

# 2024 GLS Multi-media Filter System



**FULLVISION CO., LTD**

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# Company Introduction

FULLVISION Co., Ltd. was established in 2005 in China, specializing in two key areas: water treatment technology and pool engineering construction. Over the past two decades, we have grown to become a leading enterprise in China's high-precision pool filtration industry and have contributed to the development of industry standards for swimming pool filters.

As a company with independent intellectual property and patented technologies, we operate a modern manufacturing facility dedicated to the research and development of water treatment equipment. Every year, we provide nearly 100 clients with integrated water treatment solutions, including design, production, installation, and operational maintenance.

Our proprietary "GLS Multi-media Filter System," which uses diatomaceous earth or perlite as the filter medium, offers a filtration precision of 1 micron and achieves a water turbidity level of 0.5 FTU, delivering outstanding filtration performance. The system features fully automated operation and an online remote control system, requiring no on-site personnel, making it one of the most advanced water treatment technologies available today.





FULLVISION

## Debin Li

Lifetime promoter of China's swimming industry

Leader of the Innovative Research Group for the Swimming Industry at the  
Chinese Academy of Management Sciences

Chairman of FULLVISION Co., Ltd

Academic Committee Member of Enterprise Innovation Research Institute, Chinese  
Academy of Management Sciences

Industry standard contributor for "Pressure Filters"

Executive Director of China Engineering Construction Standardization  
Association

Representative works: Automatic Multi-media Filter system



# System introduction

The GLS Multi-media filter system is the 5th generation product of the Fullvision family Multi-media Filter machine, which continues high-precision filtration of 1 micron, 0.5NTU filtration water turbidity, no need on-site personnel. Increased effective filtration area after upgrade, extend the service life, and Completely solve the problem of filter element compaction.



1. Fully intelligent control system: including temperature display, pH, OPR detection and other functions
2. Filtering capacity: From 10m<sup>3</sup>/h to 800m<sup>3</sup>/h for a single machine, it can operate with two pumps
3. The backwash time is 30 seconds, making the unit smaller and more energy-efficient
4. The core components are made of 316L stainless steel, which has a longer service life
5. Suitable for water parks, swimming pools, hot springs, water plants, sewage treatment, etc.

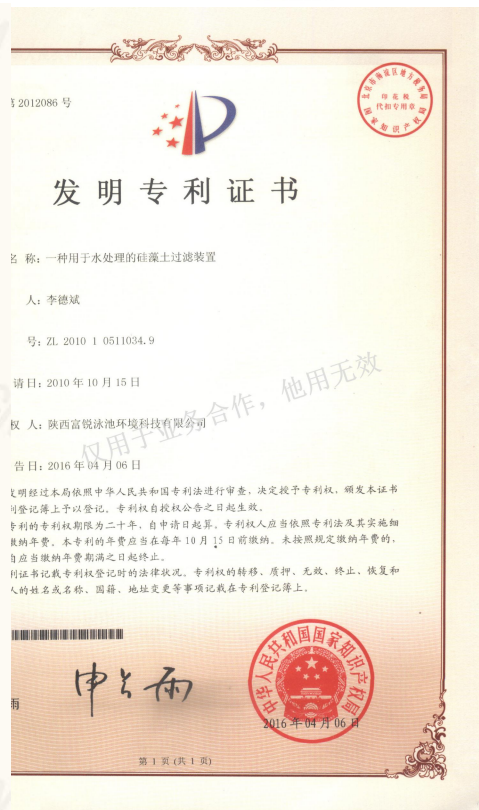


# System Patent

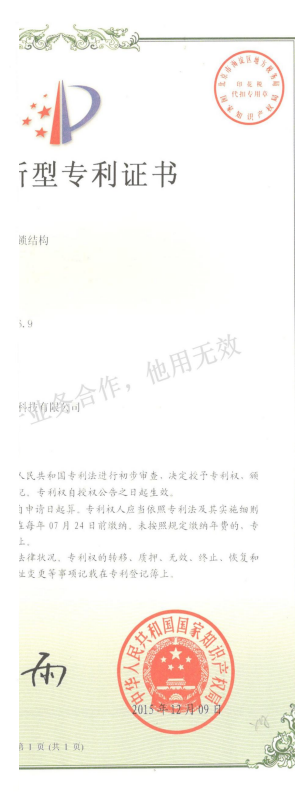
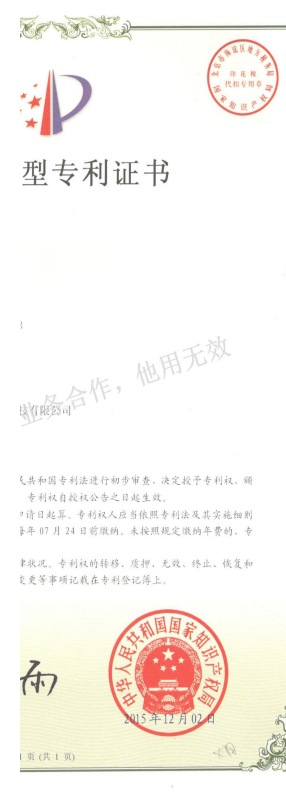
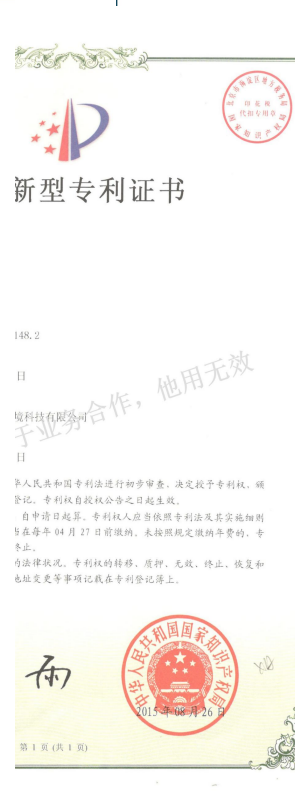
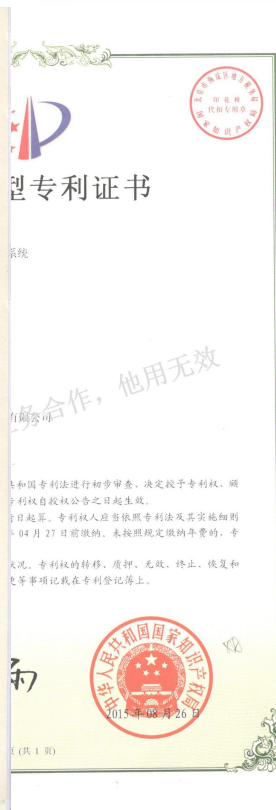
The GLS type Multi-media filter System is an upgraded of the PF type filtration unit. Combining more than 10 patented core technologies and 2 independent invention patents, the newly upgraded GLS Perlite filtration system has rapidly improved on the path of modular, intelligent, and interconnected high-end products, providing customers with a perfect and useful life experience.



Patent for invention



Utility Model Patent Certificate


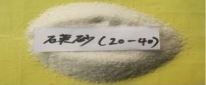


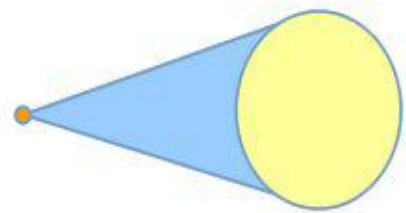
# What Is Diatomaceous Earth ( D.E.)

DE is a type of siliceous rock mainly composed of the remains of ancient diatoms, and is a biogenic siliceous sedimentary rock.

The chemical composition of D.E. is mainly silicon dioxide (SiO<sub>2</sub>), with low density and high porosity. It has good adsorption and permeability, and strong water absorption capacity.

