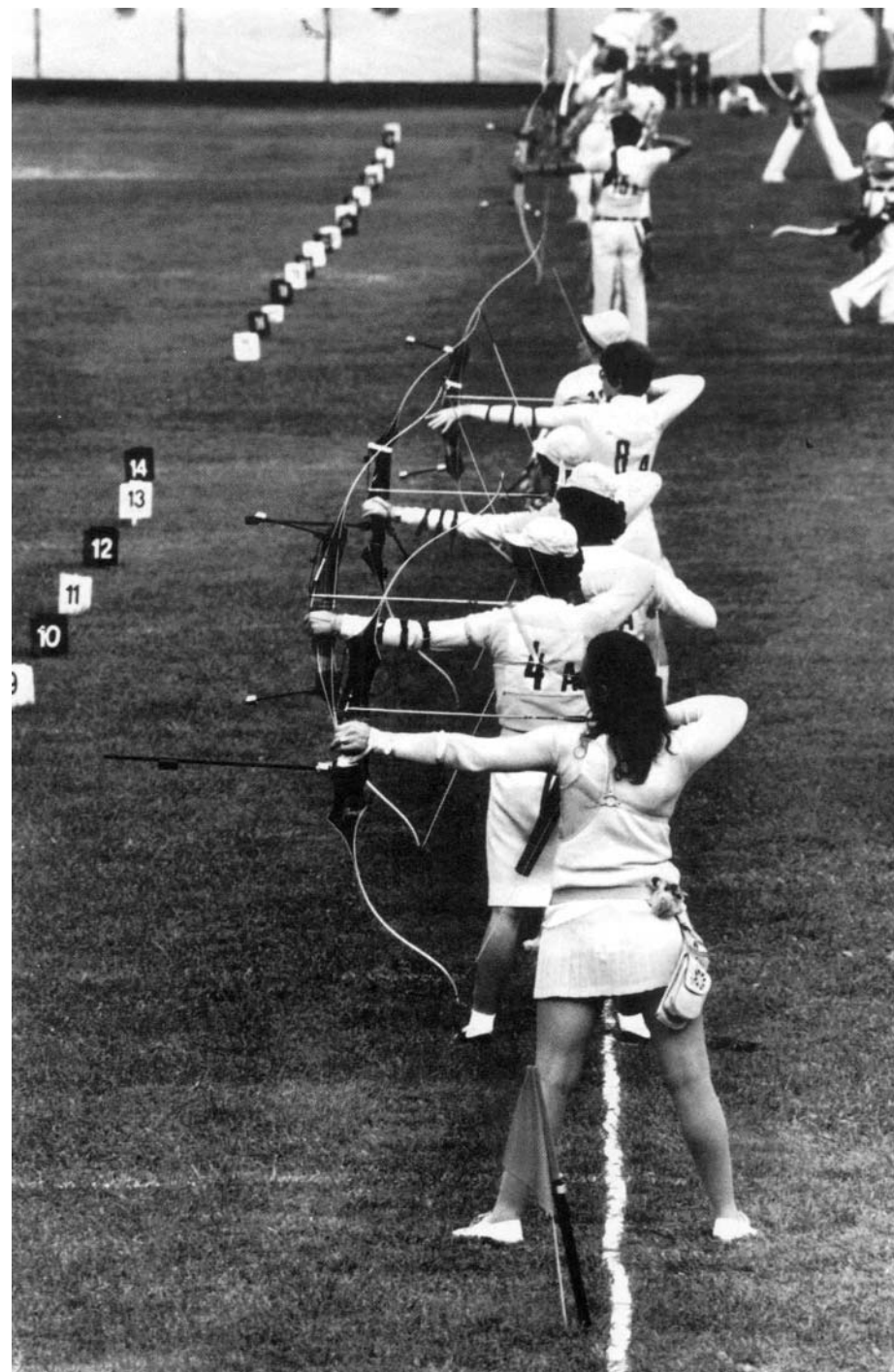
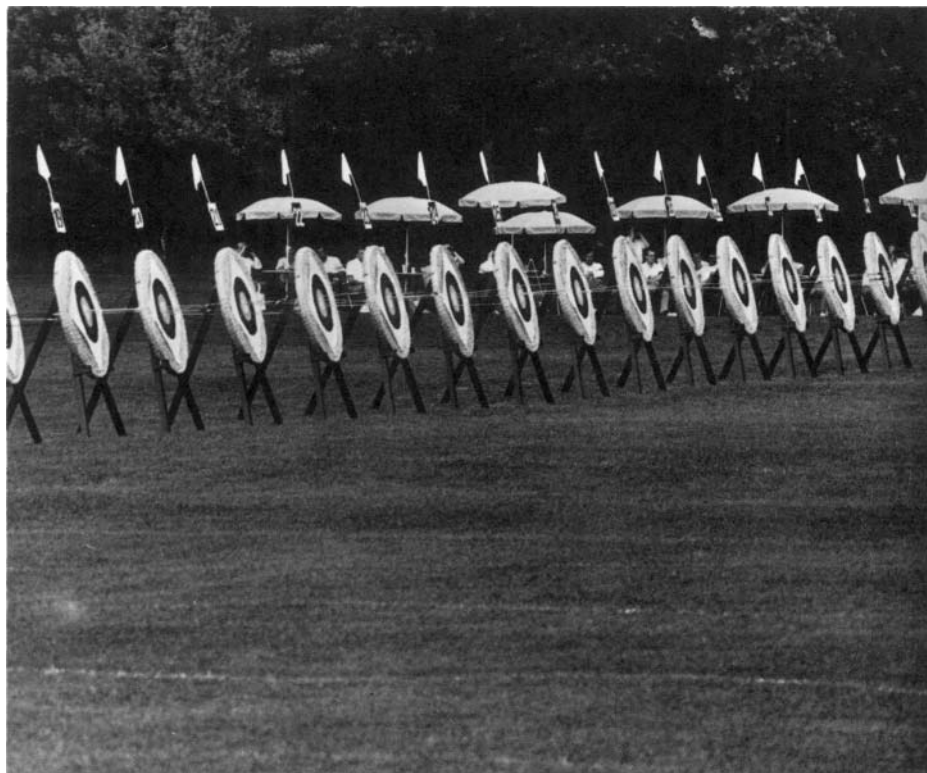
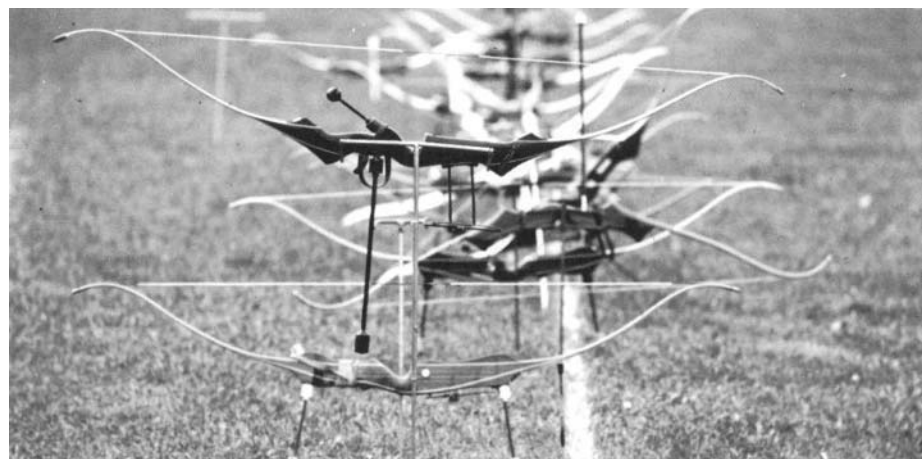


## Archery Range English Garden

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.

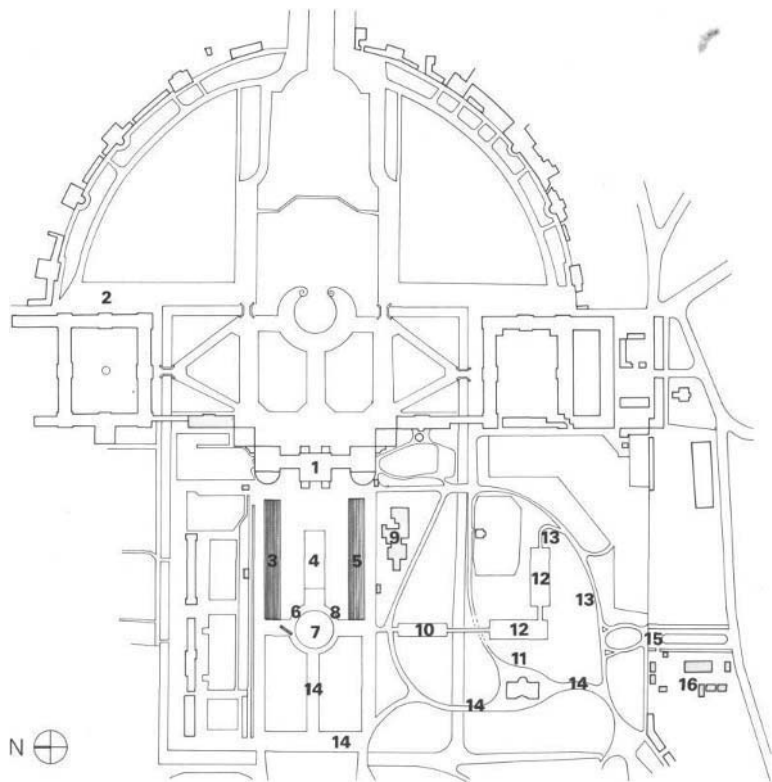
Signal lamps were set up on both sides of each range adjacent to the archers. These, together with acoustic signals, indicated the time of preparation and the moment to start shooting, the warning that shooting

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.

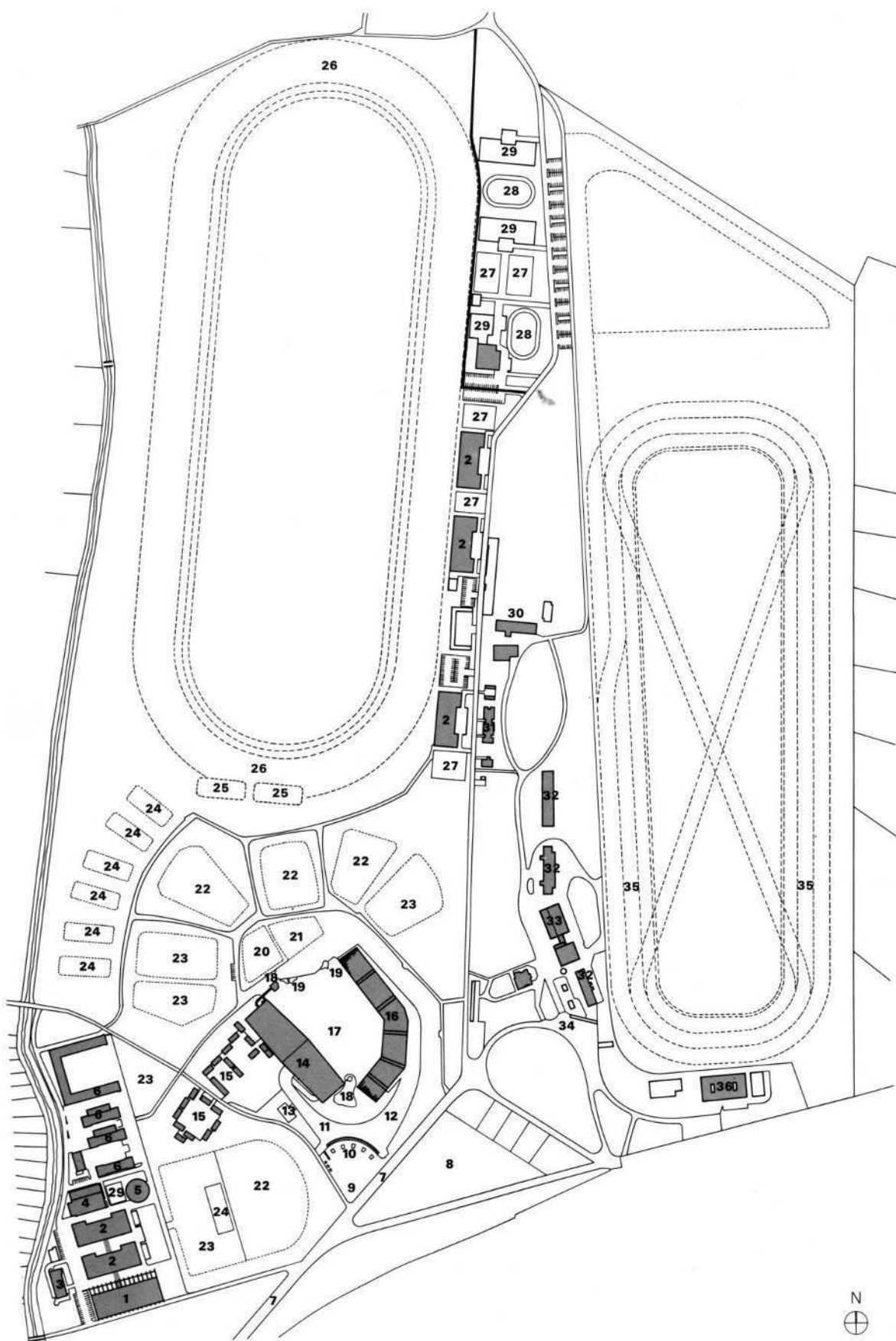




## Riding Facility in Riem

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

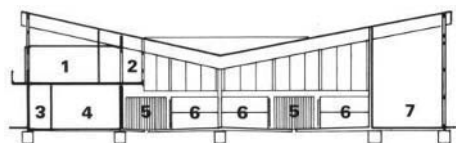
roomy square of 3.50 meters. In addition to partial air conditioning, each stall has a ventilating duct to remove ammonia fumes.

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

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.

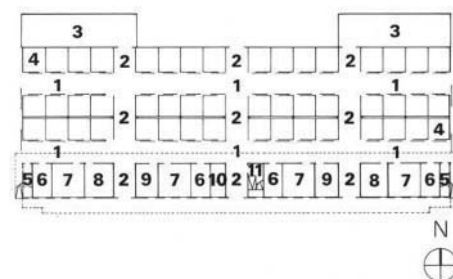


**Olympic Stable  
Cross section**

- 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.



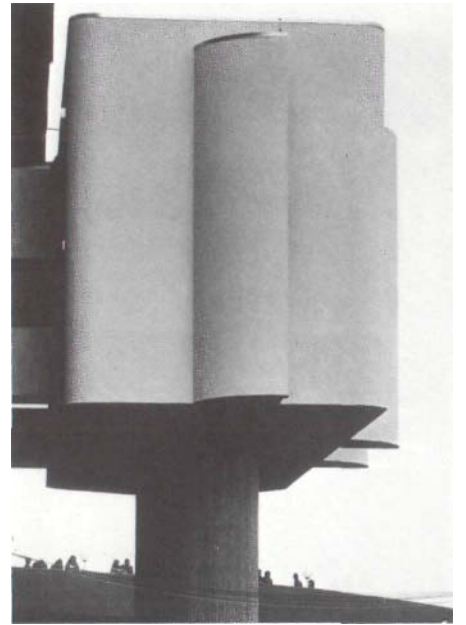
The 137-meter long covered western grandstand is composed of 24 laminated wood sections. The longest beam is a 31-meter cantilevered construction. The symetrically arched roof is covered with transparent acrylic glass panels because color television requires the contest area to be free of sharp shadows.

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.

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



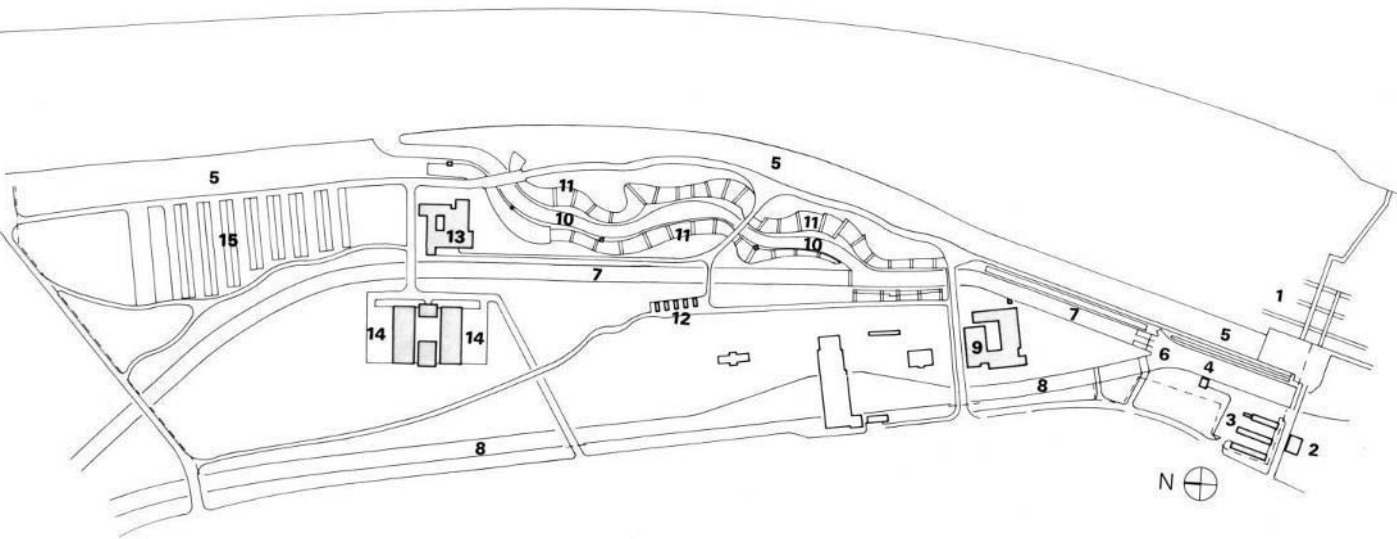






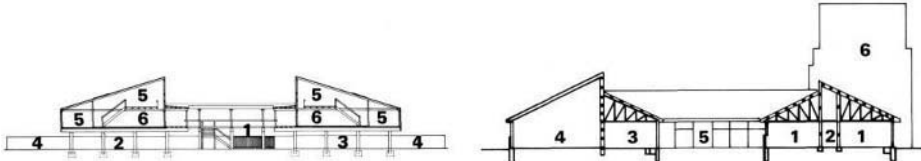
Canoe Slalom Course Augsburg

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.



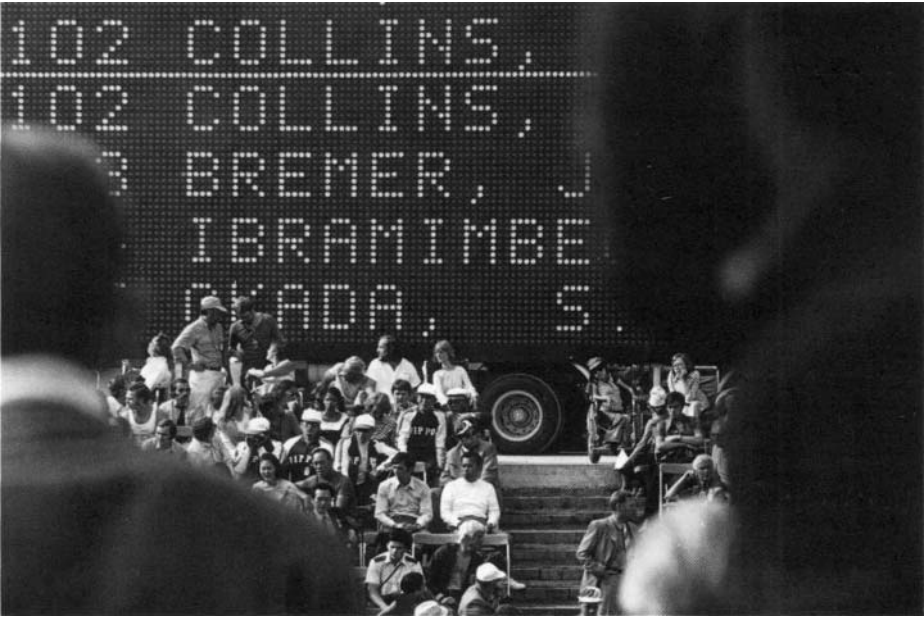


Between starting point and finish, the canal drops 3.70 m. over a stretch of 600 m., and the speed at which the water flows may vary between 3 m. and 6 m. per second. The average width of the channel is 10 m. to 12 m., and the depth, 0.40 m. to 1.20 m. 35 concrete blocks produce the back currents, whirlpools 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.







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.

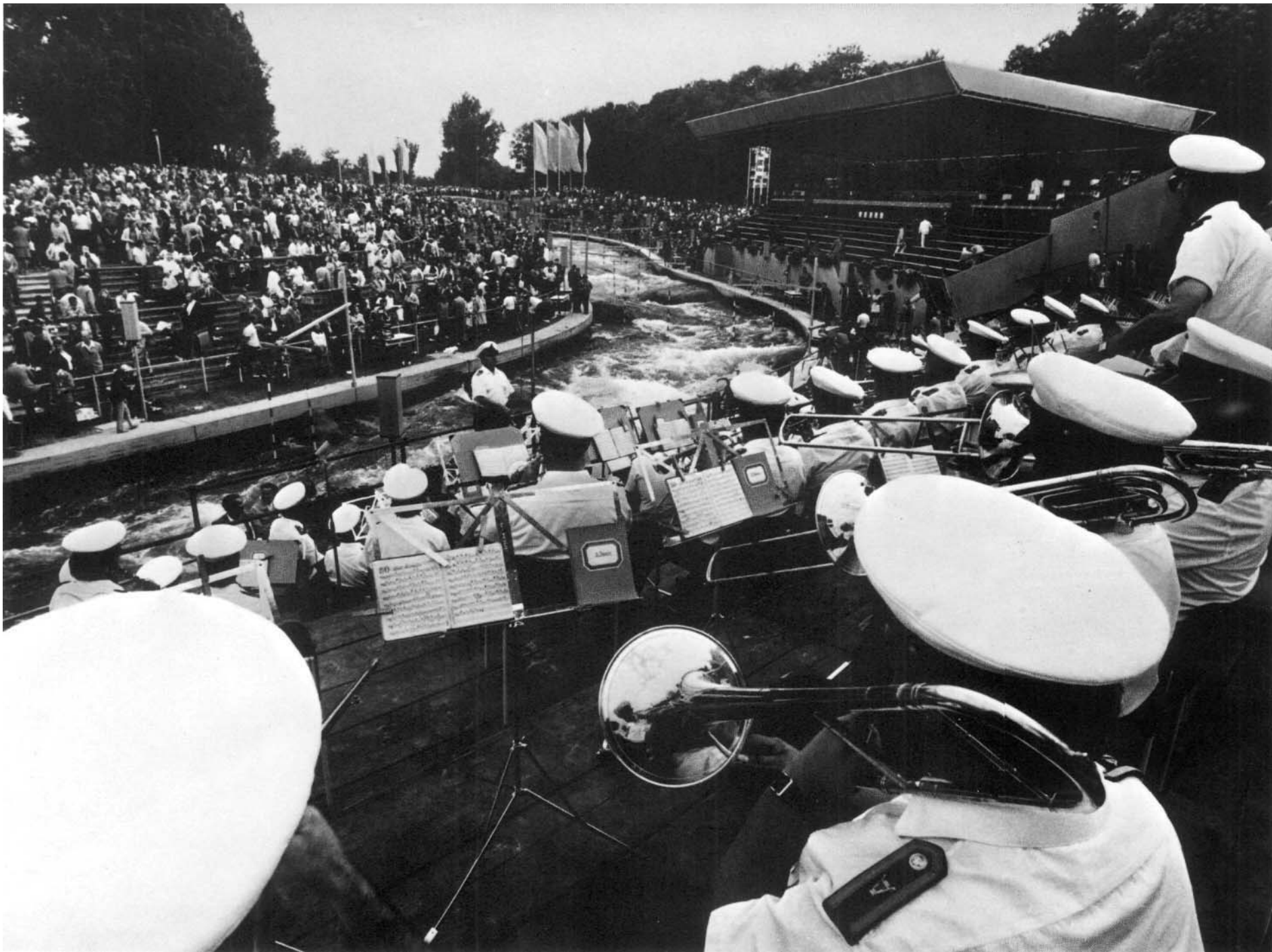
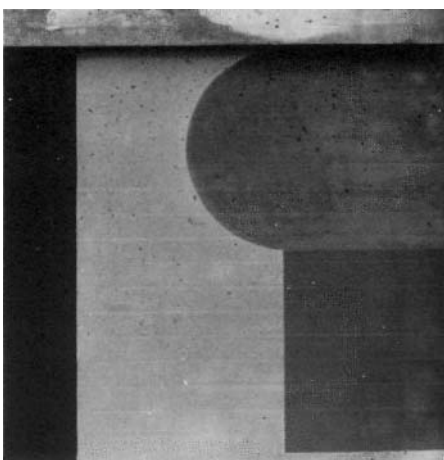


For setting up the gates for the slalom, sockets have been inserted into each side of the canal at three-meter intervals, so that the gate hanging devices can be fixed in any position required.

