

Designing a Training Facility and Risk Management

トレーニング施設の企画とリスクマネジメント

KUSUMOTO, Kinji

Department of Physical Education

Faculty of Physical Education

楠本 欣司

体育学部体育学科

NISHIGUCHI, Satoshi

Department of Physical Education

Faculty of Physical Education

西口 聡

体育学部体育学科

OGASAWARA, Masaru

Department of Physical Education

Faculty of Physical Education

小笠原 正

体育学部体育学科

KADO, Hiroshi

Department of Physical Education

Faculty of Physical Education

嘉戸 洋

体育学部体育学科

IIDE, Kazuhide

Department of Physical Education

Faculty of Physical Education

飯出 一秀

体育学部体育学科

HASHIMOTO, Hideya

Professional Trainers Team Co Ltd.

橋本 英哉

プロフェッショナルトレーナーズチーム

要旨：2009年、IPU・環太平洋大学に新しく体育関連施設が完成した。その施設内には柔道場、剣道場、パフォーマンスホール、そしてトレーニングセンターが含まれている。トレーニングセンターは総面積850平米で、1階部分と2階部分で構成されており、トレーニング器具や使用目的で6つのエリア分けをしている。本文では特にこのトレーニングセンターの施設および設置器具について紹介する。加えてトレーニング施設を安全に運営するために危機管理面においても言及している。

Keywords：facility design, layout, administration

Introduction

International Pacific University (IPU) was founded with a purpose of providing theoretical and practical integrated education system in 2007. IPU has approximately 1300 undergraduate students, and over 80% of the entire students belong to IPU athletics at this time.

IPU established a sports complex facility in September 2009. The sports facility was named "TOPGUN" by Tadao Ando who is a world-famous architect and the designer of this facility. The building is unique as a sports related facility because the appearance of the building seems a "gate" (Figure

1). This facility consists of two buildings across the road. The facility includes Judo hall, Kendo hall, Performance hall, and training center. The training center is located in the east side of the building. In this article, we introduce features of the training center. We discuss its training administration and risk management as well.

Facility Layout

The building was already determined a location and general features by the architect who is previously mentioned. Our primal tasks were to select training equipments/machines and to



Figure 1. IPU sports complex facility, "TOPGUN".

determine a training machine layout (Figure 2, 3). The entire training room is about 850m^2 , and it consists of first and second floor parts. Followings are the details:

First floor

The first floor is mainly designed for strength trainings. The area is approximately 600m^2 , and there are 50 types of machines placed. This floor is divided into four training areas by considering types of training equipments: Olympic lifting area, free weight training area, machine training area, and functional training area.

At the Olympic lifting area, we placed 14 multi combo power racks (Figure 4). The power rack is widely known for athletes to enable to perform from basic exercise to advance training. We selected a combo rack that joined two half racks together because it is convenience when a large number of athletic groups come and exercise at once. In this area, there are five climbing ropes hanging from the ceiling and its length is 8m. There are safety

mats under the ropes so that athletes can avoid an accident by the fall. We hang a safety net system for medicine ball throw training as well.

At the free weight training area, we placed different weights of dumbbells and weight fixed barbells (Figure 5). We selected to use a rubber material for this floor to absorb any shocks by dropping heavy dumbbells or barbells. Large mirrors were placed 40cm above from the floor as NSCA guideline recommended. Here is the only place where athletes can check their exercise forms using the mirrors. This area is not enough space for training numerous athletes so that they have to be careful their distance each other.

At the machine training area, we placed traditional resistance training machines such as leg press, shoulder press, and etc (Figure 6). Machine training is generally safe comparing to free weight training. This area is designed for athletes who are untrained or who have inexperienced training skills. It is available for injured athletes who require athletic rehabilitation at this area as well.

