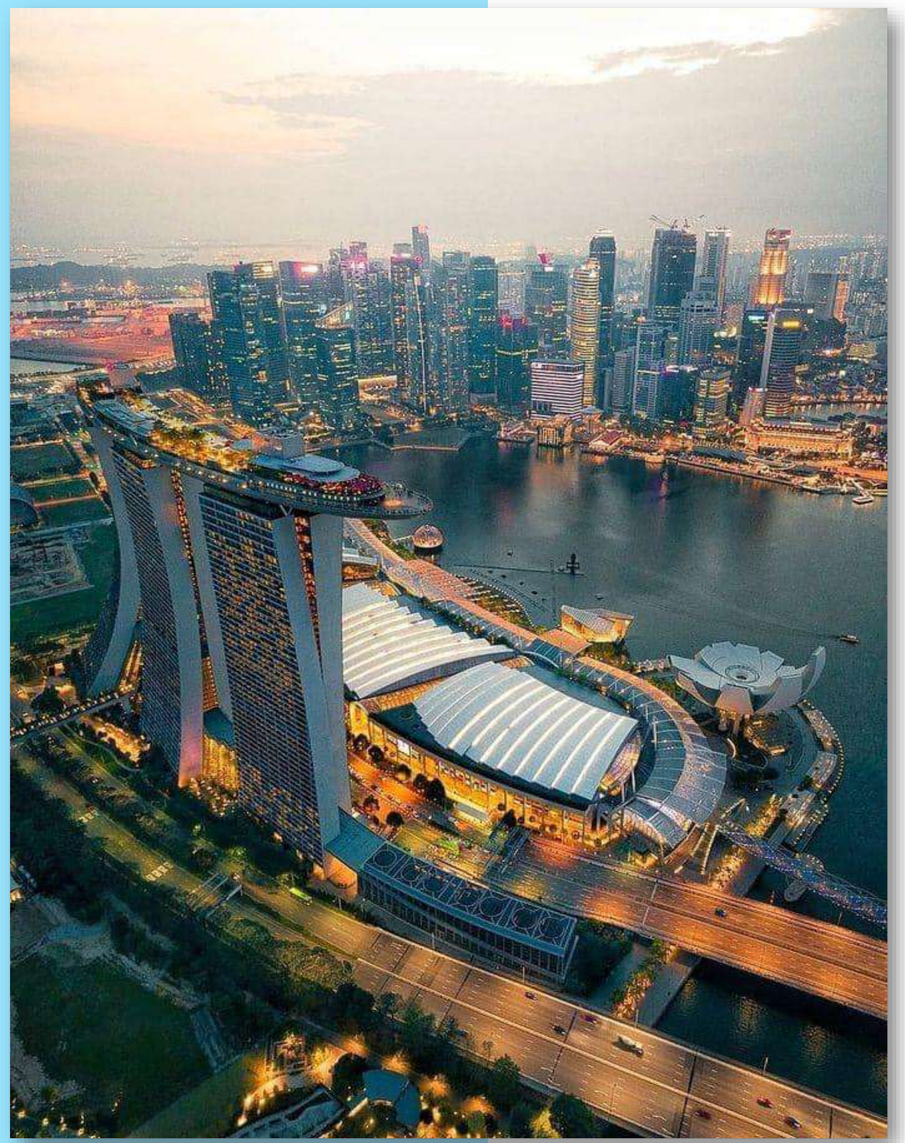
Seagull | TRUWATER®

TRUWATER COOLING TOWERS

The Cooling Tower Company with Experience You Can Trust .....
Cooling Technology Know-How You Can Depend On.....

Seagull | TRUWATER®

01 ABOUT US



About Us

Truwater Cooling Towers, a subsidiary of Seagull Cooling Technologies, is a manufacturer specialized in the wet and hybrid type cooling towers. In the last 30 years, Truwater has constructed very highly efficient and environmentally friendly cooling towers for the air-conditioning, power generation, biomass co-generation, petrochemical, chemical, oil & gas, steel mills, food and other processing industries. Engineered from a choice of available material ranging from timber, steel, concrete and even of composite FRP structures combined with various configurations of fill packs designed specifically for both the mechanical draft counter-flow or cross-flow applications.

Mision

Value creation for our customers and stakeholders while fostering our employees' happiness through continual improvement and sincerity in our core values

Vision

To be the best cooling tower service and products provider in Asia Pacific

Core Values

Integrity

Innovation

Commitment

Sharing

Truwater Cooling Towers Milestone

1982

Distributor

Sales & Marketing pump of Ingersoll Dresser Pumps (IDP), now known as Flowserve.

1984 & 1986

Distributor

Appointed as the exclusive distributor for KUKEN Kogyo Cooling Towers of Japan & Marley Cooling Towers of USA (now known as SPX).

1993 to 1994

Manufactur

Started manufacturing cooling towers under own brand name. Approved as a manufacturing member of Cooling Technology Institute (CTI).

2003

Co. Name

Changed company name from TRANSWATER to TRUWATER.

2005

Establishment

Established Truwater Asia Pacific Sdn Bhd for the global and international markets.

2006

Globalization

Established Truwater Fillex Sdn Bhd for Malaysian Market. Established Truwater Singapore Pte Ltd for Singapore Market.

2014

Globalization

Established PT. Truwater Cooling Towers for Indonesia Market.

Present

Present day

Over 3,000 cooling tower installations across the Asia Pacific, East Asia and the Middle East.

ISO 9001 CERTIFIED ISO 14001 CERTIFIED

Factory
Truwater Cooling Towers Sdn Bhd

Location:

Lot 37030, Jalan Kampung, Kampung Baru Sg. Buloh, 47000 Sg. Buloh, Selangor, Malaysia. Selangor, Malaysia (Size : 10,000 m^2)

- ✓ Manufacturing cooling tower parts (specialized in steel parts, hand-laid FRP, PVC components & etc.)
- ✓ R&D
- ✓ Warehouse
- ✓ Logistic

ISO 9001 CERTIFIED ISO 14001 CERTIFIED

Malaysia Office
Truwater Cooling Towers Sdn Bhd

Location:

Executive Suite 702, Block B, Kelana Business Centre, No.97, Jalan SS 7/2, Kelana Jaya, 47301 Petaling Jaya, Selangor, Malaysia

- ✓ Sales office
- ✓ Design & manufacturing of packaged cooling tower
- ✓ Repair & After Market Services

ISO 9001 CERTIFIED ISO 14001 CERTIFIED

Branch Office
Truwater Cooling Towers

TRUWATER SINGAPORE PTE LTD

1 Soon Lee Street #06-33, Pioneer Centre, Singapore 627605.
Tel: +62 21 2245 7239

- ✓ Sales office
- ✓ Project execution
- ✓ Repair & After Market Services

PT TRUWATER COOLING TOWERS

Komplek Gading Bukit Indah, Blok P, No.17, Kelapa Gading Barat, Kelapa Gading, Jakarta Utara, DKI Jakarta 14240 Indonesia
Tel: +62 21 2245 7239

- ✓ Sales office
- ✓ Project execution
- ✓ Repair & After Market Services

TRUWATER (THAILAND) CO., LTD.

20th Fl., Thanapoom Tower, 1550 New Petchburi Rd., Makkasan Ratthawi, Bangkok, 10400 Thailand
Tel:+66 2152 6961

- ✓ Sales office
- ✓ Project execution
- ✓ Repair & After Market Services

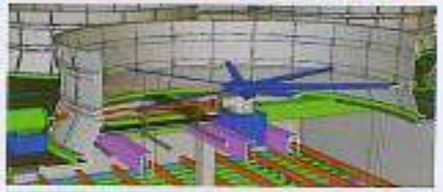
ISO 9001 CERTIFIED ISO 14001 CERTIFIED

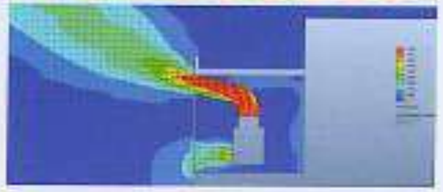
RESEARCH AND DEVELOPMENT

Truwater cooling tower design engineers administer the most stringent of standards in their cooling tower designs to conform to the strict performance parameters of the Cooling Technologies Institute (CTI) and ASHRAE 90.1. Our technical design capability is kept right on the cutting edge of technology not only with ongoing programs of research and development but also with continuous evaluation of new design concepts and materials.

Truwater's R&D program has developed a new line of cross-flow and counter-flow cooling towers that conforms to the Cooling Technologies Institute (CTI) standards with CTI STD-201 and 202 Certification.

