# PLUMBING ENGINEERING FOR HIGH RISE BUILDINGS

WORLD PLUMBING COUNCIL

## WORLD PLUMBING SCHOLARSHIP 2023

**MILIND SHETE**
**DIRECTOR, MUKTA GROUP**

MUKTA
Passion | Innovation | Satisfaction

# WPC Scholarship For Least Developed And Developing Countries - 2023

## TABLE OF CONTENT:

# WPC Scholarship For Least Developed And Developing Countries - 2023

## INTRODUCTION

It was a profound honor to be selected as a recipient of the **prestigious World Plumbing Council (WPC) scholarship for least developed and developing countries 2023**. This opportunity enabled me to embark on a comprehensive study tour across various cities in China, one of the most rapidly developing countries in the field of infrastructure and sustainable building solutions. My objectives were multifaceted — from understanding innovative plumbing systems and sustainable water practices to exploring Plumbing marvels and engaging with industry professionals.

## OBJECTIVES OF THE TOUR

The core aims of my study tour were:

- To observe and analyze high-rise plumbing systems.
- To understand Sustainable Practices in Plumbing. For eg. Rainwater Harvesting & Reuse, Grey water Recycling, Water efficient fixtures, solar integration, etc.
- To visit renowned architectural and infrastructure projects.
- To attend plumbing-related exhibitions or trade fairs
- To interact with MEP consultants and understand their work culture and design methodologies.
- To interact with Site Engineers/ Plumbing Engineers and understand real-time challenges and solutions in plumbing execution.
- To explore local plumbing practices, tools, and manufacturing units.
- To gain exposure to latest plumbing trends in China and apply the learning back home.

# WPC Scholarship For Least Developed And Developing Countries - 2023

## ABOUT WORLD PLUMBING COUNCIL

The World Plumbing Council (WPC) is a global organization that brings together professionals from the plumbing industry to promote the importance of plumbing and sanitation in improving public health and environmental sustainability. The WPC focuses on raising awareness about the crucial role that plumbing plays in both developed and developing nations, addressing global challenges such as water conservation, sanitation, and the sustainability of plumbing systems.

One of the WPC's key initiatives is the scholarship for WPC Education and Training Scholarship for applicants from developing or least developed countries, which supports professionals from emerging economies to gain exposure to international best practices in plumbing engineering.

Through this scholarship program, WPC empowers individuals to enhance their expertise and contribute to the development of their local communities and industries.

# WPC Scholarship For Least Developed And Developing Countries - 2023

## A SHORT INTRODUCTION – MILIND SHETE

My name is Milind Atmaram Shete, and I am the Founder and Director of Mukta Group, a leading MEP consultancy firm based in Nashik, India. With over three decades of professional experience since graduating in 1988, I have dedicated my career to delivering environmentally friendly, energy-efficient, and cost-effective solutions across a wide spectrum of projects—including government, semi-government, and private sectors.

I hold a Post-Graduate Diploma in Piping Design Engineering and have had the privilege of leading several award-winning projects recognized for excellence in categories such as Best Institutional Project, Best Commercial Project, and Best Township, among others.

My passion for the plumbing industry extends beyond consultancy; I have coached India's national team in global competitions such as the Community Plumbing Challenge held in in India & South Africa. I was the Mentor and Chairman of the Indian World Skills Competition Committee, where I played a key role in mentoring the Indian team in the World Skills Competitions in Abu Dhabi and Russia, as well as the Euro Skills Competition held in Budapest.

I am also actively involved in skill development, having conducted numerous training programs for engineers, architects, and government professionals, and regularly present at national seminars and conferences.

I am a member of respected professional bodies including the Fire & Security Association of India (FSAI), Builders Association of India (BAI), The Indian Green Building Council (IGBC), Indian Plumbing Association (IPA), Indian Water Works Association (IWWA) and have served as Chairman of IPA Nashik chapter for 12 years. Now, I am holding the position of National Executive Committee Member of IPA. I am also a certified Green Plumber Accredited Trainer through IAPMO.

I am honored to have been awarded the prestigious World Plumbing Council (WPC) Scholarship. This recognition is a testament to my lifelong commitment to advancing the plumbing profession and promoting sustainable water and sanitation practices.

**ACKNOWLEGEMENTS**

I would like to sincerely thank the World Plumbing Council for selecting me as a recipient of the prestigious scholarship program and providing this incredible opportunity to study high-rise structures and sustainable modern plumbing practices in China.

I am equally grateful to the President Indian Plumbing Association Mr. Gurmit Singh Arora & Vice President Mr. Chandra Shekhar Gupta, World Plumbing Council – India Director Mr. B.S.A Narayan for their continuous support and encouragement throughout this journey.

My heartfelt thanks go to China Construction Metal Structure Association (CCMSA) & Mr. Qin Yongxin, Deputy Secretary-General of CCMSA for facilitating key visits and enriching technical interactions.

I am especially thankful to Ms. Li Kai, Vice Chairman, Water Supply and Drainage Equipment Branch, CCMSA for her seamless coordination and gracious assistance during the tour.

A special note of appreciation goes to Mr. Paulraj Srinivasan, Managing Partner, Comforts International & Ms. Tin who guided and helped me to explore innovative plumbing products and technologies during the last leg of my tour.

I would also like to express my deepest gratitude to my wife Anita and my Son Abhishek & Bhavik, whose unwavering love, patience, and encouragement have been my greatest strength. Their constant support allowed me to wholeheartedly pursue this journey.

I am equally thankful to my parents and extended family for their blessings, belief in my work, and continued motivation, which have always inspired me to strive for excellence.

# WPC Scholarship For Least Developed And Developing Countries - 2023

## TOUR HIGHLIGHTS & DAILY EXPERIENCES

**City: Beijing**
**Date: 3rd November 2024 – 6th November 2024**
**Highlights:**

**1. Visit to China Construction Metal Structure Association (CCMSA) Office**

I had the privilege of visiting the Water Supply and Drainage Equipment Branch of the CCMSA on November 4, 2024**.** The meeting was marked by a warm welcome from Mr. Qin Yongxin**,** Deputy Secretary-General of CCMSA, along with Vice Chairman of Water Supply and Drainage Equipment Branch Ms. Li Kai and other senior officials namely Ms. Tan Qing, Ms. Ge Xin, and Mr. Ruan Xianglin

During the exchange, we shared insights on the current state, advancements, and challenges in the water supply and drainage sectors, R.W.H systems of their respective countries.