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.

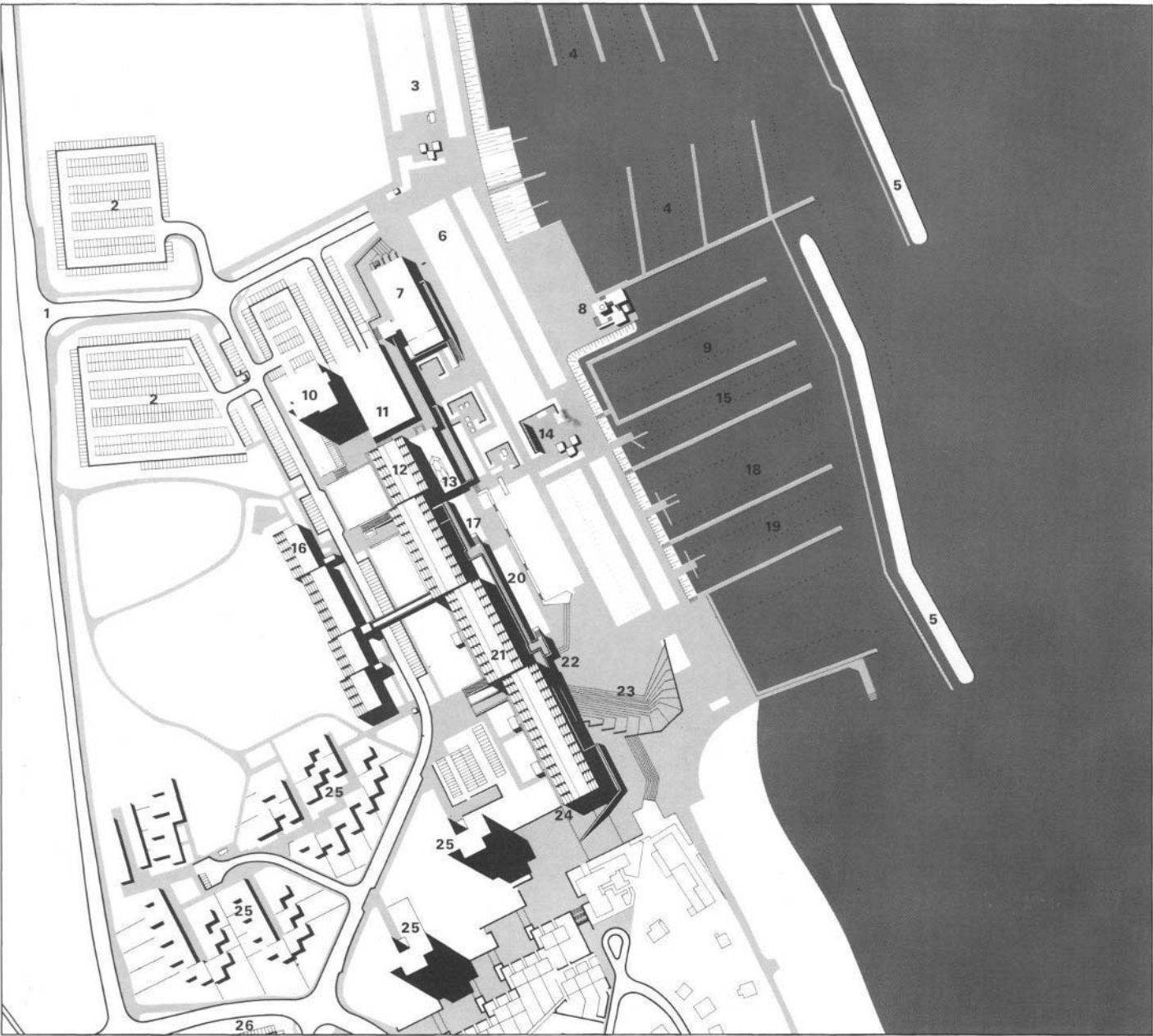
At the last bend in the canal, to the south-west of the restaurant, a temporary roofed-in stand was constructed to seat 500 competitors and guests of honor, 100 journalists and 30 television and radio commentators.



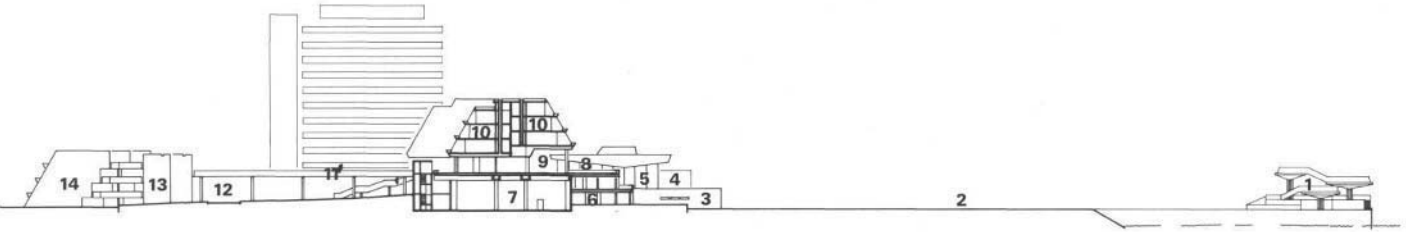




**Olympic Yachting Center**  
**Kiel-Schilksee**  
Architects:  
Hinrich Storch and Walter Ehlers,  
Hanover



- 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.







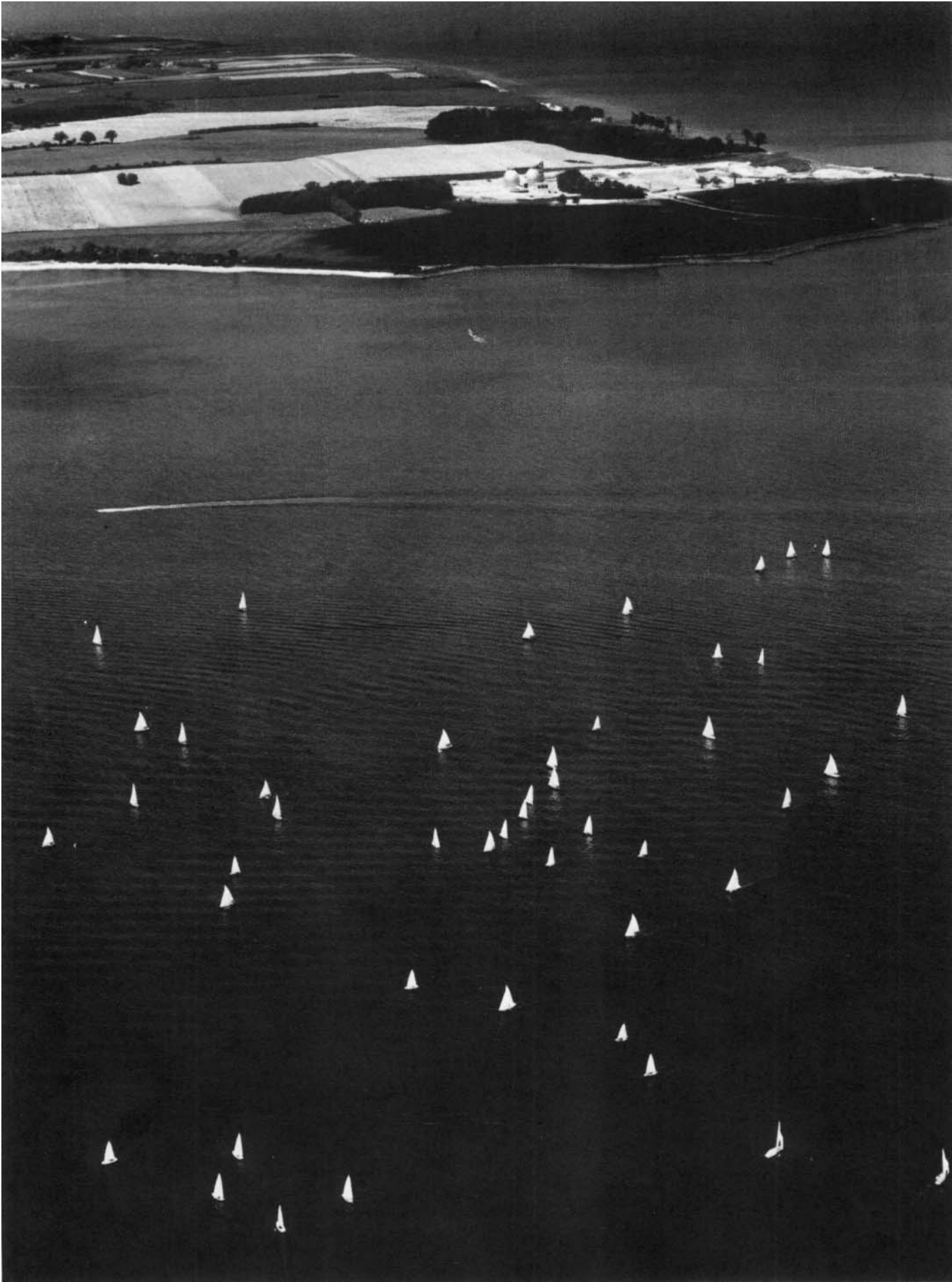
The designers of the Olympic Center at Kiel were chosen through an architectural design competition. The winning plan envisaged of an approximately 465 meter long series of building units parallel to the shoreline, supplemented by smaller clusters of buildings of varying heights. The bottom floor of 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 harbor master'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.

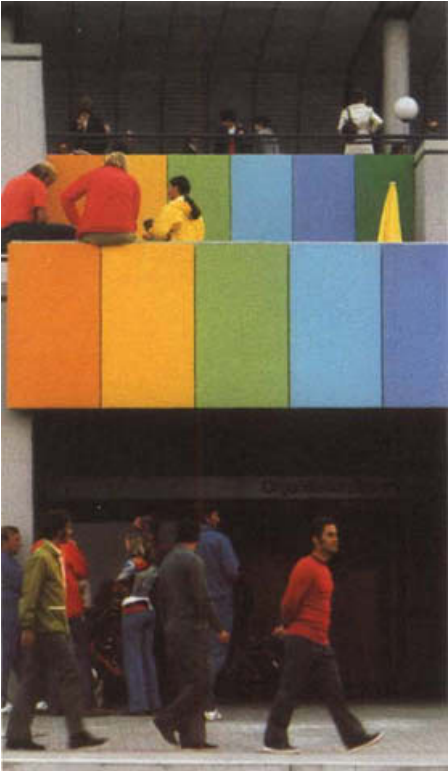
The Olympic Village on the south grounds consisted of 120 apartments in multi-storied buildings and 32 single family houses of various types. The apartment building built over the shops and restaurants contained 400 apartments for the press, regatta officials, and the contest jury. The apartment hotel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



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



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.





**Architects:**  
*Fred Angerer and Alexander von Branca,*  
*Munich*

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*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.

- 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

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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

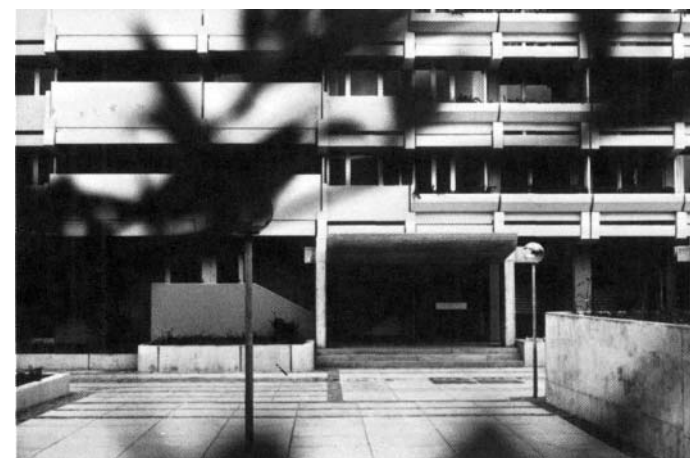
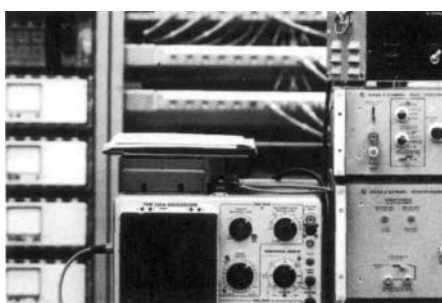
The buildings, ranging from a twenty-two story highrise to two-story low houses, were so designed that courtyards closed to traffic, and lawns where the inhabitants could relax and refresh themselves, were created.





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.

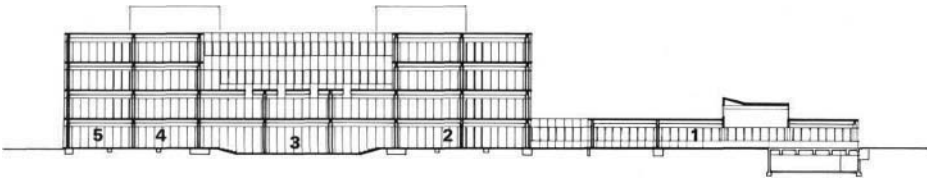
The residents were also able to stroll and shop in a roofed-over shopping center large enough for its later use. At this time most of the other facilities planned for general patronage (such as lunchrooms, medical center, drugstores, indoor swimming pool with sauna, churches, etc.) were already in use. 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

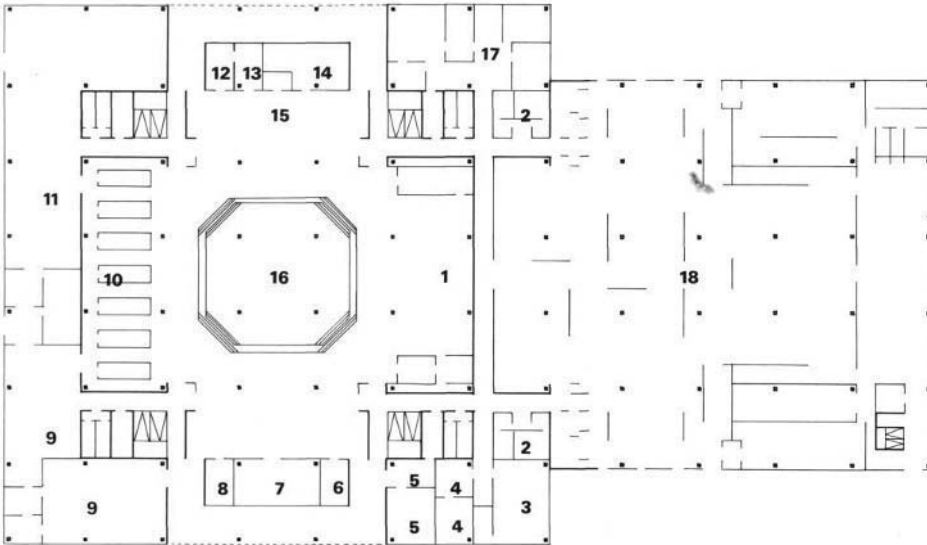
The headquarters for the 2,800 reporters and photographers was situated to the south of the press complex and on the west side of Olympic Park. It was accessible from Ries Strasse. It was easy to reach the city's main arterial streets by way of Hanauer Strasse. This ideal location was the basis of a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

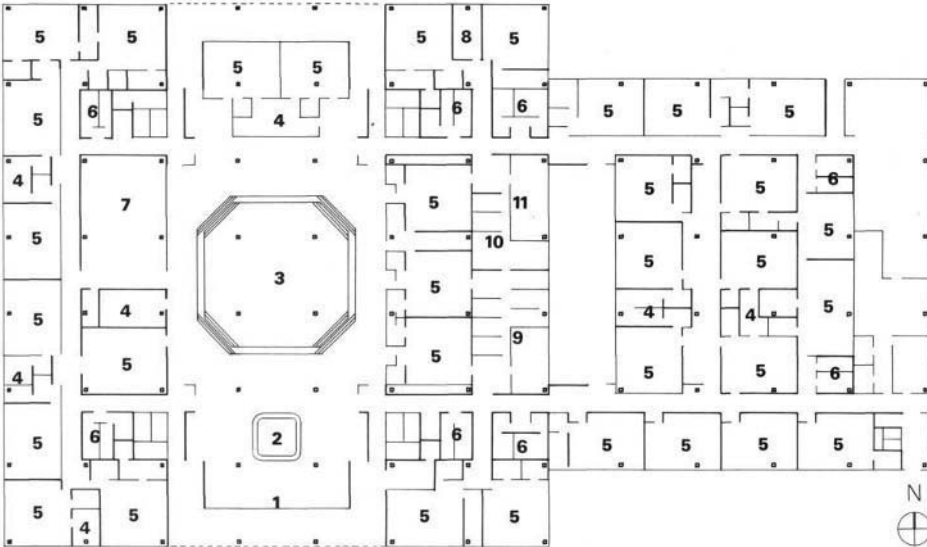
During the Olympics, this building was at once meeting place for journalists, news-room, club, communications center, work room, news agency, office, photo laboratory, and central station for telephone, teletype and telephoto systems. All of these facilities were distributed through four stories with 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.



Ground floor plan

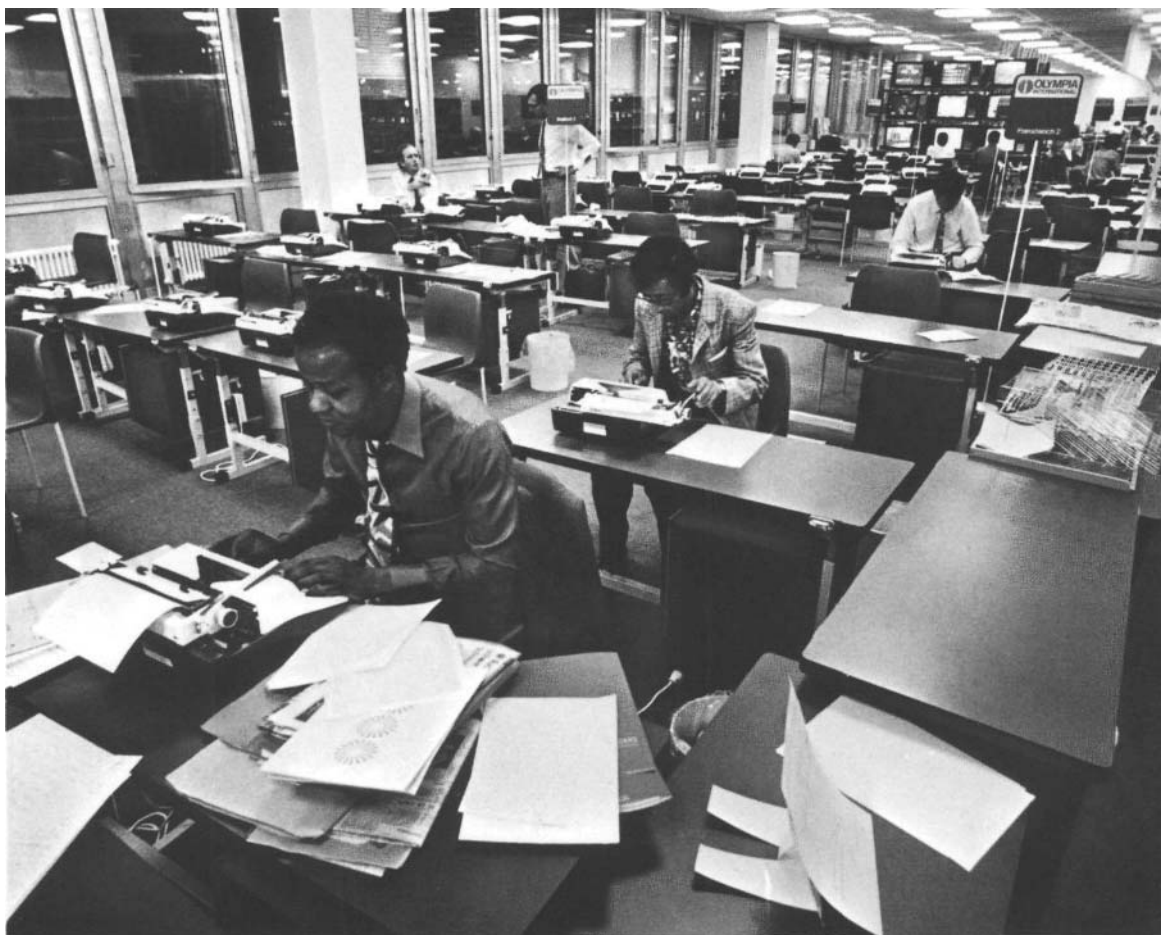
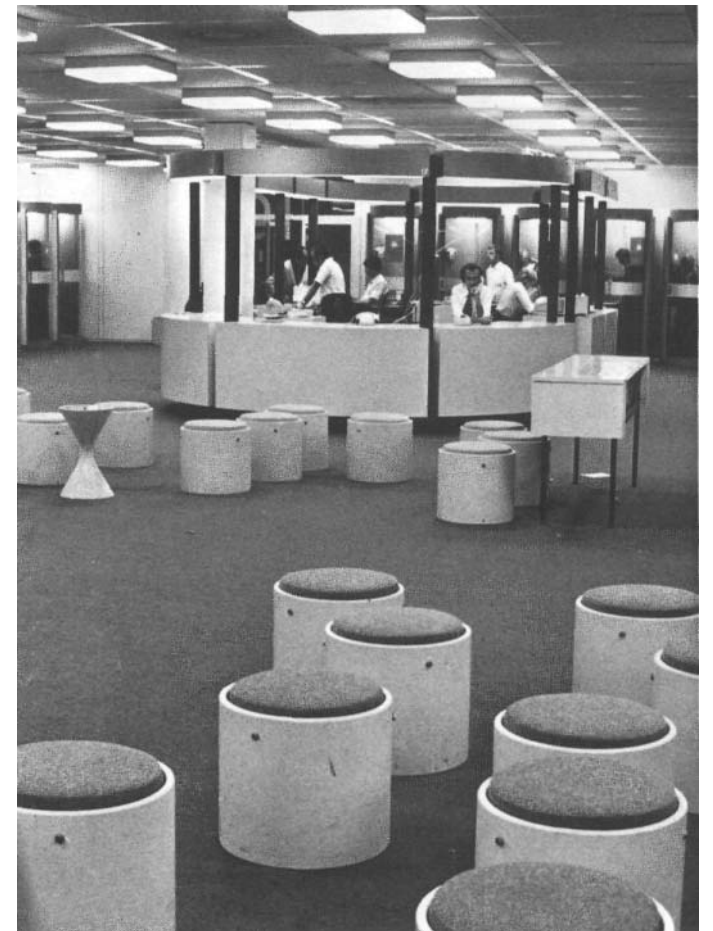
- 1 Counter hall, accreditation, information
- 2 Toilets
- 3 Post office technical apparatus
- 4 Doctors' office
- 5 Drivers' stand-by room
- 6 Travel agency
- 7 Bank
- 8 Newsstand
- 9 Post office for letters and packages
- 10 Post office boxes
- 11 Printing shop
- 12 Office of the German Sports Press 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







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.