Our latest development in 3-D modeling has enabled us and our clients to visualize in a better perspective their cooling towers even before the cooling tower physically takes shape on site.





FIELD TEST CAPABILITY

Truwater test engineers are trained to conduct "on-site" field thermal performance test on cooling towers in accordance to the requirements of CTI ATC-105, a benchmark for all cooling tower tests in the industry.

With our complete set of measuring instruments and devices comprising digital psychrometer, flowmeter, digital thermometers, barometers, wind-gauge to air-flow meter in sync with a state of the art data logger, our test engineers are able to log-in "real-time" data. Feeding these data into the CTI Toolkits software program, Truwater test engineers are able to instantaneously determine a cooling tower performance capability factor.

Many existing as well as new cooling tower owners and operators in the industry are engaging our cooling tower thermal services to test and determine the thermal capability of their cooling towers.

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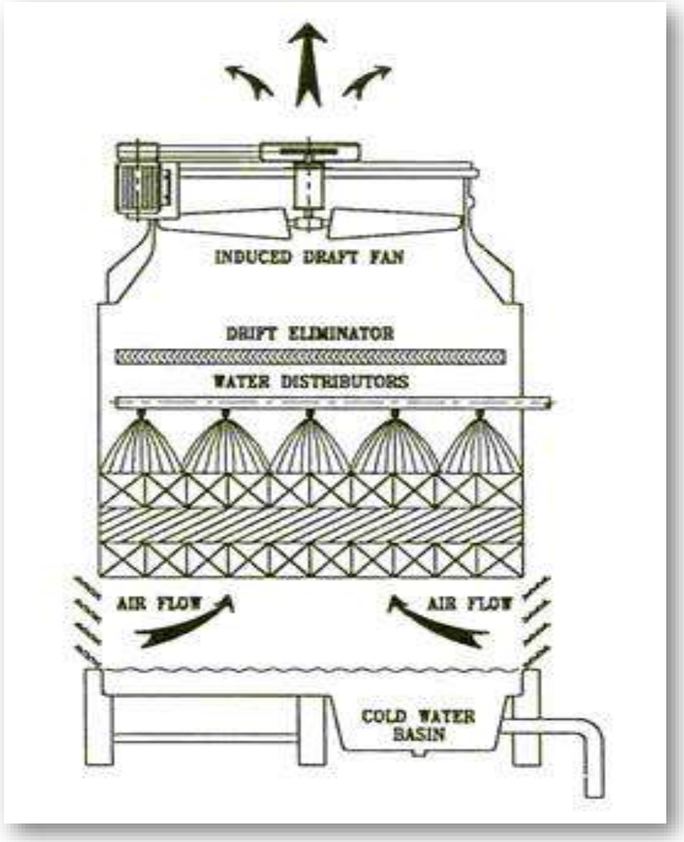
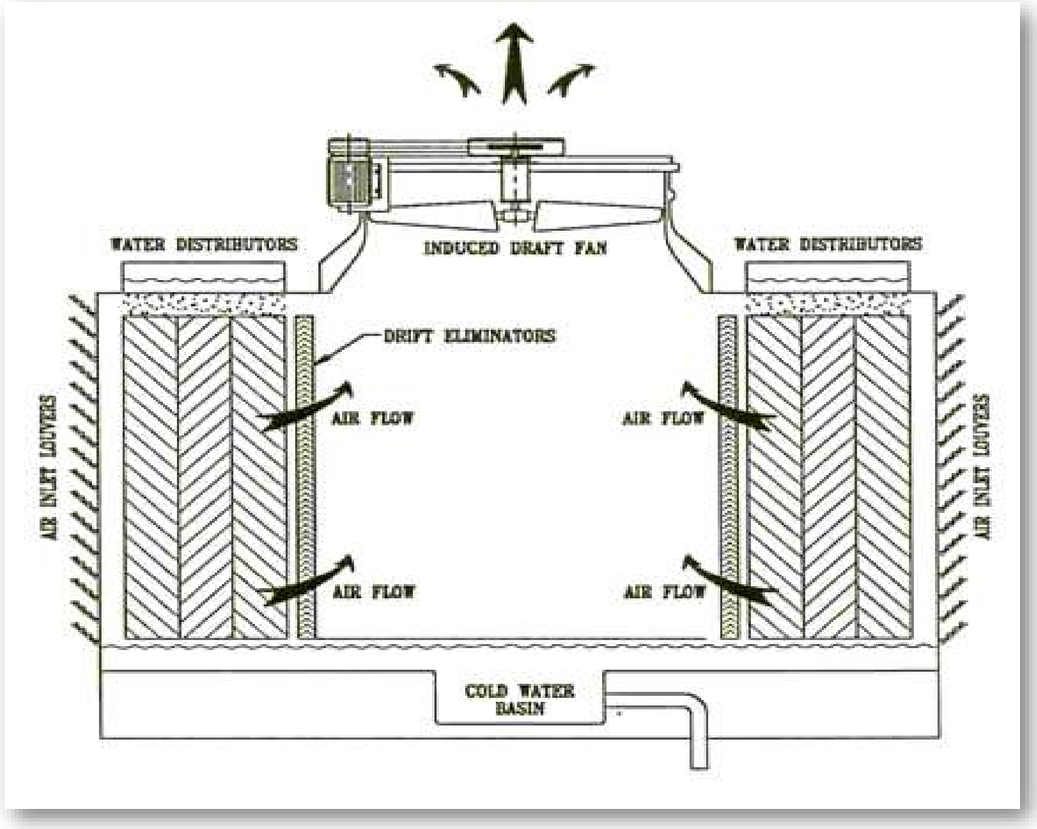
02 COUNTERFLOW CROSSFLOW For OPEN TYPE

COUNTERFLOW VS CROSSFLOW



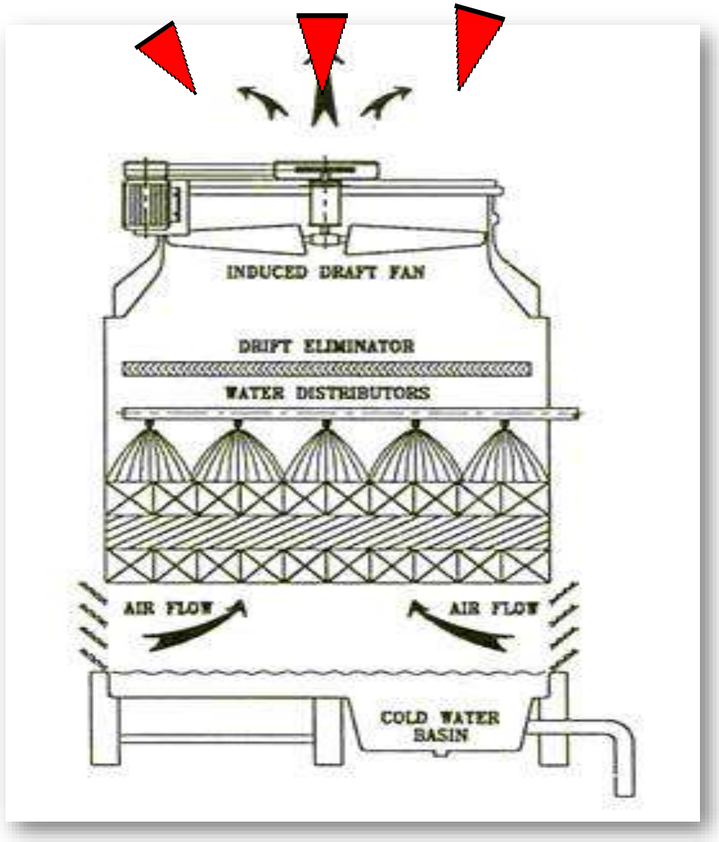
In a counterflow tower, the air is drawn up from the bottom of the tower, and mixes with the falling water over the entire height of the tower.