This long discussions focused on technological collaboration, knowledge exchange, and sustainable water management practices. This visit not only facilitated valuable professional interactions but also laid a strong foundation for future cooperation between the IPA and CCMSA.


*Meeting at CCMSA office Beijing*

*Mr.Ruan Xianglin, Ms.Ge Xin, Mr.Bhavik Shete, Mr.Milind Shete, Mr. Qin Yongxin, Ms.Li Kai (lily), Ms.Tan Qing*

**2. Visit to Guoke Enterprises**

On November 5, 2024, accompanied by Ms. Lily, we visited the Gyoko Sanitation System facility, where we explored advanced vacuum-based sanitation technologies.

During the visit, we were introduced to their innovative vacuum toilets and sanitation systems through detailed presentations and informative videos that explained the mechanism, efficiency, and environmental advantages of these systems.

Following the presentations, we engaged in an insightful discussion with the company's officials & also had the opportunity to inspect an industrial toilet installation at their premises, where a hands-on review of the infrastructure offered a deeper understanding of its real-world performance.

**3. Site Visit to Beijing Shengde Mechanical Installation Engineering Co Ltd**

We visited a high-rise residential project executed by Beijing Shengde Mechanical Installation Engineering Co. Ltd., where we studied the water supply and drainage systems in detail. The project utilised PPR piping for hot and cold water distribution and PE piping for horizontal (same-floor) drainage—demonstrating efficient zoning and pressure management strategies.

Installation methodologies, including jointing techniques, insulation practices, and routing, were explained by the engineering team. We reviewed reclaimed water and return line layouts in both raw and finished units, offering a complete view of system integration from core to fit-out stage.

Additionally, we engaged with on-site personnel to understand workforce discipline, quality control protocols, and safety practices.

In the afternoon, we visited the Temple of Heaven, an iconic 14th-century architectural masterpiece that reflects the precision and harmony characteristic of traditional Chinese engineering and cultural heritage.

***Pre wall installation of MEP services featuring neatly aligned color coded conduits and plumbing using modular clamps***

***A Glimpse of Temple of Heaven – a 14th century architectural masterpiece***

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Xian**
**Date: 7th November 2024 – 12th November 2024**
**Highlights:**

## 1. Meeting in China Northwest Architectural Design & Research Institute

In Xi'an, we visited the Hall of Fame, which honored a distinguished lady architect Ms. Zhang Jinqiu and showcased several award-winning and large-scale architectural projects, reflecting China's innovation in design.

We then toured the MEP design department, where we reviewed technical drawings created using Revit and Beam software. A detailed discussion with lead engineers and the chief engineer focused on plumbing layouts and water supply schemes tailored for high-rise structures.

Thereafter, we explored the iconic Bell Tower, a historic landmark surrounded by a lively food street. We sampled local flavors, including sweet rice and traditional soup, before ending the day.

***Presentation regarding BIM & General water supply practice in china at China Northwest Architectural Design and Research Institute***

*China's Iconic Bell Tower in Xian*

**2. Visit To Shaanxi Xingjilong Pipeline Co. Ltd – A Pipe Manufacturing Company**

During our visit to this company, we observed the complete manufacturing process of piping systems, including molding, joining techniques, and the implementation of quality control measures.

The team including Mr. Wang Wei, President, Ms. Su Ruining, General Manager, Mr. Meng Delong, Technical manager also provided a detailed explanation of the technical advantages and performance benefits of their products, offering valuable insights into modern pipeline production standards.

As a gesture of warm hospitality, they hosted a special lunch in our honor, bringing together all team members from their office.

# WPC Scholarship For Least Developed And Developing Countries - 2023

***Demonstration of PPR pipe joining using electric fusion at Shaanxi Xingjilong Pipeline Co.Ltd***


***Lunch with president of Shaanxi Xingjilong Pipeline Co.Ltd Mr.Wang Wei & their management***

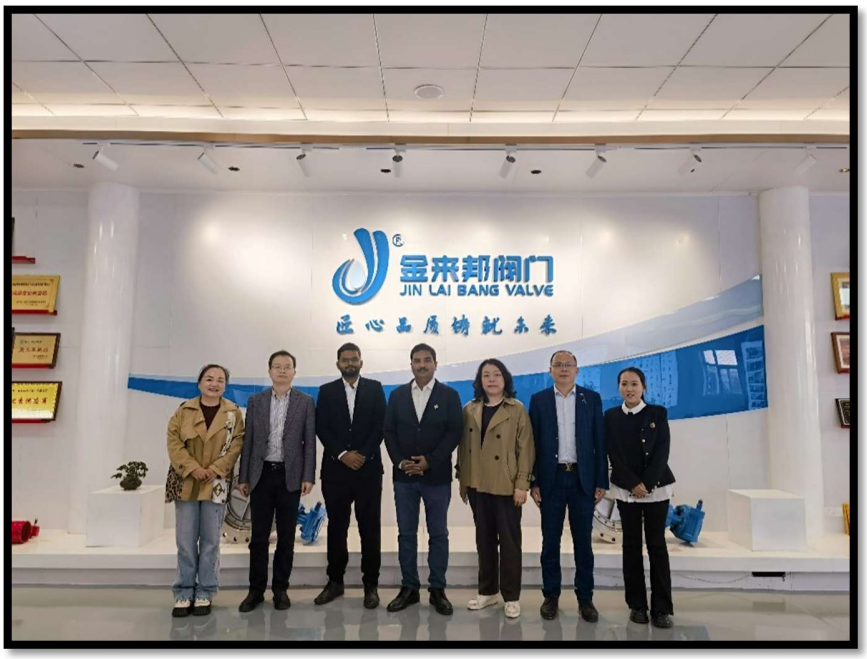
### 3. Tour to Jin Lai Bang Valve Co. Ltd – A Valve manufacturing company

At Jin Lai Bang Valve Co. Ltd, a leading valve manufacturing company, we were introduced to a wide range of valves, with detailed explanations of their types and specific advantages.

The visit was marked by warm hospitality, with tea served and a tea packet gifted as a token of appreciation.