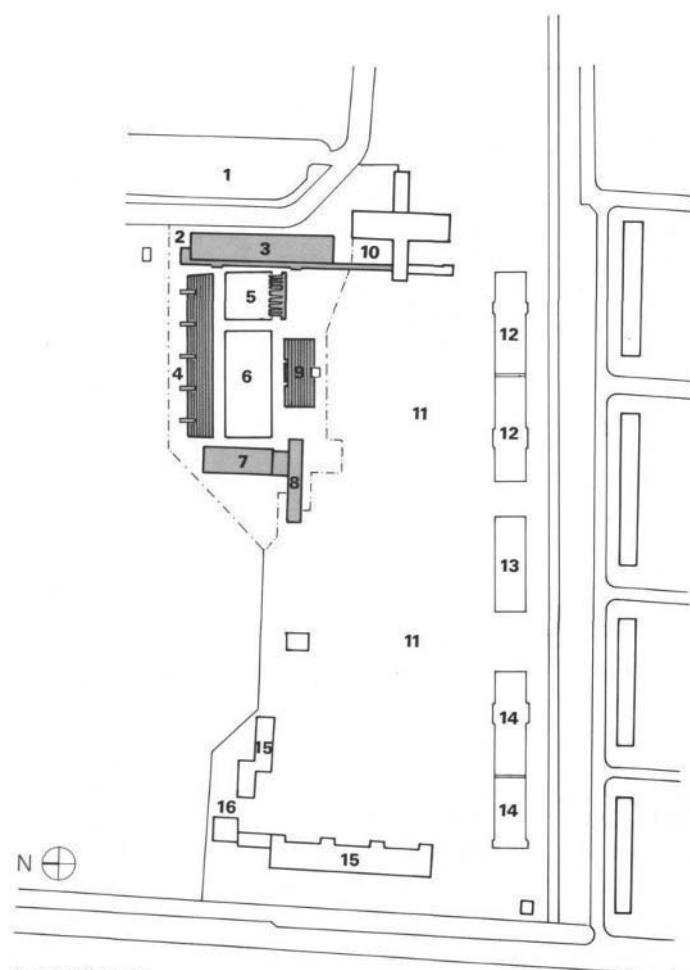






## Dante Swimming Pool

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.





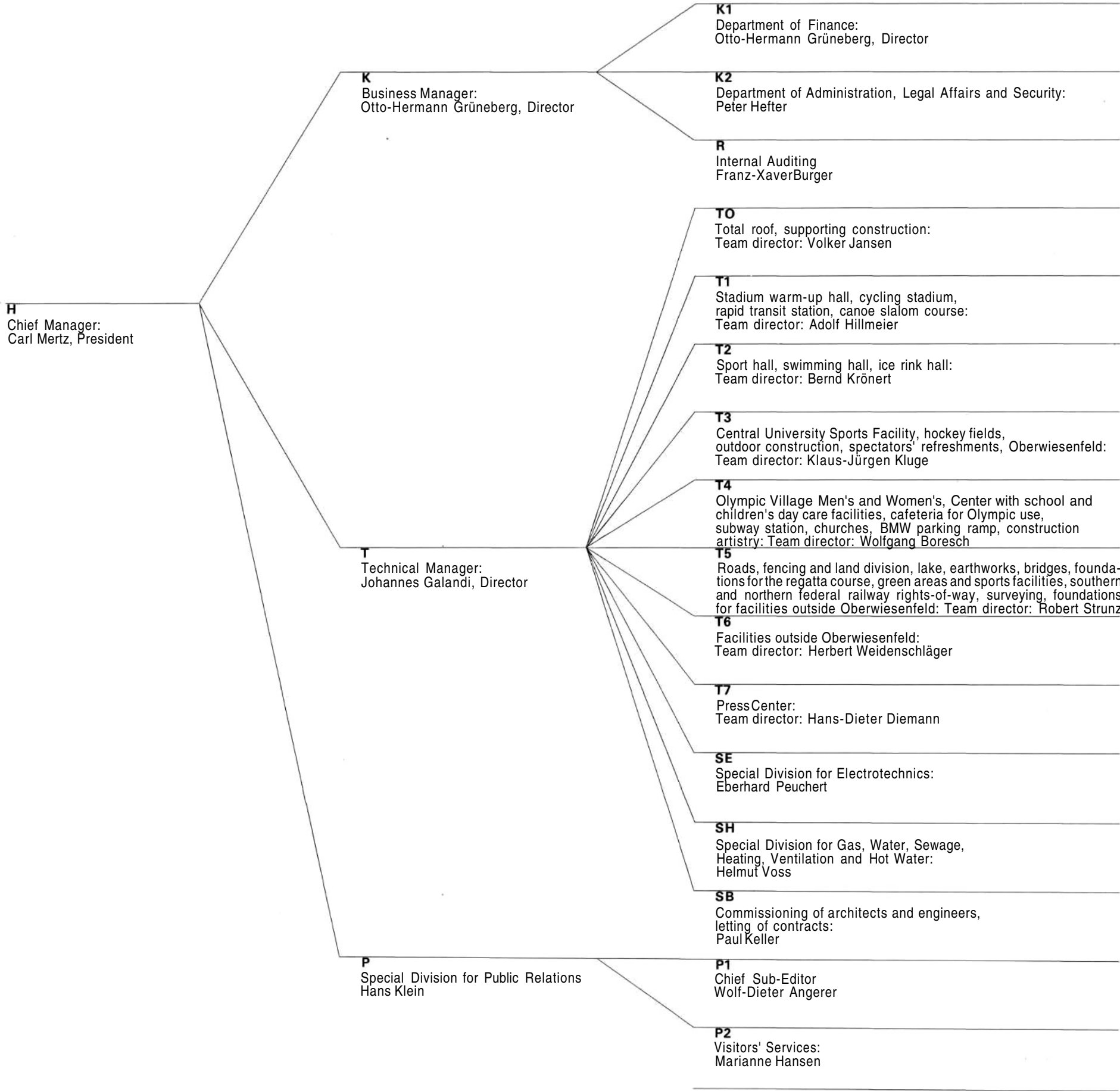
The two main structures to the east and west of the swimming stadium were newly built. On the ground floor of the eastern building rooms were provided for organization personnel and for the communication media. Upstairs are the restaurant and the sauna. The floor plan and layout in relation to the winter 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. Hundsdoerfer, 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:  
**Brandi Engineering Office, Frechen near Cologne, and Karl Bauer Company, Schrobenhausen**

**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:  
**Brandi 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, aquaducts, 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, ashs 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.  
Bordercables:  
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 mam 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 (north-west, 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 % *cynosurus 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 wash-rooms 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:

1 3 offices for national and international sports associations . . . . . 482 sq. m.  
 OC security guard . . . . . 1 91 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 Höllerer, Munich**

Heating and plumbing components:  
**Brandi 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.

The middle story of the swimming hall lies beneath the stationary western grandstands and extends, like the pool level, from south to north. On the south side under the stands is the warm-up pool for the divers. Adjacent to this are the training and teaching pools. On the northern side are the dressing rooms and the side wing. Underneath these, on the zero level under the poolside level, are located the dressing rooms for summer use, as well as all technical apparatus. During the Games, a large part of these rooms were occupied by Olympic personnel and officials. What remained served as lounge areas for the athletes. All levels of the swimming hall, from under the foyer to the zero level, were constructed of poured concrete. The supportive elements consist of reinforced concrete beams and columns. The permanent stands received prefabricated concrete steps. The swimming pools are built up of reinforced concrete and are independent of the hall itself with regard to statics and structure. The temporary bleachers, on the eastern side of the hall, were also independently constructed of steel tubing with wooden overlays, wooden benches, and their own temporary roof. The rear side (that is, the eastern side of the temporary bleachers) left a clear view into the supporting steel framework and the ventilation installations. The tone for the whole swimming hall was set by the sweeping curved roof, with its glass facade almost encircling the area, and by the soft depression of the artificially formed landscape, which defined the structure along with the competition surfaces and the diagonal slope of the stands. (The dismantling of the temporary stands and the extensions of the glass facade after the Games have created a different optical impression which is oriented more toward the open area and is more in keeping with the needs of public use).

**Dimensions of the Complex**

Total space . . . . .	222,000 cu.m.
Air space of the swimming hall . . . . .	110,000 cu.m.
Axis of the total complex, lengthwise . . . . .	155 m.
Axis of the total complex, crosswise . . . . .	120 m.
Competition pools:	
21 m. x 50 m. . . . .	1,050 sq. m.
Depth 2.5 m. . . . .	2,700 cu. m.
Diving pool:	
21.5 m. x 20 m. . . . .	430 sq.m.
Depth 5.0 m. . . . .	2,150 cu.m.
Teaching pool:	
16.66 m. x 8 m. . . . .	133 sq. m.
Depth 1.85 m. . . . .	250 cu.m.
Training pool:	
12.50 m. x 50 m. . . . .	625 sq. m.
Depth 2.00 m. to 3.50 m. . . . .	1,700 cu.m.
Warm-up pool for divers:	
Semicircular. . . . .	.10 sq. m.

**Access**

By car:  
The swimming areas could be reached from the Olympic Village by way of Lerchenauer Strasse, the Middle Ring, and the Spiridon Louis Ring. At this point, there was an entrance to the swimming hall. (During the Games this was reserved for personnel, athletes, and special guests.)  
Public transit:  
The subway station for the Olympic Park is about 600 m. to the east. Pedestrians can reach the entrances to the swimming hall

by way of Lillian Board Weg. The rapid transit station of the Olympic Park is about 800 m. to the northwest. Pedestrian paths provide access to the sports hall and swimming hall. The streetcar stop south of the swimming hall is about 1,200 m. distant on Schwere Reiter Strasse. Pedestrian walkways likewise provide access.  
Parking lots:  
During the Games, parking spaces were provided only for special guests, functionaries, and various service groups.  
**Total Cost excluding Incidentals**  
(without roof construction)  
58.3 million DM  
**Utilities**  
Heating, cooling, and ventilation:  
The heating system is connected to the urban distant heating network.  
Heating connection value . . . . . 6.9 Gcal/h.  
Permanent cooling capacity . . . . . 500,000 kcal/h.  
(Temporary capacity for stands) . . . . . 700,000 kcal/h.  
Amount of air circulated . . . . . 620,000 cu.m./h.  
The entire swimming hall is heated and, when necessary, cooled through the ventilation system. Radiation plate heaters are installed horizontally five meters up only along the facade to compensate for cold air penetration of the glass front. Fresh air is drawn in through two intakes (on the east and west ends of the north side) and is channeled through ducts to the central air conditioner. The air current on the facade is conducted from the bottom upwards. The main air input to the hall is introduced through blowers in the neighborhood of the temporary bleachers. The ventilation of these temporary stands is accomplished with apparatus provided for ventilation after the Games. The air is here blown in through slits in the bleacher steps. Air is directly exhausted into the open through axial ventilators directly above the upper bleacher edge. A visible ventilation duct on the lowest stationary partition directs air upwards as well as horizontally across the competition pool and thus forms an air barrier, which shields the spectator areas from the smell of chlorine. The restaurant also enjoys ventilation installations which produce a separating air barrier. In the stationary part of the hall, up to 60% of the air is blown into the inner area and up to 40% onto the facade. The exhaust for this part is accomplished to 50% through ventilators on the tent roof, to 20% through poolside exhausts, and to 30% on the facade. The public on the temporary bleachers were provided with cooled air according to need by a temporary air conditioner. The dressing room lockers are separately ventilated. The relative humidity is set on the basis of 60-65% in the hall. All barefoot walkways are supplied with floor heating registers.  
Water treatment:  
Total water capacity of all pools . . . . . 6,800 cu. m.  
Competition pool . . . . . 2,700 cu. m.  
Diving pool . . . . . 2,150 cu. m.  
Training pool . . . . . 1,700 cu. m.  
Teaching and warm-up pools . . . . . 250 cu. m.  
The following water temperatures were demanded for the pools: competition pool 25.5—26°C, diving pool 28°C, training pool 25.5—26°C, warm-up pool 32°C. The room temperature averages 28°C.  
The heating of the pools is accomplished by a counter-current system operated by a

distant heating facility. Water purification is performed by an electric chlorifying installation which electrolytically changes sodium chloride solution to sodium hypochlorite solution. Acidic preparations are added to the water to stabilize the pH-value. Copper sulfate is used as an algicide. The entire water supply can be recycled through the closed gravel filters in the following time periods:  
Competition pool . . . . . 3.5–4.7 hours  
Diving pool . . . . . 7.5–11 hours  
Training pool . . . . . 3 –4.7 hours  
Teaching and warm-up pools . . . . . 1.3-1.7 hours.  
Water purification is double checked by the use of redox voltage measurements. Water currents are induced horizontally across the pools through radiation turbulence devices. Input nozzles are installed in two levels along the length of the side walls, in such a way that they correspond to the spaces between the nozzles in the wall directly opposite. The water returns partly through drains in the pool bottom and partly through the overflow gutters. A specially developed overflow gutter, which resembles the fin gutter, is installed in the swimming hall.  
High voltage systems:  
The power output of the transformers installed is 3,465 kVA.  
The stand-by machinery has a power output of 300 kVA.  
Lighting: The lighting for the swimming hall (competition pool, diving pool, and grandstands) consists of rows of fixtures hanging by a trussed cable system from the roof. Five cross trusses are arranged over the main pool, with the lower edge 14.70 meters above the surface of the water. Two cross trusses are placed over the diving pool at a height of 16.70 meters. An additional truss connects all other trusses lengthwise.  
The floodlights are controlled from a console in the poolmaster's room. To protect both spectators and athletes from direct and reflected glare from the surface of the water, reflection-free mixed lighting by halogen metal vapor lamps (2 kW) and high performance fluorescent lamps (120 W) is employed. The vertical light intensity for competitions covered by television is 1,875 lux new value. For post-Olympic competitions without television coverage the intensity is 500 lux at the starting posts and 650-700 lux around the diving tower.  
For normal bathing and practice use after the Olympics, only fluorescent lighting with an intensity of 320 lux is planned. The mixed lighting is only used for television coverage. 750 lux illumination for the temporary bleachers up to a height of eight meters was provided from the trusses by means of fixtures hanging from the temporary roof. Lighting became progressively dimmer until the highest rows received only 80 lux. The stationary stands are illuminated from the trusses by horizontal lighting of 400 lux intensity. The training and teaching halls, the dressing rooms and other areas are provided with humidity resistant fluorescent tubes.  
Low voltage systems:  
Loudspeaker installation: The PA system is divided according to the requirements of space into the following areas: competition area, western stands, and passageways. These areas are served from the lighting trusses by groups of loudspeakers which are protected from humidity and chlorine

damage. The swimming-pool and diving pool are equipped with twelve underwater speakers.  
Temporary bleachers: This area was served by decentralized speaker clusters: the lower third of the stands by speakers mounted on the eastern edge of the lighting trusses, the middle third by speakers mounted on the roofedge cable, and the upper third by speakers provisionally mounted at the roof.  
Training pool, teaching pool, dressing rooms: Loudspeakers for these zones are arranged in conjunction with the ceiling lighting. Waterproof funnel speakers are used in the shower rooms.  
Gymnastics room, conditioning room, office, work and lounge areas: In these areas wall or ceiling speakers are used. The operation and control of the entire PA system during competitions in separate zones is centered in the direction booth on the pool level under the western stands. Announcement could be made from two speaker's places and twelve microphone jacks within the area of the arena. After the Olympics, a speaker's station located in the poolmaster's room can be switched to the whole PA system.  
Telephone network: The switch board for all extensions was located in the stadium. A total of 120 extensions were available in the swimming hall.  
Clock system: The clock center was located in the stadium. The entire clock system of the swimming hall was controlled by that center.  
The fire alarm system: connection to the city fire department.  
Antenna installation:  
The antenna installation was calculated in such a way that the required minimum voltage of every line was guaranteed even at full usage.  
EDP network: The data processing facility was installed in the stadium, from which the subdistribution in the swimming hall was served.  
DOZ intercommunications network: Three systems each had specific functions to fulfill. The intercom system "Diving Tower" was to contribute to the smooth functioning of the diving competitions. Another intercom system was placed in the swimming pool area. The third was reserved for emergency and technical use, comprising connections to the security guards, fire department, doctors, hygienic service, technicians, as well as the swimming master and direction booth.  
Utilities rooms:  
Poolside level: seven transformer rooms, one low voltage and mains room, as well as two chlorine rooms (electric chlorifying equipment) are located off the athletes' entrance corridor.  
Basement (technical level): Heating and ventilation centers are installed below the training hall. Other ventilation centers lie in the northeastern and northwestern corners of the building. Battery room, low and high voltage switching units are located on the northern side in close proximity to the access driveway.  
**Technical Installations for Sports**  
Scoreboards:  
Two large scoreboards measuring 9.50 m. x 4.40 m. were mounted above the permanent stands at the western and eastern ends of the swimming hall. Both boards were built in "light chamber technique". For the information of the visitors on the temporary bleachers a 4m. x 3m."Eidophor"



projection screen was suspended from the eastern edge cable of the roof above these stands. The input and operation of the scoreboards was controlled from a main console unit in the direction booth. The data input from the various sources, such as data checkpoints in the sports direction and in the diving and water polo facilities, punch card readers, digital time keeping, etc., was recoded and further processed at this main control console. The scoreboards could accordingly be employed for all the swimming events, as well as for the diving contests and water polo matches. A single scoreboard, mounted on the eastern facade facing the permanent stands, remains for post-Olympic use.

The following information was communicated: Main display: state of competition in eight lines corresponding to the eight swimming lanes. Starting number, name of the participant, nationality, interim times, and end times were displayed. In posting the final results, the participants were no longer ordered according to starting numbers, but rather in the order of finish. Sub-display 1: name of competition, two lines; sub-display 2: records, two lines; sub-display 3: digital short time clock; sub-display 4: penalty times, two lines; moving headline band: one line was used for running reports from simultaneous events in the swimming hall; clock with normal time: diameter 1.5 m. The characters measured 231 mm. in height.

Time measurement:

Primary system: The start signal was given acoustically by the starting gun which was connected to the measuring device, an electronic crystal-controlled, ten-column printer. The primary system was connected with the data processing installation, the scoreboard and the television camera, and registered the interim and end times down to 1/1000th of a second. An acoustic recall signal for false starts was provided in conjunction with the start signal.

Secondary systems: The finishing phases of all competitions and participants, as well as the handoff in relay races were checked and recorded by electronic video tape cameras. The pictures could be projected onto monitors, along with time readings. Accuracy amounted to 1/100th of a second. The contacts for the interim and end times were released by touching a contact strip on the pool. The timing was transmitted directly to the scoreboard.

Intercom systems:

See Utilities, Low voltage installations.

Pace setter system for the swimming pool: 200 successive lights are built into the long edges of the pool. These are controlled from a central console which can give impulses for various swimming speeds. The start signal is given acoustically from the control console.

Water turbulence system for the diving pool: This was installed so that the athletes could see the surface of the water during diving competitions. Water can be injected through upper side jets; air through twenty jets on the pool bottom.

**Competition Area**

Swimming and water polo:

Swimming pool

21 m. x 50 m. . . . . 1,050 sq. m.

Depth . . . . . 2.50 m.

Adjustable bottom . . . . . 21 m. x 16.67 m.

Underwater spotlights — 41 units, underwater loudspeakers — 12 units, underwater windows — 2 units each 2.00 m. x

0.50 m. and 3 units each 1.00 m. x 0.50 m. A pacesetter system was built in for training purposes (confer Technical Installations for Sports). The competition pool consists of eight swimming lanes, each with an axis-to-axis width of 2.50 m. The pool ends were each fitted with a contact strip covering the whole width of the pool to a height of 0.30 m. above the surface. This was necessitated by the fact that all pools were equipped with overflow gutters and the water surface was level with the walkway around the pool. The starting blocks were set up at both ends of the pool and were structurally linked to the contact strip. A loudspeaker was built into the starting blocks to amplify the acoustic start or false start signal. The blocks were also furnished with green lights which indicated whether time measuring device was functioning, and with a lap counter with luminous digits. The pool walls were done in white flagstone, the bottom in blue, and the stripes in black, in accordance with FINA regulations. Five meters from each end were the turning lines for backstroke swimmers; fifteen meters from the start was the false start line. All lines consisted of flag-be-decked ropes, which were stretched at 1.80 m. directly across the pool. Within the competition area there were chairs for the participants between the swimming and diving pools, as well as seats on both ends of the pool for the referees, the starters, the turning judges, and the swimming judges. Boundary lines and goal cages were installed in the swimming pool for water polo matches, and a thirty m. long referees' catwalk was erected on the western length of the pool. The diving pool was available to the water polo players for warm-up.

Springboard and platform diving:

Diving pool

21.50 m. x 20.00 m. . . . . 430 sq. m.

Depth . . . . . 5.00 m.

Underwater windows — two units, each 2.00 m. x 0.50 m., and four units, each 1.00 m. x 0.50 m.

Diving boards:

three springboards at 1 m. height, three springboards at 3 m., one springboard at 3 m. (hydraulically adjustable), one diving tower with elevator on the southern side of the pool and equipped with platforms at 1 m., 3 m., 5 m., 7.5 m., and 10 m., height. A warm-up room with 56 sq. m. of space, three warm showers, and six warm-up pools were at the disposal of the participants.

Seats were provided for the competition jury, the diving judges and the recording clerk in the area of activity. The competition area will be turned over to the public unchanged after the Olympics.

Competition preparation (poolside level):

This area is separated from the swimming hall by a glass wall.

Training pool

12.50 m. x 50.00 m. . . . . 625 sq. m.

Depth . . . . . 2.00m. to 3.50m.

Adjustable bottom 12.50 m. x 16.67 m.

1 underwater window - 1.50 m. x 0.50 m.

The training pool can be divided at the 25 meter mark by a folding wall. Two collapsible 1 m. boards were installed along the western side of the pool. The athletes have five warming benches at their disposal.

Warm-up pool (teaching pool)

8.00 m. x 16.66 m. . . . . 133 sq. m.

Depth 1.85 m., bottom adjustable by 0.30 m. By means of a separate stairway on the western wall of the teaching pool hall, the

following rooms on the lower level could be reached:

Gymnastics room with elastic floor. . . . . 210 sq. m.

Anteroom with equipment room 60 sq. m.

Conditioning room. . . . . 160 sq. m.

4 Massage parlors each . . . . . 20 sq. m.

2 rest rooms.

The dressing rooms belonging to the training and teaching swimming halls were only partially needed for use by Olympic athletes (readying rooms). The remaining space was placed at the disposal of the organizing personnel.

**Olympic Use**

August 27, 1972 to September 4, 1972

**Athletes' Area**

Competition area, swimming- and diving pools with surrounding surfaces. . . . . 4,500 sq. m.

Competition preparation area with training and teaching pools and surrounding surfaces. . . . . 2,400 sq. m.

Warming rooms, showers, and pools for divers. . . . . 56 sq. m.

Dressing areas for participants with 108 changing booths and 396 lockers, as well as 3 circular shower units, each with 24 showers and 6 toilets, foot disinfection points, the doctors' office and the doping control, total. . . . . 1,650 sq. m.

Sauna area with 2 sauna baths each for 40 persons, consisting of sauna room, cold water room, massage parlor, dressing room, shower room, and toilet facility. . . . . 350 sq. m.

The four collective dressing rooms of the teaching swimming hall were reserved for athletes' readying rooms

total. . . . . 270 sq. m.

540 places were reserved for participants and athletes in the spectator area of the eastern grandstand. The athletes had a competition preparation area at their disposal on the lower level (gymnastics room, anteroom, equipment room, conditioning room and massage parlor) . . . . . 510 sq. m.