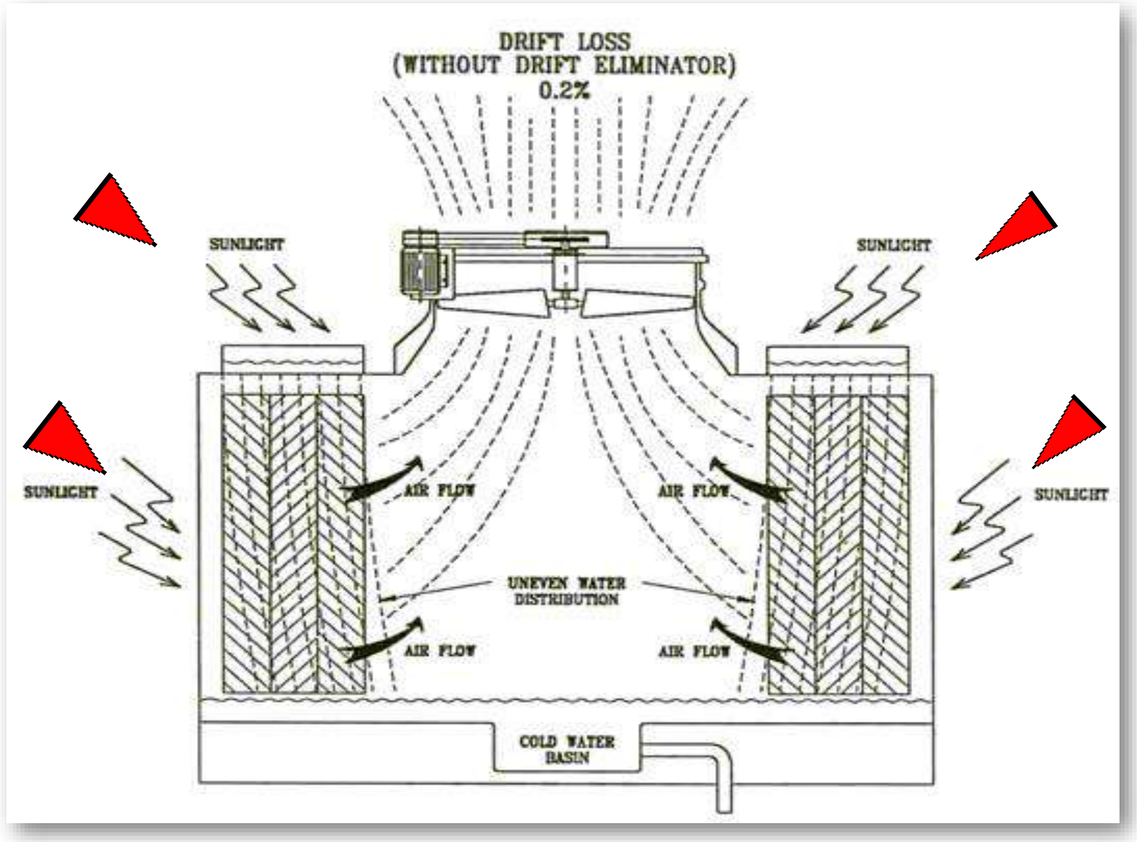
In a crossflow tower, cooling air is drawn in from the sides of the cooling and moves horizontally through the fill. This air mixes at right angles to the falling water.

COUNTERFLOW VS CROSSFLOW

ENVIRONMENTAL IMPACT



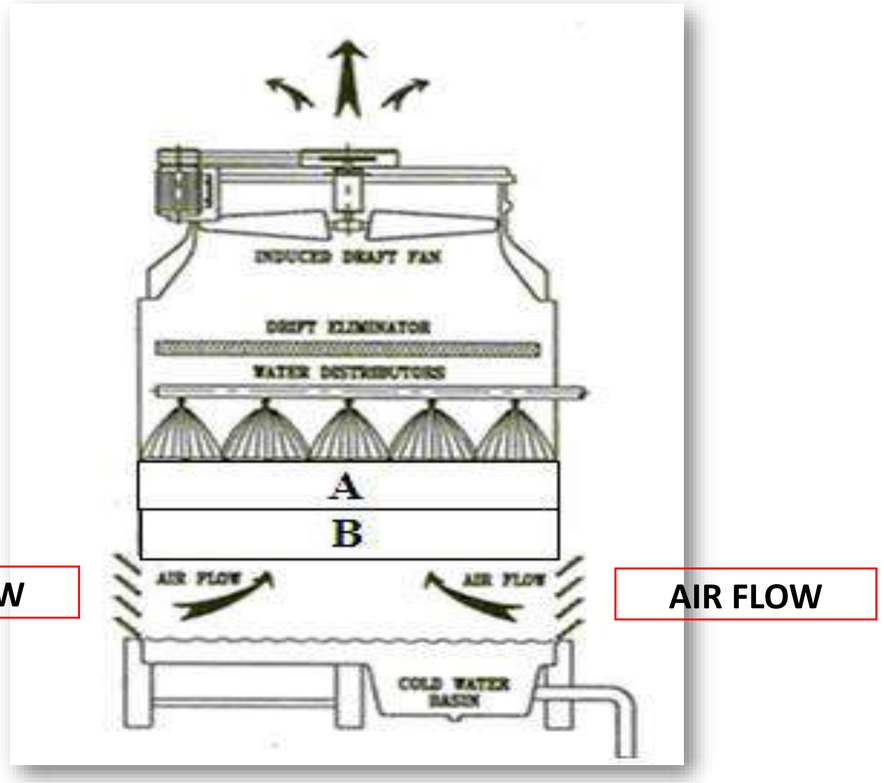
- Very low drift loss ~ 0.005%
- Less water & chemical consumption.



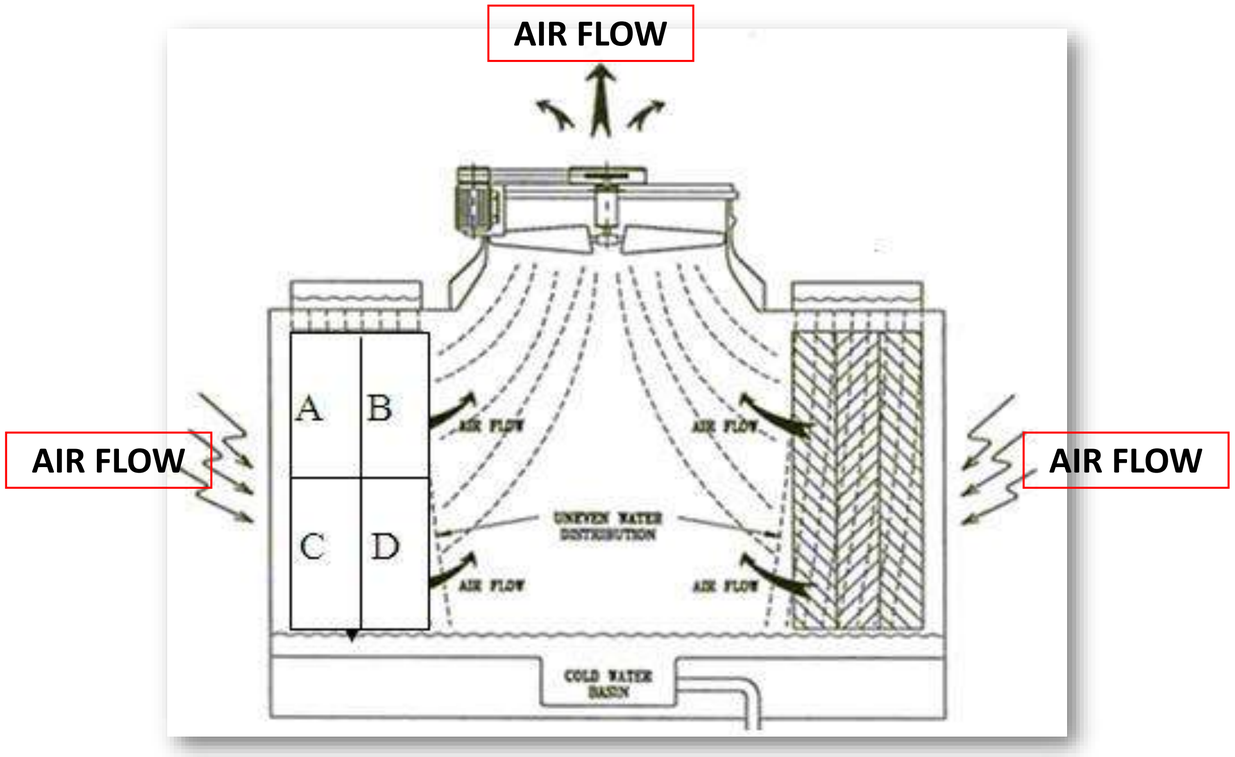
- Higher drift loss ~ 0.02%
- Expose to sunlight. High algae growth.