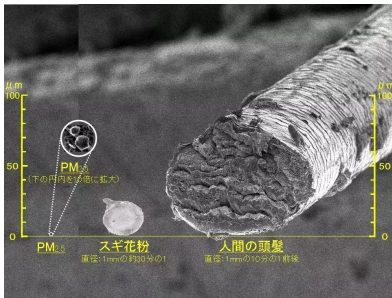
## Comparison of Sand and D.E. as Filter Media

Item	D.E.	Sand
Picture		
size	10microns	0.4~0.6m
Appearance	High porosity to high specific surface area	Composed of the edges and corners of particles
Filtering method	Mechanical screening+adsorption filtration	Osmotic pressure filtration
Filtration	1microns	30~40microns
turbidity	0.5 NTU	5NTU
filter layer	Filter layer thickness 2mm, non reusable	Filter layer thickness: 800~1100mm, reusable
Filter effects	Filtering accuracy of 1-2 microns, capable of filtering Escherichia coli and protozoan worms	Filter particles from 15 microns to 30 microns, and particles below 15 microns

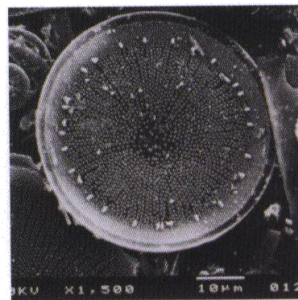


D.E. Sand

Comparison chart of particle size



Diameter of hair strands (20 microns)



D.E.: 10 microns=1/2 of a hair strand

# Visual comparison of filtering effect

The water is cloudy



before filtration



The water is clear and clean after filtration



after filtration



Unfiltered cloudy liquid

After Filtration



Diatomaceous  
earth filter

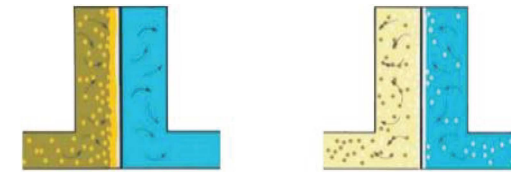
sand filter

# Principle of diatomite filtration technology

1. The equipment uses diatomite as filter aid, and the diatomite is coated on the filter element of the filter by the way of pre-coating
2. 2mm thick diatomite filter membrane is formed, and the membrane filtration/backwash automatic conversion is completed through the unique automatic five-way valve structure;
3. Bidirectional filtration for filter element and filter layer;
4. Achieve a unique bidirectional backwash cleaning effect.

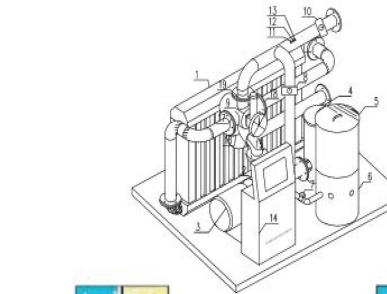
## ① *Filter process*

Raw water passes through the filter medium from left to right, accumulating dirt on the filter medium and reducing the flow rate



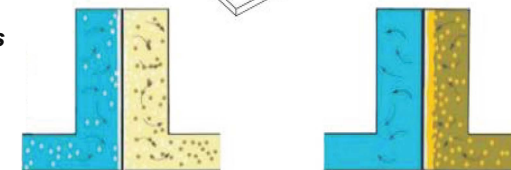
## ② *backwashing process*

During the Backwashing process, wash away the accumulated material and filter media on the left side, and form a filter membrane on the right side



## ④ *backwashing process*

Filtration from the other side.



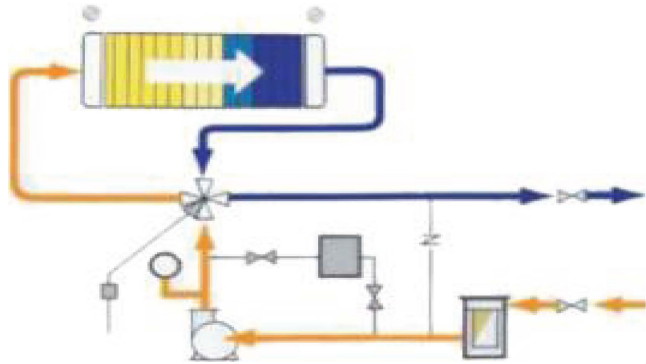
## ③ *filter process*

Filtration from the other side.

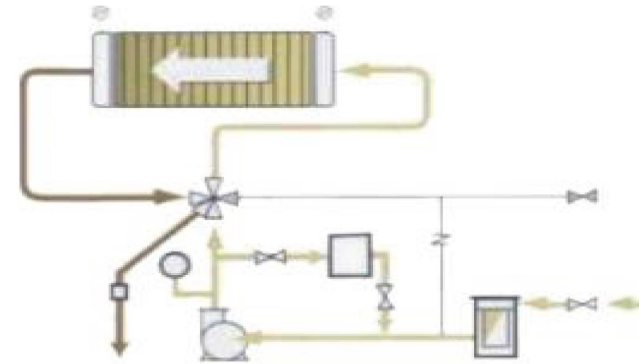


# Diatomite filter process diagram

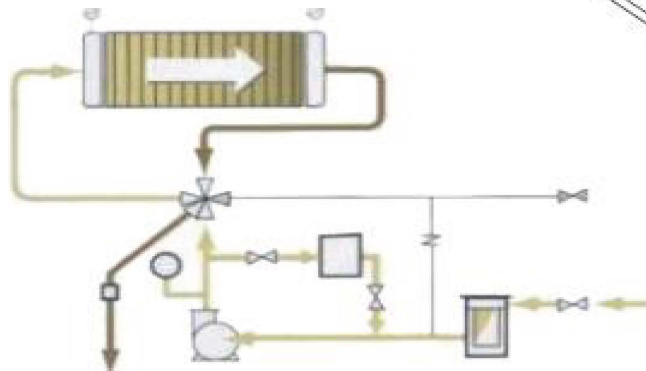
① Filtration process



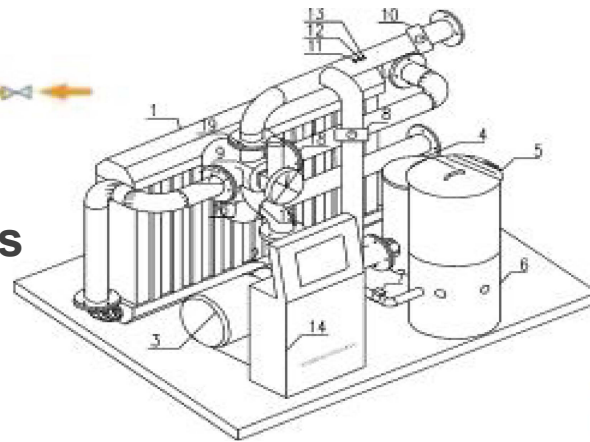
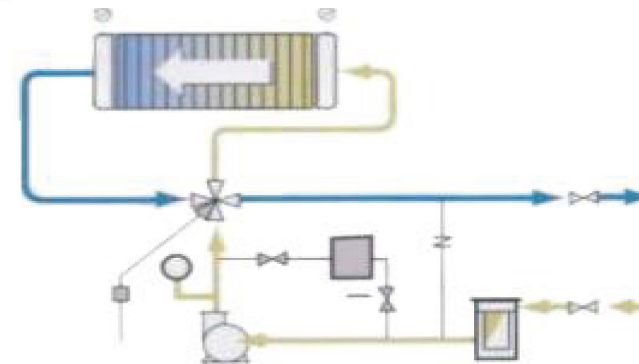
② backwashing process