Access:

There was an athletes' entrance on the northeastern corner of the swimming hall for buses from the Olympic Village. The athletes reached the grounds by means of a ramp. From this point there was direct access to the dressing rooms, lounges, massage parlors, showers, toilets, and readying areas. The doctor's office and the doping control were east of the showers between the dressing rooms and the swimming hall. A make-up or powder room, behind the swimming master's room between the training and teaching pools, could be used by winners before the victory ceremonies.

Post-Olympic use of the three swimming hall areas:

Swimming hall with competition and diving pools: These halls will also be used for future national and international competitions in swimming, springboard diving, high diving, and water polo. Primarily, though, they will be used by the public for swimming after suitable modification. From the forum between the swimming hall and the

sportshall visitors go into the entrance hall in the northwestern part of the swimming hall (foyer level). From there they go past automatic ticket sellers and checkers to the stairs leading to the dressing area with 108 cubicles and 396 lockers, 3 circular shower units, each with 24 showers, 6 toilets, 2 sinks and corresponding foot disinfection points, 1 double sauna with 350 sq. m. separated for men and women, each for 40 persons, as well as to the central dressing area on the lower level with 2,500 closets (used as organization area during the Olympics). In all areas there are separable passageways for street shoes and bare feet. The eastern facade borders on a grassy area for sunbathing. This lawn will be joined to the swimming hall by means of two wind-breaker installations, each with a walk-through foot pool.

Training swimming hall in the area of the Central University Sports Facility: To the northwest of the entrance hall, in the covered area between the sport hall and swimming hall, there is a stairway down to the college sports area. Four general dressing rooms each with 51 lockers, 3 semicircular shower units, each with 12 showers, 3 toilets, 1 sink with corresponding foot disinfection facility are available. The gymnastics and conditioning rooms on the technical basement level are reached by stairs.

Teaching swimming hall (used at the Olympics as a warm-up pool): The area of this pool offers the same facilities as the training area and can be used in conjunction with it. The swimming master's room and the overseeing room are enclosed in a glass booth between the three parts of the halls to enable easy visibility. The first aid station is located between the shower units, the dressing area and the swimming hall.

**Spectator Area**

Total spectator places. . . . . 9,182

Seats (mostly in temporary bleachers). . . . . 4,825

Standing room places. . . . . 2,830

VIP places in the temporary. . . . . bleachers. . . . . 180

Spectator places for participants and officials in the temporary bleachers . . . . . 540

Commentators' seats in the temporary bleachers. . . . . 340

Press seats with tables in the permanent stands. . . . . 259

Press seats without tables. . . . . 208

Post-olympic use — upon removal of the eastern bleachers, the following spectator places in the permanent western grandstand are available.

Seats. . . . . 1,562

Seats for participants. . . . . 135

Seats for commentators. . . . . 192

Press seats with tables. . . . . 42

VIP service:

Snack bar for VIPs under the temporary bleachers. . . . . 225 sq. m.

There was direct access from the VIP spectator seats to the VIP snack bar.

Spectator service:

Six refreshment stands and kiosks were set up on the main traffic level. Two portable snack bars were available on the foyer level behind the permanent grandstands.

Hygiene:

The temporary eastern spectator stands were served by rest rooms on the main traffic level under the bleachers. Rest rooms for the press and VIPs were provided separately

in their respective areas. Facilities for the permanent western stands were located under these stands.

Firstaid:  
The first aid station could be reached from the main access to the temporary bleachers. The doctor's office for the western spectator area was built into the stands.

Access for spectators:  
The entrance to the main spectator area was located at the northeastern corner of the swimming hall at the northern side of the stands. After passing through the ticket check, the spectators reached the main traffic level, proceeded to the seven entrances of the main stands, and finally arrived at their seats.

A separate entrance and driveway was established for the VIPs and the press. The spectators in the western stand reached these via the central plateau and upper foyer and from there went down to their seats.

**Communications Area**  
Under the stationary stands:  
DOZ subcenter for radio and television. . . . . 140 sq. m.  
Printing shop. . . . . 140 sq. m.  
Poolside level:  
Press subcenter, total . . . . . 880 sq. m.  
With the following rooms:  
1 office with 44 places, 2 interview rooms, 1 television studio for ABC, 1 television studio for DOZ, 1 director's office DOZ, 1 lounge, press information center, post office and teletype room, 1 storeroom printing shop, press snack bar . 100 sq. m.  
Post office. . . . . 310 sq. m.

Transmission installations:  
6 DOZ television cameras, one of which was movable along a poolside track.  
1 ABC camera  
4 DOZ movie cameras  
A parking lot for 10 technical vehicles with 350 sq. m. surface was provided in front of the swimming hall entrance on the northern side.

**Competition and General Organization**  
Poolside level:  
Referees' lounge on the southern side of the training hall 85 sq. m.  
Duplicating room. . . . . 20 sq. m.  
Swimming master's room between swimming hall and the teaching and training halls, with views of all three parts . . 50 sq. m.  
Referees' and assistants' dressing rooms in the four general dressing rooms of the training hall. . . . . 270 sq. m.  
Main traffic area under the temporary bleachers:  
Hostesses. . . . . 25 sq. m.  
Security guards, fire department 60 sq. m.

Lower level:  
Management of sports arenas  
Area sports directors and secretariat of the organizing committee. . . . . 70 sq. m.  
3 Conference rooms each with 35 sq. m.  
National and international associations.  
President of the Fédération Internationale de Natation Amateur (FINA), 4 rooms each with a total of. . . . . 108 sq. m.  
President of the German Swimming Federation (DSV) . 24 sq. m.  
2 lounges, each with. . . . . 30 sq. m.  
Technical area direction.  
2 rooms each with. . . . . 16 sq. m.  
Army chauffeur pool. . . . . 10 sq. m.  
Hostesses and translators,

2 rooms, each with. . . . . 16 sq. m.  
2 Maintenance workers stand-by rooms, each with. . . . . 30 sq. m.

**Restaurant**  
VIP snack bar. . . . . 225 sq. m.  
Press snack bar. . . . . 100 sq. m.  
Meals for personnel were served in the restaurant pavilion of the swimming hall. The auxiliary rooms and storerooms of the pavilion are grouped in the basement. The meal service pavilion is connected by winding stairs (arranged around an elevator shaft) both the poolside and dressing room levels as well as with the technical level. Visitors in the temporary bleachers were served by six refreshment stands on the main entrance level. Visitors in the western stands were served in the foyer area from two portable snack bars.

Cycling Stadium

Type of Sport:  
**Cycling**

Location:  
**8000 Munich 40**  
Toni Merkens Weg

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

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

Design and planning of the cycling stadium:  
**Engineers and Architects Beier, Dahms, Grube, Harden, Kaiser, Laskowski, Braunschweig**

Design and construction of the cycling track:  
**Architect Herbert Schürmann, Münster in W.**

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

**Characteristics of Design and Construction**  
Cycling stadium:  
The cycling track is surrounded by covered grandstands for the spectators. An auxiliary wing which forms a courtyard is connected to the western curve of the stadium. Auxiliary rooms are provided under the grandstands and in the above-mentioned wing (racers' quarters). A construction of fifty-six laminated wood beams forms the framework of the stadium. The ring girders, the ceiling of the ground floor, the walls, supports, ramps and stairs, as well as the foundations are constructed of reinforced concrete, poured on the site. The dominant materials are: wood constructions in a dark color, Eternit-Glasal (asbestos cement slates) and finishing panels of pre-cast concrete. The roofing consists of transparent Diolen (polyester) fabric covered with PVC (polyvinyl chloride).

Cycling track:  
The outline is determined by wooden dowels. The track surface consists of Doussie-Afzelia wooden laths nailed to each other at the sides.

Track infield:  
An open area of 2,200 sq. m. with four tennis courts (with a hard Everplay-bitumen-caoutchouc surface) for post-Olympic usage.

**Dimensions of the Facility**  
Total area:  
Stadium and auxiliary structures. . . . . 8,500 sq. m.  
Enclosed space. . . . . 17,400 sq. m.  
Roof area. . . . . 5,800 sq. m.  
Net riding surface of the cycling track. . . . . 2,408 sq. m.  
Length. . . . . 285.714 m.  
Width . . . . . 7.50 m

**Access**  
By car:  
Connection to the Middle Ring: Toni Merkens Weg.  
Parking:  
At the parking facilities in the southwest of Olympic Park; in addition, spaces

for twenty cars on the northern side of the stadium.

Pedestrians and public transit:  
Streetcar on Dachauer Strasse, subway to the eastern side of Olympic Park, rapid transit on the western side of Olympic Park; access via pedestrian walkways.

**Total Cost, excluding Incidentals**  
18 million DM.

**Utilities**  
Heating of cycling stadium:  
12,200 cu. m. of the enclosed space are heated.  
Warm air heater operated with natural gas; equipment for recirculation of air or fresh air ventilation allows a fresh air percentage of 20%—100%; temperature control by thermostats; hygrometers regulate the humidity. Total circulated air mass: 52,300 cu. m.

Heating of racers' quarters:  
A warm water pump heating system is employed - energy required: 750,000 kcal/h.

Pressurized air for tires:  
System pressure: . . . . . 161 atmosph.  
Intake capacity: . . . . . 30 cu. m.

Irrigation and drainage:  
Branching out system  
Power installations:  
Transformer capacity. . . . . 2,060 KVA  
emergency power system . . . . 210 KVA  
Current capacity for general lighting, radio, television, post office, heating ventilation system, water heating, kitchens, restaurants and track lighting: . . . . . 580 kW  
261 mercury vapor lamps = 1,500 lux (new value), 1 m. above the track. The track lighting is supplied with current by two separate supply systems; a power failure leaves 50% of the lighting in operation.

Low voltage installations:  
The PA system can be controlled from the referees' table and the direction booth. Announcements can be made from the referees' table, direction booth and winners' platform. Equipment includes 20 speaker clusters, 3 horns, and 2 sound columns. The telephone switchboard has 52 extensions in the stadium. Other equipment includes the clock system, fire alarm boxes, 8-station intercom, DV data processing, equipment in the press subcenter, printing room, timekeepers' desk, direction booth, and the lightning protection installation.

**Technical Installations for Sport**  
Scoreboard:  
10.47 m. long, 3.00 m. high, 6 lines, each with 24 units, size of characters - 31.3 cm., and two digital timing clocks, a clock with the time of day, and a completely electronic installation. Data input from teletype, from the data display station, and, direct from the timing devices.

Timing:  
Pneumatic track contacts at the start and finish lines, starting gun, timing desk and timing clock (furthermore, time is measured via connection boxes in the supporting wall of the timing tower).

**Competition Area**  
Remains the same after the Olympics.

Cycling racing section, wooden track:  
285.714 m. long, 3 ½ laps = 1,000 m.  
7.50 m. wide all around.  
Banking of riding surface from 11°56'-48°32'. Maximum speed: 90 km/h  
48.348 m. = distance between the two inner edges of the straightaways.



57.10 m. = length of a straightaway,  
75.757 m. = length of a curve, 281.72 m. =  
length of the inside edge "Côte azul",  
320.30 m. = length of the outside edge of the  
track, 301.01 m. median length of the sur-  
face (track and Côte azul).

Track markings:  
Colored marking lines, numbers in skidproof  
latex paint.

Competition preparation:  
There is a warm-up area of 500 sq. m. in-  
side the eastern curve (no roof), as well  
as a covered area for the racers inside the  
western curve, also 500 sq. m.

**Olympic Usage**  
August 31 - September 4, 1 972

**Athletes' Area**  
Atrium of racers' quarters,  
west . . . . . 73 sq. m.  
11 racers' quarters, ground  
floor, stadium-west, each  
approximately. . . . . 50 sq. m.  
28 racers' quarters, western  
auxiliary wing, each. . . . . 26 sq. m.  
1 workshop with work bench  
in each racer's quarters, wash  
basin and shower in each of  
the quarters  
1 common workshop . . . . . 64 sq. m.  
Health:  
1 health room, 1 doctor's  
office, 1 infirmary room,  
doping checkpoint, 1 toilet  
total . . . . . 46 sq. m.

Preparation area:  
Unroofed area for the vari-  
ous teams in the stadium  
infield, partitioned into  
stalls. . . . . 2,200 sq. m.  
Covered racers' area,  
western infield. . . . . 500 sq. m.  
with 14 motor stalls, each . . . . . 5 sq. m.  
(not for the Olympics, but rather for long  
distance races).

Access:  
Ride to the racers' courtyard by bus from  
the Olympic Village (this is also the drive-  
way for the fire department, police,  
sanitation vehicles, technical personnel).  
Corridors from the racers' quarters (where  
they are paged by loudspeakers) lead  
through a tunnel to the covered racers'  
area, to the team stand-by areas (unroofed  
infield) and to the track.

**Spectators' Area**  
During the Olympics:  
Total places. . . . . 4,157  
Seats. . . . . 3,051  
(Plastic individual seats)  
Standing room. . . . . 1,106  
Seats for guests of honor. . . . . 182  
Press seats with desks. . . . . 96  
Press places without desks. . . . . 190  
Commentators' places. . . . . 80  
All places are sheltered.  
The grandstands are separated from the  
track by a 90 cm. high breastwork.  
After the Olympics:  
Total spectators. . . . . 5,1 59  
Seats. . . . . 3,969  
Standing room. . . . . 1,1 90  
Refreshments for VIPs:  
The guests of honor used their own drive-  
way with entrance stairs (north) leading  
to a reception and refreshment room for  
seventy persons on the second floor, north  
side. From here there was a direct access  
to their places in the grandstand.  
Spectators' facilities:  
Toilets, kiosks, refreshment stands on the

distribution corridor levels: upstairs in the  
northern area, on the ground floor in the  
southern area.  
Hygiene station. . . . . 41 sq. m.  
Access for spectators:  
Northern approach via ramps to the distri-  
bution corridor level, then to the places.  
Southern grandstand, access via stairs.  
Ticket windows and ticket takers in the  
southeast of the cycling stadium - on the  
access paths.

**Communications**  
Press area:  
(Ground floor, north side of stadium)  
Office area, lounge and lunch  
room with bar. . . . . 245 sq. m.  
Interview room. . . . . 44 sq. m.  
Printing. . . . . 44 sq. m.  
Auxiliary rooms, cloakroom  
and rest rooms, press, mail,  
data display station, teletype,  
telephone room, total. . . . . 175 sq. m.  
Accounting rooms. . . . . 10 sq. m.  
Stadium, second floor (north):  
Hostesses. . . . . 18 sq. m.  
DOZ-subcenter. . . . . 44 sq. m.  
Post office transmission room. . . . . 45 sq. m.  
Transmission Facilities:  
Four camera stands - northern grandstand  
and stadium infield.  
1 mobile transmission unit, 2 mobile  
field units, 1 equipment truck, 2 stand-by  
vehicles.

**General and Competition Organization**  
Stadium, ground floor:  
Superintendent of sports  
facilities. . . . . 26 sq. m.  
Organizing Committee. . . . . 37 sq. m.  
Technical Supervision, OC . . . . . 20 sq. m.  
Referees  
1 referees' lounge  
1 jury deliberation room  
1 conference room, total . . . . . 147 sq. m.  
Direct access from the referees' area to the  
referees' places above the starting and finish  
line.  
Office of the Fédération  
Internationale Amateur de  
Cyclisme (FIAC) (Interna-  
tional Amateur Cycling  
Federation). . . . . 20 sq. m.  
Office of the German Cycling  
Federation (BDR). . . . . 20 sq. m.  
Stadium, upper floor:  
Track custodian. . . . . 13 sq. m.  
Fire department. . . . . 12 sq. m.  
Police. . . . . 21 sq. m.  
Timekeeping. . . . . 27 sq. m.  
Electronic data processing  
maintenance personnel  
(Equipment and tools). . . . . 37 sq. m.  
Security guards and ticket  
takers. . . . . 30 sq. m.  
Electrical and display  
board technique. . . . . 43 sq. m.  
Chauffeurs' room and adjoining  
rest rooms and auxiliary rooms . . . . . 57 sq. m.  
Grandstand, north:  
Direction booth. . . . . 15 sq. m.  
(Announcements, Scoreboard input, music  
transmission, lighting)

**Restaurant**  
Upper floor, north:  
Kitchen with storeroom and  
pantries. . . . . 140 sq. m.  
for the VIP cafeteria and spec-  
tators' restaurant (including  
personnel rooms)  
VIP cafeteria with service:  
approximately 70 people. . . . . 110 sq. m.

next to the kitchen and auxiliary  
rooms, connected to the VIP  
grandstand by a corridor.  
Spectators' refreshments (self-  
service). . . . . 110 sq. m.  
next to the kitchen and auxiliary  
rooms, separated from VIP area.  
In addition, 1 food kiosk. . . . . 10 sq. m.  
on the entrance level of the  
grandstands.  
Exterior, south:  
2 food stands for spectators,  
together. . . . . 108 sq. m.  
Ground floor, north:  
Press refreshments: A snack bar in the press  
lounge.  
Lunches for personnel:  
Central personnel restaurant, Olympic  
Stadium.

**Central University Sport Facility - ZHS -  
in Olympic Park including its outdoor  
facilities (volleyball hall excluded)**

Function during Olympic use

Buildings:  
**German Olympic Center (DOZ)**  
Radio and television arrangement for the  
Games of the XXth Olympiad in Munich  
Outdoor facilities:  
**Training fields for various sports**

Location:  
**8000 Munich 40**  
Connolly Strasse

Team director for the Olympic Construction  
Company, Ltd.:  
Buildings:  
**Architect HBK Klaus Jürgen Kluge,**  
**Munich**  
Outdoor facilities:  
**Dip).-Ing. Robert Strunz, Munich**

Project director for the Olympic  
Construction Company, Ltd.:  
Buildings:  
**Engineer Wilhelm Pankow, Munich**  
Outdoor facilities:  
**Garden and Landscape Architect**  
**Siegfried Lukowski, Munich**

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

Sport technical advisors:  
**Dr. Otto Vogt, Bavarian Sport**  
**Academy, Munich**  
**Richard Vorhammer, Bavarian**  
**Ministry of Education and Culture,**  
**Munich Heinrich Zech, University**  
**Institute for Physical Education,**  
**Munich**

Statics and Construction:  
**Prof. Leonhardt, Andrä and Boll,**  
**Stuttgart**

Building-director:  
**Engineering Consortium for Olympic**  
**Buildings, Munich**  
Engineering Office Rüping, Düsseldorf,  
Engineering Office Dr. Walter, Essen.

Traffic Planning:  
**Engineering Office Billinger and**  
**Associates, Stuttgart**

Landscaping:  
**Garden and Landscape Architects**  
**Miller and Luz, Stuttgart**

The German Olympic Center for Radio and  
Television (DOZ) together with the volley-  
ball hall forms the highrise section of the  
Central University Sports Facility (ZHS).  
The building complex is situated in the  
middle of the long eastern side of the ZHS  
outdoor sports facility. It is in an extension  
of the south tract of Olympic Village. The  
outdoor sports areas are closely bound with  
the building in their post-Olympic function.  
During the Olympic Games there was no  
functional connection between the radio  
and television facilities and the outdoor  
sports areas. The ZHS outdoor sports  
areas were used as training sites for a variety  
of sports during the Olympics. The buildings  
were so conceived that after the games,  
they would be able to fulfill their function  
as a university sports facility. Olympic use  
was made possible by temporary furnishings.

Characteristics of Design and Construction Highrises:

The individual buildings are clustered around a forum whose surface level is the same as the pedestrian embankments. A bridge connects the embankments with the forum level and approach level. This forum forms the visual center point of the entire complex by its position at the cross point of the north-south and east-west axes of the facility. All buildings were constructed with steel frameworks. "Cor-Ten-Steel" was utilized for all outdoor steel elements. The special property of this material lies in its developing a protective finish by corrosion during an interval of two years. This finish makes all further rust proofing measures superfluous. The dark brown color of the steel together with the white sandwich facing panels, is both a characteristic construction element and a decorative feature. The wall panels in the training, playing, and sports hall area are impact resistant. Another decorative feature is the symmetrical shed roof areas in the vicinity of the halls. The sheds were assembled from empty steel cases bound at a 60° slant. The approach level is paved with travertine. This establishes the visual relationship of the buildings among each other in connection with the recurring material and construction features. The interior rooms of the building all had temporary walls built of removable plaster walls on wood or steel supports. The construction of the walls was either fire retarding or resistant in accordance with fire building codes. The walls between studios and administrative rooms had to meet high technical sound requirements and thus were equipped with additional sound conditioning materials. All ceilings were built-in as high quality mineral fiber acoustical ceilings. Metal acoustical ceilings were used in the already existing areas. In some places textile floor coverings were used, in others PVC coverings. The studios were equipped with textile floor coverings.

Access

By car:  
The German Olympic Center, was served by the internal Olympic Park street pattern and connected with the press complex, the Olympic Village streets and the approaches to all other Olympic Park contest sites. The city streets were usually reached via the Middle Ring.  
Public Transportation:  
The rapid transit station was located about 500 meters to the west and the subway station was about 600 meters to the east. These were reached by the pedestrian paths.  
Parking places:  
Three hundred parking places were located in the immediate vicinity of the Central University Sports Facility. These were to be used by the technical stand-by personnel, interview guests, and the trucks containing broadcasting equipment.

Total Costs of the highrises excluding Incidentals

Total cost . . . . . 73 million DM  
Built before the Olympics . 47 million DM  
Remodeling of studios and technical facilities of the German Olympic Center (DOZ) pre-Olympic. . . . 14 million DM  
Removal of the DOZ facilities and the building measures needed for the permanent Central University Sport Center 12 million DM

Technical Data

(including the volleyball hall)  
Heating, ventilation, cooling:  
The DOZ (ZHS) buildings were connected to the hot water pipe system of the Munich-Freimann district heating plant.  
Connection capacity. . . . . 2.1 Gcal/h  
post-Olympic. . . . . 4.2 Gcal/h  
Space heaters were provided in the following buildings: athletics hall, volleyball hall, calisthenics hall, the small halls, the entrance hall and central building (auditorium and music rooms). Additional ventilators were installed in the shed areas of the small halls to service the studios. The total volume of circulated air comes to 481,000 cu. m./h. The buildings' ventilation was provided by six centers. Radiators were installed in the central locker rooms (house of studies) and in the passageways (corridors) around the inner courtyard.  
Cooling effect, Olympic. . . . 2.3 Gcal/h  
post-Olympic only. . . . . 370,000 kcal/h  
During Olympic use all radio and television studios (including the adjoining control rooms) were completely air conditioned and a temperature of +23°C. was maintained. The air conditioning for the technical rooms determined the correspondingly high cooling effect during Olympic use.  
High voltage:  
Installed transformer capacity. . . . . 6,845 kVA  
of this, temporary transformer capacity for kiosks, DOZ technical equipment, DOZ in general. . . . . 4,410 kVA  
Emergency generator for post-Olympic use. . . . . 80 kVA

Olympic Use

All essential rooms for television and radio were finished in March, 1971 and handed over directly to DOZ for the installation of technical equipment. The administrative rooms were completed in December, 1971 and afterwards handed over to their Olympic users. The volleyball hall area along with the remaining sport areas were handed over to the Organizing Committee in July, 1972. The actual Olympic use of the ZHS rooms began with the opening ceremony on August 26, 1972, and finished around the end of September, 1972.

Classification according to Function

Track and field athletics hall:  
Dimensions  
Volume. . . . . 26,700 cu. m.  
Area. . . . . 2,540 sq. m.  
General hall clearance height 9 m.  
Overhead room per floor . . 3 m.  
(Olympic division)

Olympic Use

The room which was conceived as a one-storied athletics hall, was divided into two levels by a temporary deck with a steel framework and prefabricated reinforced concrete slabs. The Olympic users had two floors at their disposal, each with three meters clearance. The height of the space inside the suspended ceiling was 1.5 meters. Room program for Olympic use: the following rooms are available, according to floor:  
32 radio announcer rooms, each 10 sq. m  
these were divided by a sound-proof glass partition.  
32 directors' rooms each . . . .19 sq. m.