COUNTERFLOW VS CROSSFLOW

COOLING TOWER PERFORMANCE



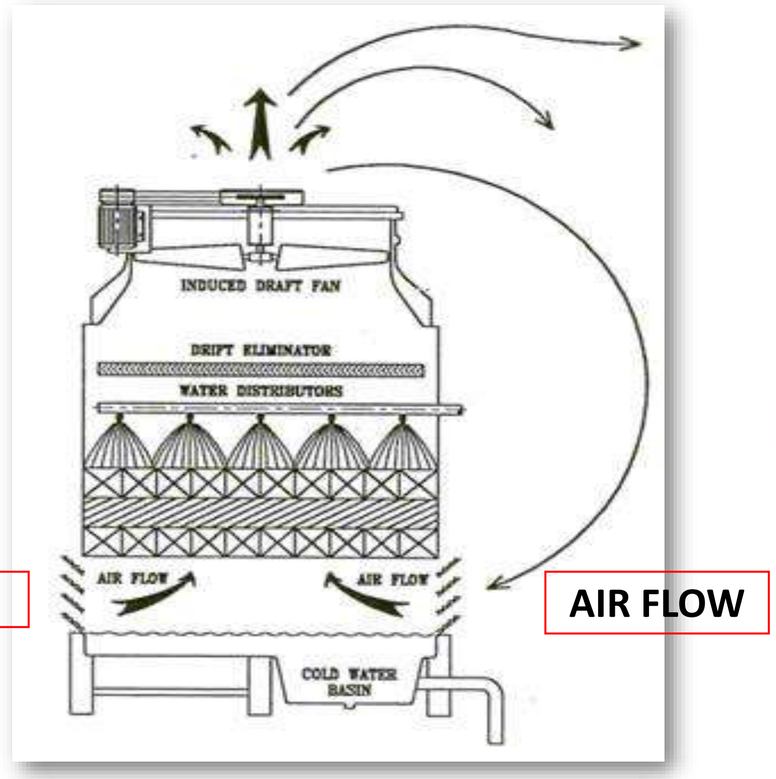
- Even water distribution.
- A – Slightly hot air meets hot water.
- B – Cold air meets slightly cold water.



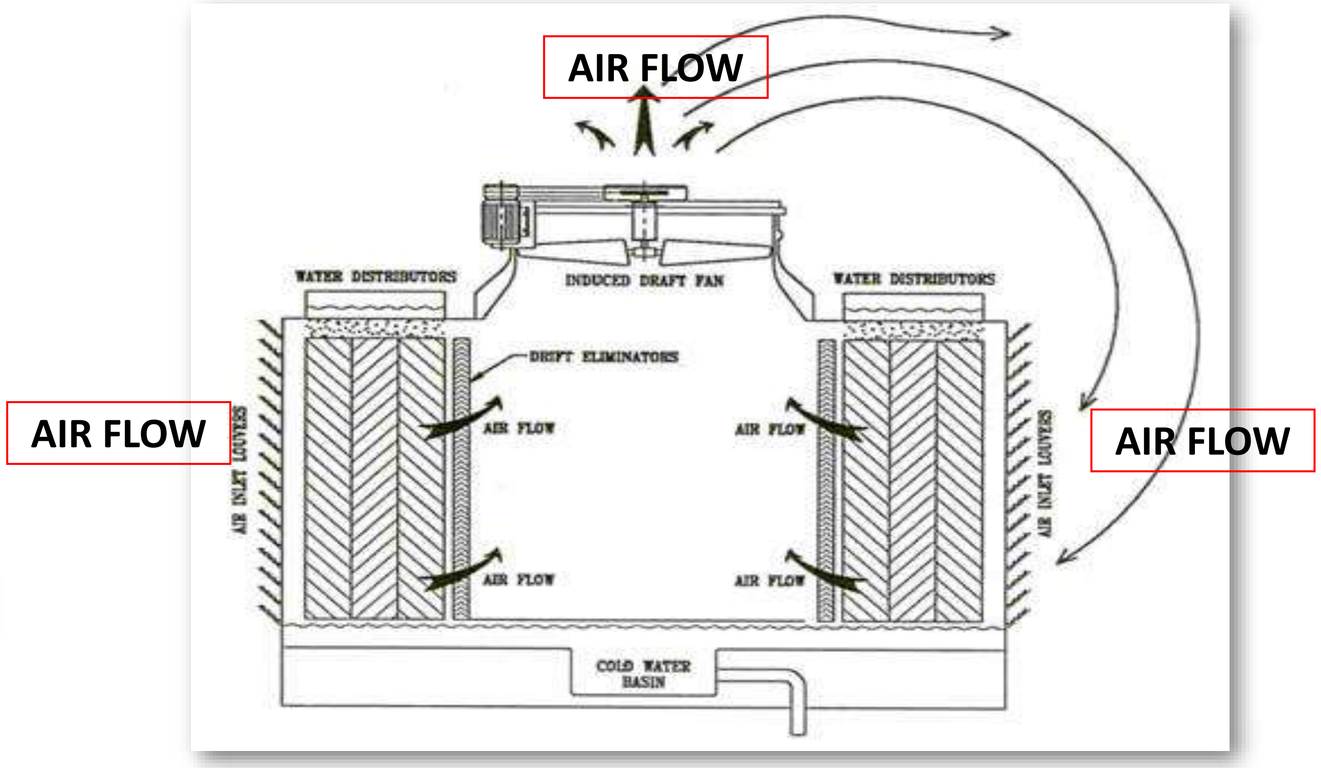
- Uneven water distribution due to non-uniformity of air velocity & static pressure.
- A – Cold air meets hot water.
- B – Slightly hot air meets hot water.
- C – Cold air meets slightly cold water.
- D – Slightly hot air meets slightly cold water.

COUNTERFLOW VS CROSSFLOW

RECIRCULATION



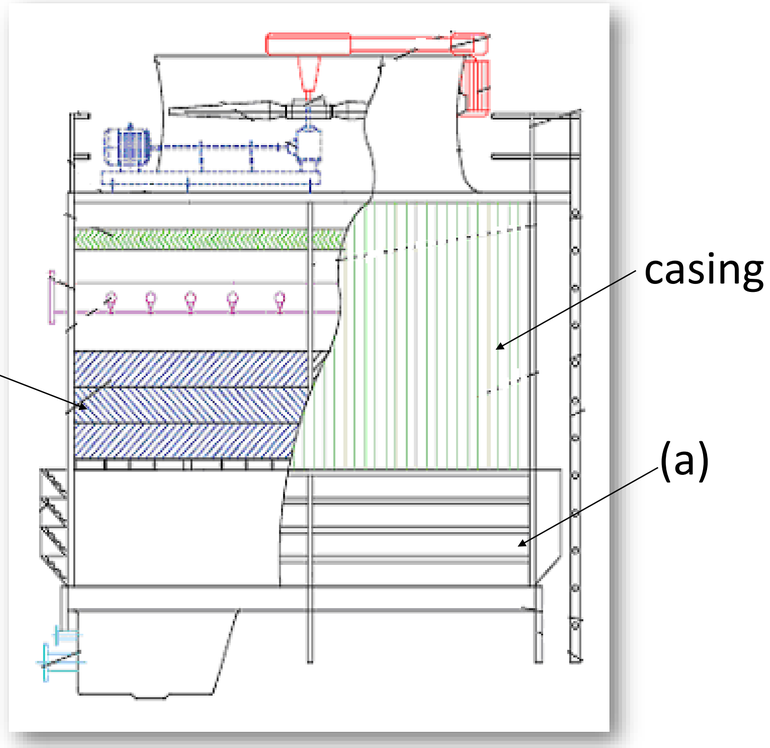
Distance between fan discharge and louver is far apart.
Low tendency for recirculation.