***Presentation at Jin Lai Bang Valve Co.Ltd regarding different types of innovative valves used in china.***

# WPC Scholarship For Least Developed And Developing Countries - 2023



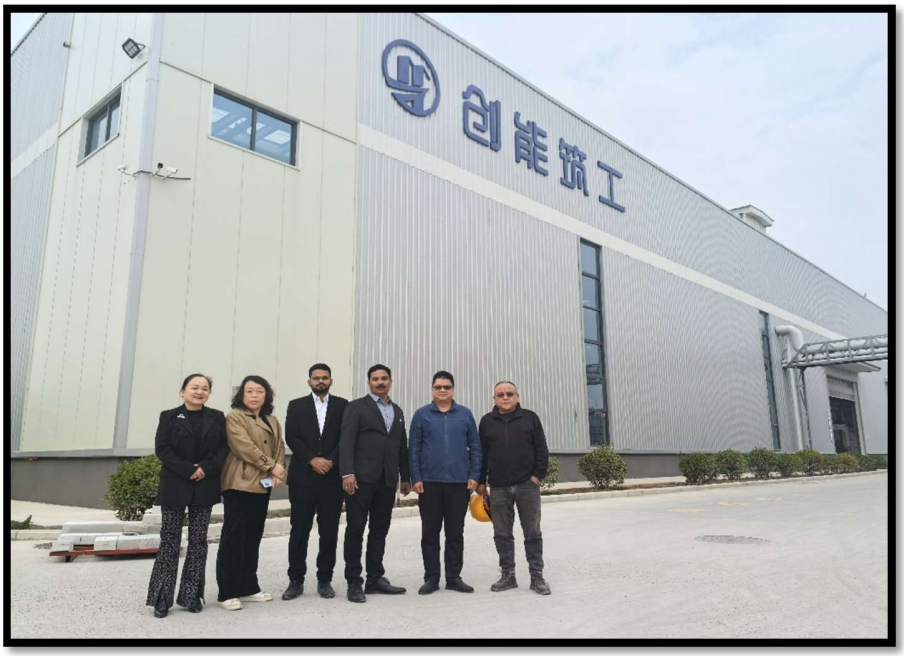

***Visit to manufacturing & quality control plant of Jin Lai Bang Valve Co.Ltd with President Mr.Weng Yuanhui.***

***Prefabricated skid mount fire pump at Jin Lai Bang Valve Co.Ltd.***

**4. Visit to Shaanxi Chuangneng Zhugong Technology Co ltd - An Aerator Concrete Block Factory**

During the visit, we received an in-depth explanation by Mr. Cheng Zhao of the manufacturing process of a product widely used in civil construction, noted for its lightweight, durable properties ideal for modular infrastructure.

Later in the evening, around 6:00 PM, we explored a renowned tourist destination called "The City That Never Sleeps." The site offered a lively and picturesque setting, providing a perfect and memorable conclusion to the day.




***Visit to manufacturing plant of AAC walls at Shaanxi Chuangneng Zhugong Technology Co.Ltd with Mr.Weng Yuanhui.***

*A perfect evening in famous tourist place "A City that never sleeps"*

**5. Visit to Shanxi Qiguang Information Technology – Learn Smart Rainwater & Flood Control Monitoring System**

We visited a factory specializing in AI-driven solutions, where we explored a range of advanced systems including water monitoring, flood control, flow meters, and irrigation measurement technologies. The tour included a detailed walkthrough of the manufacturing units, allowing us to gain valuable insights into the functionality, integration, and real-world applications of these intelligent systems in modern infrastructure and water management.

*Visit to Smart Rainwater & flood control monitoring system lab of Shanxi Qiguang information technology*

## 6. Site Visit to Jinghe Hospital

Later, we visited a government hospital construction site, where we closely observed the piping systems and installation processes in progress. This hands-on exposure provided a comprehensive understanding of how plumbing and water supply systems are practically implemented in large-scale healthcare facilities, highlighting the precision and planning required for such critical infrastructure.

# WPC Scholarship For Least Developed And Developing Countries - 2023

***Site Visit along with project manager at Jinghe Hospital***

***Site Visit at Jinghe Hospital with project manager Mr. Liu Bin***

## 7. Tour to Sponge City Construction in Xian New Area

On 11th November, we visited the Sponge City project, a significant government initiative aimed at enhancing urban water management.

The team provided a detailed presentation on rainwater harvesting (RWH) runoff, flood control, and sustainable water management systems which included permeable pavements, bio swales, rain gardens, and urban wetlands to reduce runoff and recharge aquifers.

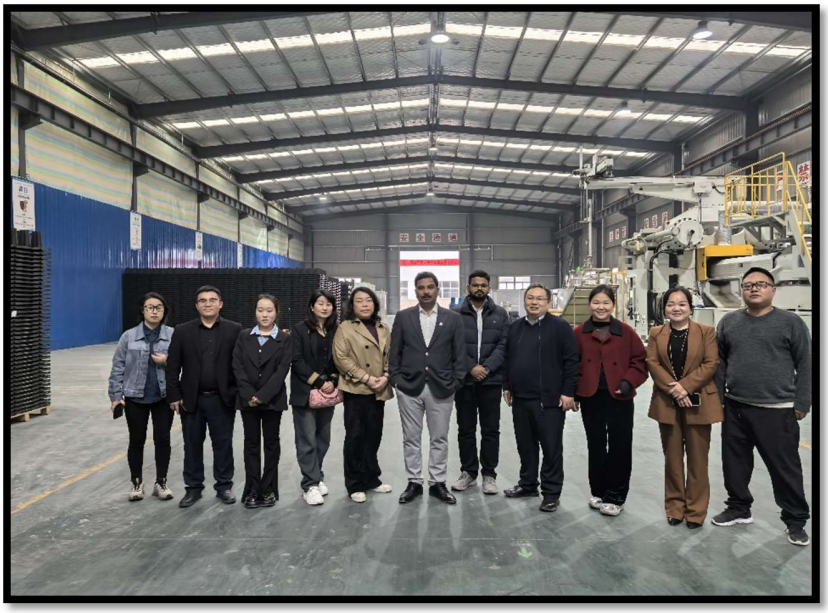
*Visit to Education and scientific research base of Eco-sponge City*