The editorial staff rooms are divided by an approach corridor, but nevertheless connected to each director's room, each . 17 sq. m.  
2 supervisory rooms, each . . 17 sq. m.  
The following rooms are located on the lower story of the hall's eastern side (street level 507):  
DOZ-control room. . . . . 210 sq. m.  
Post office transmission room and adjoining room. . . . . 138 sq. m.  
On the upper story (forum level 5):  
2 technical measuring rooms, each. . . . . 40 sq. m.  
6 rooms for broadcast supervisors, each. . . . . 40 sq. m.

Post-Olympic Use

The hall will be used as an athletics hall without the dividing deck after the Olympics. The rooms on the eastern side of the hall will be rebuilt into one-story adjoining rooms, whereby the second level will remain as a gallery. The teachers' locker rooms, equipment storage rooms, conditioning rooms, storerooms and toilets will be housed in these areas. The hall will receive a solid plastic floor covering with an underlying cushioning layer. The entire thickness of the covering will be 20 mm.

The following sports will be provided: short distance running, broad jump, pole vault, shot put and discus throw (with net).

Triple, Playing and Sport Halls:  
Olympic Use  
The volleyball courts were created by joining both hall areas and sinking the contest areas. For a detailed description see "Volleyball Hall" building data, likewise the "Warm-up hall."

Forum area (Lower story):  
Dimensions  
Volume. . . . . 12,200 cu. m.  
Area. . . . . 2,700 sq. m.  
The headroom in the areas under the forum measure between 2.50 m. and 3 m.

Olympic Use

The rooms for DOZ technical equipment, sound, offices and house utilities were set up in this area. The areas between the volleyball hall, house of studies and central building were designated as the forum area. The rooms used during the Olympics were set up according to requirements with the light-weight partitions described above and had three meters head room. The height of the space above the suspended ceiling measured 1.50 m.  
Spatial program for Olympic use:  
Information service, mail rooms, customers areas and doctors' rooms were set up in 11 rooms with a total area of 490 sq. m.  
13 rooms with a total of. . . . 330 sq. m. were occupied by radio, sound mixing and directors' rooms of ARD (a West German broadcasting company).  
11 rooms were available for the technical transmission facilities of the post office department with a total of. . . . . 240 sq. m.  
Technical control service . . . . 35 sq. m.  
DOZ cafeteria. . . . . 400 sq. m.

Post-Olympic Use

The forum area will be used partially as a sport physicians' center within the ZHS. The ARD area will be occupied by music practice rooms and the post office transmission area will be a sauna.

The central building:  
Dimensions  
Volume including the courtyard above the auditorium . . . . 37,700 cu. m.  
Area. . . . . 2,200 sq. m.

Olympic Use

On four stories DOZ administration offices and information posts were located, and the schooling areas were in the auditorium.  
Level 512 (entrance floor at forum level):  
The entrance hall in front of the auditorium was used as a general information area. The corridor areas north of the auditorium contained DOZ accreditation windows. The rooms south of the auditorium were used as snack areas by DOZ and the broadcasting companies.  
The hall area east of the auditorium was available for general service agencies, for example, post office, banks, travel agencies, etc.  
Level 517 and Level 521:  
These were totally available to DOZ for administrative rooms and offices.  
A restaurant to meet special requirements (guests of radio and television companies) was set up for 100 persons.

Post-Olympic Use

Lower story: utilities, waste removal and storagespace.  
Entrance hall, at the forum level as a lobby with doorman/desk clerk, hat check, snack bar and windows for student management.  
Both upper stories are for the use of the Central University Sports Facility Administration.  
The auditorium will be used as a large lecture hall. The seating arrangement as well as all other necessary technical facilities for lectures had already been installed before the Games. Other smaller lecture halls and the library will be located in both upper stories.

Central locker rooms (House of Studies):  
Dimensions  
Volume (three stories) including two courtyards. . . . . 24,700 cu. m.  
Area. . . . . 1,900 sq. m.

Olympic Use

Editorial offices were located in the two upper stories (over the forum level) and film processing laboratories and cutting rooms were set up in the lower story. The ZHS centralized locker area was divided into thirty rooms for Olympic use and the entire area together with sanitary facilities was available as film cutting rooms. The western part was remodeled as a central film processing laboratory. Two automatic film processing machines were installed in the main work room. Each machine had a base measuring 1 m. x 8 m. Wooden platforms 0.5 m. high were built to service the machines. The adjoining rooms on the west side were used to prepare the developing solutions. These areas were developed as wet rooms.  
House of Studies:  
All rooms in the house of studies were already set up for their permanent function before the Olympic Games. Thus no drastic remodeling was necessary in these areas after the Olympics. A total of 61 editorial rooms each with 20 sq. m. of floor space were available on both floors. A kitchenette and a lounge measuring 150 sq. m. were set up near the editorial rooms.



Post-Olympic Use

The entire Olympic installation except for the toilets was removed from the area under the forum level. Shower rooms were installed on the long northern side and changing rooms with lockers were built along the long southern side. The film processing room was converted into a central general changing room.

Post-Olympic use of the area over the forum level (House of Studies): Both stories will be used as study quarters. A total of 21 rooms on the first story and 29 rooms on the second story each with an area of some 20 sq. m. are available. In addition there are four kitchenettes and a lounge (as during Olympic Use) measuring some 150 sq. m. Four apartments for personnel will also be furnished.

Calisthenics Hall:  
**Dimensions**  
Volume. . . . . 14,800 cu. m.  
Area . . . . . 2,300 cu. m.  
Clearance . . . . . 5.60 m.

**Olympic Use**  
The main DOZ center, the world-wide supervision for radio and television, the post office department transmission room and the magnetic record center (MAZ) were located in this one storied hall. The calisthenics hall and all adjoining areas were divided by room-high light removable partitions into various areas for Olympic Use. Spatial programming for Olympic use: Television center, that is, center for all TV broadcasts during the Olympic Games. . . . . 240 sq. m.  
Post office center, Transmission room of the post office department for sound and picture. . . . . 160 sq. m.  
Director for world TV with adjoining rooms total . . . . 200 sq. m.  
Center for magnetic recording . . . 400 sq. m.  
3 adjoining rooms, each . . . . 25 sq. m.  
Archives. . . . . 26 sq. m.  
Store room. . . . . 18 sq. m.

**Post-Olympic Use**  
An area measuring 28 m. x 28 m. (784 sq. m.) will be set up as a gymnastics room with adjustable floor, mirrored walls and ELA facility. The partitions for Olympic use will be removed. The adjoining rooms will then be divided and changed into music and practice rooms.

Small sport halls:  
**Dimensions**  
Volume. . . . . 23,000 cu. m.  
Area . . . . . 4,200 sq. m.  
Clearance . . . . . 6 m.

**Olympic Use**  
The television studios with the necessary directors' rooms and areas for the offcamera announcers were located in the one-story halls. All studio areas were divided by light-weight acoustical partitions. The adjoining rooms which were formed by these acoustical walls and ceilings had 3 m. head space. Spatial programming for Olympic use: Live broadcasts and sport reports were produced in eight TV studio areas measuring between 100 sq. m. and 200 sq. m. These studios were used by broadcasting companies of all nations. The rooms were 8 m. high and the walls and ceilings were

built of high quality acoustical materials to meet the acoustical requirements of TV studios. A weight bearing ceiling grid system supported the necessary equipment required for the special lighting. The floors were covered with PVC covering. The recording background consisted of screens and additional acoustical material. Every studio had a directors' room a magnetic recording room and a small studio. The entire area was a technical room measuring. . . . . 140 sq. m.  
4 film blending studios, each . . . 60 sq. m. each consisting of a film blending room and a director's room.  
61 TV commentators' booths, each . . . . . 4 sq. m. (off-tubespeakers)  
The announcers' cubicles were adjoining the technical and director's rooms. The entire area enclosed. . . . . 540 sq. m.

**Post-Olympic Use**  
The entire area will be divided into six small gymnasiums each measuring 14 m. x 28 m. . . . . 392 sq. m. with an overhead clearance of 6 m. These gymnasiums will be used as work-out rooms for the following sports: Boxing, wrestling, judo, fencing, table tennis and gymnastics. Conditioning, teachers', equipment and storage rooms are adjoining.

Building of the American Broadcasting Corporation "ABC":  
**Dimensions**  
Volume. . . . . 5,000 cu. m.  
Area . . . . . 1,100 sq. m.  
Overhead clearance. . . . . 3,00 m.

**Olympic Use**  
Matching the rest of the installation, a temporary building with a steel framework was built for ABC in addition to the ZHS buildings. The interior rooms were created by removable light partitions reaching the ceiling (3 m. overhead), which was suspended. The windowless building was artificially lighted and ventilated. Room program:  
Graphics and studio. . . . . 110 sq. m.  
Conference room. . . . . 36 sq. m.  
12 offices, each between . . . . . 35 sq. m. and 17 sq. m.  
Teletype room. . . . . 10 sq. m.  
Telephone room. . . . . 10 sq. m.  
Film cutting room. . . . . 72 sq. m.  
2 lounges, each . . . . . 45 sq. m.  
Kitchen. . . . . 50 sq. m.  
Store room. . . . . 190 sq. m.

**Characteristics of Design and Construction (Outdoor facilities)**  
The outdoor sport areas are clustered around the north, west and south sides of the DOZ or ZHS buildings, respectively. These facilities are located on the northern part of the Olympic grounds which was unified and built up with ten meters of hill in some places. All playing fields are arranged in a north-south direction. There are differences of elevation of up to three meters among them. The individual playing fields are separated from each other by strictly geometrically modeled embankments with a trapeze profile which run parallel to the boundary lines of the playing fields. A richly structured and distinctive open air sport facility was created by terracing and dividing earth embankments. The sculpturing of the landscape was intensified

by the plantings. Mounds of earth, slopes and strips between the fields are planted with both large and small crowned trees intermixed, in groups, on a grid or in rows. The plantings and landscape modeling provide not only a certain amount of noise control among the fields during simultaneous use, but also shade and shield the spectator area on the sloping area from the wind. Linden trees of various sorts were planted as the dominant trees on the embankments. Small crowned trees such as the ball maple (Acer glubosum) and ball acacia (Robinia inermis) line the paths. Sitting areas are marked by clusters of chestnut trees. Structure of the sports areas:

Lawns  
The overall makeup of the intensively used grassy playing fields are as follows: leveling layer approximately 15 cm. thick made of gravel and sand 0/30, (8 cm. thick) drainage and filtering level made of foam lava grit-texture 0/15, the actual lawn bearing level of very lean soil and finally a sand and peat covering layer with a total thickness of 12 cm. Most lawns were built with an overall slant of 1 %. Only the four adjoining fields and the throwing contest fields did not have a slight slope. Surfaced areas  
The surfaced playing areas were constructed and maintained according to the recommendations of the "Institute for Sports Site Construction" in Cologne. In general, highly water-permeable materials were avoided to the advantage of the stability of the surfacing.

Sites with plastic coverings  
The synthetic covering "Rekortan", the plastic combination covering "Everplay-Elastopor" (water-permeable) and "Akus Elastik" were used over a bitumen base.

Watering and drainage facilities:  
Automatic built-in sprinkler systems with hydraulic-electric control programs were used for the lawns. The surfaced areas were also equipped with sprinkler systems to moisten the covering. The synthetic and the combination plastic surfaces were drained by gutters. All grass and surfaced playing areas were equipped with drains that had a 1 % slope. The excess rain water was drained into cisterns.

**Individual Functional Area Summary**  
Athletics-contest facility  
Athletics-pentathlon and decathlon  
Athletics-practice facility  
Circuit-facility  
4 volleyball courts  
3 small playing fields  
Field for throwing contests  
All-weather large playing field (multi-purpose division)  
4 large grass playing fields  
5 handball fields  
4 large playing fields (surfaced)  
2 hockey fields  
5 basketball courts  
with a throwing practice area.

**Descriptions of the Individual Facilities**  
Athletics contest sites:  
Inclined curved track type B with 6/400 m. and seven short straight tracks, broad and triple jump area, pole vault site, two high jump sites, two discus throw sites, two shot put sites, one javelin throw site, water hazard for the steeplechase and a grassy

playing field. The tracks and segment areas have a "Rekortan" (synthetic) surface. This competition site is located on the eastern side of the unroofed standing room gallery (concrete steps) with 3,000 places as well as on the western side of a roofed gallery section with approximately 250 seats. A double-headed broad-jump and triple jump area is located between the roofed gallery and the 100 meter track.

Athletic pentathlon and decathlon facilities:  
The pentathlon and decathlon area has a running area measuring 50 m. x 45 m. The surface is composed of a 13 mm. "Rekortan" covering on a bitumen base. The following sites for various sports are available: five pole vaulting sites, ten long jump sites, six high jump sites, one shot put site with five putting circles and an impact area measuring 20 m. x 45 m.

Athletics-practice facility Type C:  
Facilities for various sports are available: high jump, two sites; discus throw, two sites; long jump, three approaches, one sand pit; pole vaulting, one site; shot put, 1 site with five starting circles; javelin throw, one track; one grassed field. The athletic areas are surfaced. Circuit-facility:  
The circuit-facility has an area of 1,250 sq. m. The following equipment is provided: one ball throwing wall 3 m. high; two parallel bars; three wall bars; three horizontal bars at various heights; three dumb bell stands; one climbing framework with ropes; one climbing tower with poles; one slalom pole field; one sand running area 20 m. x 5 m.

Volleyball courts:  
Are each 13 m. x 24 m. The courts are divided by 3-m. wide criss-crossing paths. The courts are surfaced with "Everplay-Elastapor" (water permeable) coating. A slight incline of 0.6% and drainage gutters were installed insuring a good playing surface.

Smaller playing fields:  
Northwest of the volleyball courts are three small playing fields for small field handball, that are also surfaced with "Everplay-Elastapor" coatings. Each measures 22 m. x 44 m.

Fields for throwing events:  
The throwing field has a grassy area of 13,000 sq. m. and has the following facilities: one javelin throwing track 36.50 m. x 4 m.; a javelin throw site 40 m. x 30 m. for group training. Both sites are surfaced. There are also two hammer throw sites and four discus throw sites. Along the outer periphery of the throwing field there is a sweat-drop track 1.50 m. wide, 600 m. long with five clusters of equipment.

All-weather playing field:  
The playing field measures 109 m. x 70 m. and is covered with a synthetic combination "Akus-Elastik" surface. There is a slight incline of 1 % and the surface is water permeable. Field markings are provided for the following sports: soccer, field handball, volleyball, and basketball.

Large grassy playing fields:  
The grassed playing areas measure 70 m. x 109 m. and have no incline. Portable goals are provided for field games. Faustballfields:  
There are three faustball fields measuring 66 m. x 32 m.

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".

**Volleyball Hall, Olympic Park**

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. (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 installed 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, executed 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 individual 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 temporarily 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 extension 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 competition 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 (practice 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 entrance 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.



**Spectators' Area**

Total spectator places.	3,680
VIP seats.	392
Press places with desks.	36
Press seats without desks.	64
Commentators' places.	40
Athletes' seats.	228

Refreshments for VIPs:  
A refreshment bar (52 sq. m.) for guests of honor was installed on the east side of the hall on the level of the driveway.  
This was accessible from the VIP drive-way and from the access level of the central grandstand.

Refreshments for spectators:  
A refreshment stand in the main entrance area of the atrium catered to the refreshment needs of the spectators.

Toilet facilities:  
In the entrance area, at both the northern and southern ends of the atrium, there were rest rooms and check rooms for the spectators.

First aid:  
Medical personnel within the volleyball hall were available for first aid treatment of spectators. The doctor's room on the street level was used for treatment.

Access for spectators:  
The approach to the spectator facilities was from the forum via the main access level of the entire complex. From the atrium the spectators came up temporary double stairways to the access corridor of the grandstands, and from there to their places in the northern and southern grandstands.

**Communications Area**

The temporary communications rooms were situated under the southern grandstands:  
DOZ-subcenter with 3 rooms, each. . . . . 32 sq. m.  
4 interview rooms, each. . . . . 50 sq. m.  
Post office branch. . . . . 67 sq. m.  
Postal telephone room. . . . . 33 sq. m.  
2 postal auxiliary rooms, each . . . 33 sq. m.  
1 press cafeteria . . . . . 52 sq. m.  
Printing room. . . . . 56 sq. m.  
The sanitary facilities for these rooms were located in the southeastern corner of the building.

Transmission installations:  
3 DOZ television cameras, 2 DOZ movie cameras. A total of 151 sq. m. parking area was required for 4 technical vehicles.

**Contest and General Administration**

Superintendence of the hall and area direction Sports. . . . . 49 sq. m.  
Conference room. . . . . 60 sq. m.  
International and national associations Fédération Internationale de Volley-Bail (FIVB). . . . . 30 sq. m.  
German Volleyball Assoc. (DVV). . . . . 26 sq. m.  
Office room for the special sports associations. . . . . 26 sq. m.  
3 rooms for the security guards, each. . . . . 34 sq. m.  
Hostesses' lounge. . . . . 32 sq. m.  
5 rooms for short-term personnel, police (2 rooms), general services (ticket takers), fire department, and technical direction, 1 room each with . . . 20 sq. m.  
Cleaning personnel. . . . . 30 sq. m.  
For the individual areas there were toilets and washroom or shower facilities available.

**Restaurant**

VIP-bar. . . . . 52 sq. m.  
(Snacks and drinks)  
Pressbar. . . . . 52 sq. m.  
(Snacks and drinks)  
One kiosk in the atrium was available to supply the spectators with drinks and refreshments as well as with other small articles.

**Hockey Facility, Olympic Park**

Type of Sport:  
**Hockey**

Location:  
**8000 Munich 40**  
The grounds are north of the Central University Sports Facility

Team director for the Olympic Construction Company Ltd.:  
for the highrise buildings:  
**Architect HBK Klaus-Jürgen Kluge, Munich**  
for the outdoor facilities:  
**Dipl.-Ing. Robert Strunz, Munich**

Project director for the Olympic Construction Company Ltd.:  
for the highrise buildings:  
**Building Engineer Wilhelm Pankow, Munich**  
for the outdoor facilities:  
**Garden and Landscape Architect Siegfried Lukowski, Munich**

Concept, Design and Building Supervisors for the highrise buildings:  
**Architects Schraud and Karg, Munich**

Concept and Design for the outdoor facilities:  
**Garden and Landscape Architects Miller and Luz, Stuttgart**

Building supervisor:  
**State Capital City of Munich,**  
Building advisor, Municipal Garden Bureau

**Characteristics of Design and Construction**

The hockey field is situated to the northwest of Olympic Park. It is bounded on the west by Landshuter Allee and on the north by Moosacher Strasse. The complete layout approximates a rectangle which is bounded in all four directions by earth embankments opposite the Olympic Village to the east, the open areas to the south, and the two streets mentioned above to the west and north.

Playing fields:  
The six grass playing fields are set up as follows: Contest field 1 (final play site) was connected to the temporary grandstand (highrise) on the eastern side of the field. The remaining three sides received temporary collapsible bleachers. Playing field No. 2 adjoined the eastern side of the grandstand. North of this were fields No. 3, No. 4, No. 5, and No. 6 which were provided with portable bleachers. These four fields were used in rotation to save the grass. East of field No. 2 was a training area.

Buildings:  
The sloping areas of the grandstand which were arranged to resemble a gabled roof formed the dominating feature of the hockey facility. One area with six seating sections was set to face main field No. 1 in the west and one area faced field No. 2 to the east. The supporting construction in the three diagonally placed grandstands as well as the roof was built of visible collapsible steel pipe framework. Traffic areas, railings, sloping areas, and seats were mostly built of planed wooden planks. The roof was constructed of translucent PVC sheets. All necessary facilities for the hockey fields were located under the sloping areas of the grandstands. The partitions were formed by removable fire proof wall elements. Concession stands, toilets and ticket offices

were built into the grandstands. The middle connecting level of the grandstand provided the link between the entrances and the various stands.

**Dimensions of the Facilities**

Complete area of the grounds. . . . . 95,000 sq. m.  
Playing areas:  
6 contest fields  
61 m. x 101.40m. . . . . 37,112 sq. m.  
1 training field  
61 m. x 101.40m. . . . . 6,185sq. m.  
Buildings:  
Built — over area — total . . . . 13,014 sq. m.  
(grandstands, concession stands, toilets, ticket booths, bridge buildings)  
Enclosed space  
Grandstand . . . . . 64,594 cu. m.  
Adjacent stands. . . . . 4,850 cu. m.  
Concession stands. . . . . .830 cu. m.

**Access**

By car:  
The hockey grounds were connected by the Kusoczinski-Damm to the Press Center. There is also an eastern approach to Moosacher Strasse by connecting streets between Strassberger Strasse and entrance to the hockey grounds at level 0.00 m. (level of the playing fields).  
Public transit:  
The rapid transit system station could be reached by a pedestrian path from Werner Seelenbinder Weg and the Kusoczinski-Damm.

**Total Cost excluding Incidentals**

Outdoor facilities including playing fields. . . . . 1.0 million DM  
Buildings. . . . . 3.4 million DM

**Utilities**

High voltage installation:  
Installed transformers . . . . . 630 kVA  
Heating requirements were covered by temporarily installed electric space heaters and infrared radiators.  
Ventilation:  
Exhaust ventilating ducts were installed in the various hygiene areas only.

**Technical Sport Facilities**

Scoreboard:  
At the main entrance to the hockey grounds a manually operated magnetic Scoreboard (2.00 m. wide x 4.00 m. high) was installed. A review of the day's games could also be displayed on this board. The following information was displayed: the starting numbers and names of the players, nationality, playing field, referee, playing time, and scores. Fields No. 1 and No. 2 had additional manually operated magnetic 1.50 m. x 2.00 m. scoreboards to display the scores.

**Contest Area**

The main playing field (for the finals) field No. 1, as well as five additional playing fields were all grass lawns measuring 91.40 m. x 55 m. There were 2 m. wide safety margins along the sides, and 4 m. wide ones at both ends. The playing surface was equipped with (hip-roof) slopes. The grade both in building and rough plan was 1 %. The contest sites were constructed from the bottom up as follows:  
15 cm. sand and gravel mixture 0/30 was laid as an equalizing and filtering layer.

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. . . . . 73,000sq. 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 1 8.80 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.  
1 2 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 (IJF) . . . . . 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.

Access:

General:  
During the Olympic Games the entire Olympic Village was closed to the public. Contact with the outside world was confined to the so-called "contact area" near the southern main entrance 1. Several buildings, for example, the administration building G1 and the hotel G3, were located in a semi-public or public area. Otherwise admission was allowed only to persons whose presence was required by administrative demands.

By car:  
Traffic was conducted mainly from Lerchenauer Strasse (eastern tangent) through main entrance 1 (southern) and main entrance 2 (northern). From street level, it went under the pedestrian level to the internal street level. A ring street connects both main entrances under the Helene Mayer Ring. From this circle of streets, other streets lead to the appropriate parking areas under the three housing tracts or U-turn loops. The feeder streets have traffic signals. There are accesses to the pedestrian level from all important points on the vehicular level. There are standing lanes for buses and taxis next to the regular lanes. A branching emergency traffic system which partially includes paved walkways is installed for fire engines and ambulances.

Public transit:  
A station of the Munich subway system is located next to the villagers' main entrance 1. The rapid transit station is located about 1,000 meters from the village center. Both systems connect the village center with the city center in about fifteen minutes. Bus lines were furnished for Olympic participants from the village to all contest sites.

Pedestrians:  
The pedestrian area of the village begins at the ramp of main entrance 1 on Lerchenauer Strasse. Other paths from outside lead to the check point before the contact zone and from there to the village center. All pedestrian paths cross at the village center.

Parking lots:  
About 3,000 parking spots were available in free areas and under the pedestrian mall. Nevertheless, the automobile parking spaces were only used by persons carrying special permits during the Olympic Games. Eventually they will be at the disposal of the Olympic Village residents.