At the functional training area, we placed six cable

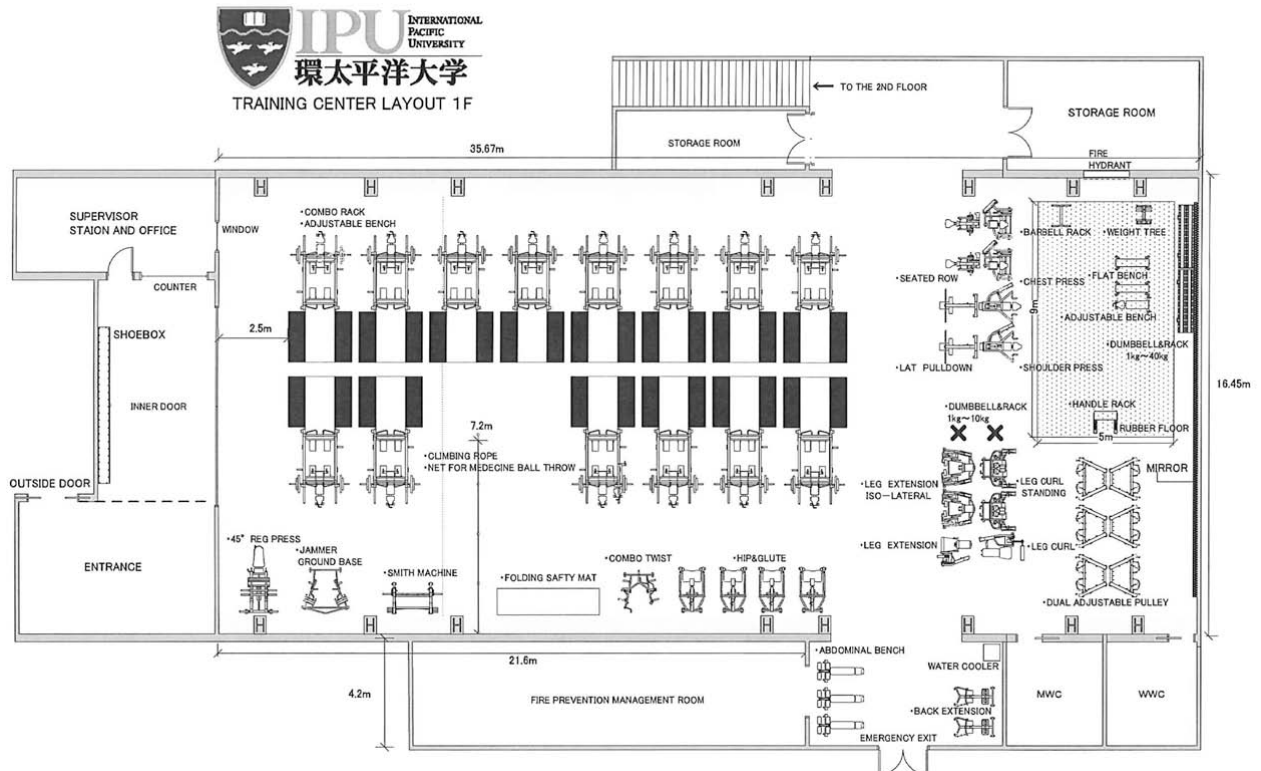


Figure 2. The layout of the first floor.

system machines (Figure 6). Cable machine training enables to train the whole body parts such as upper limbs, lower limbs, and trunk by adjusting cable length and its grips. The cable machine modifies individuals' training positions from standing to sitting for their training purposes. It is available for them to exercise at different movements such as isolateral and unilateral positions as well.

Here are the features of the first floor:

Heavy-duty equipments

- 14 multi combo power racks with platforms & adjustable benches.
- 1 linear leg press.
- 1 ground-base chest press.
- 1 ground-base core twist.
- 1 smith machine.
- 4 hip/glute machines.
- 1 leg press & 2 isolateral leg presses.
- 1 leg curl & 2 isolateral kneeling leg curls.
- 2 chest presses.
- 2 shoulder presses.
- 2 lat pulldowns.

- 2 seated rows.
- 6 dual cable motion machines.
- 2 back extensions.
- 3 decline/abdominal benches.

Additional traditional/nontraditional equipment includes:

- 74 sets of weight plates of 2.5 & 5.0 kg.
- 90 sets of weight plates of 10, 15, & 20 kg.
- 2 sets of rubber dumbbells from 1-10 kg and 12-30 kg.
- 1 set of rubber fixed barbell from 10-45 kg.
- 2 flat benches & 1 adjustable bench.
- 14 barbells.
- 2 half barbells.
- 2 EZ bars.
- 1 hexagon dead lift bar.
- 5 climbing ropes (length: 8 m).
- 1 safety net for medicine ball throw (W×D: 5 m×8 m).
- 2 safety mats (W×D×H: 2 m×4 m×50 cm).