*Discussion of Sponge City new model at Xiaan china*

## 8. Site Visit to Shaanxi Qianchang Rainwater building technology – A project of Rainwater Harvesting Modular Tank

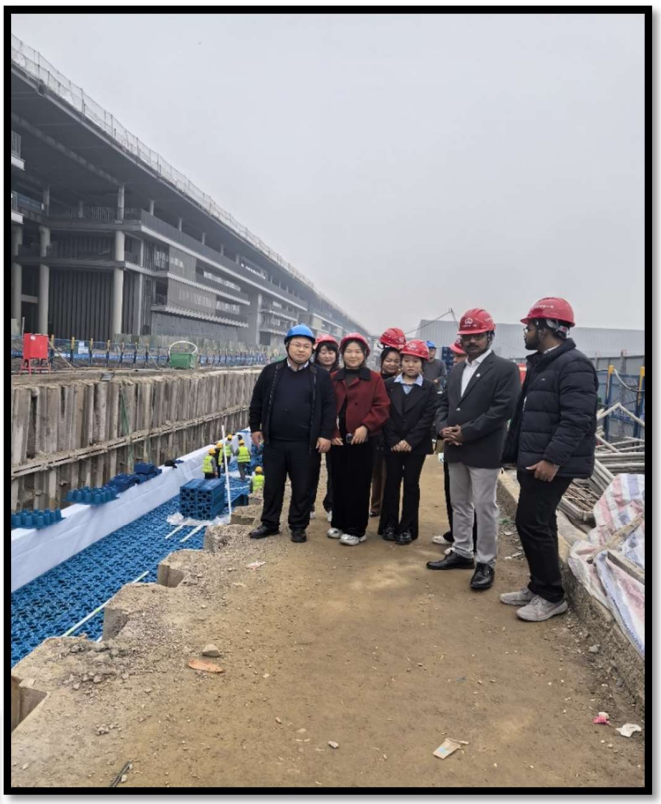
Following the session, we observed the on-site installation of a modular water storage tank for storing Roof Top Rainwater of a Factory having a single roof of 6 lacs sq ft. The setup utilized a siphonic roof water drainage system to efficiently collect rainwater, which was channeled into underground (U.G.) storage through readymade chambers.

This visit offered valuable insights into large-scale, eco-friendly water conservation infrastructure. We also observed the production of shallow tanks specifically designed for installation along footpaths. The team Mr. Zhou, Ms. Ma Ning, Mr. Liang Weichao provided a detailed explanation of the manufacturing process, highlighting the design features, structural integrity, and functional benefits of these tanks in urban water management and drainage systems.

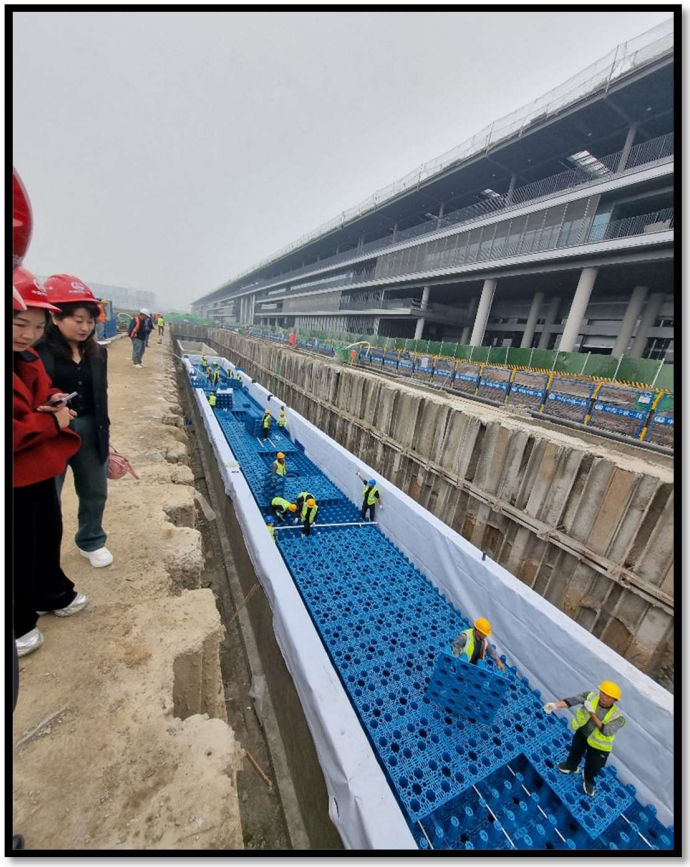


***Factory visit of Shaanxi Qianchang Rainwater building technology with chief engineer Mr. Zhou Zhiquan & associates***

# WPC Scholarship For Least Developed And Developing Countries - 2023



*Site visit to observe installation of rainwater modular tank*



*Modular Storm water storage tank installation for R.W.H and ground water recharge*

**9. Meeting with Plumbing Consultant in Shaanxi Hengrui Architectural design engineering Co. ltd**

On 11th November, we visited a consultant's office, where we had an engaging discussion with Mr. Ma Qiang (Chairman) & Ms Hua lei (Chief Plumbing Engineer) who shared valuable insights into the firm's operations and workflow while addressing several of our queries.

As part of the visit, we explored the MEP department, where we observed the use of advanced design tools such as Beam and Revit, widely employed in China. We also studied the design processes in detail, with a focus on municipal water systems, hot water distribution, sewage treatment, and water purification technologies, gaining a deeper understanding of China's integrated approach to infrastructure planning.

***Visit to office of Shaanxi Hengrui Architectural design engineering Co.Ltd for discussion of high rise building plumbing design.***

# WPC Scholarship For Least Developed And Developing Countries - 2023

*Discussion regarding plumbing practices in China and India with Mr. Zhang Yanjun (Executive General manager), Ms. Hua Lei, and Mr. Yanpeng*


*Photo with MEP Consultant Team of Mr. Zhang Yanjun (Executive General Manager)*

***On site discussion regarding plumbing innovations in high-rise project with Mr. Yanpeng (Head, PHE) Shaanxi Hengrui Architectural design engineering***

**10.Visit to Daxing Park Mansion – A Residential Project**

Our day on 12th November, began with a visit to the Daxing Park Mansion Residential Project, accompanied by a plumbing consultant. At this high-rise site, we explored various critical building systems and infrastructure components. We thoroughly inspected the basement pump rooms, firefighting rooms, and stainless steel buffer tanks.

A detailed study was conducted on the firefighting systems within the panel rooms and the centralized hot water system, which notably used steam supplied by the municipal corporation for floor heating.

The site featured PPR piping for water supply, PP Pipe was designated for drainage lines.

