

# How Does One Calculate Playground Requirements?

By Carl Diem

No Mayor of a modern city would be so far behind the times that he would not approve of the construction of playgrounds and training centres, but the path to the realization of such projects is beset with obstacles and offers many an opportunity for evasion and excuse. The city fathers may finally decide to build sporting grounds — but outside the city where land is “cheap” and not so important to the town as that in the residential and business districts. The words addressed to me 25 years ago by the Mayor of Boston apply equally to the present day: “Our inhabitants want their playgrounds just around the corner”.

We are now living in an age of major municipal changes. The motorcar, as a means of conveyance even of the ordinary worker, has resulted in residential districts being extended into the farther environs and the working districts being concentrated, so that a complete re-planning of the traffic system is necessitated. In this connection an excellent opportunity is offered for the provision of essential sporting centres, which should be planned in advance. For this purpose a definite system of calculation is advisable, one which takes into consideration the local conditions. The following estimates, which have been based on conditions in an average German town, may be revised to correspond to other localities so that in every case a satisfactory calculation will result.

The estimates are computed for the three principal types of sporting facilities which come into question for the majority of the people: playgrounds, gymnasia, and indoor swimming baths. The requirements will naturally vary depending on local conditions, as for example, the availability of parks and lawns for games and athletic exercises, or the climatic conditions in warmer zones, which exclude the necessity of indoor swimming pools and covered gymnasia. In such cases, it is merely necessary to make appropriate allowances in the fundamental estimates.

## Playground and Sporting Field Requirements

In any estimate, the following statistics must be taken into consideration:

1. Proportion of the different age groups of the active sporting population to the total population — number of participants.
2. Average number that would engage in sport at a normal centre — participation group.
3. Establishment of the average playing privilege at the disposal of each individual, and from this the number of privileges which are available in one week at a single playground or sporting field.

From these three statistics the essential amount of sporting field space per capita of the population can be computed. In the case of new city planning, the future population of the settlement districts must be estimated.

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Sporting conditions must be calculated separately for children (2 to 10 years of age) and for young people (10 years to maturity). The estimate must therefore include (a) playgrounds for children, and (b) sporting fields.

(a) **Playgrounds for children:**

1. Number of playing children in each 100,000 inhabitants, following deduction of invalids, etc. Number of participants : 15,000.
2. A playing child requires an average of 10 square metres. A normal playground of 1.2 acres is therefore large enough for 500 children (Participation group).
3. Children below school age can play an average of two hours daily, those of school age, one hour (playing privilege). Under these conditions, 3 x 500 children can play daily. Three playing privileges are thus available weekly.

Result:—  $\frac{15,000}{500 \times 3}$  10 playgrounds. A city of 100,000 inhabitants thus requires 10 playgrounds each 1.2 acres in size for its children, or in other words, .5 square metres per capita of the population.

(b) **Sporting fields:**

1. Number of sport participants over 10 years of age in each 100,000 inhabitants: 25,000 (participation group). Those between 10 and 17 years of age may be reckoned at 100% ; between 17 and 20, at 70% ; between 20 and 30, at 40%; between 30 and 40, at 15%. Those over this age are not included. The proportions may be altered to correspond to local conditions.
2. A sportsman requires an average of  $133\frac{1}{3}$  square metres of playing space on a normal sporting field of about 5 acres. In the case of the young people, the requirement is about 50 square metres per person, but in adult games, as for example football, 350 square metres per person are necessary. One hundred and fifty persons can exercise simultaneously on a 5 acre field (Participation group).