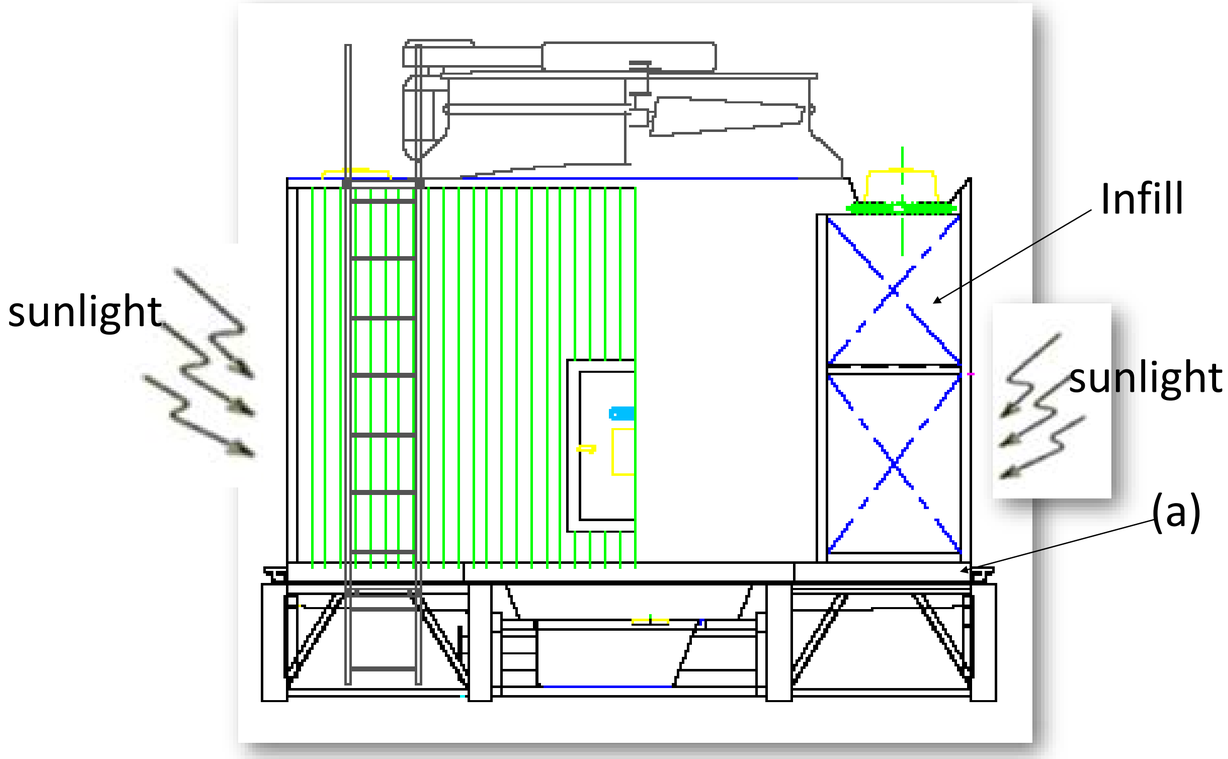
Fan discharge to louver is very near.
High tendency for recirculation.

COUNTERFLOW VS CROSSFLOW

MAINTENANCE



a) Cold water basin easy to clean by remove out the louver blade only.
b) Infill life span longer due to infill was covered by casing and not expose to sunlight.
c) Low drift loss (0.005%), tendency for Legionnaire disease reduce.



a) Filling cover part of cold water basin, difficult to clean by access in the tower.
b) Infill expose to sunlight and cause formation of silica. Infill cleaning was required and tend to reduce infill life span.
c) High drift loss (0.02%), tendency for Legionnaire disease higher when access in for cleaning.

COUNTERFLOW VS CROSSFLOW

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SUMMARY

	Counterflow	Crossflow
Heat transfer capabilities	• High	• Low
Environmental Impact	• Low drift loss (0.005%) • Less water & chemical consumption.	• High drift loss (0.02%) • More for same work
Recirculation	• Low tendency.	• High tendency
Fan horsepower	• Usually less required.	• More hp for same work
Floor area	• Usually less required.	• More floor area for same work
Maintenance	• Cold water basin easy to clean. • Infill life span longer. • Have Tendency to grow Legionnaire Disease	• Filling cover part of cold water basin, difficult to clean • Infill life span shorter • Have Tendency to grow Legionnaire Disease
Initial cost	• Larger capacity tower, less	• Cost more for same work

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03 COUNTERFLOW CROSSFLOW For CLOSED TYPE

Product Introduction for CLOSED TYPE

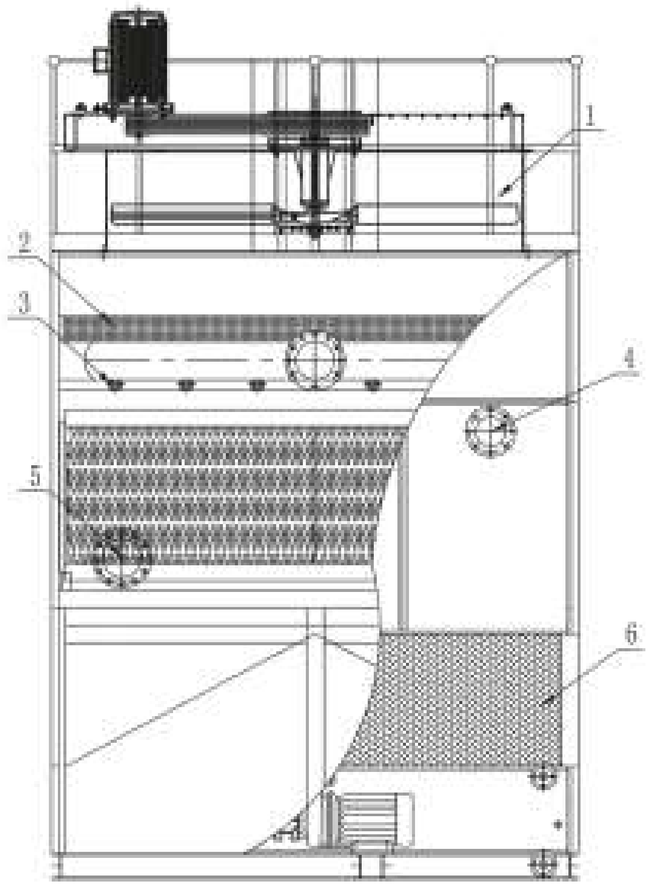
INTRODUCTION

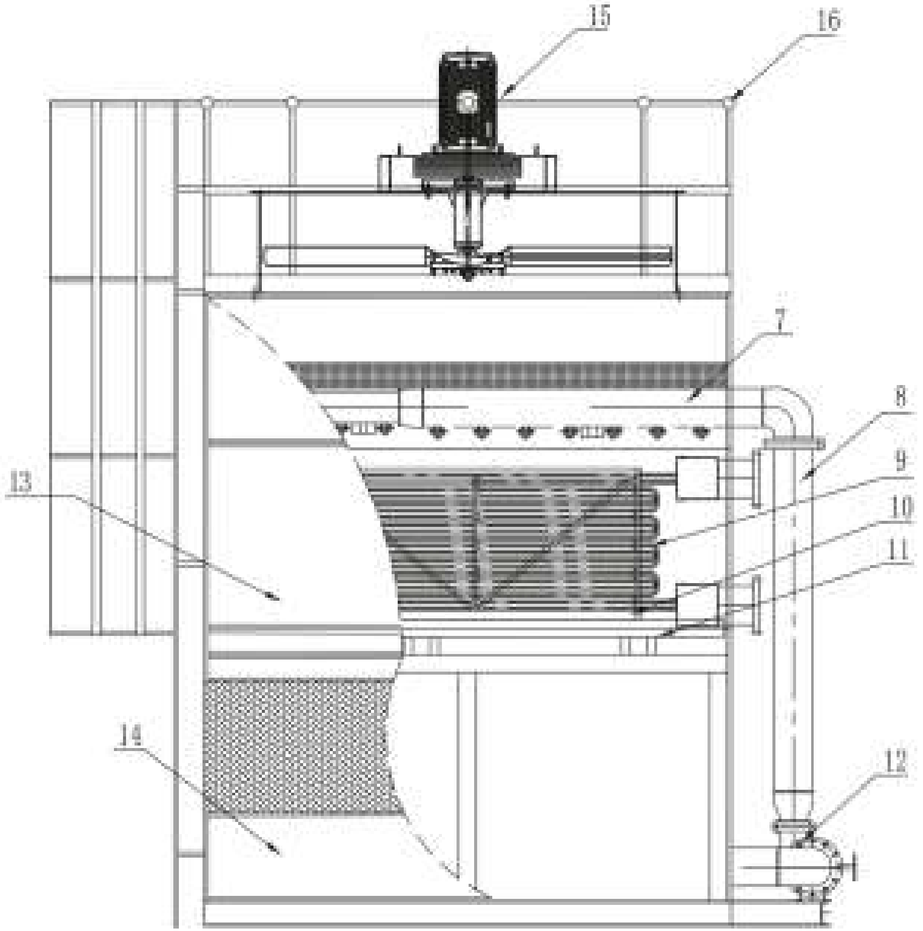
TK-S Series Closed Circuit Cooling Towers are used in the following applications: commercial air-conditioning, industrial processes, air compressors, welding machine cooling, mold water cooling, power plant auxiliary cooling, furnace cooling, transformer cooling, closed condenser loops and critical systems.