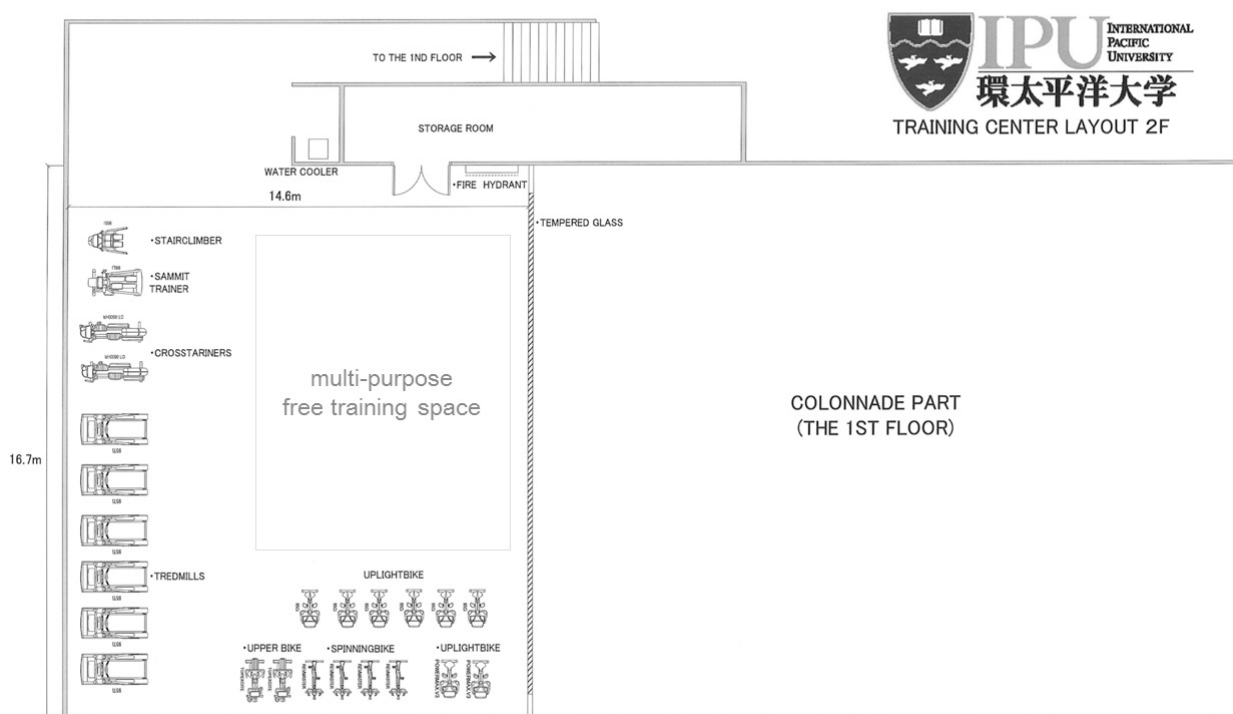


Figure 3. The layout of the second floor.

Second floor

The second floor is designed for aerobic and conditioning trainings. The area is approximately 250m². This floor is divided into two training areas: aerobic training area and conditioning area.

At the aerobic training area, we selected eight different types of the latest aerobic machines (Figure 7). We placed enough twenty-four aerobic machines to reduce waiting time and to increase exercise time as much as possible. Most aerobic machines generate electrical power from exchanging individuals' exercise movements to control those machines. Although many aerobic training machines are stationary bikes, there are a couple of upper-body ergometers for injured athletes.

At the conditioning area, a variety of athletic groups or individuals enable to perform multi-purpose trainings (Figure 8, 9). For example, athletes can exercise with using swiss ball, rudder, form roller, and other training materials for developing agility, power, flexibility, etc. Athletes usually do warm-up and cool-down at this area. In addition, this

place can utilize to use practical class courses for educational purposes. Depending on courses, this area can accommodate up to fifty students.

Here are the features of the second floor:

Aerobics equipments

- 6 treadmills.
- 8 upright bikes
- 2 upper-body exercise machines
- 2 elliptical cross-trainers.
- 1 summit trainer.
- 1 stair climber.
- 4 spinning bikes.

Additional traditional equipment includes:

- 10 form rollers.
- 10 stretch mats.
- 4 agility ladders.
- 4 BOSU balances.
- 3 sets of medicine balls from 1-6 kg.
- 1 mini rebounder
- 2 sets of plyo-boxes of 30, 45, and 60 cm.
- 6 swiss balls



Figure 4. Olympic lifting area.