- The young people as well as adults have a playing privilege of at least two exercise periods of 2 hours' duration each week. The computation includes, however, only 3 hours per person for those willing to participate. Among the 25,000 comprising the participation group, 10,000 are of school age and 15,000 are wage earners. The sporting fields must be adequate for the latter, who are able to participate only after working hours. This group usually engages in sport between 7 p.m. and 9 p.m. on weekdays, from 6 p.m. till 10 p.m. on Saturdays, and from 8 a. m. till noon and 3 p.m. till 9 p.m. on Sundays. This comprises a total of 24 hours, or in other words, 8 exercise periods of 3 hours each. For those of school age, the remaining hours of from 3 p.m. till 7 p.m. on weekdays and 2 p.m. till 6 p.m. on Saturdays also equal 24 hours or 8 exercise periods of 3 hours each. During the forenoon and up till 3 p.m. the sporting fields are at the disposal of the schools for gymnastic classes. Sporting fields are considered which offer unlimited possibilities of utilization, as for example, rolled playgrounds. Should turf be selected, which is preferable from the point of view of health and attraction, the exercise periods must be reduced from 8 to 5. In the case of turf one portion of the field can always be left unused to enable the grass to grow.

Result :

Rolled playgrounds:  $\frac{15,000}{150 \times 8} = 12.5$  courts covering 5 acres = 62.5 acres for 100,000 inhabitants = 2.5 square metres per capita of the population.

Grass courts:  $\frac{15,000}{150 \times 5} = 20$  courts covering 5 acres = 100 acres for 100,000 inhabitants = 4 square metres per capita of the population.

Total Results:

Playgrounds and sporting fields thus require between 3 and 4.5 square metres per capita of the municipal population. These calculations are based upon German conditions, which include grass-covered fields. Only the usable area is taken into consideration, and allowance must also be made for paths, landscaped strips, dressing houses and spectator stands. A circle of interest with a radius of 2 kilometres has been allotted to each sporting field, the same applying to gymnasia and swimming pools.

In other words, playgrounds and sporting fields totalling 4.5 square metres of usable space (turf) per capita of the population should be constructed at the centre of each area having a radius of 2 kilometres.

### Gymnasium Requirements

- Number of gymnasts : 30,600 for each 100,000 inhabitants, of which 17,300 are wage earners and 13,300 of school age. In the participation group, those between 6 and 17 years of age may be reckoned at 100%; between 17 and 20, at 70% ; between 20 and 30, at 40% ; between 30 and 40, at 15%.
- Gymnastic participation group: an average of 40 participants in a normal gymnasium 12 x 20 metres or 240 square metres in size (an undesirably small size).
- Participation times: from 8 a.m. till 1 p.m. and 4 p.m. till 6 p.m. for school gymnastics, and 6 p.m. till 10 p.m. for wage earners. Gymnastic privilege: for pupils, 1 hour daily on weekdays; for wage earners, an average of 3 hours weekly. Seven gymnastic periods weekly are thus available for pupils and 8 three-hour periods are at the disposal of wage earners. Result reckoned on the basis of the requirements of the wage earners:  $\frac{17,300}{40 \times 8} + 54$  gymnasia each 240 square metres in size = 12,960 square metres for each 100,000 inhabitants = .129 square metres per capita of the population. The gymnasia would be adequate for the daily gymnastic hours of the schools.

### Indoor Swimming Baths

- Number of swimmers: 32,000 for each 100,000 inhabitants. In the participation group, those between 10 and 17 years of age may be reckoned at 100% ; between 17 and 20, at 70% ; between 20 and 30, at 60% ; between 30 and 40, at 30% ; between 40 and 50, at 20% ; between 50 and 60, at 10%.
- Participation group: an average of 50 swimmers in a normal swimming bath with a pool 20 metres long, 10 metres wide and an average depth of 1.5 metres = 300 cubic metres' volume.
- Swimming times: the bath is open on weekdays from 7 a.m. till 9 p.m. A swimming privilege of 30 minutes weekly is accorded to each citizen. A total of  $84 \times 2 = 168$  swimming periods are thus available.

Result:-  $\frac{32,000}{50 \times 168} = 3.8$  pools of 300 cubic metres' volume or 1140 cubic metres for each 100,000 inhabitants = .014 per capita of the population or 1 pool of 300 cubic metres' volume for every 30,000 inhabitants.

The requirements in outdoor swimming pools may be calculated on this basis, consideration being given to the larger size of the pools but also to the longer swimming periods in the summer.