Dimensions of the total Project

Total area of the Olympic Village. . . . .	394,206 sq. m.
Built-over area. . . . .	210,000sq. m.
Total volume of the Village. . . . .	3.2 million cu. m.
Center. . . . .	312,000 cu. m.
Administration building G1. . . . .	58,000 cu. m.
Short term personnel G2. . . . .	83,000 cu. m.
Hotel-highrise G3. . . . .	78,000cu. m.
Medical center G4 . . . . .	80,000 cu. m.
Contact zone with shopping center. . . . .	13,000cu. m.
Church center. . . . .	20,000cu. m.
Amusement center. . . . .	30,000cu. m.
Food service center. . . . .	20,000cu. m.

Volume of Men's Olympic Village. . . . .	2,643,000 cu. m.
Volume of Women's Olympic Village. . . . .	240,000 cu. m.

Cost

The ODMG stated that the construction cost including purchasing the site and all other incidentals was 500 million DM.

Utilities

Heating:  
Together with the Oberwiesenfeld sport areas, the Olympic Village was supplied with heat by the Munich-Freimann central heating plant which had a separate sub-station on the Olympic Village grounds. The total heating capacity is about 38 Gcal/h.

High voltage:  
Twenty two transformers with a total capacity of approximately 15,000 KVA provide the Olympic Village with electricalenergy.

Refuseremoval:  
The entire Village is provided with a pneumatic refuse removal system. There are rubbish chutes on each floor to remove waste materials. These chutes are connected to an underground collecting network, which forces it under pressure to the center. Here the refuse is compressed and removed by the Munich DPW in sealedcontainers.

Olympic Use

The Olympic Committee rented the Olympic Village from the ODMG after February 1, 1972 for Olympic furnishing. The opening and occupation of the Village followed on August 1, 1972. The last of the Olympic participants moved out between September 10 and 19, 1972. Afterwards the Olympic furnishings were removed. The Olympic renting period ended October 31, 1972.

Description

G 1, the Administrative Building on Helene Mayer Ring 4

Location and construction:  
The highrise G 1 is located immediately north of the main entrance to the Village next to the subway station. It is vertically dominant and a landmark designating the main entrance. The building is constructed of prefabricated concrete and white facing cement concrete. It extends sixteen stories above the pedestrian level.

Olympic function:  
The following functions were located in G 1 : The Olympic Village mayor's office with the complete village administration, registration, reception of participants, functionaries and VIPs; the organization center for food and shelter service, security guards (police), accreditation, the press, and the paging service broadcasting center in a penthouse on the roof.

Post-Olympic use:  
The entire building will be rented out as offices.

Utilities:  
All usable areas are air-conditioned.

G 2, Highrise for Short-Term Personnel on Helene Mayer Ring 10

Location and construction:  
G 2 is the southernmost part of the north-to-south highrise tract running parallel to Lerchenauer Strasse. It screens the open area of the center from the street area. The structure is made of steel reinforced gravel concrete (transverse wall system) and has a white prefabricated concrete facade attached. It extends 22 stories above the pedestrian level.

Olympic function:  
All rooms in G 2 were used to house the short-term personnel. The printing plant for the Olympic Village newspaper was located in the cellar.

Post-Olympic function:  
G 2 was planned and constructed in terms of apartment units. These units will be sold as condominiums.

Utilities:  
The building is heated by elements buried in the floor. All kitchens, bathrooms and toilets that are situated in the interior of the building are completely ventilated. Living rooms and bedrooms which are on the outer walls are mechanically ventilated.

G 3 Hotel Highrise at Helene Mayer Ring 12

Location and construction:  
G 3 forms the middle section of the north-south highrise (see G 2). It was located in the public part of the Village, that is, it was open to outside visitors. It was built of conventional steel and concrete (transverse wall system). It extends seventeen stories over the pedestrian level.

Olympic function:  
The lower stories were occupied by guests of the OC. It was the Olympic Village Hotel above the 14th floor and was available to guests of the OC during the Games.

Post-Olympic function:  
After the Games, the hotel will continue to operate as such. The lower stories will be sold as condominiums except for the ground floor which contains stores.

Utilities:  
See G 2 for heating and ventilation.

G 4, Medical Center at Helene Mayer Ring 14

Location and construction:  
G 4 is in the northernmost part of the highrise row on Lerchenauer Strasse. It was in the closed-off area of the Village during the Games. It has the same construction and number of stories as G 2.

Olympic function:  
Except for four floors the entire building was occupied by Olympic participants. These four stories housed the Olympic medical center which had the following facilities: central doping control, specialists for internal medicine, surgery, orthopedics, anesthesia, urology, dentistry, laboratory, X-ray section and a thirty bed infirmary. A whirlpool bath and sauna, gymnastics room, hydrotherapy and electrophysical therapy with underwater massage were installed in the lower story.

Post-Olympic use:  
The furnishings mentioned above will remain in their present condition after the Games and will be operated as a private medical center.

Utilites:  
The technical installations correspond to those in G 2.

Contact Zone and Shopping Center

Location and construction:  
The contact zone is located between G 1 and G 3 in the vicinity of main entrance 1, partially outside of the closed area. The shopping center extends from in front of the forum in a right angle to the north along Helene Mayer Ring. The contact zone and shopping center are situated on the pedestrian level. The row of shops is partially contained in highrises G 1 and G 4. Both structures are one story and are constructed of prefabricated steel concrete components and white facing cement on on multiple layered wall elements.

Olympic function:  
The contact zone includes the Rendezvous Cafe, interview rooms and a milk bar. The shopping center included the following shops and services: information center, finance company, customs house, service installations,hairstressers,barbers, laundry, dry cleaning, self-service stores, delicatessens, pharmacies, and souvenir shops.

Post-Olympic function:  
The Rendezvous Cafe was remodeled into a finance company and some areas of the shopping center underwent change of function. All in all, however, the shopping center has kept its various businesses open to fulfill the needs of the new occupants of the Olympic Village.

Utilities:  
The technical facilities are the same as those of G 2; only the heating utilizes radiators.

Church Center on Helene Mayer Ring

Location and construction:  
The church center is located on an extension of the shop street to the north. The one-story tract is connected with the churches at the pedestrian level. The lower level areas open to the west on a courtyard with daylight. The structure was conventionally constructed of steel and concrete in the lower level. The roof which extends over the worship areas is constructed of steel pipe framework.

Olympic function:  
The one-story worship areas for different creeds were at the pedestrian level. Necessary adjoining rooms, community rooms and a library are located on the lower level in the open space that faces the green courtyard.

Post-Olympic function:  
This area will remain as ecclesiastical community center after the Games. The worship areas will serve the Evangelical and Catholic residents.

Utilities:  
See the contact area and shopping center.

Amusement Center on Nadi Strasse

Location and construction:  
The amusement center was located at the middle point of the center at the end of the middle tract west of the shopping center. The strongly accented two-story structure was constructed of conventional concrete and steel frame.

Olympic function:  
The amusement center had two areas: a quiet zone with reading rooms, the library, the record library, and the Bavaria Club; and the lively zone with a theater for cultural programs and shows, the Village Cinema, rooms and free spaces for sports and games, coinoperated games and television sets as well as the main post office.



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 facadeelements.

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 Hugle, 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.



**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.

**Weightlifters' Hall, Fairgrounds**

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".

Types of Sport:  
**Wrestling and Judo**

**Characteristics of Design and Construction**

The almost perfectly square wrestling-judo hall with its visible exterior steel skeleton is covered over by an external framework of threaded steel pipes which require no other support. The structure and surface of the roof are suspended under this framework. Stairwells with elevator shafts are constructed as external additions out of concrete. The high one-story auditorium will be remodelled into a two-story exposition hall after the Olympics by the construction of another floor inside the present hall. Later, the interior of the exposition hall will be illuminated by a horizontal strip of windows and approximately 100 skylights in the roof. For the Olympics the windows and skylights were all darkened by covers. The facade is constructed of multi-layer aluminum panels. The floor of hard poured asphalt was covered with sisal carpets.

**Dimensions of the Facility**

Interior space. . . . . 17,000 cu. m.  
Area covered. . . . . 5,800 sq. m.  
Area of platform. . . . . 800 sq. m.  
(Four mats for wrestling competitions)

**Access**

By car:  
From the Olympic Park the fairgrounds on Ganghofer Strasse could be reached via the Middle Ring.  
Public transit:  
Streetcar stop at the corner of Ganghofer and Heimeran Strasse, visitors' entrance to the fair-grounds on Ganghofer Strasse.  
Parking lots:  
The fairgrounds parking lots outside of the fairgrounds proper were available to visitors.

**Utilities**

Heating:  
There is a hot water boiler with a capacity of 700,000 kcal/h installed in the basement. This supplies heat for the ventilation facilities as well as hot water. In addition, radiators for the locker rooms and shower rooms are connected to the heating system.  
Ventilation of the competition hall:  
The competition hall was supplied with 240,000 cu. m./h of fresh air, a fresh air ventilation rate of 40 cu. m./h per person. The exhaust air was withdrawn through gratings in the steps of the grandstands (60%) and through those in the ceiling (40%). For this purpose there were four exhaust ventilators on the basement floor. At the central air intake facility there were four gas-fired warm air heaters, each with a heating capacity of 400,000 kcal/h. To cool the air there were heat exchangers available with a total cooling capacity of 256,000 kcal/h. They utilized city water, with a consumption of around 60 cu. m./h. This equipment held the temperature around the wrestling mats between 24°C and 26°C. In the audience area a maximum temperature of 29°C could be measured in a few places under unfavorable conditions; normally it was 25°—26°C in the auditorium.

Ventilation of offices and areas for the participants:

These areas were equipped with their own intake and exhaust facilities. They also worked exclusively on a fresh air system.  
Plumbing:  
Because of its later use, the hall was equipped from the beginning with a sprinkler system. The organization offices and the rooms for the participants were beneath and behind the grandstands and were not included in this system. There were supplementary hand fire extinguishers and fire hoses at all stairways, near the exits. Equipment to step up the pressure (located on the basement floor) guaranteed the water supply for the fire hoses.  
Besides the permanently built-in locker and shower rooms, prefabricated cubicles were installed in the areas for the participants and for the spectators. Temporary connections were made to the watering and sewage system which was planned for the building's later use as an exposition center.  
High voltage installations:  
The wrestling hall is supplied with electricity by its own transformer substation (three transformers with 800 kVA). The emergency electrical system to supply the essential needs has an output of 400 kVA. The high voltage switching installation has fourteen circuits, the main lower voltage distribution center contains thirty-seven circuits. The special lighting installation for color television was constructed of eighty-three floodlights, each of which was rated at 2,000 watts, and could be switched to several different intensities. Measured in the reference axis of the television cameras, the median horizontal illumination was 3,000 lux and the median vertical illumination was 1,600 lux.  
Low voltage installations:  
The auditorium was served by an 1,800 watt PA system with fourteen speaker clusters. The telephone installations of the fairgrounds used during the Olympics were increased to include forty direct connections to the telephone exchange in the Olympic Park and four hundred extensions. Additional communications installations included a fire alarm system with ten circuits, the two-way intercom with sixteen units, and the clock system with fifteen synchronized clocks. An industrial television monitoring system with four cameras and four monitors was installed, as well as a common antenna system with twenty connections. From a central switchboard (which also indicated any failures) all the lighting could be turned on or off.  
**Technical Equipment for Wrestling**  
Scoreboard:  
Execution in "light chamber technique", length6.50 m., width 4.20 m., depth 0.60 m. The following information was displayed for all four mats (in the case of final matches, for both of the two mats used): type of competition, start number, name of the participant, countries, result of the competitions, and a complete summary. Above each mat a three-sided scoreboard was suspended displaying the following: points, duration of the match, rounds. The display was controlled from the referee's table. It was possible to transmit a monitor picture of the scoreboard to the referee's table by television. An acoustic signal was sounded at the beginning and end of every round.

**Technical Equipment for Judo**

Scoreboard:  
An electronic display board in "light chamber technique" was set up next to each mat. They were 1.20 m. long and 0.80 m. high. The following information was displayed: duration of the match (acoustic signal when time expired), points, length of pauses. Controls were handled by the timekeeper at the referee's table. The results were displayed as in wrestling.

**Competition Area**

Platform for wrestling and judo:  
Total area 58 m. x 16 m. or 928 sq. m. Useful platform space 56 m. x 14 m. or 784 sq. m. The platform, which could be dismantled, consisted of painted plywood sheets on a frame of steel tubing. The cross-section of the platform was quadrilateral. The four competition surfaces consisted of four wrestling mats with a diameter of 9.00 meters. The platform was 0.95 meters high and had five sets of steps leading to it. The competition area was approximately 22 m. x 64.5 m. (1420 sq. m.). The four referees' tables (between the grandstand for the VIPs and the platform) were assigned to the four wrestling mats.  
Warm-up:  
There were two rooms with warm-up mats, each about 150 sq. m. Training took place in Hall 18 forjudo and in Hall 19 for wrestling.

**Olympic Usage**

August 27 - August 31, 1972 - Wrestling.  
September 5 - September 10, 1972 - Wrestling.  
September 1 - September 4, 1972 - Judo.

**Participants' Area**

Ground floor, east:  
nineteen dressing rooms, each approximately. . . . . 20 sq. m.  
Two lounges, each approximately. . . . . 20 sq. m.  
Two bathrooms, each with three prefabricated stalls (vestibule, nine toilets and urinals)  
Doctors' area:  
Waiting room. . . . . 25 sq. m.  
Doctor and doping control. . . . 25 sq. m.  
Room for resting. . . . . 25 sq. m.  
Bathroom (sink, toilet, shower)  
Basement:  
19 massage rooms, each. . . . . 19 sq. m.  
4 rest rooms, each with vestibule and five stalls  
1 massage and dressing room . . 25 sq. m.  
1 weighing room . . . . . 16 sq. m.  
Passageways for athletes:  
The entrance for athletes is at the southeastern corner of the auditorium and leads to the adjoining quarters for the contestants-locker rooms, bathrooms, doctors' station and warm-up mats for immediate preparation for the events. From there a corridor leads under the grandstands to the place of competition. The massage rooms and the weighing-in room in the basement are accessible from the ground floor via a stairway within the athletes' quarters. From here those places in the auditorium which are reserved for participants may be reached.  
**Spectator Area**  
Total spectator capacity. . . . . 5,750  
Division of the spectators' seats:  
VIPs. . . . . 172  
Press area with desks . . . . . 100

Seats for the press. . . . . 120  
Places for commentators. . . . . 20  
Places for participants in front of the competition area. . . . . 184  
VIP area:  
Arrival for VIPs was possible by car to a special entrance in the northwestern corner of the building, from where they had access to the  
VIP lounge. . . . . 25 sq. m.  
and to the places reserved for guests. The restaurant for VIPs was in building No. 7, centrally located for the entire fairgrounds.  
Refreshments:  
Two concession stands were set up on the level of the entrances to provide refreshments for spectators. Additional kiosks were in the tents in front of the wrestling hall.  
Sanitation:  
There are toilets in the stairwells on the upper level that opens to the grandstands. Prefabricated toilets were set up temporarily on the entrance level.  
Spectator movement:  
Two temporary open stairways on the southern side of the auditorium constituted the public entrance to the spectator entrance level (5.75 m. above the floor of the building). This was also the lower entrance level to the grandstands. The upper entrance was reached by a stairwell. Ticket booths were near the entrance to the grounds on Ganghofer Strasse. Tickets were checked at the main entrance on Ganghofer Strasse.  
**Communications Area**  
Ground floor, east side:  
DOZ-subcenter. . . . . 31 sq. m.  
Office. . . . . 19 sq. m.  
Interview room. . . . . 25 sq. m.  
For the press subcenter for the entire fairgrounds, see building No. 5.  
Transmission facilities:  
One mobile television camera along the entire length of the sports platform (on the side opposite the VIPs); three additional DOZ television camera platforms and two for movie cameras; parking places for mobile transmission units on the northern side of the building. Around 165 sq. m. of parking area was required for the five mobile units.  
**Competition and General Administration**  
Ground floor, west side:  
Direction of sport facilities. . . . 21 sq. m.  
Washroom. . . . . 6 sq. m.  
Kitchenette. . . . . 8 sq. m.  
Lounge. . . . . 15 sq. m.  
OC office. . . . . 26 sq. m.  
2 offices, each. . . . . 15 sq. m.  
OC technical staff, 2 rooms each . . . . . 21 sq. m.  
Fédération Internationale des Luttes Amateurs (FILA)  
FILA President. . . . . 30 sq. m.  
Secretary general FILA. . . . . 25 sq. m.  
Office. . . . . 24 sq. m.  
Deutscher Ringerbund (DRB)  
DRB room. . . . . 25 sq. m.  
International Judo Federation (IJF)  
IJF President. . . . . 25 sq. m.  
IJF office. . . . . 18 sq. m.  
Deutscher Judo Bund (DJB)  
DJB room. . . . . 16 sq. m.  
2 offices, each. . . . . 15 sq. m.  
Meeting room. . . . . 80 sq. m.  
2 rooms OK Sports, each . . . . 16 sq. m.  
4 referees' dressing rooms, each 22 sq. m.  
1 lounge . . . . . 21 sq. m.



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.

Sanitaryinstallations:  
In the foyer of hall 11, four sanitary cells of 9 sq. m. each were set up to provide toiletfacilities.

Spectatoraccess:  
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'Escrime (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, 18 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 épée 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'Escrime (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 reinforced 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  
19m. x 32m. . . . . 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.  
. . . . . 16 sq. m.  
. . . . . 32 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.  
. . . . . 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.

Types of Sport:  
**Shooting, Modern Pentathlon (Shooting)**

Location:  
**8046 Garching Hochbrück**

Team supervisor 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, Supervision of Construction, and Engineering:  
**Architect Committee Dipl.-Ing. Wolfgang Kleibömer, Hamburg/Munich**  
**Dipl.-Ing. Michael Eberl, Munich**  
**Architect Erich Stein, Munich**

Local construction supervision:  
**Building Engineer Gerhard Hermel, Munich/Aachen**

Landscaping:  
**Gottfried Hansjakob, Munich**

**Characteristics of Design and Construction**

The buildings, three shooting galleries for rifles and pistols, the grandstands, the restaurant and the administration building all together form a "T". The shooting galleries are mostly constructed of pre-cast reinforced concrete building elements. The restaurant was executed as a reinforced concrete framework together with wooden materials. The administration building has a skeleton of poured concrete finished with masonry. The dominant materials visible from the outside are: concrete, wood and glass. The construction of the shooting galleries: walls of acoustical clinker or cloth-covered, ceilings of sound-absorbing mounted panels, floors with textile coverings. The safety blinds of the shooting ranges consist of a concrete and wood construction with fiber glass filling. Other protective walls and blinds are of prefabricated reinforced concrete with sound-absorbing ribbed sheets of light gas-concrete.

**Dimensions of the Facility**

Land area	240,000sq. m.
Total enclosed space	40,200 cu.m.
Administration building and restaurant	14,700 cu.m.
Rifle range	12,500 cu. m.
Service trenches	2,000cu. m.
Pistol range, incl. Scoreboard cover	4,500 cu. m.
Moving boar target range	4,000 cu. m.
Grandstand interior rooms	2,500 cu. m.
Total area under roof	4,300 sq. m.
Rifle range	1,900sq. m.
Pistol range	600 sq. m.
Moving boar target range	550sq.m.
Grandstands	300 sq. m.
Administration building	600 sq.m.
Restaurant	350 sq. m.
Contest area, total	76,500sq. m.
Rifle range	27,000sq. m.
Skeet and Trap	45,000 sq. m.
Moving boar target range	2,250 sq. m.
Pistol range	2,250 sq. m.

**Access**

By car:  
From Olympic Park via the Middle Ring north to B 13, from there turn off into a private access road to the shooting range.  
Public transit:  
Bus station at B 13.

**Total Cost excluding Incidentals**  
20.6 million DM.

**Utilities**

Heating:  
Oil-burning warm-water heating with radiators in the restaurant and administration building.  
Total heating capacity: 730,000 kcal/h with warm water heating. In all the shooting galleries, the shooting stands are heated by electric floor heaters and by radiant heaters.  
High voltage installations:  
Current supply network for the entire facility with a transformer output of 630 kVA. Mobile emergency generator unit capacity 170 kVA.  
Lighting:  
Indirect lighting above every shooting stand with 50 lux illumination (on the contestant). Target lighting with spotlights at 80 lux.  
Low voltage installations:  
Telephone system, extension system with 69 extensions.  
Data viewing stations:  
Central station in the administration building, monitor station in every part of the facility, data transmission throughout the grounds with an ELA installation.

**Technical Installations for Sports**

Central Scoreboard:  
Display of the scores and standings in all shooting events for the entire duration of the competitions. Notices were put up by hand on slips of paper.  
Size of the Scoreboard: length 10.000 m., height 2.00 m.  
Location: eastern wall of the rifle range near the winners' platform, western wall of the pistol range.  
Scoreboard, skeet and trap area:  
A bulletin board with hand posted notices as above. The entire progress of the skeet and trap shooting competitions was displayed with scores and standings. Location: southern side of the grandstands.  
Display installations for individual contests:  
Rifle range: magnetic board at each shooting stand to show the results of the current individual competition.  
Pistol range: recording desk with a projector to display the results of the on-going individual competition.  
Range for moving wild boar targets: monitor with recording desk and projector as above.  
Modern pentathlon: magnetic board, as above.  
Target area:  
Free rifle: target towing device, indication given by signal baton, magnetic board for spectators.  
Free pistol and small-bore rifle: target system Gehmann, endless strip target, report by telescope.  
Pistol range:  
Silhouette target system with timing shifts and a light barrier backing target (phantom target).  
Moving target UIT—wild boars, scoring and target control, communication of the

point of entrance of the bullet through monitors and electronic displays.  
After the Olympics, the 300 m. range for free rifle, free pistol and small-bore rifle (50 m. and 100 m.), including the target towing system, are being operated as used during the Olympics. The same is true of the skeet and trap range and the accompanying automatic trap.

**Contest Area**

Rifle range:  
Sheltered area 176 m. x 13 m. with 102 stands and judges' stands.  
300 m. range:  
Open area 75 m. x 300 m. with 43 stands, cover trench 75 m. x 2.50 m.  
50 m. range:  
Open area 172 m. x 50 m. with 165 stands (of which 43 are combination stands for 50 m./300 m.), cover trench 75m. x 2.50 m.  
Skeet and trap area:  
Shooting range 210 m. x 90 m. (total with safety area, 450 m. x 200 m.).  
UIT-wild boars moving target:  
Open area 38 m. x 50 m. with two stands, one judging stand and 43 m. x 13 m. sheltered gallery.  
Rapid fire pistol:  
Open area 58 m. x 25 m. eight stands, one judging stand and 58 m. x 16 m. sheltered gallery.  
Direction booth:  
On the grandstand. . . . . 10 sq. m.

**Olympic Usage**  
August 27 - September 2, 1972

**Athletes' Area**

Hygiene:  
Participants' building, ground floor—Doctor's office, anteroom, lounge, doping control with anteroom, showers and toilets  
5 rooms . . . . . 69 sq. m.  
Preparation:  
Participants' building, upstairs—43 team rooms and lounges, each . . . . . 15.5 sq. m.  
Under the grandstands—7 team rooms and lounges, each . . . . . 15.5 sq. m.  
Administration room . . . . . 20 sq. m.  
Each team lounge is furnished with two cots, one table, two chairs, one cabinet, one wash basin with shelf.  
Common showers and toilets are provided for the various team rooms.  
Access:  
Shooting range complex main entrance, south—to the team lounges, locker rooms, showers and toilets—to lounges on the second and third floors of the participants' building (for skeet and trap shooters to the team lounges under the grandstands). Through the ground floor of the participants' building to the gun inspection, doctor's room, doping control, and via sheltered connecting corridors to the various ranges.