Figure 5. Free weight training area.

Figure 6. Machine training and functional training area.

- 3 gymstics.
- 1 portable massage table.

Additional testing equipment includes:

- 2 vertecs.
- 2 myotest.
- 5 heart rate monitors.
- 10 pedometers.
- 1 body composition scale.
- 1 reach flexible tester.
- 1 hand dynamometer.
- 1 Back - Leg - Chest dynamometer.
- 1 interval timer.
- 1 yo-yo test CD.

Additional Features Supervision office

A supervision office is located by an entrance of the training center. Three training staffs administrate the entire training facility. All staffs

have a personal computer with internet connection and a telephone on their desks. Staffs can control all air temperature, ventilation, and lighting system in this office. Staffs can control an audio system in this office as well. Two surveillance cameras are placed in the center for the purpose of security. Of course, the training staffs check a monitor in this office. We developed an original administration system that consists of a laptop with an external touchpad and a bar code reader (Figure 10). This device works with student identification cards utilizing Microsoft "Access" software. It enables paperless and minimum statistical data management. A running cost using this original system is obviously cheaper than using other company-developed administration systems as we estimated.

Flooring

We selected to use "Taraflex" that made of polyvinyl chloride resilience sports floor material on

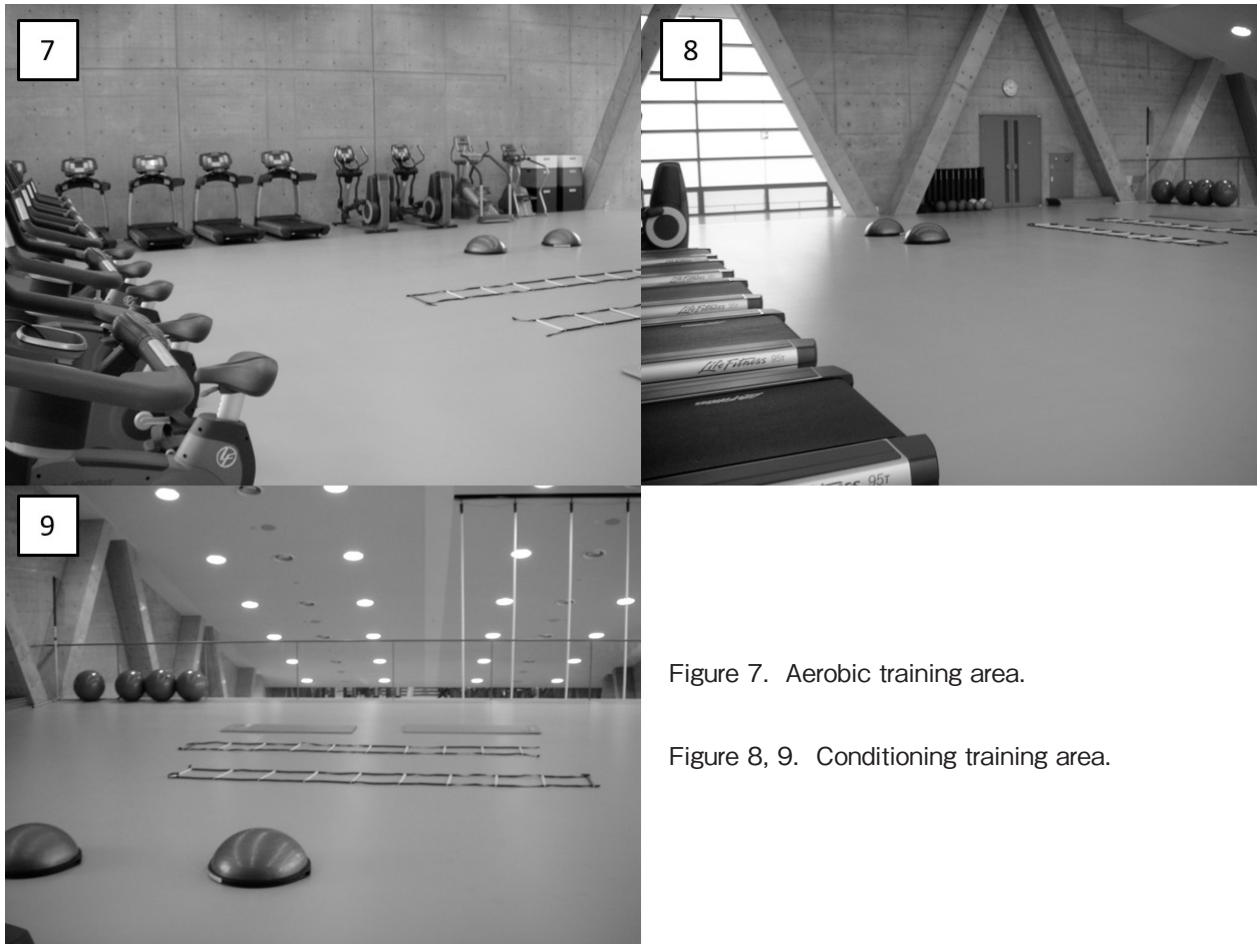


Figure 7. Aerobic training area.

Figure 8, 9. Conditioning training area.

the entire floors. This material reduces slip speed by the perspiration and prevents corrosion with the training machine materials. In addition, it is easy to clean up on the floor.

We only selected to use "Duraflex" that made of another rubber material on the free weight training area. This material is an abrasion quality and weatherproof good babul. This material has an advantageous effect to protect the floor from dropping dumbbells and barbells.

Valuables boxes

Eighty valuable boxes are located near by the supervision office. Although a box is small, it can secure their wallets, keys, cell phones, and other personal items. We selected to use automatic keyless conversion boxes so that athletes do not need to carry a key with them or not to worry to lose it.

Outer and inner doors

The training room has outer and inner doors. The doors are made of glass and they are automatic. We selected to use slide-type double doors instead of opening/shutting-type door to prevent possible collisions. Such double doors system keeps the room temperature and humidity as comfortable as possible.

Restroom

Both male and female restrooms are designed barrier-free. We considered that injured athletes could use the place without difficulty. We selected a sensor expression auto perception lighting system not to forget to put it out. We placed a hand-drying machine (a jet towel) in both restrooms as well. Moreover, there is an urgent button in case of an emergency.