④ backwashing process



③ Filtration process



# Comparison between sand cylinder and diatomaceous earth module machine room

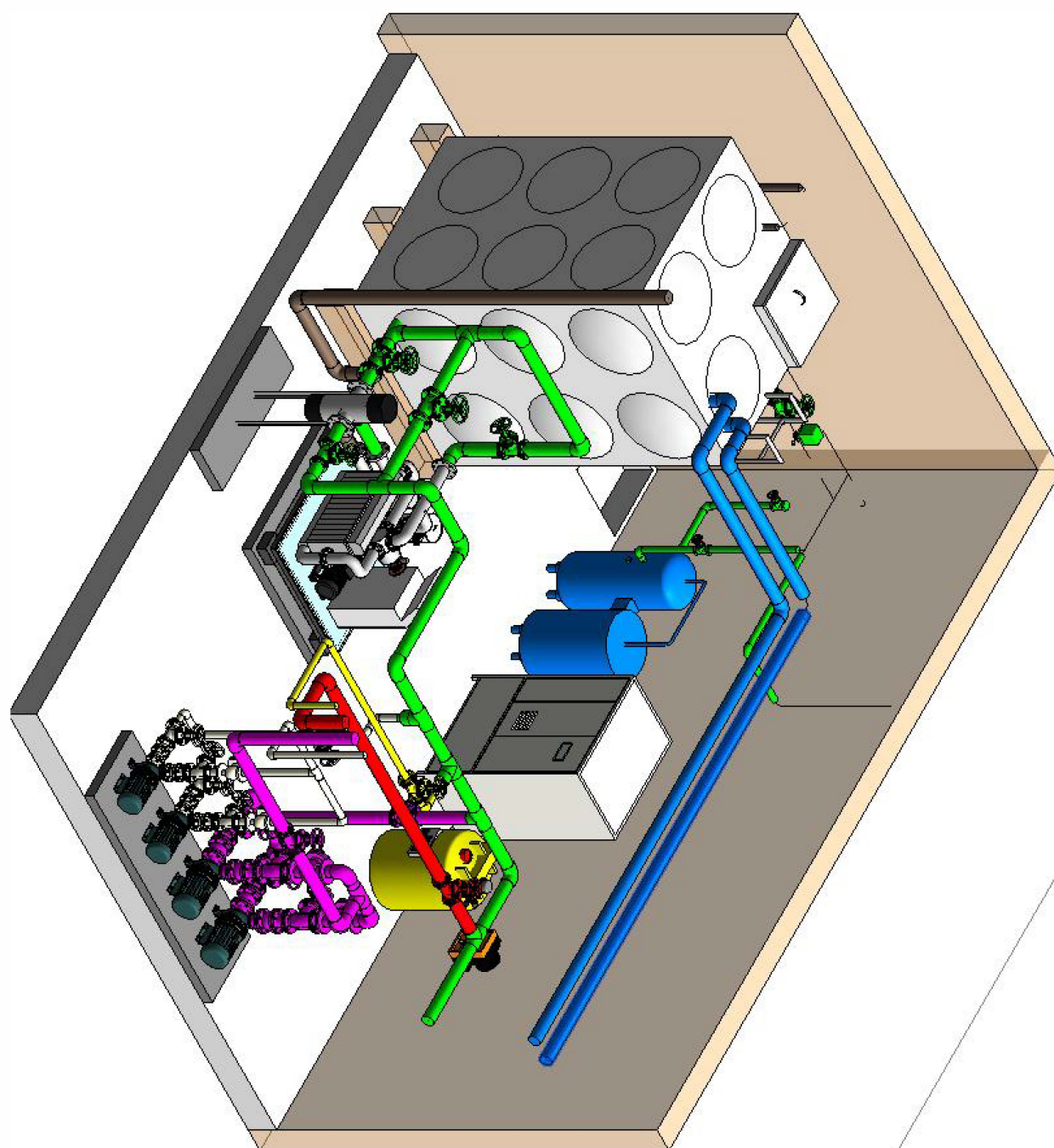
		diatomaceous earth intelligent integrated computer room module	Traditional sand filtration+ozone system+constant temperature+shower+dehumidification
Comparison of core equipment	Comparison of filtering equipment	Adopting GLS100-210AT; Fully automatic control, filtration accuracy of 1 micron, system effluent turbidity of 0.5 NTU; Filtering speed of 6-10m/h; The equipment covers an area of 5 square meters	Adopting sand tank, water pump hair collector, and control cabinet; The difficulty of self-control is high, and most of them are manually controlled. The filtration accuracy is 30 microns, and the effluent turbidity is 2 NTU. After full flow and half process ozone disinfection, the effluent turbidity is between 0.1 NTU and 1 NTU, and the filtration quality shows a decreasing trend year by year; Filtering speed of 25m/h; The sand tank ozone occupies a total area of 50 square meters;
	Sterilization configuration	Integrated medium pressure ultraviolet radiation, solving certain special bacteria, full flow and automatic	The system consists of one ozone generator, one negative pressure feeding device, one reaction tank, and two activated carbon adsorption tanks. The principle is that ozone reacts in the reaction tank for 1-3 minutes and dissolves naturally in water, with the highest ozone concentration in water being 0.6mg/L; Half life of 3-5 minutes; Due to the toxicity of ozone gas, use an activated carbon adsorption tank to reduce the ozone concentration to the minimum before leaving the computer room, and there should be no ozone gas in the swimming pool
	pipeline valve	Due to the limited number of pipelines, 304 stainless steel is used, with a special configuration of 316L stainless steel	The pipeline adopts UPVC and ordinary valves; The price of all stainless steel pipes is very high
System comparison	Pool water heat exchange unit	The heat source adopts an air source heat pump or boiler for the initial heating of the swimming pool, which is uniformly supplied to four heat demand units. It has a one to three function and can automatically compensate for heat, fully utilizing the power of the heat source configured for the initial heating; The heat medium adopts a closed cycle, and the air source heat pump provides energy consumption for the water pump in the elevation cycle caused by its installation on the rooftop. It provides heat exchangers for swimming pools, showers, dehumidification heat pumps, air auxiliary heaters, and underfloor heating collectors (if any); The heat recovery of dehumidifying heat pumps can be prioritized for heating between the pool water heat exchanger and the heat recovery heat source; Layered heating of shower hot water; The pool water can be filtered off and the independent heating function can be turned on;	Separate configuration and operation
	Heat source circulation unit		Separate configuration and operation
	Shower hot water unit		Separate configuration and operation
	Dehumidification cycle and winter air assisted heating		Separate configuration and operation