*Highly organized plant room featuring MEP systems and smart piping*

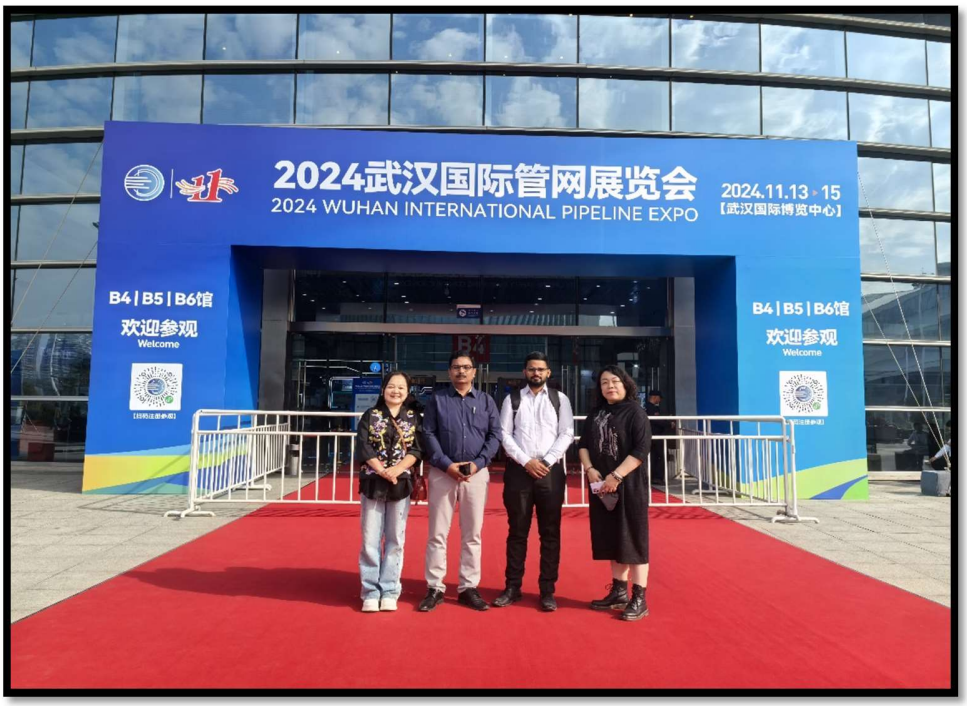
# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Wuhan**
**Date: 13th November 2024 – 14th November 2024**
**Highlights:**

## 1. Exhibition Visit - Wuhan International Pipeline Expo

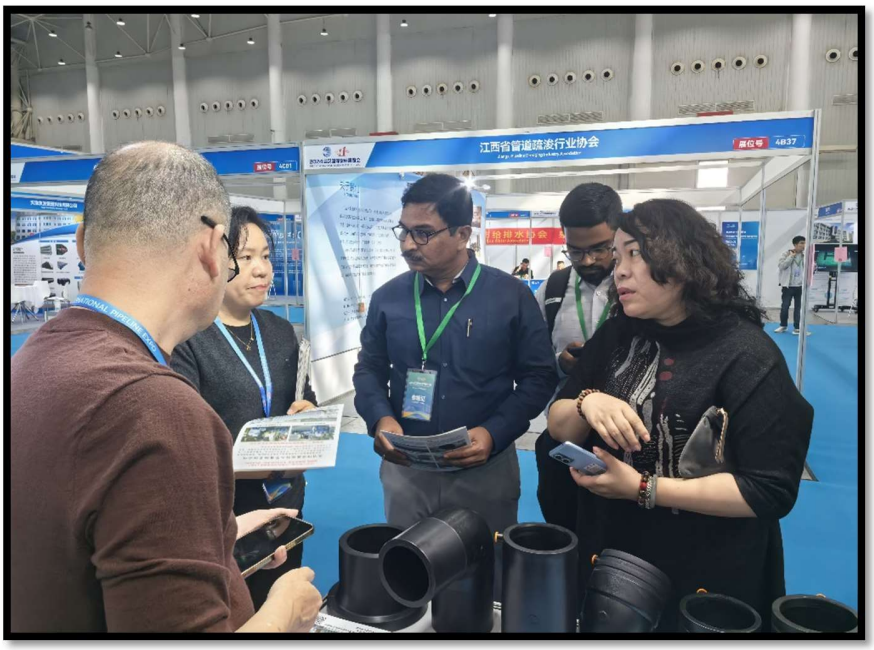
On 13th November, we attended a large-scale exhibition featuring over 700–800 stalls, showcasing a diverse array of products and emerging technologies in the plumbing and infrastructure sectors. A key highlight was the innovative "Trenchless pipe" technology, which enables the reuse of existing pipelines without requiring extensive surface damage, representing a sustainable advancement in pipeline rehabilitation.

We also observed a wide range of pipes (from small-scale to large-diameter), valves, measuring instruments, and leak detection systems. This exhibition offered valuable insights into the latest developments in piping systems, water management solutions, and infrastructure technologies, further enriching our technical knowledge.




***Visit to 2024 Wuhan international pipeline expo with Mrs. Ting, Mr. Milind Shete Mr.Bhavik Shete, Ms.Li Kai***

# WPC Scholarship For Least Developed And Developing Countries - 2023




*At Wuhan International Pipeline Expo discussing new technology for Electrofusion piping*

*At Wuhan International Pipeline Expo discussing leak detention system for cross country piping*

## 2. Visit to a Residential Project – Observe SS Pipe Installation

On 14th November, our day commenced with a site visit organized by the WEGS (Shanghai) Fluid Technology Co., Ltd., where we had the opportunity to observe a remarkable installation of stainless steel piping.

The site offered a close-up view of the application, craftsmanship, and durability of stainless steel pipes used across different building systems in 24 floors.


***Site Visit at residential project in Wuhan with Mr. Hong Xiang (Technical manager WEGS Fluid technology ltd)***

# WPC Scholarship For Least Developed And Developing Countries - 2023

***At Imperial Tower, Wuhan Plantroom with SS Buffer Tank and Hydro pneumatic system***

***At Plantroom of Imperial Tower, Wuhan***

*Implementation of SS pipe in high rise residential building 2*

*Implementation of SS pipe in high rise residential building*

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Wuhu**
**Date: 15th November 2024**

**Highlights:**

1. **Visit To Wuhu Keyi (Cozy) Residential Equipment Co. Ltd**

The day started with a visit to Wuhu Keyi (cozy) Residential Equipment Co. ltd, a leader in modular kitchen and toilet manufacturing, where we explored the entire production process.

We had the chance to examine the SMC (Sheet Molding Compound) panel and tiled panel systems, gaining valuable insights into their design and functionality. Mr.Yan Lihui, Mr.Li Ming & Ms.Liu Suhua helped us to visit the whole project.

A detailed discussion followed on how these innovative systems could be adapted for the Indian market, highlighting their potential applications and benefits.