ADVANTAGES

- Clean process fluids sustain the performance of high efficiency components
- Energy saving by operating on free cooling mode during cold weather
- Reduces the cleaning of heat exchanger
- Extend the life of the equipment
- Save water treatment cost

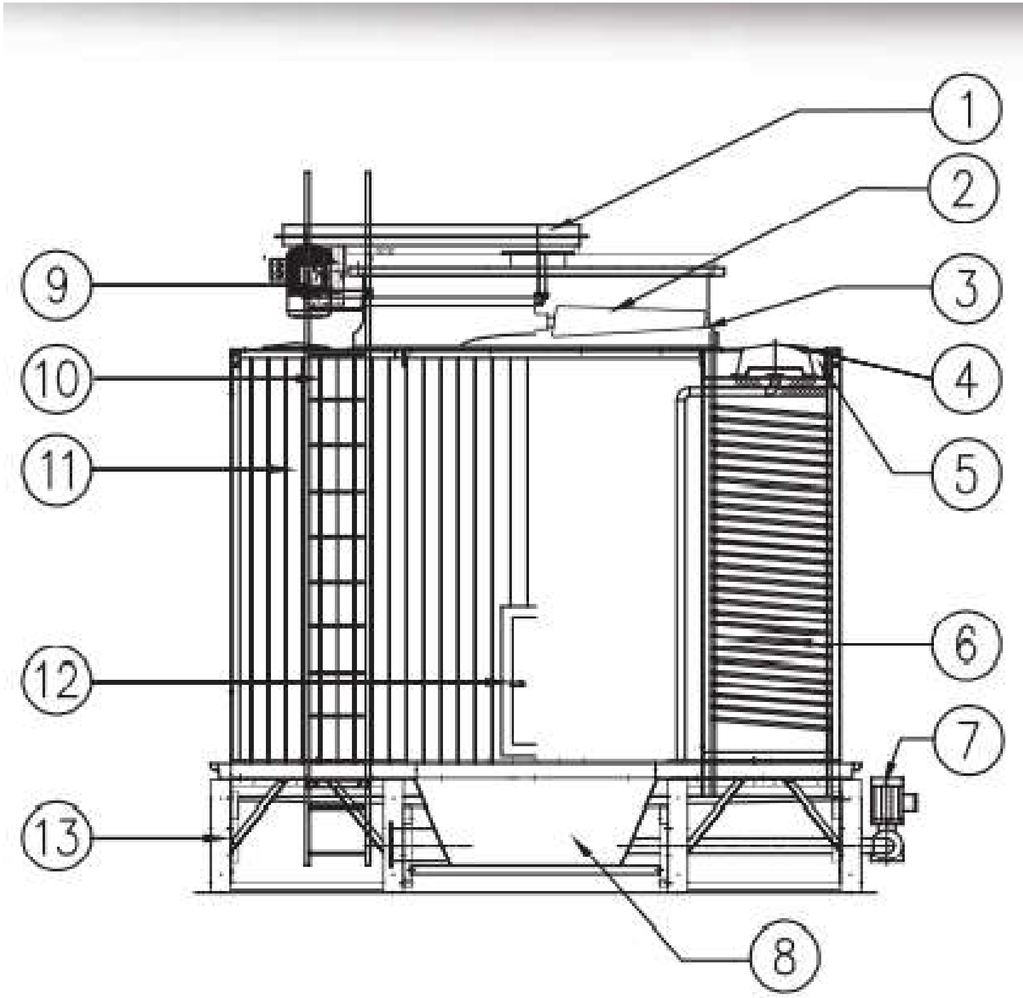
COUNTERFLOW for CLOSED TYPE





No.	Description	Material/Specification
1	Fan Assembly	Aluminium Alloy
2	Drift Eliminator	PVC
3	Non-Clog Spray Nozzle	ABS
4	Hot Water Inlet	HDG Steel
5	Cold Water Outlet	HDG Steel
6	Louver	PVC
7	Internal Water Distribution Piping	PVC
8	External Water Distribution Piping	PVC
9	Heat Exchanger Coil	SS304
10	Heat Exchanger Coil Frame	SS304
11	Heat Exchanger Coil Support	HDG Steel
12	Spray Pump	Cast Iron
13	Casing	GI
14	Cold Water Basin	GI
15	Motor	TEFC/Weather Proof Type
16	Safety Handrail Caged Ladder	HDG Steel

CROSSFLOW for CLOSED TYPE



No	Description	Material / Specification
1	V-Belt and Pulley System	FRP Pulley Cover
2	Fan Assembly	Aluminum Alloy
3	Fan Stack	FRP
4	Hot Water Distribution Box	FRP
5	Hot Water Basin	FRP
6	Coil & Infill	Copper & PVC
7	Spray Pump	-
8	Suction Sump	FRP
9	Motor	Weather Proof TEFC Type
10	Ladder	HDG Steel
11	Casing / Louver	PVC
12	Inspection Door	FRP
13	Cold Water Basin Frame	HDG Steel

OPEN TYPE VS CLOSED TYPE

SUMMARY

	Open Type	Closed Type
Heat transfer capabilities	• High	• Low
Electrical Consumption	• Low	• High
Dimension	• Usually less required.	• More floor area for same work
Commercial Impact	• More Competitive Price	• Relative high price
Floor area	• Usually less required.	• More floor area for same work
Maintenance	• Cold water basin easy to clean. • Need more water treatment • Need more make up water	• Need less water treatment • Need less make up water

Seagull | TRUWATER®

04 TRUWATER PROJECT REFERENCES

Seagull | TRUWATER®

We Have Complete Projects in More Than

50 Countries Worldwide

OUR PARTNERS

Seagull | TRUWATER®

TRANSmart Carrefour

YKK Little Parts. Big Difference.

ASTRA AGRO LESTARI

ASTRA international

REKAYASA

INDOKORDSA

IndoAgri

summarecon Wonderful Life · Wonderful World

mrt jakarta increasing mobility, improving life quality

MAYORA

TOYOTA-ASTRA MOTOR

PUSRI PUPUK UREA PALEMBANG INDONESIA

PERTAMINA

PUPUK KALTIM PT PUPUK KALIMANTAN TIMUR

Best Best Plantations

PERURI

AHM PT. Astra Honda Motor

smart agribusiness and food

Sime Darby

PERMATA HIJAU GROUP

pindo deli paper products

CJ INDONESIA

BRIDGESTONE A GRIP ON THE FUTURE™

cdp CILIANDRA PERKASA GROUP

WINGS GROUP INDONESIA

socimas oleochemical

sinarmas

PT. WILMAR NABATI INDONESIA Excellent & Trustworthy

INDUSTRIAL

- **LOCATION**
  Karawang
- **MODEL**
  1 Unit x TXS 1000-2L

- **LOCATION**
  Jakarta
- **MODEL**
  1 Unit x ECS-1012G3-1BM
  1 Unit x TXS 600-2L
  1 Unit x TXS 250-1L
  1 Unit x TXS 1000-2L

- **LOCATION**
  Jayanti Balaraja, Tangerang
- **MODEL**
  1 Unit x TXS-150-1L
  1 Unit x TCS - 175 -1B

- **LOCATION**
  Karawang
- **MODEL**
  2 Unit x TXS-750-3LIA

POLYPLEX

- **LOCATION**
  Tangerang
- **MODEL**
  1 Unit x ECS-1414-2BA
  1 Unit x ECS-1012F2-1BA

Abbott

- **LOCATION**
  Bogor
- **MODEL**
  1 Unit x TXS-400-2L

barata indonesia

- **LOCATION**
  Gresik
- **MODEL**
  1 Unit x TCS 125Z-1BM
  2 x TCS 500E-1BM
  1 x TCS 350D-1BM

TEMPO SCAN

- **LOCATION**
  Surabaya
- **MODEL**
  1 Unit x TXS-500-2LIA

YKK

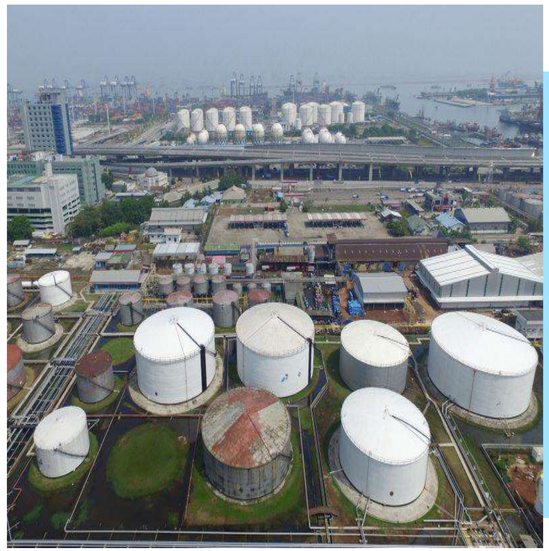
- **LOCATION**
  Cibitung, Bekasi
- **MODEL**
  1 Unit x TCS 350 -2BA