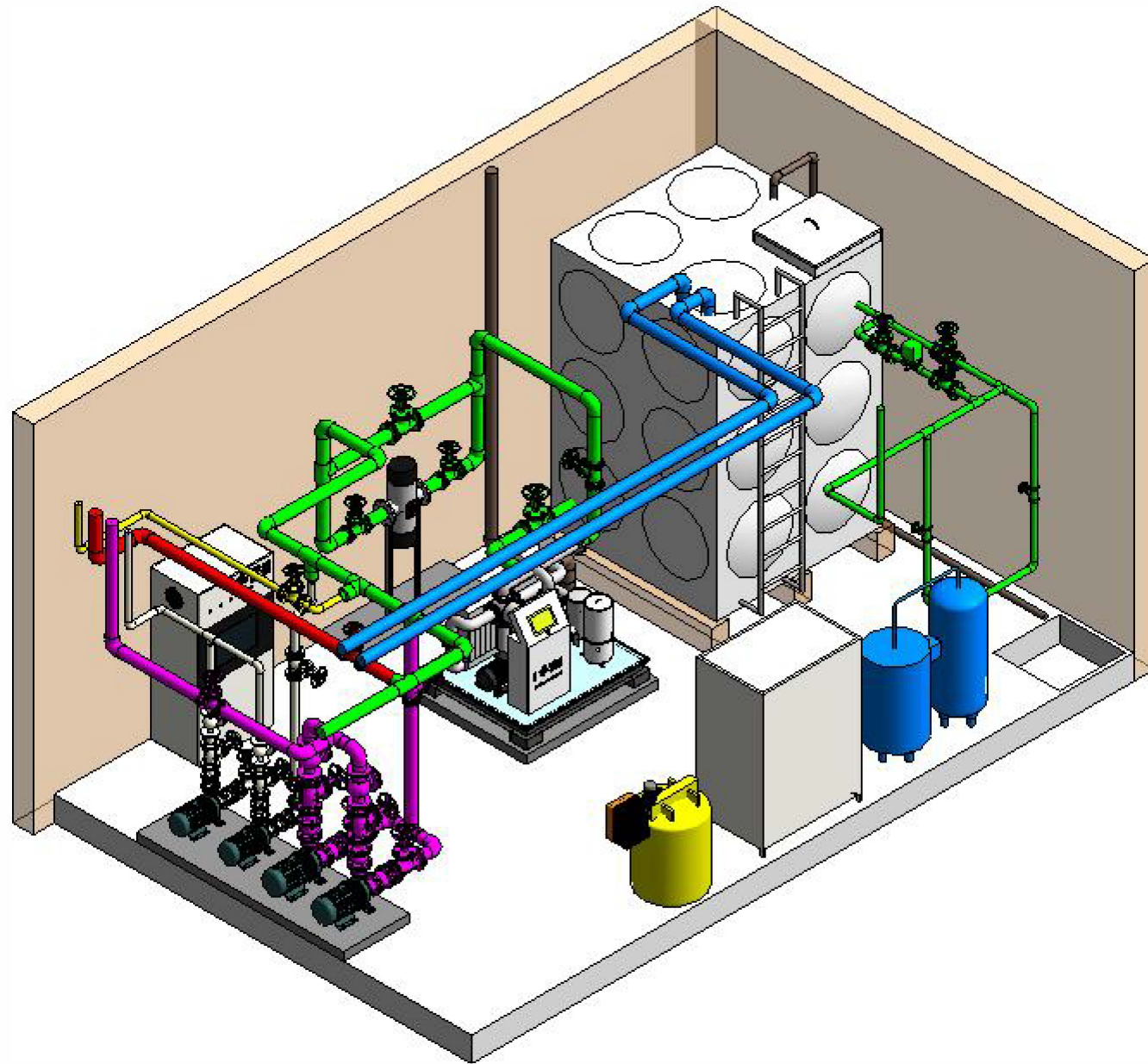


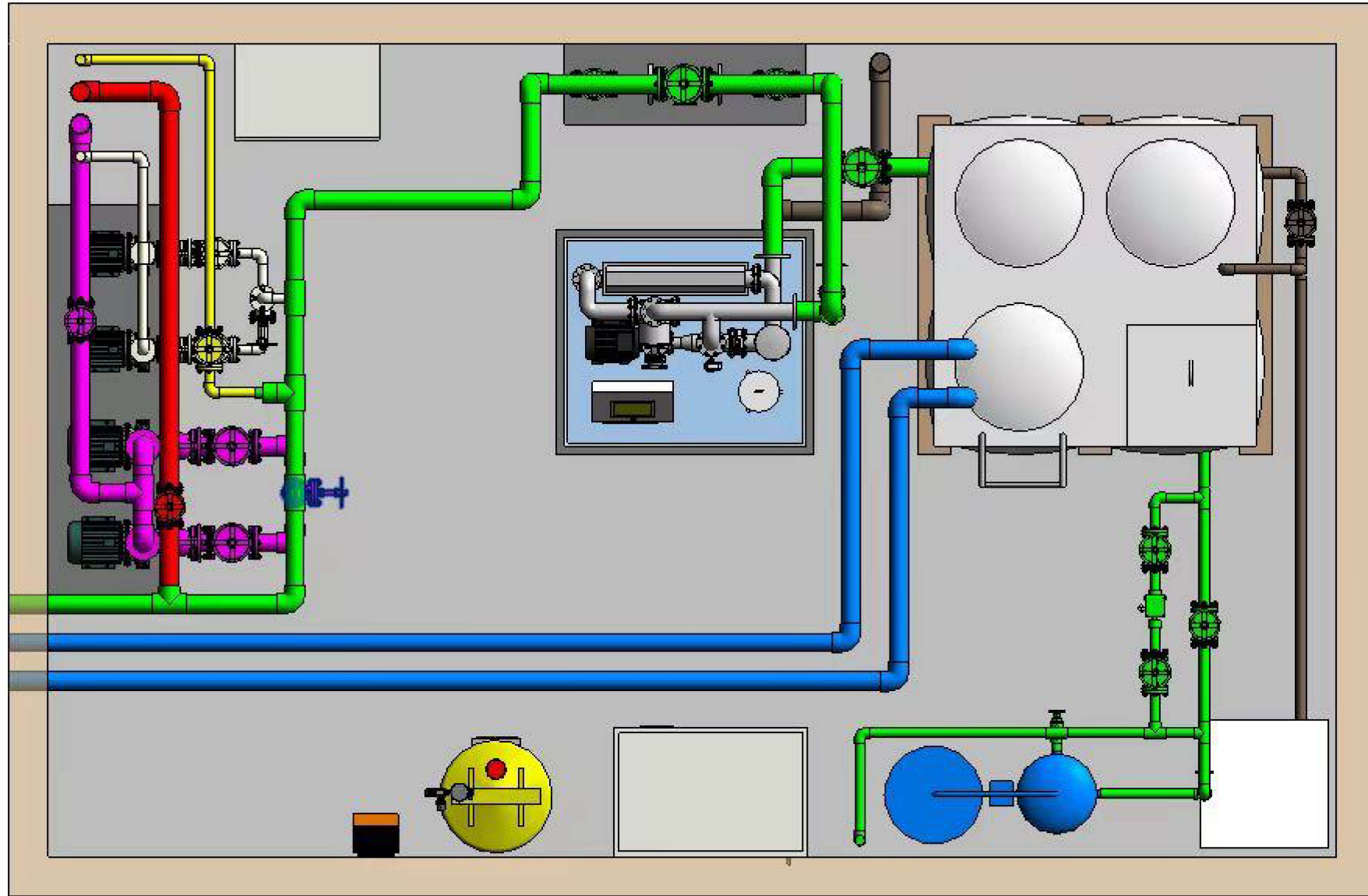
# Comparison of operating costs between D.E. system and sand filter

No.	expense category	D.E.filter	sand filter
1	electric charge	Due to the high precision of diatomaceous earth filtration, it can meet the water quality requirements in one cycle. (Excluding constant temperature heating cost) 15KW/hour x 2 x 4 hours x 360 days x 1 RMB/KW=43200 RMB	Due to the low precision of sand filtration water quality, the filtration time is correspondingly extended (excluding constant temperature heating costs) at 7.5KW/hour x 6 x 8 hours x 360 days x 1 RMB/KW=129600 RMB
2	water rate	(Calculated based on daily backwash consumption and 1.5% water taken away by the human body): 1125 x 1.5% x 360 days x 2.5 RMB/ton=15187 RMB	(Calculated based on daily backwash consumption and 5% water taken away by the human body): 1125 tons x 3% x 360 x 2.5 RMB/ton=30375 RMB
3	Drug operating costs	Diatomaceous earth swimming pool has high filtration accuracy, fewer types of drugs, and less dosage. (1) Disinfectant water is calculated at a rate of 0.3g/m <sup>3</sup> , with 2 doses per day: 1125m <sup>3</sup> x 0.3g/m <sup>3</sup> x 60 times per month x December x 0.023 RMB/g=5589 RMB (2) Acid base: calculated at a rate of 3g/m <sup>3</sup> per day, with a unit price of 0.002 RMB/g: 1125m <sup>3</sup> x 3g/m <sup>3</sup> x 0.002 RMB/g x 360 days=2430 RMB (3) Diatomaceous earth: The equipment is equipped with a filtration area of 33 square meters, with a filtration area of 0.2 kilograms per square meter every 2 days, calculated at 8 RMB/kg per kilogram: 33 square meters x 0.2kg x 360 days x 8 RMB/kg=1900 RMB	In addition to using chlorine agents for disinfection (bleach), traditional swimming pools also require the addition of luminum salts, acid and alkali. (1) Disinfectant water is calculated at 1g/m <sup>3</sup> , with 2 doses per day: 1125m <sup>3</sup> x 1g/m <sup>3</sup> x 60 times per month x December x 0.023 RMB/g=18630 RMB (2). Aluminum salt is calculated at 15g/m <sup>3</sup> per day, with a unit price of 0.0035 RMB/g: 1125m <sup>3</sup> x 15g/m <sup>3</sup> x 0.0035 RMB/g x 360 days=21262 RMB (3). Acid and alkali are calculated at 3g/m <sup>3</sup> per day, with a unit price of 0.002 RMB/g: 1125m <sup>3</sup> x 3g/m <sup>3</sup> x 0.002 RMB/g x 360 days=2430 RMB (4) Quartz sand is maintained once every 2 years and replaced by 1/2, with 9 tons per time, and the labor and material costs are calculated at 1800 RMB/ton: 1/4 x 9 x 1800=4050 RMB The sentence is:
	amount	9919RMB/year	46372RMB/year
	4		(1+2+3)=68306RMB