***Visit to Wuhu Keyi (cozy) Residential equipment Co.Ltd manufacturing plant with Mr.Li Ming & Mr.Yan Lihui***

# WPC Scholarship For Least Developed And Developing Countries - 2023

*Wuhu Keyi (cozy) technical discussion with Mr. Li Ming (Chief Technology Manager)*

*Wuhu Keyi (cozy) technical discussion with Mr. Li Ming (Chief Technology Manager) & his team*

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Yixing**
**Date: 16th November 2024**
**Highlights:**

## 1. Visit to Yixing Eco-Sanitary Manufacture Co. Ltd

On 16th November 2024, the day began with a visit to a public park toilet facility, where we observed firsthand the sewage treatment process, water recycling system in operation. This offered valuable insights into the management and reuse of wastewater in public settings.

We then met with Mr. Allen Joe and his assistant, Ms. Grace, before heading to a factory specializing in Sewage Treatment Plants (STPs). There, we explored innovative samples and discussed the concept of "Off-grid Toilet System"

A modular toilet and STP setup was showcased, comprising toilet blocks for 3 ladies, 3 gents, and 1 disabled module. The use of solar power in the system was also highlighted as a key energy-saving feature.

A compact, plug and play, solar powered self-contained sanitation solution was observed consisting of a containerized toilet block with 7 toilets, integrated water tank and STP.

This toilet block is a mobile and scalable solution, specifically designed to cater large crowds at public gatherings and events. It offers convenient, hygienic sanitation that can be quickly deployed and easily relocated as needed.

# WPC Scholarship For Least Developed And Developing Countries - 2023

***Observing containerized toilet block with integrated Water tank & STP - a compact and self-contained sanitation solution by Eco-San***

***Visit at innovation center of Eco-sanitary Manufacture Co.Ltd.***

# WPC Scholarship For Least Developed And Developing Countries - 2023


*Visit at innovation center of Eco-sanitary Manufacture Co.Ltd. With Mr. Zhou Xiaokang general manager*

*Interaction regarding compact cost effective STP technology with Mr. Zhou Xiaokang (general manager)*

# WPC Scholarship For Least Developed And Developing Countries - 2023

***Innovative STP using natural, sustainable filtration medium engineered from volcanic minerals and advanced microbial fibers – for efficient, low- impact sewage treatment***

***Waterless and drain free WC pan designed for sustainable. Off grid sanitation***

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Ningbo**
**Date: 17th November 2024**
**Highlights:**

## 1. Visit to Spec – Study Same floor Drainage System

One of the most unique and insightful visits of our journey was to a laboratory specializing in drainage systems, organized by Mr. Guan, the director and owner of the factory.

At the lab, we observed the installation and rigorous testing of pipes, including the water seal disturbance test and the operation of a remarkable 68-meter testing tower. The demonstrations were clearly explained, with comparisons to related systems, deepening our understanding of the technology.

We also witnessed an impact test and learned about intermittent testing methods used to evaluate system efficiency under various conditions.

I was also invited to give a detailed PowerPoint presentation on different drainage systems, which sparked a productive exchange of ideas which was highly appreciated.

***Product Presentation by Mr.Guan Wenmin***

# WPC Scholarship For Least Developed And Developing Countries - 2023

*Discussion on same floor drainage and its different configuration with Mr.Guan Wenmin*

*Deliberation on same floor drainage with different modules and its application*

# WPC Scholarship For Least Developed And Developing Countries - 2023


***Presentation on drainage system adopted in India with spec technical team***


***An amazing display at Spec Company***

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Shanghai**
**Date: 18th November 2024 – 19th November 2024**
**Highlights:**

1. **Visit to Karon Valve – A Valve Factory**

We visited the Karon Valves factory on 18th November, where we engaged in an in-depth discussion about various types of valves and their specific applications, their manufacturing processes and advantages as well as efficiency of their products.

2. **Visit to Stand ford Residence – A Site Visit**

We visited a project site to study the Plumbing System of an Ultra luxury apartment, which provided us with valuable exposure to modern plumbing techniques and their real-world applications.

3. **Meeting with Plumbing Consultant**

On 18th November 2024, we had an engaging and insightful meeting with Miss Cathey, an expert Plumbing Consultant. During this long session, we delved into various aspects of plumbing systems, focusing on the significance of skilled plumbers and the critical role of quality workmanship. The discussion fostered a meaningful exchange of knowledge and perspectives, making it a highly productive and enriching experience.

4. **Visit to Shanghai's Imperial Tower**

The day 19th November included a visit to the High Rise Imperial Tower, where we had the opportunity to closely examine the building's integrated systems, gaining valuable insights into its infrastructure and design.

We then proceeded to the China Life Insurance Tower to explore the plant and pump rooms, which provided a deeper understanding of the mechanical systems and their maintenance.

Later, we met with Ms. Leo from Cozy Company to discuss the adaptability of their products for the Indian market, focusing on cost considerations and potential modifications for local conditions.

In the evening, we concluded our day with a formal visit to the iconic Shanghai Tower, ascending to the 126th floor to witness the spectacular light show on the Damper and enjoy breathtaking views of the city skyline.

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Chaozhou**
**Date: 20th November 2024 – 22nd November 2024**
**Highlights:**

## 1. Visit to Sanitary ware Company - Chenda /Tucci, I-cera & Guess / Mage

Over two days, we visited three prominent ceramic and sanitary ware factories, gaining in-depth knowledge of the industry. On 21st November 2024, we began at **Chenda/Tucci**, where we studied the entire production line, offering a comprehensive view of the ceramic ware manufacturing process.

Later that day, we were invited by Mr. Chin to tour the ultra-modern **I-Cera factory**, which produces high-quality sanitary products for prominent brands in Europe & US. Although photography was not permitted, we explored their advanced testing methods, mold designs, and premium-quality products.

On 22nd November, Mr. Ma, the owner of **Guess/Mage** factory, personally guided us through their office and factory. A standout feature was their smart toilet system, which functions without electricity using a water tank—an innovative, efficient solution. We also visited their vanity factory, known for offering cost-effective yet high-quality products, providing insights into affordable options in the market.

***Visit to ceramic ware manufacturing factory Chenda - Tucci in Chaozhou***

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Guangzhou**
**Date: 23rd November 2024 – 24th November 2024**
**Highlights:**

1. **Visit to Meeting (Heat Pump Company) / Qlozone (Ozonator & Koi Pond Filter Company) & Visit to Fenlil (A Fountain Factory)**

   On 23rd November 2024, we visited a heat pump company, named meeting where we had an insightful meeting with Ms. Alena. We observed large residential centralized heat pumps, water-to-water pumps, and wastewater heat pumps, studying the technology behind these systems and explored the potential for future projects.