Drinking water cooler

There are drinking water cooler machines placed at the each floor. The main reason is to minimize PET bottles as forgotten trash. In addition, we made a rule that the training center is prohibited in eating because of hygiene issue.

Locker and Storage Room

Two locker rooms are located in the first floor, and one storage room is located in the second floor. The storage room is always locked for security. No valuable lockers are placed because of the room size. No shower rooms are placed in the training room, but there are shower rooms in the other side of the building.

Risk management

Training may become a high-risk activity by inappropriate facility administrations and machine operations. We maintain the followings to reduce or minimize any risks: 1) facility orientation; we explain a facility policy and all machine operations when athletes come to use the training center for the first time, 2) clothes and shoes; athletes are required to wear appropriate clothes and shoes to exercise. No shoes are prohibited to use, 3) machine maintenance; we clean the facility everyday at the end of a day. We educate athletes to use sterilize alcohol to clean training machines and equipments every after they use, 4) first aid; we have a first-aid kit always ready in the supervision office. Although an ice machine and AED are located in the other side of the building, it is easy access to bring. Other risk managements basically refer to the NSCA guideline.

Conclusion

This article introduced features of a newly established training

center at International Pacific University (IPU). The entire IPU training center is 850m² areas, and it is divided six training area by considering types of training equipments and training purposes. This article discussed the facility administration as well as risk management. Finally, we were honored to be involved in the overall process from the planning to the administrating of the training facility.

References

1. Greenwood, M. Facility layout and scheduling. In: *Essentials of Strength and Conditioning*. Earle, RW. and Baechle, TR. Earle, eds. Champaign, IL: Human Kinetics, 2nd ed. 2000. pp549-566.
2. Greenwood, M and Greenwood, L. Facility maintenance and risk management. In: *Essentials of Strength and Conditioning*. Earle, RW. and Baechle, TR, eds. Champaign, IL: Human Kinetics, 2nd ed. 2000. pp587-601.
3. Hendrick, A. Designing a Strength and Conditioning Facility at the United States Air Force Academy. *Strength Cond J*. 2005; 27(3): 64-68.
4. Kusumoto, K. Risk management of training and conditioning. In: *Risk Management in Sport*. Ogasawara, M. and Suwa, N., eds. Tokyo, Japan. Gyousei. 2009. pp322-325. (In Japanese)

(平成22年11月19日受理)



Figure 10. IPU original administration system