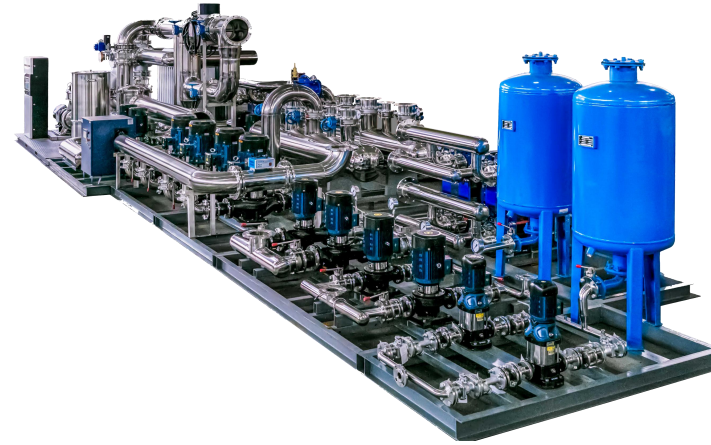
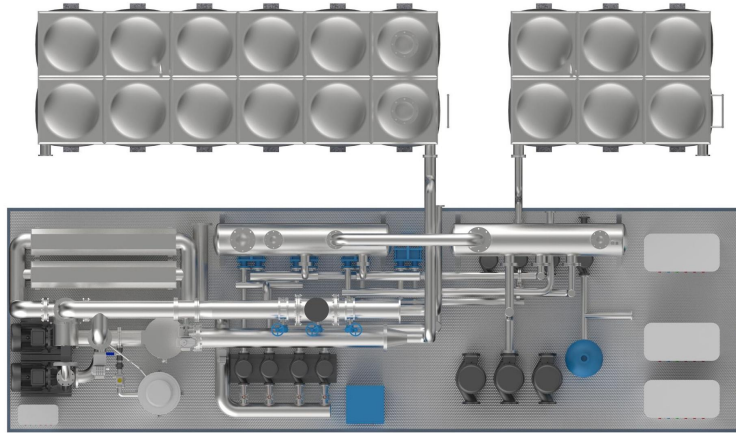
**The diatomaceous earth filter saves \$19,500 in annual operating costs compared to the sand cylinder filter**







# COMFILTER-PLEX intelligent water treatment system



## Engineering productization and modularization

The intelligent module of the overall computer room of a 2000 cubic meter standard swimming pool covers an area of 39.8 square meters

The module occupies 1/8 of the traditional (sand filtration+full flow ozone process) computer room area

Fully automatic stacked reversible diatomaceous earth filtration system

Medium voltage ultraviolet radiation

Dual molecule bubble ozone gas dissolution technology

Thermal automatic compensation system

Shared heat source primary side automatic closed-loop

Constant temperature automatic energy-saving priority heating technology

Filter off independent heating technology

Shower hot water layering technology

Filter frequency conversion control flow switching technology

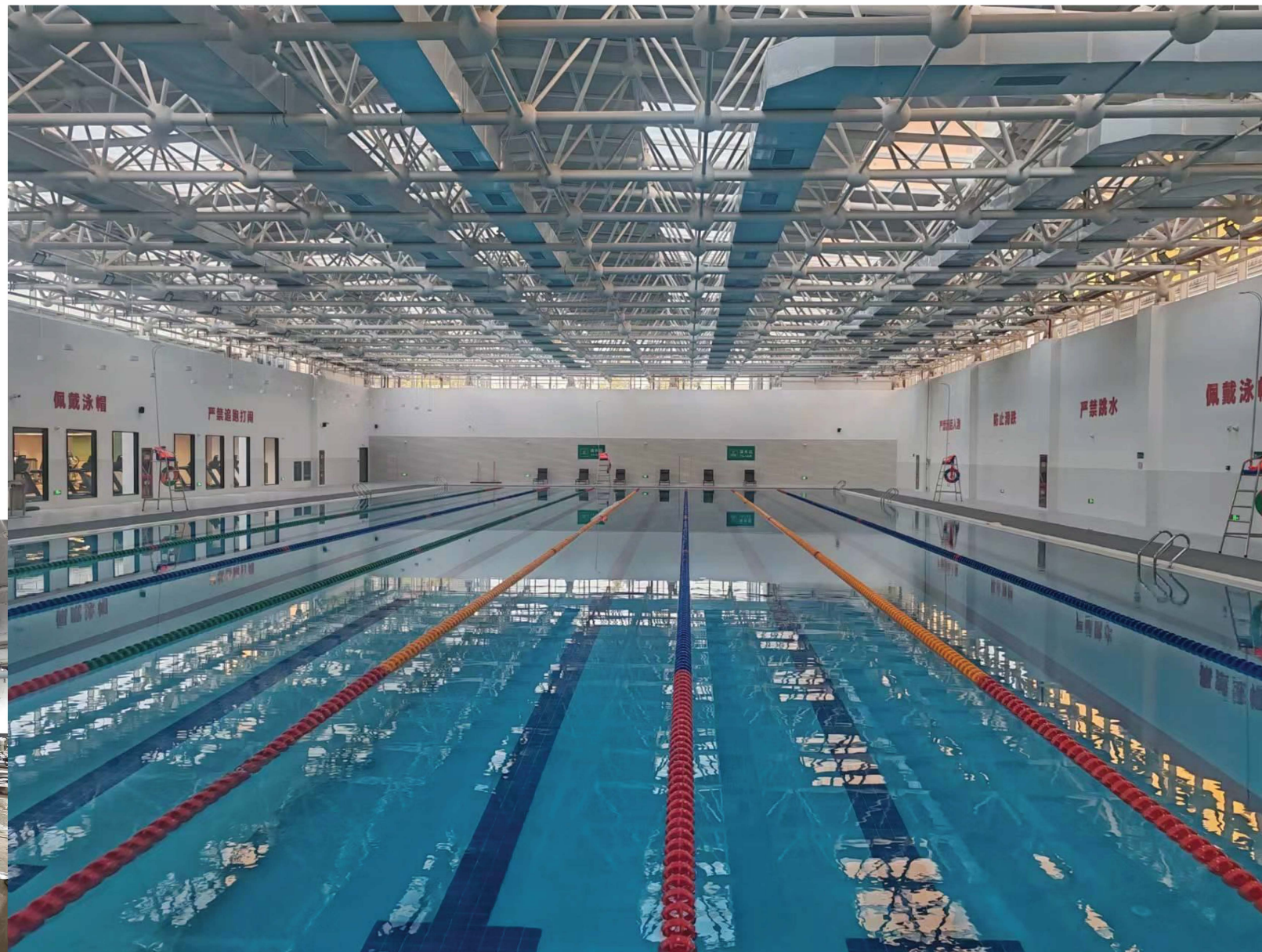
Remote monitoring services; Water quality services; Remote training; Equipment warning;

Dual cold and hot side triple integrated dehumidification heat pump achieves initial heating, constant temperature, and shower hot water heating

The COMPALTER-PLEX system is currently the unique swimming pool equipment room module in the field of water collection technology, with several single advanced technologies, comprehensive and systematic operation optimizations, both domestically and internationally; It has the characteristics of good water quality, small footprint, convenient installation, high efficiency and energy conservation, and economical operation;

It has advantages in fully automatic operation, systematic energy-saving, combined disinfection and safety, green health, 1-micron physical high-precision filtration, 5G technology remote measurement and control service early warning, functional adaptation and sharing, excellent materials, and exquisite manufacturing;