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The three fundamental units of a sporting centre (1. Running track, throwing and jumping field, and playing field; 2. Gymnasium; 3. Swimming bath) should be joined together at a single site if possible in order that comprehensive physical education may be encouraged. The permission to use one of the facilities must always extend to the others. Special admission tickets, perhaps at advanced prices, violate the purpose of a sporting centre and prevent the full, healthy utilization which is obtainable only in the combination of general physical training and swimming (not merely showers).

Sporting centres are the source of strength of a state. Their upkeep should be maintained by those who refrain from utilizing them, but since such a just system of taxation could scarcely be employed, the costs must be borne by the community at large.

The utilization of sporting centres, including indoor swimming baths, should be free of charge.

Active participants perform a duty of honour to the state.

## Conseils à tous les sportifs

rédigés par ordre et avec le concours de la Commission médico-sportive de l'Association nationale d'éducation physique.

Par le Docteur Ernst Baumann, Langenthal

(Extrait)

Le sens de l'éducation physique. Tu es citoyen suisse. Tu dois veiller dans la mesure de tes forces à ta santé morale et physique, dont dépend le travail productif de ton esprit et de ton corps. Tu conserveras ainsi dans toutes les circonstances de la vie ta liberté et ton indépendance.

Le sport procure la joie de vivre. Si tu ne te rends pas avec joie à l'entraînement, à la compétition sportive à laquelle tu prends part, si tu ne t'y sens pas pleinement à l'aise, c'est que ton état laisse à désirer. La jeunesse aime à dépenser ses forces jusqu'à la limite de ses possibilités. Apprends, tout en jouant avec tes camarades, la technique nécessaire à l'exercice de ton sport favori. Jouis de la vie!

Façon de vivre et de jouir de la vie. Un travail productif, tant physique, qu'intellectuel, dépend d'un organisme sain, fonctionnant normalement. Quiconque nuit à son organisme par une vie déraisonnable, en se surmenant, en usant de stupéfiants, en négligeant les soins et précautions nécessaires en cas de maladie, paie inévitablement ses erreurs par une usure prématurée. Les plaisirs de l'existence ne sont nullement interdits au sportif. —

Boisson et nourriture. D'une manière générale, règle-toi d'après tes besoins et ton appétit. Pendant les périodes d'entraînement intensif et au moment des compétitions, l'organisme demande une nourriture particulièrement solide et abondante. Une nourriture trop riche est cependant dangereuse pour l'estomac et l'appareil digestif. Ne bois pas pendant les repas. Calme plutôt ta soif en buvant entre les repas. Les fruits frais et les légumes frais, le beurre, sont d'importants facteurs de l'alimentation quotidienne. La nourriture végétarienne convient très bien aux coureurs de fond. Les sportifs pratiquant les sports de combat et les sports combinés ont besoin de viande. Le besoin naturel de sucre doit être satisfait par l'absorption de fruits, parce que ceux-ci contiennent des substances indispensables, inexistantes dans le sucre fabriqué. Le muscle. La musculature est intensément mise à contribution par la culture physique. Le muscle n'a qu'une action: il se contracte par l'excitation des nerfs; dès que cette excitation prend fin, il redevient flasque et se laisse facilement commander à nouveau. La contraction et le relâchement bien dosés donnent un jeu parfait, qui constitue la base de tout exercice physique justement exécuté. Aussi, le relâchement des muscles doit-il être étudié aussi soigneusement que leurs mouvements. Le muscle relâché acquiert à nouveau l'endurance nécessaire; c'est au repos seulement qu'il est alimenté à nouveau en sang neuf.

La réussite d'un exercice dépend d'un juste dosage. L'effort doit être suffisant, faute de quoi il ne sert à rien. La durée et l'intensité de l'effort doivent être accrues peu à peu et ne pas dépasser un certain maximum, sinon les tissus risquent d'en souffrir. D'où les troubles connus pouvant être provoqués par la pratique des sports. Tu feras donc bien d'écouter les conseils de ton maître et de ton médecin.

De petits exercices de souplesse par un temps frais détendent les muscles. Pense à cela, si tu veux éviter des déchirures musculaires par suite d'efforts violents.