   Next, we visited Qlozone & had meeting with Ms. Diana to discuss ozonators and koi pond filter systems, focusing on wastewater treatment for koi ponds.

   Later, we toured a fountain factory named Fenlil, where Ms. Lola guided us through the showroom, showcasing a wide range of products, including fountains, spa and sauna systems, and swimming pool equipment.

***Visit to meeting heat pump co. ltd assembling plant with Ms. Alena (Technical Manager)***

# WPC Scholarship For Least Developed And Developing Countries - 2023

*Visit to Finn forest fountain manufacturing & R&D plant*

*Display of Swimming pool and fountain products*

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Foshan**
**Date: 25th November 2024 – 28th November 2024**
**Highlights:**

## 1. Visit to Amitime – A Heat pump Company

On 25th November 2025, we visited Amitime, where we observed a wide range of heat pumps designed for both domestic and commercial use. A key highlight was the compact heat pump models suitable for Jacuzzis and small swimming pools. Ms. Aurora Gao (Marketing Manager) and Ms. Silver (Assistant sales manager) provided us with all the relevant information in a clear and comprehensive manner.

In the afternoon, we visited two divisions of their company. The first division offered a detailed tour of the production line, quality control processes, and inspection procedures. We had the chance to view the finished products in the gallery, which showcased the final stages of manufacturing.

Our second visit was to another division where we gained insights into their operations and overall business structure. This rounded out the day's activities, providing us with valuable perspectives on manufacturing and quality control processes of the heat pumps.

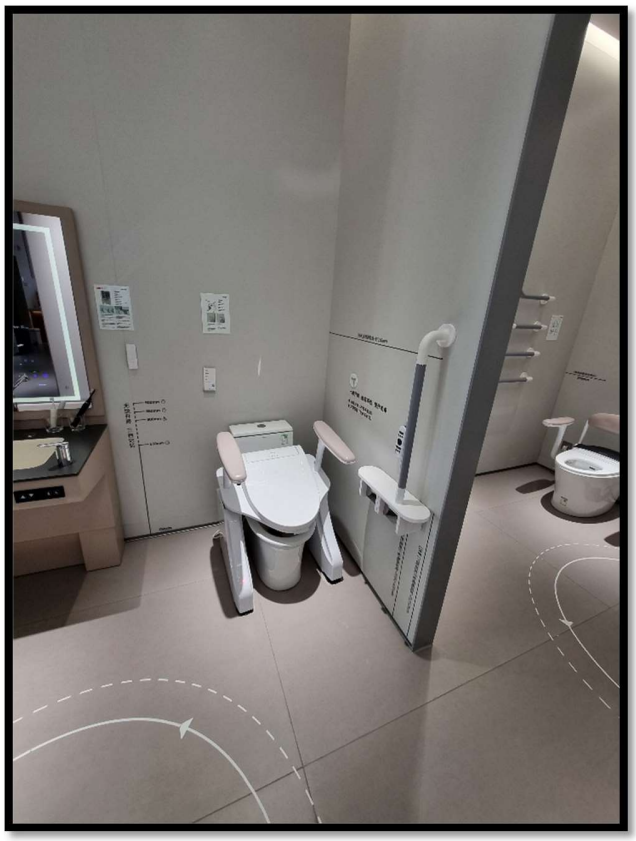
***Visit to multi cascading heat pump project executed by forissam heat pump***

**2. Visit to Arrow (A Sanitary ware Factory) / Forlss man (A heat pump Factory)/ Godi & Itava (A Vanity)**

On 26th November 2024, we first explored the Sanitary Ware Factory - ARROW Display Centre, where we observed beautifully designed disabled toilets and smart toilets. The showroom featured a range of products including faucets, cubicles, and innovative features such as feather-touch opening systems and automatic glass cubicles, which were thoroughly studied.

Next, we visited the Heat Pump Factory - Forlssman, where we had a detailed discussion with Mr. Sam, the sales manager, who explained their full range of products. We were introduced to the enamel coating process for water tanks, which is critical for ensuring product durability. Additionally, we learned about the system used for dormitories, the different heat pumps they manufacture, and their innovative 2-in-1 heat pump models.

Lastly, we visited the Ceramic Ware Factory – Godi & Itava, a large-scale manufacturer specializing in vanity products. During our visit, we interacted with the owner and explored both the ceramic ware production processes and their display center. We also had the opportunity to observe modular toilets, which were part of their diverse product offerings.



*Remote controlled height adjustable WC pan for easy transfer of differently abled person*

*Smart motorized shower pods for the differently abled people featuring adjustable seat, height-adaptable shower and foldable support arm for bathing*

### 3. Visit to Huayi & Dien (Sanitary ware Company) & Chaizhou (Faucet Company)

On 27th November 2024, we visited three companies specializing in Chrome Plated (CP) fixtures, starting early at 8:00–8:30 AM.

Our first stop was at **Huai**, where Mr. Sun welcomed us and introduced their technologically advanced products, including AI-modulated taps that responded to voice commands, along with sensor and touch-activated taps. The company also showcased uniquely designed taps aimed at high-end markets.

Next, we visited **Dien**, a company offering mid-range products similar to those found in India. Since the product range was familiar, we took a quick tour of the showroom without spending too much time there.

Our final stop was **Chaizhou**, a large group offering a wide range of products across low, mid, and high-end segments. Their extensive collection was impressive, and we made sure to collect their catalogue for future reference.

Overall, the visits provided valuable insights into the latest advancements in CP fixture manufacturing and highlighted the differences in product offerings across various market segments.


***Factory visit to huayi faucet & sanitary ware manufacturing plant***

4. **Visit to SSWW and Hegll (A Sanitary ware Company)**

We began our day at 10:30 AM on 28th November 2024 with a visit to a prominent sanitary ware mall, where leading manufacturers showcased their products. The aim of the visit was to study the latest trends and explore new products that we may have missed previously.

During the tour, we examined a wide range of products, focusing on those most suitable for the Indian market. Among the highlights were the smart toilets from HEGII and SSWW, which impressed us with their advanced technology and extensive product ranges. Their high-end offerings demonstrated cutting-edge innovations in the sanitary ware industry.

This visit provided valuable insights into emerging trends and innovations, deepening our understanding of the evolving landscape of sanitary ware products.