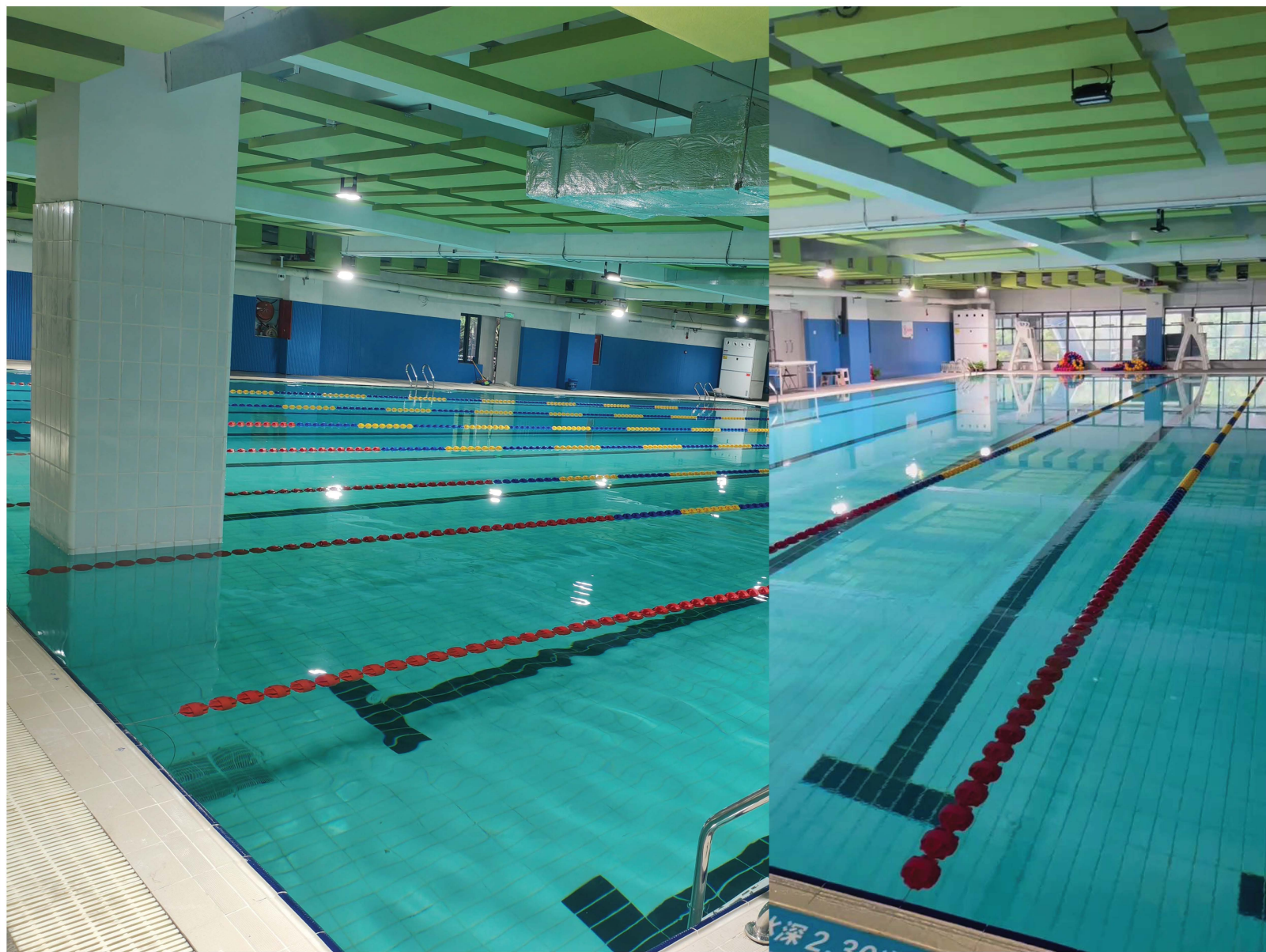
# Xianyang CEC Factory Swimming Center



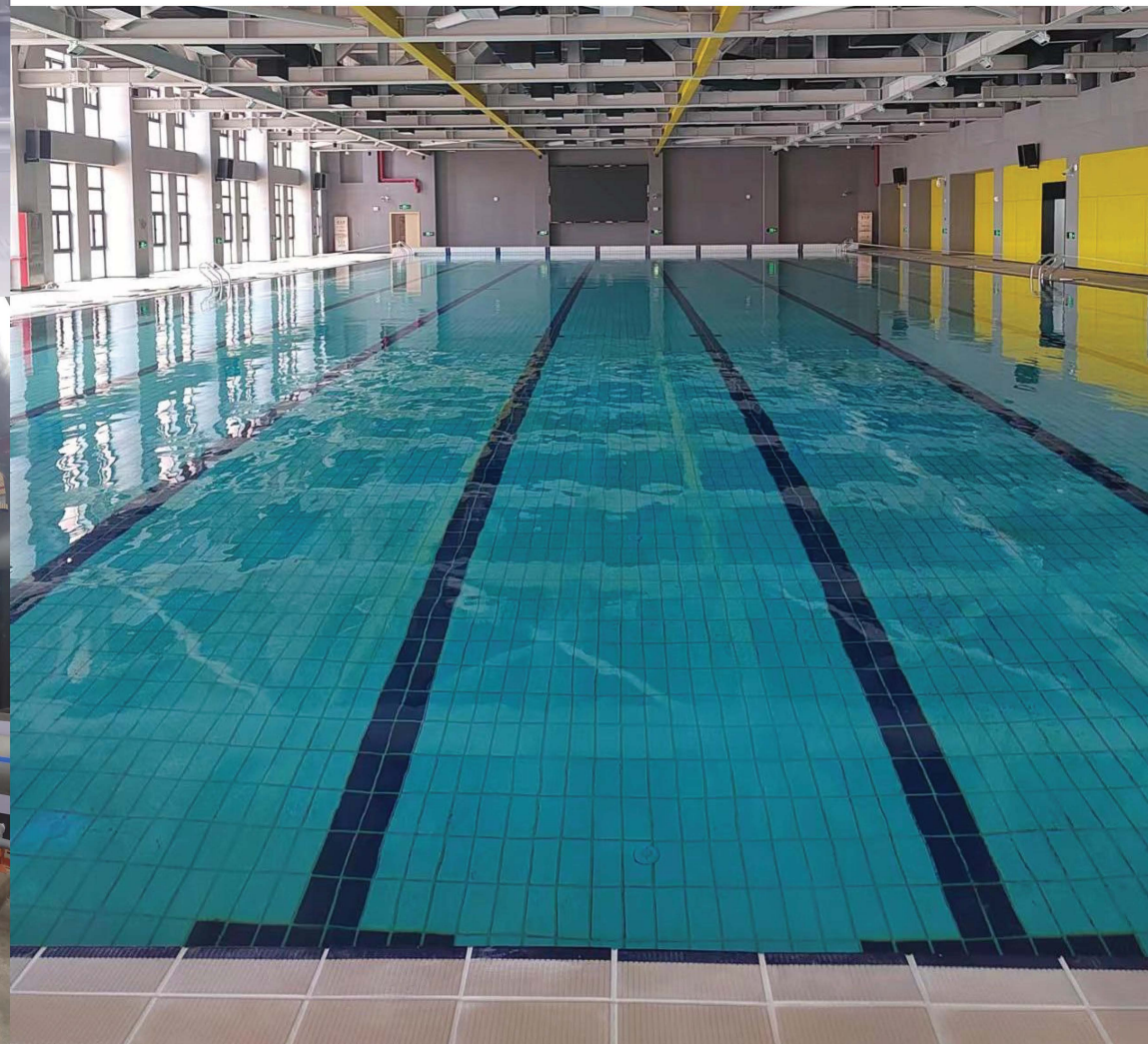




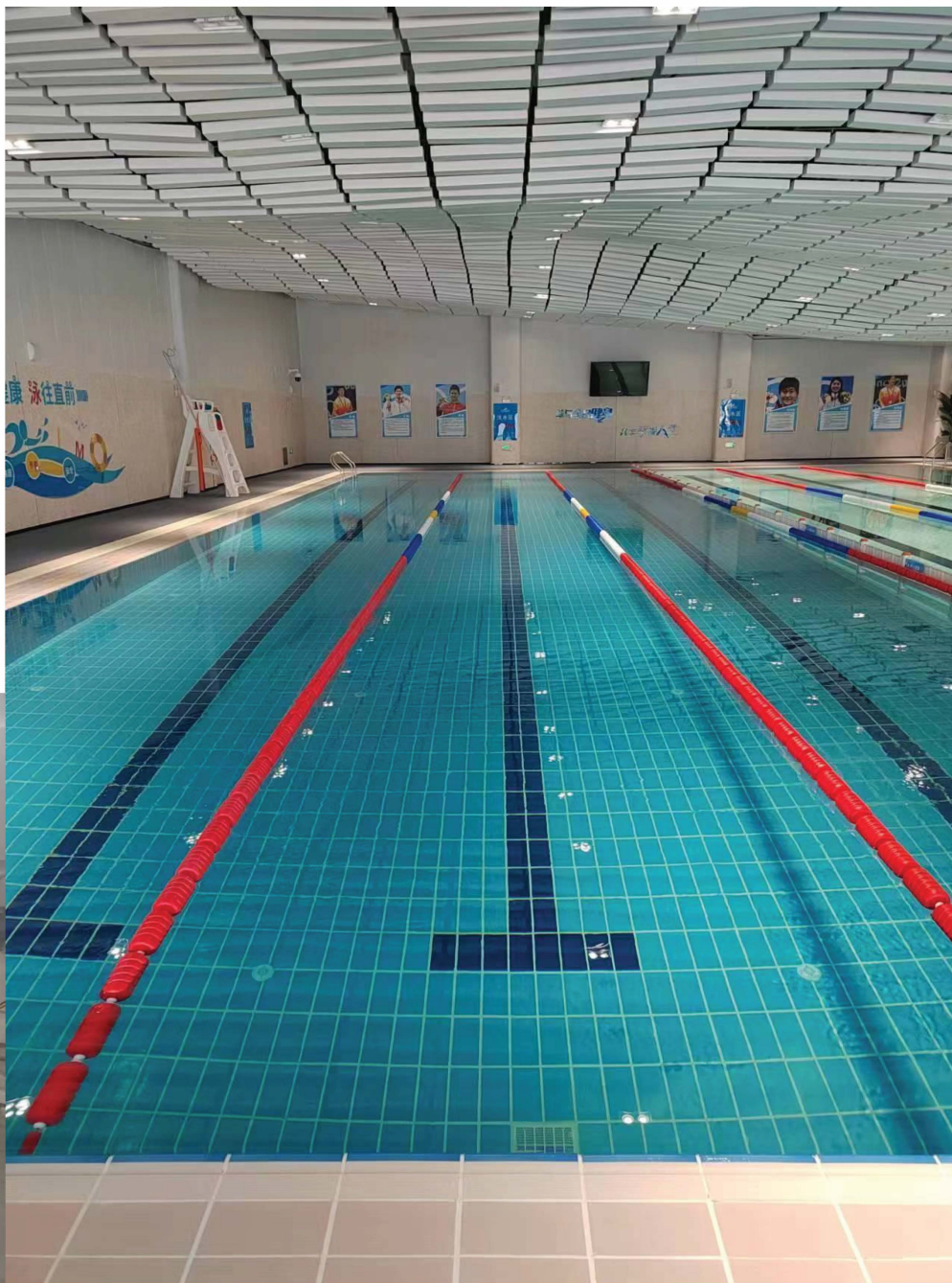
# Zigong Swimming Training Center