**Spectators' Area**

Rifle, pistol and moving target competitions, total:  
Seats and standing room in the various galleries for 4,500.  
Skeet and trap shooting:  
Grandstands for 1,700 people with reserved seats and standing room for 2,300.  
Allocation of spectators' places:  
VIP grandstand seats. . . . . 80  
Press places (observers' places) in the grandstands. . . . . 25

Press seats without desks in the shooting galleries . . . . . 80  
Spectators' refreshments:  
Restaurant with 230 places, refreshment stand beneath the grandstands.  
Sanitation:  
Toilets in the galleries, under the grandstands and in the basement of the restaurant.  
First aid:  
On the ground floor of the administration building.  
Access for spectators:  
Main entrance south—ticket control—dispersion to the galleries—and via the central courtyard to the grandstands at the skeet and trap range.

**Communications**

Press subcenter on the ground floor of the participants' building:  
Office area, teletype room, information, mail, four rooms  
total . . . . . 140 sq. m.  
Interview hall . . . . . 69 sq. m.  
General information in the atrium of the restaurant.  
DOZ film storeroom, basement restaurant, press places in the grandstands and in the shooting galleries.  
Transmission installations:  
Two DOZ-movie cameras, two film equipment vehicles.  
Parking area for technical vehicles:  
Parking space as required from among the 150 available parking places.

**Contest and General Administration**

Participants' building, ground floor:  
Scoring statistics, 1 room . . . . . 139 sq. m.  
Printing, 1 room . . . . . 48 sq. m.  
Gun smith, 2 rooms. . . . . 32 sq. m.  
Hostesses' room. . . . . 23 sq. m.  
Participants' building, upstairs:  
Deutscher Schützenbund (DSB)  
4 rooms, total . . . . . 60 sq. m.  
Union Internationale de Tir (UIT)  
3 rooms, total . . . . . 47 sq. m.  
Sports facilities direction, OC, technical direction, specialist direction. . . . . 77 sq. m.  
Meeting room . . . . . 144 sq. m.  
Security guards, ticket takers, police, fire department. . . . . 69 sq. m.  
(provided for in barracks outside the grounds)

**Restaurant**

230 places inside (unsheltered terrace in addition)  
Allocation: spectators, press area, VIP area.  
Rest rooms for guests, the kitchen and various auxiliary rooms in the basement of the restaurant.



Types of Sport:  
**Rowing and Canoeing**

Location:  
**8042 Oberschleissheim near Munich**  
on Federal Highway 471

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

Project director for the Olympic Construction Company, Ltd.:  
**Dipl.-Ing. Ludwig Kübler, Munich**

Design:  
**Architects' Team**  
**Eberl and Associates, Munich**

Earth moving and foundation planning:  
**Engineering Office of Dorsch Consult, Munich**

Traffic planning:  
**Architects' Team**  
**Eberl and Associates, Munich**

Drainage and sewage planning:  
**Engineering Office of Kaiser and Lehner, Munich**

Fresh water supply:  
**Preuschel Engineering Office, Oberschleissheim**

Regatta trench drainage planning:  
**Engineering Office of Dorsch Consult, Munich and Preuschel Engineering Office, Oberschleissheim**

Gas connection planning:  
**Public Works Department, Munich**

Electricity connection:  
**Isar-Amper Power Works, Munich**

Television, post office, and post cable planning:  
**General Postal Administration, Munich**

Landscaping:  
**Architects' Team**  
**Eberl and Associates, Munich**  
**Landscape Architect, Georg Penker, Neuss**

Stressing:  
**Held Engineering Office, Germering-Munich**

Surveying:  
**Bendel Surveying Office, Munich**

On-site director of earth moving and foundations:  
**Engineering Office of Dorsch Consult, Munich**

**Characteristics of Design and Construction**  
The 2.230 km. long regatta course was incorporated into the local marshland landscape along a southwest (start) to northeast (finish) axis, along which the following buildings were erected: the starting tower for rowers was placed at the southwestern end of the regatta trench, 5 m. before the starting line (0.00 m. line). At the 1 km. mark on the southeastern bank is starting tower 1 for canoeists. The main group of buildings begins on the south-

western bank at the 1.5 km. mark. Here is starting tower 2 for canoeists, and here begin the standing room bleachers, which adjoin the sheltered stands to the northeast. The latter extend to the finish tower with the jury and organization building. Three boathouses are positioned at a right angle to the course axis at the northern end of the trench. The participants' house, with gymnasium, restaurants, and caretaker's living quarters, lies on the northwestern bank next to the boathouses at a 45-degree angle to the course axis. Besides the starting towers, eight time-keeping posts are spaced along the course to facilitate the organization of the boat races. The victors' bridge rises before the finish tower in front of the main grandstands. Boat landings extend into the basin at the northeast end of the trench in the finish area. The motorboat harbor is situated in the finish area on the northwest side.

Temporary buildings:  
Beer tents were set up east of the main stands and standing room bleachers to serve refreshments to spectators.

The following construction methods were employed:  
The standing room bleachers consisted of pre-cast concrete steps with poured concrete breastworks. The main stands boasted of a cantilevered laminated wood roof, which was anchored at the back by a supporting steel structure. The steps were pre-cast concrete as in the standing room bleachers. The breastworks and main supports were built of reinforced concrete cast on the site. The jury building was likewise constructed of reinforced concrete produced on-site. The boathouses are of reinforced concrete with pilings sunk in cement foundations. The roofs are of laminated wood beams. The participants' house is done mostly in faced concrete with laminated wood roofs.

The regatta trench lies in the ground water area of the Munich gravel plain. The trench bed and sides are of locally available gravel; only in areas of wave action was a dumping of 20 mm. coarse gravel deemed necessary.

**Dimensions of the Facility**  
Size of the total site. . . . . 850,000 sq. m.  
Total surface area of buildings. . . . . 30,173 sq. m.  
Standing room bleachers . . . 10,140 sq. m.  
Grandstands with seats . . . 10,750 sq. m.  
Jury building. . . . . 686 sq. m.  
Boathouses. . . . . 6,162 sq. m.  
Participants'house. . . . . 2,110 sq. m.  
Caretaker's house. . . . . 109 sq. m.  
Starting towers — 3 units, each with 54 sq. m. . . . . 162 sq. m.  
Finish tower. . . . . 54 sq. m.  
Total space. . . . . 73,660 sq. m.  
Toilet facilities in standing room bleachers. . . . . 2,129 cu. m.  
Grandstands with seats . . . 12,670 cu. m.  
Jury. . . . . 6,607 cu. m.  
Boathouses. . . . . 39,802 cu. m.  
Participants'house. . . . . 9,843 cu. m.  
Caretaker. . . . . 682 cu. m.  
Starting towers - 3 units each 303cu.m. . . . . 909 cu. m.  
Finishtower. . . . . 1,018 cu. m.  
Water surface in regatta trench 2,230m. x 140m. . . .312,200 sq. m.  
Water surface usable for sport 2,230 m. x 81 m. . . . 180,630 sq. m.

**Access**  
By car:  
The regatta course could be reached from the Autobahn Stuttgart in the west, using the Dachau exit and the federal highway B 471. Access from the north was from the Schleissheim exit of the Autobahn Nuremburg—Munich and by highway B 471 to the competition site. Lerchenauer Strasse led from the Olympic Village and points farther south to the site.

Public transit:  
By rapid transit to the station at Oberschleissheim, and from there by public buses to the site.

Parking lots:  
2,340 parking spaces were built within the confines of the regatta course. These were situated north of the boathouses and east of the jury building. During the Games, a further parking lot for 5,660 automobiles was made available on the future autobahn from Munich to Deggendorf.

**Total Cost excluding Incidentals**  
56 million DM

**Utilities**  
Heating:  
The central heating installation in the participants' house is connected by ducts to the caretaker's house, the gymnasium, and the boathouses. Later, auxiliary electric storage heaters were installed in the jury building. In the boathouses, only the workshops and upper floor are heated. All other buildings are unheated.

Ventilation:  
The participants' house and the gymnasium, as well as the locker rooms, showers and washrooms on the upper floor of the boat-houses are fully ventilated. The cafeteria in the VIP section of the main grandstands is fitted with exhausts.

High voltage installations:  
Installed transformer output: 763 kVA. The facility includes the entire lighting installations of all buildings, the lighting of the course near the finish line, the transformer station in the jury building, and the emergency power supply in boathouse 3b, with an output of 105 kVA, which in an emergency controls the compressor for the fire extinguisher system.

Low voltage installations:  
The rented telephone switchboard in the jury building had 250 extensions, and was reduced after the Games. Checkpoints for the security guards are installed in all buildings, as well as a direct fire alarm connection to the fire department in Oberschleissheim. A clock system was also installed. All inside and spectator areas have public address speakers.

**Technical Installations for Sports**  
ElectronicScoreboard:  
This was executed in "light chamber technique" and measures 19 m. in length, 2.20 m. in width, and 5.65 m. in height. The entire Scoreboard is mounted on a special trailer and can be transported. (Confer the conoe slalom course at Augsburg, where the regatta scoreboard was used.)  
Display capacity: 7 lines, each with 31 characters and a minimum height of 525 mm. The type of the current match, lane numbering, nations, symbols showing position of boat, and end times were posted. The scoreboard was placed opposite the main grandstand. The first sub-program had connections to a digital mini-computer for middle times and end results. The second

sub-program provided for showing the position of the boats on the scoreboard. New values were posted every 250 m. along with timings reported by the timekeeping posts.

The direction booth was positioned in front of the scoreboard and measured 3.80 m. x 2.20 m. x 2.80 m.

Starting systems:  
Six intercom stations were installed for rowing and nine for canoeing. Starting gates in the form of floating berths were also provided in the ratio of 6 to 9.

Course markings:  
The lanes were delineated by chains supported at intervals of 12.5 m. by buoys. There were seven of these chains for rowing and ten for canoeing. Steel cables were hung across the course. From these 1.00 m. x 2.00 m. lane markers were suspended.

Time measurement:  
The primary system consists of two film cameras at the finish, which automatically record the time on the film. The secondary system consists of stop contacts which are administered by the nine finish judges, and which, when tripped, show the elapsed time. Boards indicating distances covered were set up every 250 m. The finish line cameras were placed in the finish tower. The following timekeeping facilities were installed along the eastern bank of the course:  
Input posts for the scoreboard, telephone connection and intercom system every 250 m. along the course, survey markers along the western bank with measuring and sighting equipment, starting towers, finish tower, eight timekeeping posts, and the starting tower for rowing, which was placed along the course axis 5 m. before the starting line.

0.000 km. starting line with single-story alignment post  
0.250 km. single-story timekeeping post  
0.500 km. single-story timekeeping post  
0.750 km. single-story timekeeping post  
1.000 km. two-story starting tower for canoeing  
1.250 km. single-story timekeeping post  
1.500 km. two-story starting tower for canoeing  
2.000 km. five-story finish tower  
The wind measurement post was set up on the finish tower.

**Competition Area**  
The regatta course:  
Length of the racing course: 30 m. + 2000 m. + 200 m. = 2,230 m.  
Width: course bed 98.00 m., surface 140 m. to 143 m.  
Six lanes of 13.50 m. for rowing = 81 m.  
Nine lanes of 9.00 m. for canoeing = 81 m.  
Depth: at least 3.50 m. along the 2,030 m. race course. The 50 m. x 270 m. basin lay in the finish zone to the northeast of the course by the boathouses. Here were also four landings of 6 m. x 30 m. dimensions and two landings 4 m. x 30 m. These served as launches for the boats.

Starting gates:  
These were of the floating variety. Six gates were installed at line zero and nine at the 1,000 m. and 1,500 m. lines. The victors' bridge, which measured 60 m. x 3 m., was anchored in front of the main grandstand. The main direction booth was above the main stand.

Preparation for competition:  
Gymnasium 15 m. x 28 m. . . .420 sq. m.  
Conditioning room 9.40 m. 9.40 m. x 15 m. . . . . 141 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 pre-fabricated 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. . . 2,200cu. 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.

Firstaid:  
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.

DOZ commentators' subcenter  
2 rooms each . . . . . 15 sq. m.  
with direct connections to the commenta-  
tors' booths on the south stand.  
Transmission facilities:  
4 DOZ cameras  
2 motion picture cameras  
For the five broadcasting company trucks  
approximately 200 sq. m. of parking space  
was provided in the vicinity of the tem-  
porary buildings.

**Contest and General Organization**  
OC Sport and contest site  
administration. . . . . 20 sq. m.  
OC Technical. . . . . 20 sq. m.  
Printing. . . . . 40 sq. m.  
Stand-by craftsmen. . . . . 15 sq. m.  
Data processing. . . . . 15 sq. m.  
Advertising and personnel. . . . 15 sq. m.  
OC service. . . . . 15 sq. m.  
Hostesses' room. . . . . 20 sq. m.  
Cleaning service. . . . . 15 sq. m.  
Police, security force, fire  
department. . . . . each 20 sq. m.  
Snackbar personnel. . . . . 30 sq. m.  
First aid for spectators. . . . . 40 sq. m.  
Additional toilet facilities and representa-  
tion rooms were located in Nymphenburg  
Palace. The following specialized craftsmen  
were available: smiths, saddlers, painters,  
and carpenters. Additional space was  
provided in the school near the palace.  
Fédération Equestre Internationale (FEI)  
Deutsche Reiterliche Vereinigung (FN)  
Office. . . . . 30 sq. m.  
2 exercise rooms, each. . . . . 25 sq. m.  
Reporting office. . . . . 50 sq. m.  
Conference room. . . . . 40 sq. m.  
Room for Dressage. . . . . 20 sq. m.  
Writing room. . . . . 20 sq. m.  
Mimeograph room. . . . . 15 sq. m.  
Lounge for interpreters. . . . . 30 sq. m.  
Room for telephone exchange. . . 20 sq. m.  
Room for short-term workers . . . 30 sq. m.  
2 Special mobile post offices.

**Restaurant**  
Concession tents (snacks, beverages, and  
sundries) for the personnel, contestants,  
and spectators were located in the area  
behind the spectators' stands.

**Riding Facility at Riem**

Types of Sport:  
**Riding, Modern Pentathlon,  
Military Start for Military Cross-  
country, Grand Prize for Individual  
Jumping**

Location:  
**8 Munich 81 (Riem)**  
Landshamer Strasse 11

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

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

Design, planning, building direction and  
engineering:  
**Atelier Kleineichenhausen  
P. F. Miller and Associates,  
Kleineichenhausen**

Landscape design:  
**H.W. Hallmann, H. Riese, Chr. Habeck,  
Munich**

**Characteristics of Design and  
Construction**  
The riding facility at Riem was construct-  
ed on the grounds of the Riding Academy  
and the Munich Racing Club. There are two  
distinguishable areas: the riding stadium  
with its surrounding area and the riding  
facility with stables and riding hall.  
The riding stadium was conceived as a "U"  
which opened north to the training areas.  
The built-up earth embankment of the open  
air stands began in the north and extended  
bow-shaped around the contest site lawn  
to the southwest and ended as an entry ramp  
to the second level of the roofed stands,  
which marked the western boundary of the  
stadium. The 28 m. cantilevered roof had  
a laminated wood framework which was  
supported by stress and pressure joists.  
The sloping base for the spectator seats, as  
well as the entire supporting structure, is  
made of laminated wood beams. The stand  
enclosures and the mantling of the pillars  
were finished with reinforced concrete to  
meet fire regulations. The stands in the  
southern half are cut off on the third level  
by the restaurant tracts. The sanitary  
facilities are housed in a reinforced con-  
crete tower which is erected in the open  
behind the stands. Foot bridges connect  
the free-standing judges' tower with the  
roofed stands. Training places for dressage  
and jumping close off the facility to the  
north.

Stables:  
The existing stables north of the smaller  
riding hall were modernized for Olympic  
use. Two completely new Olympic stables  
were built between the smaller and larger  
riding hall. The "Olympia" type stable was  
laid out so there would be two rows of  
stalls with one middle passageway. The  
stable building is covered with a double  
roof sloping from the middle up towards  
the sides. At a high point of the roof, that  
is, on one of the long sides of the build-  
ing, the rooms for the grooms are so ar-  
ranged along a connecting gallery that it is  
possible to look down into the stalls.

Riding halls:  
The stables and wide training areas are  
clustered around the large and small rid-  
ing halls.

The large riding hall:  
The rectangular track which measures  
30 m. x 75 m., is enclosed by L-shaped  
viewing stands on the western and northern  
sides. A restaurant wing is attached to  
the eastern wall on the second level with  
a view of the track. The southern long  
side of the track was bounded by the hall's  
exterior wall. Sixteen three-jointed  
beams, with a folding roof on the topside,  
form the framework of the hall. The gable  
walls and the vertical southern side wall  
of the hall are constructed of prefabricated  
concrete elements. The slanting northern  
wall of the hall is constructed primarily  
of translucent material.

The small riding hall:  
The existing structure of the smaller rid-  
ing hall was renovated for Olympic use.  
After the Olympics the riding facility will be  
used as the regional riding school. Three  
stables will be taken over by the Munich  
Racing Society.

**Dimensions of the Facility**  
Entire property including lots  
belonging to the Riding  
Societies. . . . . 450,000 sq. m.  
Riding Facility at Riem. . . . 60,000 sq. m.  
Riding stadium:  
Area of the riding stadium . . . 27,700 sq. m.  
Built-over areas, roofed  
stands. . . . . 5,900 sq. m.  
Embankment areas, stands . . . 6,600 sq. m.  
Stadium interior area . . . . . 15,200 sq. m.  
Contest area. . . . . 14,600 sq. m.  
5 Olympic riding stables:  
Enclosed space. . . . . 60,000 cu. m.  
Built-over area. . . . . 10,500 sq. m.  
The hospital stable:  
Enclosed space. . . . . 6,200 cu. m.  
Built-over area . . . . . 1,250 sq. m.  
Longer circle:  
Enclosed space. . . . . 600 cu. m.  
Built-over area. . . . . 200 sq. m.  
3 Heating plants:  
Enclosed space. . . . . 2,200 cu. m.  
Built-over area. . . . . 550 sq. m.  
Training areas:  
15 training areas. . . . . 62,600 sq. m.  
Large riding hall:  
Enclosed space. . . . . 21,600 cu. m.  
Built-over area . . . . . 3,275 sq. m.  
Small riding hall:  
Enclosed space. . . . . 2,100 cu. m.  
Built-over area. . . . . 950 sq. m.  
Existing buildings:  
Three houses, four stables, a casino build-  
ing, small riding hall.

**Access**  
Vehicular traffic:  
The riding facility can be reached via the  
Middle Ring and via the Daglfing Race  
Track exit off the airport expressway and  
from there along Landshamer Strasse to the  
main entrance.  
Public transit:  
Ride to the Riem station of the Munich  
rapid transit and from there on foot to the  
stadium (about 500 m.). Besides the rapid  
transit, there are connections to the city  
center and other Olympic sport events by  
municipal bus lines (bus stops at  
Landshamer Strasse).  
Parking lots:  
5,000 parking places were temporarily set  
up for visitors outside the riding facility.

**Total Cost excluding Incidentals**  
58.1 million DM

**Utilities**  
Heating for the stadium areas:  
Electric hot water heaters were installed  
in the restaurant and the kitchen.  
Ventilation of the stadium areas:  
Air intake and exhaust ventilation was  
provided for the restaurant area and the  
sanitary facilities in the towers.  
Heating center No. 1 for two Olympic  
stables, the casino and the large riding  
hall:  
The heating plant was built next to the  
casino. A central hot water heating system  
with three high capacity boilers 800,000  
kcal/h each served the buildings mentioned  
above. The stables and the large riding  
hall were heated with hot air heaters. The  
casino and the living quarters on the  
upper level of the stable were heated by  
radiators.

Heating center No. 2 for three Olympic  
stables:  
A hot water heating system with two high  
capacity boilers 800,000 kcal/h heated  
three Olympic stables. The heating of the  
stalls and living quarters was the same  
as above.  
Heating the hospital stable:  
One high capacity boiler with an output  
of 80,000 kcal/h provided the central hot  
water heating system to temper the air  
registers for heating the stalls. The apart-  
ments were heated with radiators, as  
above.

Function of the hot air heaters:  
The stalls were ventilated by two separate  
systems; one intake, the other exhaust.  
It was heated to 12°C in winter.  
Heating the ventilating system in each  
stall:  
12,500/8,000/6,000 cu. m. of air per hour.  
Capacity of the air exhaust system per stall  
5,000/3,750/2,500 cu. m. of air per hour.  
Heating capacity per stable "Olympic"  
type 125,000 kcal/h. The riding hall is  
heated by individual air heaters. These  
could be operated either with fresh air or  
recycled air. The capacity of the system  
could be controlled as follows: 8,000/  
6,000/4,000 cu. m. per hour. Heating  
capacity: 60,000 kcal/h.

**Technical Sport Equipment**  
Scoreboard:  
The permanently installed electronic  
scoreboard measuring 13 m. x 3.30 m. with  
readouts using light cell technique is  
located under the judges' tower. The  
following data could be displayed: start-  
ing order, number, name and nationality of  
the rider, the horse's name, current results,  
end results and order of the riders and  
horses according to the final results.  
Timing, stadium:  
The start and finish lines were equipped  
with electric eyes. An electronic timing  
device, counter with digital system would  
be started by the start signal. A second  
electronic timer independent of the first  
together with manual timing provided the  
necessary security, should the main  
system fail.

Timing the military cross-country:  
The starting and finish lines were equip-  
ped with electric eyes. The timing mechanism  
had an accuracy up to 1/100 of a second.  
The calculation of phase times was done  
by tabulating machines. The intervening  
times were transmitted to the participants'  
center and to the measured stretch.



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.

SpectatorArea

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.  
Presssubcenter:  
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 ..... 20 sq. m.  
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

the sports facility. The canoe slalom course is on the city bus line: bus stop, Spickel Strasse.  
Parking lot:  
Six thousand temporary parking places right next to the course.

**Total Cost excluding Incidentals**  
14.9 million DM

**Utilities**  
Heating:  
Gas-fired hot water heating for the press and administration building, the restaurant and the competition center.  
Ventilation:  
Only in the restaurant and competition center.  
High voltage installations:  
High voltage supply network along the slalom course as well as for all buildings. Installed transformer capacity 300 kVA: emergency generators on loan with 30 kVA and 15 kVA.  
Low voltage installations:  
Telephone system with ten exchange connections and thirty extensions, clock system, antenna installation for television, intercom, PA system along the course, fire alarms, electronic data processing, data transmission, data monitoring station.

**Technical Installations for Sports**  
Scoreboard:  
Mobile Scoreboard from the regatta course at Oberschleissheim (cf. idem).  
Timing:  
Photographic timekeeping system.  
Judging facilities:  
Judging stations installed along the course with manual input system and intercom system.

**Contest Area**  
Slalom Course:  
660 m. long, 6 m—8 m. wide, 0.40 m—3.00 m. deep, a grade of 4.5 m. descent on the entire course.  
3 m.—6 m./sec. water speed, 30 judging gates, 35 concrete obstacles.  
Team stand-by rooms:  
18 temporarily built rooms for men and women participants.  
Bridges:  
At the starting building and assembly area, 2 m. x 30 m. At the finish line 4 m. x 30 m.  
Hygiene (along the course):  
1 health room, parking area for ambulances.  
Life-savers' area (course):  
6 blocked-off places for rescue squads along the course with entrance and exit. Ambulance parking place.  
Contest preparation in the participants' building — boat house (competition center):  
1 training room, 8.40 m. x 16.80 m.  
1 kayak pool, 5.00 m. x 8.50 m. x 1.80 m.

Post-olympic use as a training facility in canoeing.