# WPC Scholarship For Least Developed And Developing Countries - 2023

**City: Guanzhou**
**Date: 29th November 2024**
**Highlights:**

**1. Visit to Rainbow Fountain**

On 29th November 2024, we visited Rainbow Fountains, where we had the opportunity to meet the technical directors and gain detailed insights into various fountain accessories, types of fountains, and the advanced technology behind their designs.

Rainbow Fountains specializes in large-scale fountains, including those used for spectacular city-wide light shows. Our second stop was at a sister concern of Rainbow Fountains, which offered similar products.

**City: Foshan**
**Date: 30th November 2024**
**Highlights:**

**1. Visit to Standview – A Heat Pump Company**

On our last day in China, we visited Stand View Company, where we had an insightful discussion with their technical experts. They walked us through their manufacturing and testing processes, offering valuable insights into their quality control and production techniques.

After the discussion, we returned to Foshan, bringing our study tour to a close. This visit left us with a deeper appreciation of the advanced manufacturing technologies and industry practices in China. It was a comprehensive learning experience that significantly enhanced our knowledge of the latest trends and innovations in the sector.

## KEY LEARNINGS & OBSERVATIONS

- **Sustainability is Mainstream:** In China, the integration of sustainability measures into buildings and infrastructure projects is highly commendable.

  More importantly, these practices are not limited to isolated developments—they are widely and systematically implemented at the level of city planning and public infrastructure.

  **Key examples include:**
  1. Installation of modular storage tanks to harvest and store large volumes of rainwater, particularly in industrial sectors.

  2. Dedicated public pipeline networks for the distribution of reclaimed water for non-potable uses such as landscaping, flushing, and industrial processes.

  3. District-level energy-efficient heating systems using centralized boilers that supply hot water or steam for residential and commercial floor heating, especially in colder regions.

  4. Integration of solar photovoltaic (PV) and solar thermal systems, not only on rooftops but also embedded into building façades for enhanced energy efficiency.

  5. Adoption of 'sponge city' concepts, incorporating permeable pavements, green roofs, rain gardens, and bio-swales to manage storm water runoff and enhance groundwater recharge.

  6. Widespread use of smart meters and leakage detection systems in municipal water infrastructure to improve water management and reduce losses.

  These examples reflect how China has progressed from regulatory frameworks to large-scale, effective implementation. India, while making significant strides through updated building codes and broader adoption, is still in the process of achieving such systemic and integrated execution.

- **BIM is Non-Negotiable:** In China, BIM is widely and efficiently used in major projects, reducing on-site rework and material wastage.
- **Smart Infrastructure:** IoT-based systems in plumbing and HVAC help monitor, diagnose, and control issues proactively.
- **Prefab Dominance:** Modular washrooms, shafts, and pipe assemblies enable faster and cleaner installations.
- **Quality Control:** Every stage, from material selection to final installation, is documented and quality-verified—something India can implement more rigorously.
- **Community-Centric Design:** Chinese neighborhoods focus on access to public spaces, gardens, and pedestrian safety—offering lessons in urban livability.

## COMPARATIVE INSIGHT: INDIA VS. CHINA

As two of the world's fastest-growing economies and most populous nations, China and India both face similar urbanization pressures, their approaches to design, construction, infrastructure, and sustainability reflect distinct philosophies, technological adoption, and policy priorities.

This comparative insight explores key differences in work culture, tools for execution, smart infrastructure, quality control, plumbing practices, water management, and city-level systems. The analysis highlights how each country navigates the challenges and opportunities of modern infrastructure development.

(Refer table below)

| Criteria | China | India |
|---|---|---|
| Work Culture | - Disciplined, process-oriented<br>- Strong adherence to timelines and standardized protocols<br>- Coordination challenges are common on multi-vendor projects | - Flexible, often reactive<br>- Execution depends more on individual efficiency<br>- Coordination challenges are common on multi-vendor projects |
| Tools for Design & Execution | - Extensive use of BIM, Revit, 3D coordination and clash detection from design to construction | - Predominantly AutoCAD-based<br>- BIM/Revit use is growing especially in high-end or large-scale projects only |
| Smart Infrastructure | - Widespread use of IoT, AI, Smart meter and BMS<br>- Real-time water monitoring, leak detection, automated control | - Limited to isolated smart solutions (sensor taps, smart meters)<br>- Full-system automation still emerging |
| Quality Control | - Strong factory-based QC, batch testing, QR-coded traceability<br>- Standardized installation protocols | - QC varies by site and contractor<br>- Common reliance on manual checks; less automation |
| Plumbing Installation Practices | Highly standardized with modular shafts, pre-assembled pipe clusters and factory built bathroom pods allow clean, fast & precise installations | Prefab adoption is growing but still limited. Conventional site based plumbing is more common. |

| | | |
|---|---|---|
| Rainwater Harvesting & Reuse | Modular tanks and large-scale storage systems are widely used in industries and public infrastructure. | Mandated in codes; implemented in many buildings but less common at city-scale or industrial scale. |
| Grey water Recycling | Recycled water distributed via dedicated public pipeline networks; widely used for flushing and landscaping. | Mostly limited to individual buildings or green-certified projects; limited public reuse systems. |
| City-Level Hot Water /Heating | In northern China, cities have district heating systems - energy-efficient central boilers distribute hot water/steam to buildings for floor heating. | No district heating concept. Hot water is generated at building or household level using electric, solar, or gas geysers. |
| Storm water Management | China implements "Sponge City" concepts: permeable pavements, bio swales, rain gardens, and urban wetlands to reduce runoff and recharge aquifers. | - Still in early stages.<br>- Pilot projects in smart cities.<br>- Most cities rely on conventional drainage systems which are prone to clogging and overflow. |

## CONCLUSION

My study tour to China, under the esteemed World Plumbing Council Scholarship, has been an eye-opening and transformative experience. From exploring high-rise plumbing systems and cutting-edge MEP technologies to engaging in cross-cultural dialogues and visiting world-class infrastructure projects, every moment of this journey offered a wealth of knowledge and inspiration.

China's integrated approach to sustainability, speed and precision in execution, and forward-thinking design practices have provided valuable lessons that I am eager to carry into my professional work in India.

As I return home, I am committed to applying these insights to promote smarter, greener, and more efficient sustainable solutions. I remain deeply grateful for this opportunity and look forward to fostering continued knowledge exchange between two nations for the advancement of the plumbing and construction industry.