# Jinjiang Sports Center Swimming Pool



Fujian  
Datian  
Sports  
Center  
Swimming  
Pool





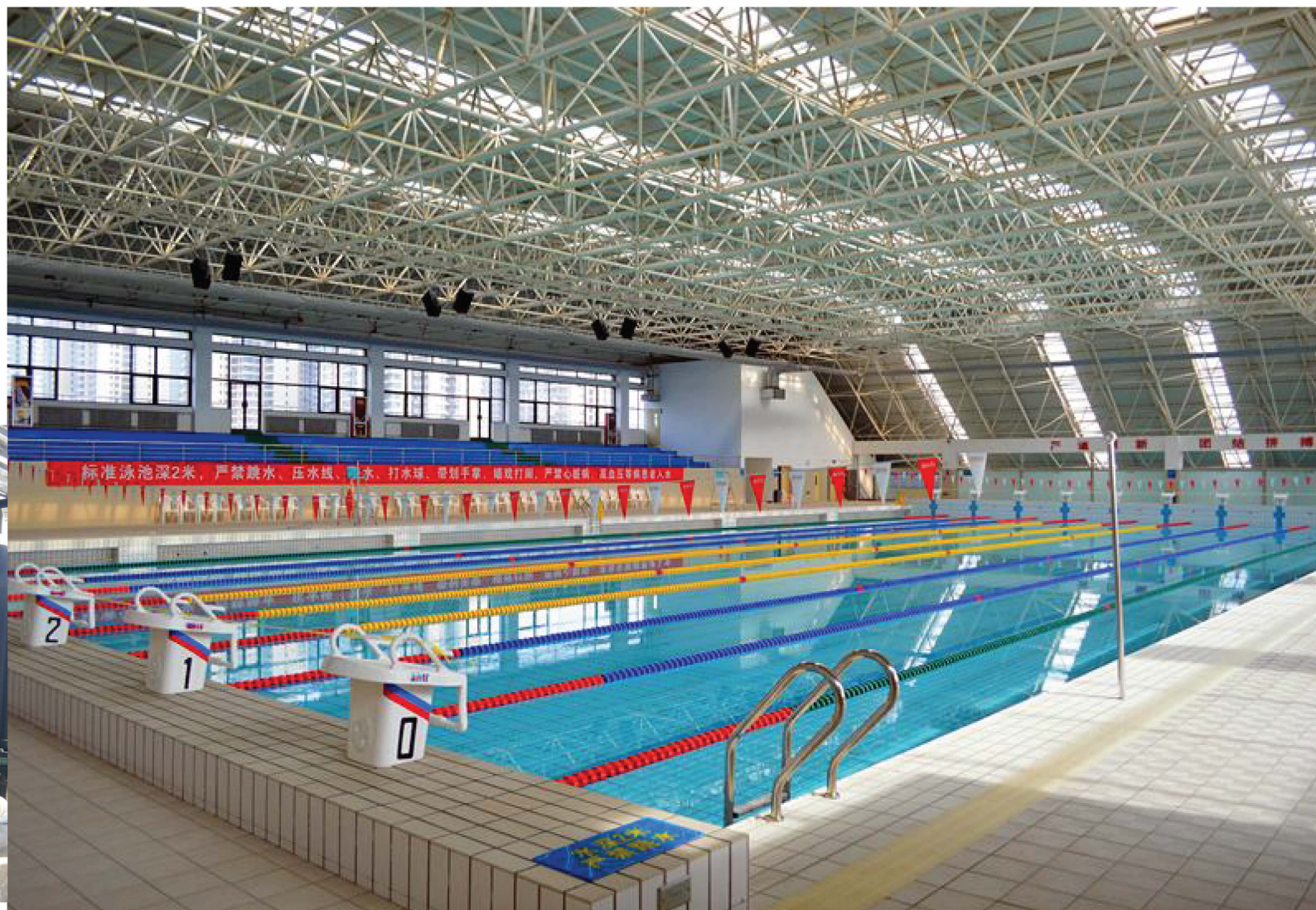
## Shijiazhuang Police Academy Swimming pool, crossing training pool