MEIRA

- **LOCATION**
  Karawang
- **MODEL**
  1 Unit x TXS 100 - 1L

SAKATAMA

- **LOCATION**
  Gresik
- **MODEL**
  1 Unit x TCS 1400-4SB



PERTAMINA

- **LOCATION**
  Jakarta
- **MODEL**
  1 Unit x TCS 900-3B

INDO KORD SA

- **LOCATION**
  Cibinong, Bogor
- **MODEL**
  1 Unit x TCS 350 -2BA
- **LOCATION**
  Cengkareng
- **MODEL**
  3 x TXC 1500-1B

ANJ
PT AUSTINDO NUSANTARA JAYA Tbk

- **LOCATION**
  Papua
- **MODEL**
  1 Unit x TXC 2100-3B

GISTEX

- **LOCATION**
  Subang
- **MODEL**
  1 Unit x TXC 600 - 2L

TOYOTA
INDONESIA
PT Toyota Motor Manufacturing Indonesia

- **LOCATION**
  Karawang
- **MODEL**
  4 Unit x TXS 1000 - 4LI

TRAIN STATION & AIRPORT

MRT JAKARTA

Bendungan Hilir Station

Setiabudi Station

Senayan Station

Istora Station

Bunderan HI Station

Dukuh Atas Station

- **ECS 0811B2-225-1D x 9 NOS**
- **ECS 0811C2-250-1D x 3 NOS**
- **ECS 0711B2-175-1D x 4 JOINED x 1 NO**
- **ECS 0711C2-200-1D x 4 JOINED x 1 NO**

MRT JAKARTA

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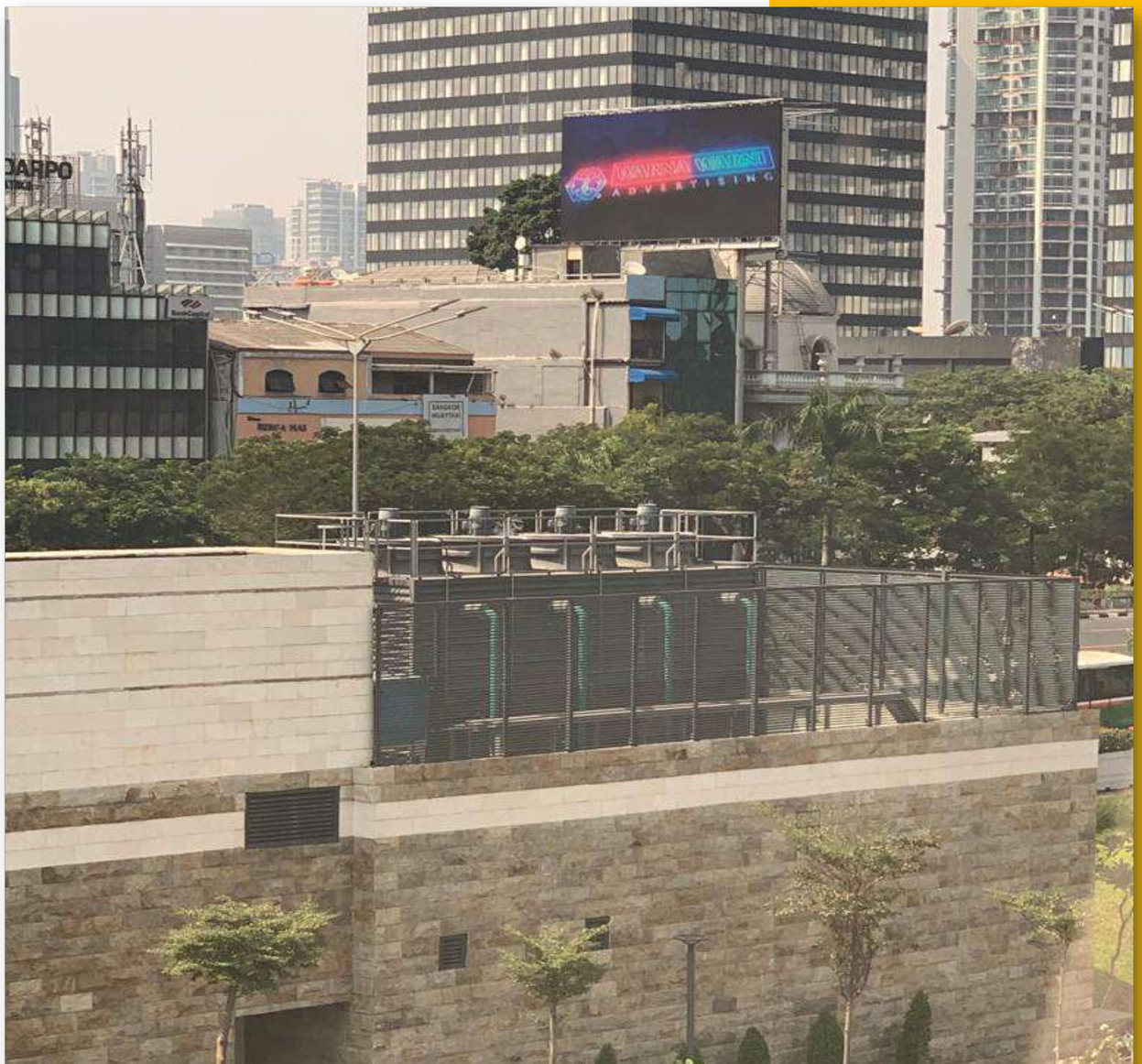
Dukuh Atas Station



AIRPORTS
Kertajati – West Java

5,000 HRT
5 units TXS 1000-2LIA

Owner / Developer1 :
PT. Bandar Udara Internasional Jawa Barat

MEP Engineering :
PT. Penta Rekayasa & Arkonin

Architect Design :
PT. Penta Rekayasa & Arkonin

General Contractor :
(Infrastructure)
PT. Adhi Karya (Persero) Tbk

(Passenger Terminal)
PT. WIKA (Persero) Tbk &
PT. PP (Persero) Tbk

(Operational Support)
PT. Waskita Karya (Persero) Tbk

AIRPORTS
Kertajati – West Java

AIRPORTS

Sutan Mahmud Badaruddin II - Palembang

400 HRT

1 x TXS-400-2LIM

SHOPPING CENTER

SHOPPING CENTER

AEON MALL – TANJUNG BARAT

3 x TXS-1200-4L
2 x TXS-400-2L

AEON MALL – BSD CITY

3 x TXS-1200-4L
2 x TXS-400-2L

SHOPPING CENTER

Mall Botania 2

TXS 900-3L x 3 NOS

Plaza Blok M

TXS-600-2LIA X 3 NOS

Hartono Mall, Solo

TXS 1400-4LM x 5 NOS

Gramedia BSD

TXS 600-2L x 1 NO

Mall Epicentrum, Lombok

TXS 780-3LM x 3NOS

Mall Nipah, Makassar

TXS 700-2L x 4 NOS

TXS 225-1L x 3 NOS

SHOPPING CENTER

Holland Village Mall

TOTAL HRT : 4.475 HRT
MODEL : TXS 1200-4LIA x 3 NOS
TXS 175-1LIA x 5 NOS

SHOPPING CENTER

Transmart Tegal

ECS 0711C2-2B x3 NOS

Transmart Mataram

ECS 0811C2-2B x 3 NOS

Transmart Padang

ECS 0811C2-2B x 3 NOS

Trans Studio Bali

TXS 1200-6LIA X 4 NOS

Transmart Bintaro

TXS 600-2LIA Xx 3 NOS

Transmart Solo

ECS 0811C2-2B x 3 NOS

Transmart Cirebon

ECS 0911C2-2B x 3 NOS

Trans Park Cibubur

TXS 1200-6SIA x 6 NOS

TXS 700-3SIA x 2 NOS

SHOPPING CENTER

Trans Studio Bali

TOTAL HRT : 4.800 HRT
MODEL : TXS 1200-6LIA X 4 NOS

HOTEL & RESORTS

HOTEL & RESORTS

Hotel Sultan
TXS 900-3L x 3 NOS

Mercure Batavia Hotel
TXS 600-3S x 3 NOS

Crown Plaza Hotel
TXS 600-2L x 2NOS

Hotel Alana
TXS 300-1L x 3 NOS

Hotel Samasta Movenpick
TXS 1400-4LIM x 1 NO

Hotel Lumire
TXS 500-2L x 1 NO

DATA CENTER

DATA CENTER

GTN Data Center

(Cikarang) 1 x ECS 1111E1 - 2B
(Tangerang) 2 x ECS 1111E1-800-2B

DATA CENTER

Indokeppel (Dubnium Data Center)