**Olympic Usage**  
August 28th and 30th, 1972

Participants' building, 2nd and 3rd floors:  
24 teams rooms(lounges) each 16 sq. m.  
1 large lounge for all participants, including refreshment area 120 sq. m.  
Beverage serving area 24 sq. m.  
2 temporary large dressing rooms  
6 small locker rooms built for

permanent use and connected with shower rooms and toilets.  
Participants' building, ground floor:  
9 boat halls 12.60 m. x 4.00 m. x 2.70 m. high. 50 sq. m.  
1 measuring room with measuring models  
13.00 m. x 5.00 m. x 4.00 m. high. 65 sq. m.  
1 workshop 100 sq. m.  
1 storeroom 23 sq. m.  
1 heating room 23 sq. m.  
1 training room, fully equipped, 8.40 m. x 16.80 m. 141 sq. m.  
1 kayak pool room.....100 sq. m.  
Sauna:  
Vestibule, locker room, cold water room, pool, sauna room, total. 50 sq. m.  
Hygiene area:  
2 health rooms, each 12 sq. m.  
Doctor's room. 12 sq. m.  
Doping control. 12 sq. m.  
Rest rooms, total. 65 sq. m.  
An ambulance parking place including entry and exit ways.  
Assembly point:  
An open area 20 m. wide with a parking lot for 20 cars.  
Preparation:  
3 halls for the assembly of the teams.  
7 team rooms with massage benches and rest rooms for each hall.  
Meals:  
In a special part of the restaurant.  
Access and transport:  
By bus to the south entrance of the complex, from there to the boat houses, locker rooms, hygiene facilities, lounges. Boat transport to the assembly hall at the start. After completion, boats were transported by car from the finish back to the assembly hall.

**Spectator Area**  
Standing room for spectators along the course. 25,000  
VIP seats. 250  
Athletes' seats. 250  
Press places with desks. 28  
Press seats without desks. 70  
Commentators' places without desks. 60  
VIP meals:  
Separate area in restaurant building.  
Spectator refreshments:  
Kiosks or tents along the course.  
Restroom facilities:  
Temporary toilet facilities for women and men.  
First aid:  
2 tents of the German Red Cross.  
Access for spectators:  
Spectator entrances in the south, east and north, ticket booths and control, from there a closed-in path to the course (free choice of standing position within the spectator area along the entire course).

After the Olympics, the outdoor facilities will be used as a recreation area. The restaurant is open to the public.

**Communications Area**  
Ground floor, administration building:  
DOZ subcenter. 42 sq. m.  
Mail room. 14 sq. m.  
Telephone switchboard. 23 sq. m.  
Interview room. 44 sq. m.  
Telephone and teletype room.... 89 sq. m.  
Press working area with press information stand. 89 sq. m.

Transmission facilities:  
6 DOZ television cameras and 6 DOZ movie cameras.  
Parking for technical vehicles:  
205 sq. m. for a total of seven vehicles.  
**Competition Organization and Administration**  
Tower of the administration building:  
2nd floor  
1 room for direction of sports facilities and competition  
3rd floor  
1 room, International Federation. 15 sq. m.  
1 room National Federation ..... 15 sq. m.  
4th floor  
1 control room 35 sq. m.  
Attic  
1 room for announcers 35 sq. m.  
Ground floor, administration building:  
1 room, data processing 50 sq. m.  
1 room, data evaluation 17 sq. m.  
1 room, check-up calculation .... 17 sq. m.  
1 room, sports direction 17 sq. m.  
1 room, technical direction ..... 17 sq. m.  
1 room, printing 46 sq. m.  
1 lounge for hostesses 35 sq. m.  
1 room, security guards 17 sq. m.  
1 room, police and fire department 17 sq. m.  
2 rooms, health service, water rescue squads, each ..... 17 sq. m.

**Restaurant**  
Service for athletes, guests of honor, officials and personnel in separate areas of the restaurant (total 200 places). Storage rooms and personnel rooms in the basement.  
Kiosks and tents along the course were provided for spectators.

**The Olympic Yachting Center in Kiel-Schilksee**

Type of Sport:  
**Yachting**

Location:  
**2300 Kiel**  
Schilksee Section

Overall Planning:  
**Dipl.-Ing. Hinrich Storch, Walter Ehlers, architects, Hannover**

Landscaping:  
**Rolf Ehlgötz, garden and landscape architect. Bad Gandersheim**

Statics:  
**Dipl.-Ing. Gerhard Demuss, architectural consulting engineer, Hannover**

Surveying:  
**Dr. Klaus David, consulting engineer, Kiel**

Heating (district heating), sanitation, swimming pool technology, ventilation:  
**Hans Fey Senior and Junior, consulting engineers, Wuppertal**

Electrical Work:  
**Behrend and Ohlendorf, Engineering Group, Hannover**

Acoustics:  
**Heinrich Keilholz, Hannover**

General coordinating and scheduling:  
**Business Consultants, Gelsenkirchen/Kiel**

**The Building Program and its Characteristics**  
The building program included the following projects:

1. The Yachting Center  
Structures with massage facilities, sauna, swimming pools, showers, changing rooms, a recreation center (lounges with dining facilities), boat houses (multi-purpose halls).
2. Organization and press buildings  
Regatta management, jury, press center, administration, information.
3. Spectators' facilities  
Promenades, the ceremonial area, a bus station.
4. Olympic living quarters  
Apartments with shopping center and restaurants, dwellings as either flats or one-family houses, an apartment hotel with cafe and bar.
5. Special facilities  
The Olympic flame, decorative flags, etc.

Additional projects including improving and widening of the surrounding yachting basins, the construction of a youth village and promenades for visitors.

**Design**  
The situation at hand:  
The construction site is located 13 kilometers from the center of Kiel on the northern edge of the Kiel-Schilksee section on the Kiel Förde. Knolls from the hilly landscape to the south of the cliffs jut like tongues into the competition area. The elevation descends from about twelve



meters above mean sea level to practically sea level in the marshy area around Fohlensee. This low lying area is separated from the sea by a dike. The construction site is situated on a beach promenade extending from the Schilksee resort area (about 500 meters away) to Strande (about 1,500 meters away).

Design tasks:  
The new components of the entire building complex had to fit into the situation described above creating a sports center of architectural prominence.

The architectural arrangement:  
A foundational structure houses the jury, the administration, the press center, a swimming pool, garages for the apartments and boat houses. It supports a promenade at the second level which runs directly along the harbor. It takes in the knolls and the cliffs to the south and continues their outline northwards as far as the path on the dike to Strande. The apartments are terraced and are set in progressively receding structures which follow the lines of the foundation. While one of these superstructures forms a roof over the promenade, another extends into the landscape to the west. The very height of the apartment towers of the Olympic living quarters emphasizes the topographical features of the terrain. They are joined to the main building in the south. The one-family houses are located in the southern part of the site and are arranged either as row houses or houses with enclosed yards. This entire area is screened with dense hedges.

At the same time, the promenade with its shops, restaurants, refreshment stands and swimming pool had to be a center of attraction for visitors in its post-Olympic use. It was also to make Schilksee an interesting place to visit even when there are no yachting events, and offer visitors better views of boating events at other times. Since the regatta courses are so distant there could not be any organized viewing stands as in other sports. Here spectators would watch the events while strolling or lounging on the elevated promenade with its panoramic view of the harbor. The promenade was also the spectators' gallery at the opening, closing and victors' ceremonies. It separated the visitors' area from the harbor activity without isolating either. The Olympic flame marked the center of the harbor area and was an integral part of the events occurring both on land and at sea.

**The Building Program and Survey of its Use**

**The Indoor Swimming Pool**  
The indoor sea water swimming pool is equipped with an adjustable bottom and measures 12.5 m. x 25.0 m. Diving equipment includes a 1 m. board, a 3 m. board and a 3 m. diving platform. There are 60 changing booths, 180 lockers, a sauna and health baths.

Olympic use:  
It served as a relaxing sport for the yachters. The lobby was temporarily expanded for use as a reception area for the organizing committee.

Post-Olympic use:  
It will be open to the public and at the same time be a training center for yachters.

**The Recreation Center**  
This multi-purpose hall for sports and other events measures 18 m. x 36 m. It also has changing and shower rooms, a 250-seat self-service restaurant, which can be subdivided into four smaller independent rooms, a kitchen, various storerooms and personnel rooms. There are also seven groups of rooms which serve as club rooms with coat rooms and toilets, washrooms and toilets for yachters, etc. There is also an apartment for the caretaker.

Olympic use:  
It served as waiting rooms, dining rooms and lounges for the participants in the yachting events.

Post-Olympic use:  
It will be used simultaneously as a multi-purpose hall for school and social events, a public restaurant and dining facilities for the performing center. The club rooms will be used by various yachting associations. The toilets and washrooms are open both to visitors and yachters.

**South Boat House**  
Its entire area measures approximately 4,200 sq. m., has 5.5 m. overhead clearance, is located on the ground floor and is built of concrete and steel.

Olympic use:  
It housed the special temporary facilities (see below).

Post-Olympic use:  
It will provide winter storage space for boats and additional garage space for the apartments in summer.

**North Boat House**  
This hall has approximately 2,400 sq. m. of floor space with the adjoining workshops (paint shop, sailmaking, boat building, spare parts, etc.). Its foundation is built on steel piles; the walls and pillars are built of reinforced concrete; and the roof joists are steel.

Olympic use:  
The regatta boats were measured and repaired here.

Post-Olympic use:  
Larger boats will be stored here during the winter. Boats will also be measured and repaired here during regattas.

**Regatta Administration, Jury and Press Buildings**  
There are about 2,376 sq. m. of floor space for offices, conference rooms and equipment storage available to the organization and the press.

Olympic use:  
Offices, conference rooms and storerooms were located here for the organization and some of the press personnel. There was also a temporary press bar.

Post-Olympic use:  
Organization and press rooms will be located here for yachting events. There will also be accommodation and teaching rooms for the performing center.

**Information Center**  
There are about 325 sq. m. available for tourist information personnel, a lost and found department, police and small restaurants (with rural decor).

Olympic use:  
Tourist information, a bank and dining facilities for visitors were located here.

Post-Olympic use:  
It will be an information center for resort and vacation opportunities, and sports.

**East Apartment Building**  
There are 240 apartments, of which one third measures 53 sq. m., one third 46 sq. m., and the others 39 sq. m. The apartments are built in a terraced structure with partially roofed balconies. One half of them face the sea and have a view; the other half face inland and enjoy the sun. There are about 2,000 sq. m. of space available for shops and their supply rooms on the promenade. It also has approximately 400 sq. m. of restaurant space (A bowling alley and clubrooms are planned.) with kitchens, pantries and personnel areas. There are also terraces on the promenade.

There is a garage on two levels with 73 parking spaces in the basement.

Olympic use:  
The apartments of sport functionaries and press representatives were located here. There were also shops and restaurants to serve visitors. Special temporary facilities were situated in the garages (see below).

Post-Olympic use:  
Apartments, vacation dwellings, shops to serve yachters, guests and residents will be located here. The garages will be used by apartment dwellers.

**Apartment Tower 1**  
There are 78 apartments on 13 stories, of which

13 are	1 room apartments
13 are	2 room apartments
39 are	3 room apartments
13 are	4 room apartments

There is approximately 5,525 sq. m. of living space.

Olympic use:  
It was used as living quarters for participants and their trainers and for medical attention.

Post-Olympic use:  
The apartments will be sold or rented.

**Apartment Tower 2**  
There are 90 apartments on 15 stories of which

15 are	1 room apartments
15 are	2 room apartments
45 are	3 room apartments
14 are	4 room apartments
1 is a	5 room apartment

There is a total of about 6,375 sq. m. of living area. The central heating plant for the Olympic Center is located in the basement.

Olympic use:  
It was used as living quarters for participants and trainers.

Post-Olympic use:  
The apartments will be rented or sold.

**The one-Family Houses**  
There are 32 dwellings in corner houses or houses with yards and gardens. The individual dimensions are 24 houses with 124 sq. m. and eight with 148 sq. m. of floor space. There is a total of about 4,165 sq. m. of living space and 32 garages.

Olympic use:  
They served as living quarters for participants and trainers.

Post-Olympic use:  
They will be private homes.

**The Apartment Hotel**  
There are 506 beds in 161 suites distributed as follows:  
69 single rooms with two beds each and 92 two-room suites with four beds each.

In addition there is a lobby, a breakfast room with a small kitchen, personnel and other rooms and a garage for twenty automobiles.

Olympic use:  
It was used as living quarters for guests of the OC and the City of Kiel. Short-term personnel also had accommodations here.

Post-Olympic use:  
It will be the apartment hotel "Hotel Olympia".

**The Harbormaster's Area and the Olympic Flame**  
There are three accessible platforms built on a single foundation. The harbormaster's office and the customs house are located under two of the platforms. The third platform holds the Olympic flame and has nothing built under it.

Olympic use:  
The Olympic flame burned here. There was an observation platform and the technical equipment for operating the harbor were controlled from here.

Post-Olympic use:  
The brazier and a winners' plaque will be a monument to the 1972 Olympic Games. The harbormaster's and customs house will continue to operate and there will be an observation platform for visitors.

**The Harbor**  
A second yacht basin was constructed and equipped with docks, a boat platform measuring some 70 m., a 20 ton capacity winch launching facility, etc. An additional wharf was constructed with a stationary crane and provision for several additional mobile cranes for moving boats. There were also berths for boats and trailers and a breakwater to protect the new yacht basin from heavy seas.

Utilities:  
Water, electricity and telephones were installed for the docks and the berths. There is a ceremonial area with 800 terraced seats and a signal mast. Refreshment islands with shelters, wind screens and kiosks were provided. Scoreboards for regatta results were also installed.

Olympic and post-Olympic use:  
There are berths for boats with opportunities for yachtsmen and aides to repair their boats. They can also take advantage of the dining facilities and overnight accommodations.

**Special Temporary Facilities**

**The Special Post Office**  
Function:  
It served as a general post office for visitors.

Location:  
It was situated in the southern section of the south boathouse.

Construction:  
Ventilation, wall coverings, ceilings, partitions and a floor were built-in.

**Reception Centralized Services**  
Function:  
It served as a reception hall; as an information center, dining area, bank, post office and lounge for visitors. It also included the administrative offices for the Olympic Village.

Location:  
It was situated in the south boat house.

Construction:  
See "special post office" above.

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 Forde 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  
Münchner Zeitungsverlag  
Tidningarnas Telegrambyra, 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.

Parkinglots:  
Five hundred parking places on Homer Strasse were reserved primarily for vehicles with special parking permits.

**Total Cost excluding Incidentals**  
13.5 million DM

**Utilities**

Heating:  
Heating from the separate district heating system is provided in the form of steam, or optionally of warm water (for direct heating of the pools). Heat transfer takes place in a counter-current device. The water in the pools can also be heated by the direct addition of warm water, if desired. The heating system is controlled automatically. The entire Dante Pool complex has the following facilities: the large Olympic swimming pool (water polo and competition area), the diving pool (preparation for competition), as well as five other swimming pools, of which two (each measuring 14.5 m. x 50.0 m.) were fixed up to serve as Olympic training pools. The total capacity for the heating of all the pools listed above amounts to 4.2 Gkcal/h. The heating capacity for the buildings (including the basement level corridors around the pools) is 300,000 kcal/h.

Ventilation:  
Athletes' locker rooms (western building) 105,000 kcal/h 11,000 cu. m./h.  
Offices restaurant and sauna (eastern building) 400,000 kcal/h 30,500 cu. m./h.

Filtersystem:  
Twelve gravel pressure filters with a capacity of 2,400 cu. m./h.  
Total volume, including training pools = 9,500 cu. m.  
Filter cellar. . . . . 250 sq. m.  
Disinfection of the swimming pool water:

Chlorinator, chlorination room with chlorine storage room on the ground floor of the western building, total. . . . . 12 sq. m.  
The aluminum-sulfate equipment is installed in the basement of the western building, in the passageway to the filters. . . . . 10 sq. m.  
The water in the swimming pools is being experimentally monitored by a redox voltage measuring device.

Water circulation:  
In the competition pool and the diving pool, the water is brought in and circulated horizontally by jets which are set in the walls of the pools on their longer sides ("radiation turbulence"). Two-thirds of the water flows out via the overflow gutters, one-third through the drains in the bottom of the pools.

High voltage installations:  
The output of the transformers installed is. . . . . 630 kVA  
The emergency diesel generator has an output of. . . . . 80 kVA  
The exterior illumination of the stadium area is provided by a floodlight system with five masts, each of which is 27.5 m. high. The forty spotlights produce a vertical illumination of 600 lux. During the Olympics, the floodlights were used only for training. For underwater illumination, there are a total of 64 spotlights (each 750 watt) installed in the competition swimming pool and the diving pool.

Low voltage equipment:  
The following installations are provided: a telephone system with 57 extensions, a

clock system intercoms, a PA system, a portable underwater speaker system, an antenna system, and three teletype machines.

**Technical Equipment for Sports**

Electronic Scoreboard:  
This part of the scoreboard, executed in the light chamber technique, is permanently built in. It is 2 m. high and 3.5 m. long. There are five lines with a maximum height of 27 cm. each. It is technically set up for both water polo and swimming competitions. The data is fed to it by the control console at the referees' table.

Manual Scoreboard:  
The electronic Scoreboard is flanked by two magnetic boards. Each is 2 m. high and 1 m. wide. On the magnetic boards, the following data are displayed: the names of the athletes, the starting numbers, team colors, and countries. The manual part is manipulated from the service room on the upper floor of the western building.

Timing system for the 45-second rule:  
This installation consisted of a control console on the referees' table and two light number displays on the northern and southern edges of the playing area. At the end of the 45 seconds, an acoustical signal was sounded.

Intercom system:  
This installation provided speech contact between the direction booth, the FINA-room and the referees' table.

Water polo playing area:  
Slack lines and marking lines indicated the boundaries of the playing area. The floating water polo goals were secured with ropes to the long sides of the pool. A floating water polo basket in the middle of the playing area served as the fixed point for the ball at the beginning of the play.

**Competition Area**  
Water polo, competition and training.  
Water polo playing area 20 m. x 30 m. in the competition swimming pool of size 21.5 m. x 50.0 m., 2.0 m-2.2 m. deep. Temperature = 27.5°C.  
Preparation pool:  
Diving pool 21.56 m. x 22.15 m., 5.00 m. deep.

Upper floor, eastern wing:  
Direction booth, direction of competition. . . . . 22 sq. m.  
After the Olympics the installation will be used as a public open-air swimming pool.

**Olympic Usage**  
August 28 - September 4, 1972

**Athletes' Area**

PoolGallery:  
The benches for the reserve players of both teams were set up on the long sides of the pool, parallel to the playing area, and on the pool's northern side.  
Ground floor and second story, western wing:  
Each floor has six locker rooms. In each locker room, there are benches along the walls, sixteen lockers, one wash basin and one massage table.  
6 locker rooms, each. . . . . 25 sq. m.  
Doping checkpoint with toilet on the second floor. . . . . 20 sq. m.  
Hygiene:  
Waiting room, doctor's room, toilet and shower. . . . . 30 sq. m.  
Pre-swim showers, each floor  
2 x 6 showers with 4 toilets. . . . . 47 sq. m.

Ground floor foyer, athletes' passageway with bar for the participants. . . . . 40 sq. m.

Access:  
The bus stops for the water polo teams were on the grounds of the Dante Pool complex, west of the athletes' bathhouse. The participants reached the locker rooms, toilets, showers, doping checkpoint and doctor's area via their own special entrance. The pool was reached via the foyer on the ground floor.

**Spectator Area**

Permanent northern grandstand:  
Total spectator places. . . . . 3,200  
Seats. . . . . 1,220  
Standing room. . . . . 980  
VIP seats. . . . . 112  
Press seats with desks. . . . . 24  
Press seats without desks. . . . . 28

Temporary southern grandstand:  
Seats. . . . . 1,000  
Participants' seats. . . . . 1 30  
Spectators. . . . . 870  
Ten places (with desks) for commentators were set up on a special camera tower behind the southern grandstand.

Serving of VIPs:  
The guests of honor were served in the restaurant upstairs in the eastern wing  
Serving of spectators:  
For the spectators the concession area was available in the western building, as well as a kiosk under the northern grandstand.

Sanitation facilities:  
For those in the northern grandstands, there were toilet facilities installed under the grandstands. The toilets in the western building were convenient for spectators in the southern grandstand.

First aid:  
The first aid room was on the ground floor of the eastern building.

Access:  
Spectators came via the approaches on Homer Strasse to the ticket windows and ticket takers on each side of the eastern building. From there they were directed to the spectator areas of the northern and southern grandstands, which were separated from the rest of the complex.

**Communications Area**

Ground floor, eastern wing:  
Press subcenter total. . . . . 190 sq. m.  
Teletype room. . . . . 15 sq. m.  
Press office area. . . . . 63 sq. m.  
Press telephone room. . . . . 20 sq. m.  
Press mail. . . . . 28 sq. m.

Ground floor, western wing:  
Interview room (warm-up area) 45 sq. m.  
Transmission installations:  
Four television cameras on the camera tower and the pool gallery, an underwater camera (underground corridor around the pools), one black-and-white camera, a mobile DOZ subcenter, a mobile postal unit, a mobile transmission unit, a equipment truck. Parking places for technical vehicles. . . . . 90 sq. m.

**General and Competition Organization**

At poolside:  
Referees' table (with roof) 6.00 m. x 0.80 m., timekeepers, announcers, control console for the scoreboard, referees' catwalk 30 m. x 1.50 m., by 0.35 m., high chairs for the line referees.

Organization building, eastern wing:  
Basement:  
Data processing. . . . . 45 sq. m.  
Telephone switchboard. . . . . 13 sq. m.  
Ticket takers. . . . . 13 sq. m.  
Printing and display technique. . . . . 32 sq. m.  
Information. . . . . 13 sq. m.  
General services - police, fire department. . . . . 26 sq. m.

Ground floor:  
Office for the Fédération Internationale de Natation Amateur (FINA)—International Amateur Swimming Federation, two rooms each. . . . . 24 sq. m.  
Office of the German Swimming Federation (DSV). . . . . 24 sq. m.  
Technical supervision. . . . . 25 sq. m.  
Competition auxiliary personnel, equipment and superintendent of the training pools. . . . . 35 sq. m.  
First aid. . . . . 35 sq. m.  
Ticket window and inspection, security guards. . . . . 13 sq. m.  
Referees' locker room. . . . . 55 sq. m.  
Chauffeurs. . . . . 18 sq. m.  
Hostesses' room. . . . . 55 sq. m.  
In each case, the closed-off areas have their own toilets and locker rooms.

Upstairs:  
Superintendent of the sports facilities: office with ante-room and teletype. . . . . 45 sq. m.  
Double sauna for the competitors, locker room, toilet, massage, lounge, sauna room, cold water room, total. . . . . 160 sq. m.

**Restaurant**

There was a sit-down restaurant for 250 persons upstairs in the eastern building. A partitioned area was reserved for the guests of honor, the officials, and the press. The rest served the personnel of the sports facilities.  
Total area. . . . . 320 sq. m.  
Snack room in the western wing:  
See "Spectator Area".  
Kiosk under the northern grandstands:  
See "Spectator Area".



**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:**

1. Total installation	
Planning and competition. . .	41 titles
2. Total installation under	
construction. . . . .	62 titles
3. Application of modern	
techniques of construction. .	4 titles
4. Heating and sanitary instal-	
lations. . . . .	8 titles
5. Facilities for traffic. . . . .	8 titles
6. Food distribution center. . . .	3 titles
7. Sport sites and roofs. . . . .	33 titles
8. The sports hall. . . . .	4 titles
9. Olympic Village. . . . .	6 titles
10. Swimming pools. . . . .	6 titles
11. Cycling stadium and cycle	
racing track. . . . .	11 titles
12. Riding stadium. . . . .	5 titles
13. Basketball hall. . . . .	2 titles
14. Volleyball hall. . . . .	1 title
15. Hockey field. . . . .	2 titles
16. Ski sport facilities. . . . .	1 title
17. Rowing and canoe regatta	
course. . . . .	9 titles
18. Sailing center at Kiel-	
Schilksee. . . . .	13 titles
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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