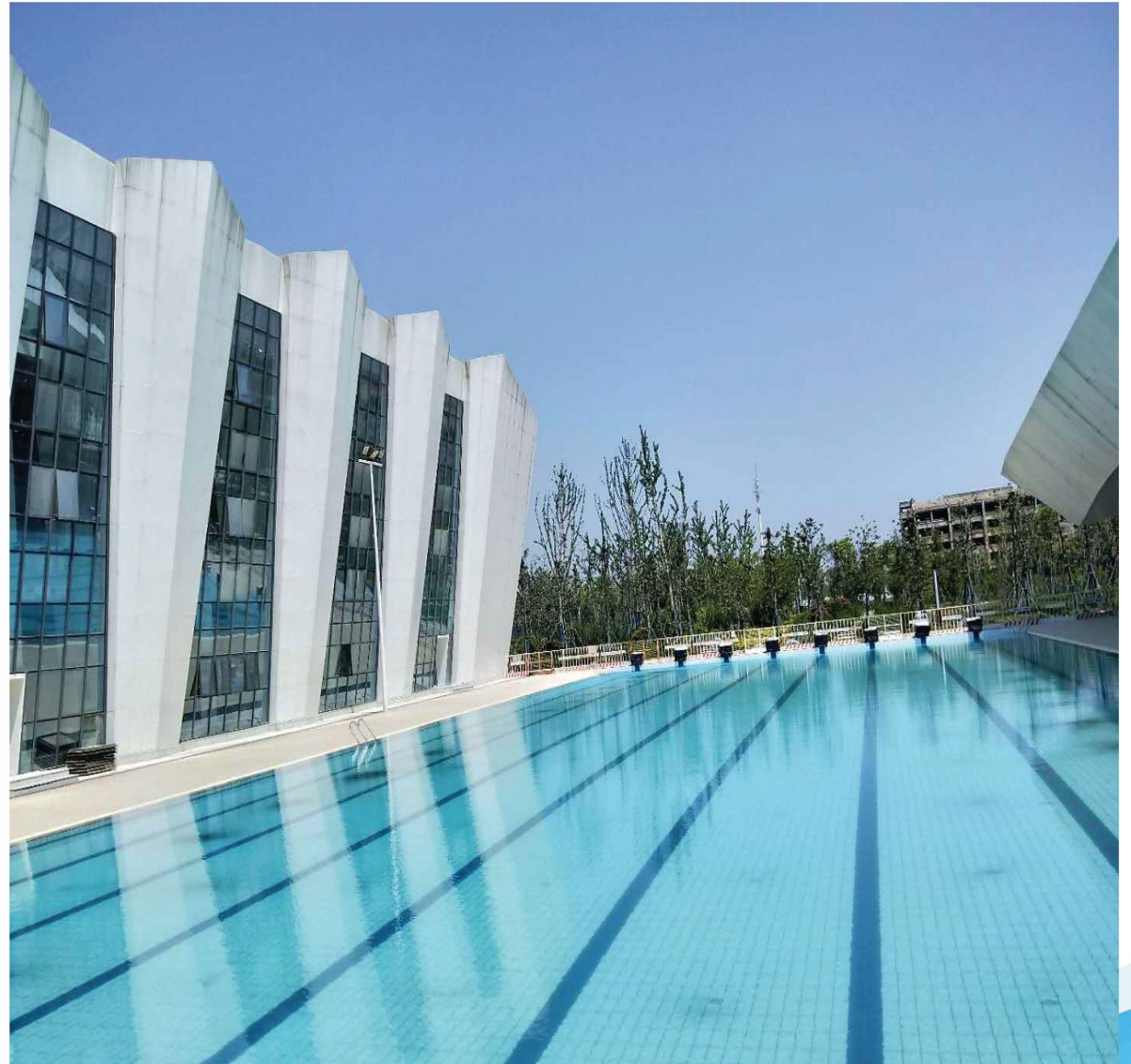
# Xi'an Fengxi Energy Center Swimming Pool



# Xi'an Sport University Swimming Pool



# Anhui Fengyang Sports Center Swimming Pool



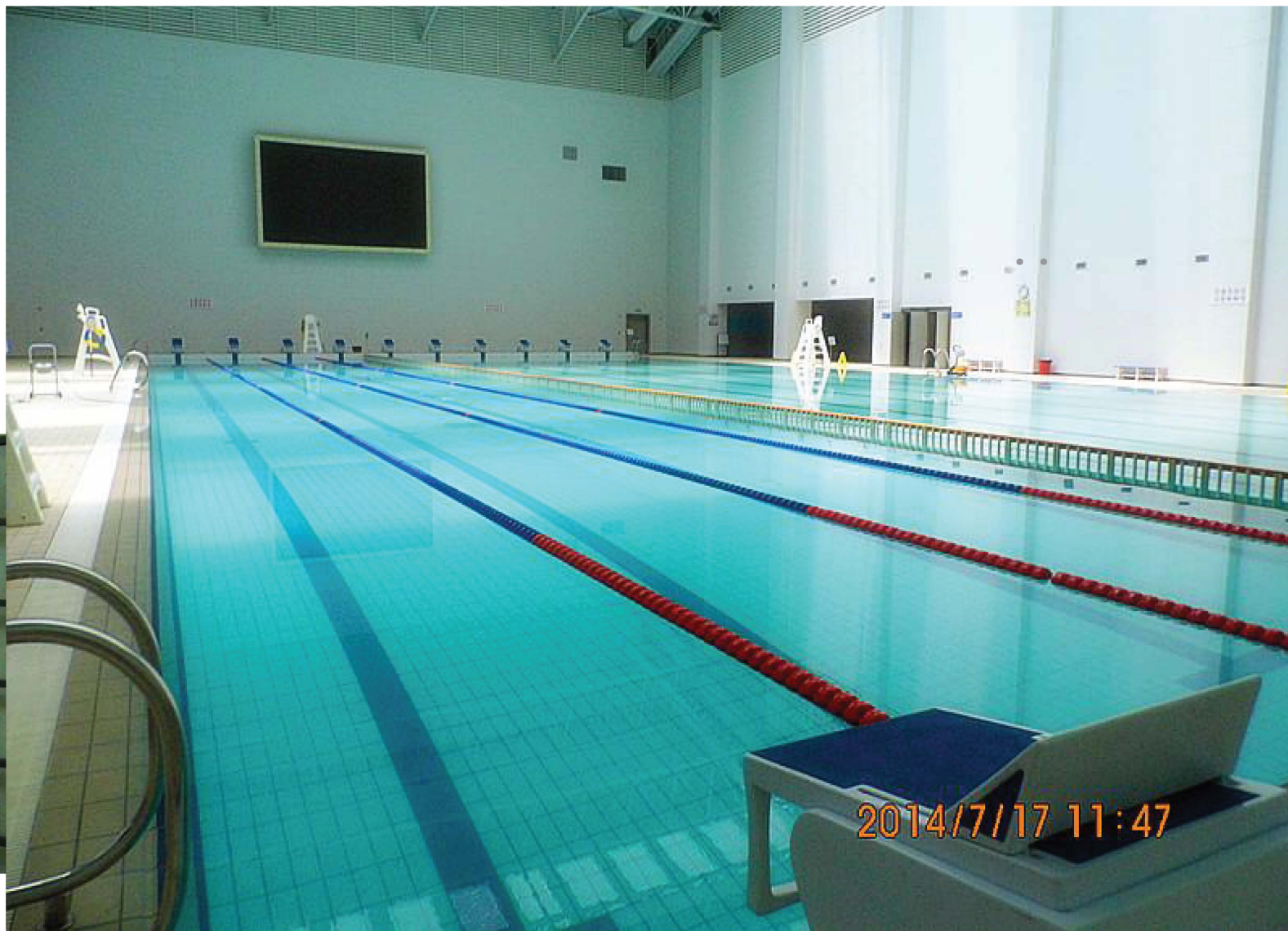
Xi'an Xixian New  
Area

Airport New City  
Swimming Pool





Fujian Shaxian Sports  
Central Swimming Pool



Van'an University  
New Campus  
Gymnasium  
Swimming Pool





Sanya  
Kangnian Hotel  
infinity pool