Phase 1 : ECS 2020G2-1GSA x 2 NOS
Phase 2 : ECS 2020G2-1GSA x 3 NOS

DATA CENTER

Menara Tendean (MTen) Jakarta

2 x TCS-350B-2B

Lintas Artha Taman Tekno

1 x TXS-800-2L

OFFICE
UNIVERSITY
HOSPITAL
MUSEUM
CONVENTION CENTER

OFFICE

Seagull | TRUWATER®

MPP TOWER

5250 HRT
7 units EXS 1314E-1BSIA

Owner / Developer	: Mori Building Co.,Ltd
Designer	: Kohn Pedersen Fox Associates (KPF)
Architect Design	: PT. Penta Rekayasa & Arkonin
General Contractor	: PT. Shimizu Corporation
	PT. Bangun Cipta Kontraktor

OFFICE

Seagull | TRUWATER®

INDONESIA 1 (CHINA SINANGOL) TOWER

TOTAL HRT : 12,300 HRT
TOTAL CELLS : 21 CELLS
MODEL : EXS 1114E-5BI X 2 NOS
EXS 1114E-4BI X 2 NOS
EXS 1110D-1BI X 3 NOS

Owner / Developer:	PT. China Sinangol Media
Designer:	Kohn Pedersen Fox Associates (KPF)
Consultant:	PT. Davy Sukamta & Partners
General Contractor:	PT. Acset Indonusa Tbk China Construction Eight
Location:	Thamrin Jakarta

OFFICE

Menara Kompas
TXS 700-2LIM x 4 NOS

Permata Plaza
TXS 1000-4LI x 1 NO

Menara Thamrin
TXS 900-3LI x 2 NOS

BNI 46 Serpong
TXS 675-3L x 3 NOS

IFC Indonesia Building
TXS 900-3LI x 3 NOS

Sima Office
TXS 900-3SI x 3 NOS

UNIVERSITY & HOSPITALS

Binus Alam Sutera

TCS 350-2B x 1 NO

Binus Malang

TXS 175-1L x 2 NOS

TXS 100-1L x 1 NO

UMN Serpong

TXS 800-4LI x 1NO

RS Indriyati Solo

TXS 1000-4L x 4 NOS

Univ. Prasetya Mulya BSD

TXS 350-2L x 1 NO

RS Budi Medika Lampung

TXS 250-1LA x 2 NOS

INTERNATIONAL PROJECTS

SHOPPING CENTER

Seagull | TRUWATER®

Pavillion Bukit Jalil

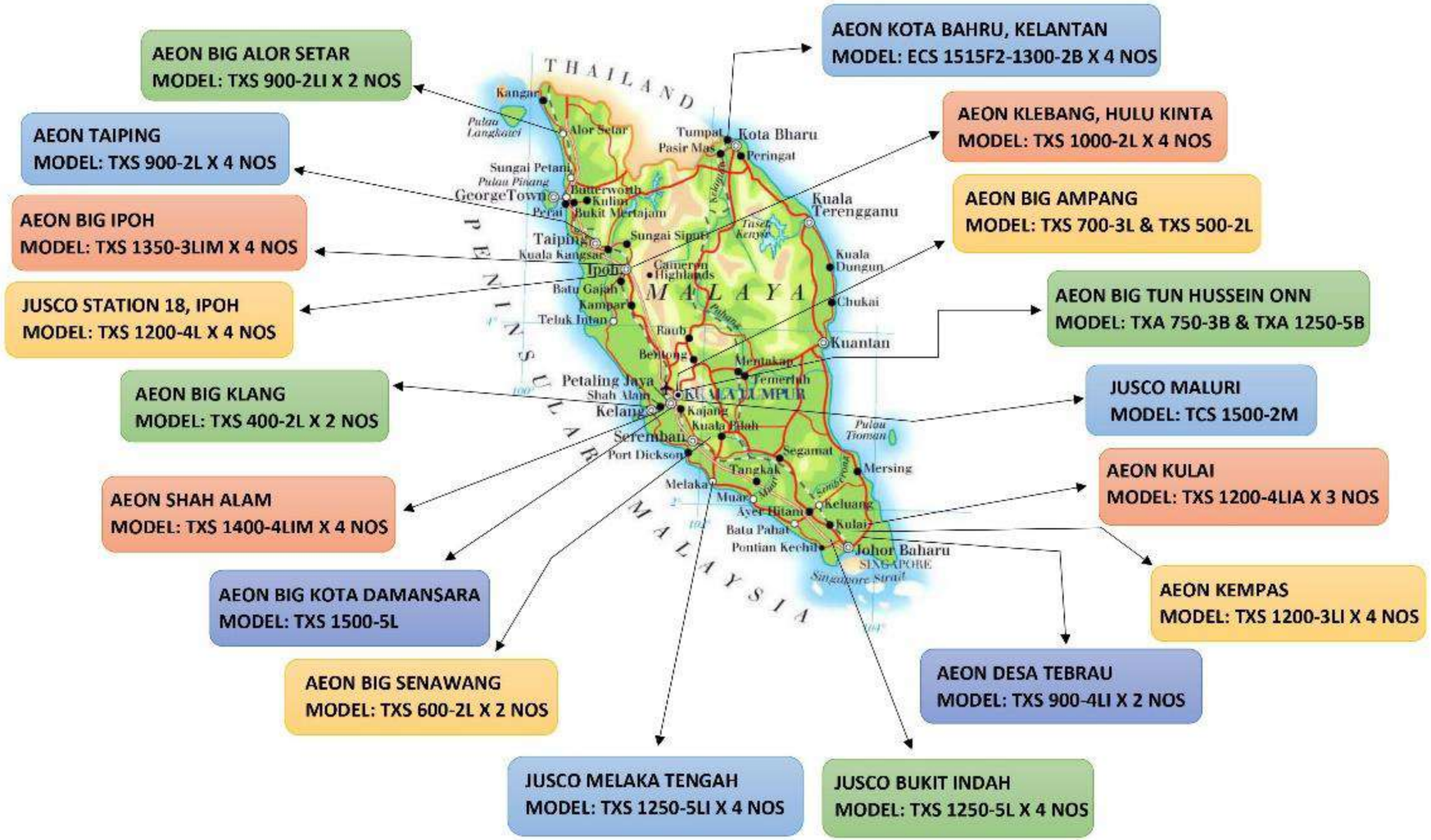
Model	ECS
Unit	6
Design condition	36.11/30.56/27.78 @ 8,176 m^3/hr
Total HRT	16,800
Scope	Supply of 6 cells of ECS cooling tower

SHOPPING CENTER

Seagull | TRUWATER®

TRUWATER®

AEON



AEON BIG ALOR SETAR
MODEL: TXS 900-2LI X 2 NOS

AEON TAIPING
MODEL: TXS 900-2L X 4 NOS

AEON BIG IPOH
MODEL: TXS 1350-3LIM X 4 NOS

JUSCO STATION 18, IPOH
MODEL: TXS 1200-4L X 4 NOS

AEON BIG KLANG
MODEL: TXS 400-2L X 2 NOS

AEON SHAH ALAM
MODEL: TXS 1400-4LIM X 4 NOS

AEON BIG KOTA DAMANSARA
MODEL: TXS 1500-5L

AEON BIG SENAWANG
MODEL: TXS 600-2L X 2 NOS

JUSCO MELAKA TENGAH
MODEL: TXS 1250-5LI X 4 NOS

JUSCO BUKIT INDAH
MODEL: TXS 1250-5L X 4 NOS

AEON KOTA BAHRU, KELANTAN
MODEL: ECS 1515F2-1300-2B X 4 NOS

AEON KLEBANG, HULU KINTA
MODEL: TXS 1000-2L X 4 NOS

AEON BIG AMPANG
MODEL: TXS 700-3L & TXS 500-2L

AEON BIG TUN HUSSEIN ONN
MODEL: TXA 750-3B & TXA 1250-5B

JUSCO MALURI
MODEL: TCS 1500-2M

AEON KULAI
MODEL: TXS 1200-4LIA X 3 NOS

AEON KEMPAS
MODEL: TXS 1200-3LI X 4 NOS

AEON DESA TEBRAU
MODEL: TXS 900-4LI X 2 NOS

AEON MALL

DATA CENTER

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Keppel Data Center, Johor

Model	ECS
Unit	4
Design condition	36/30.56/28 @ 565.2 L/S
Total HRT	4,400
Scope	Supply of 4 cells of ECS cooling tower

DISTRICT COOLING SYSTEM

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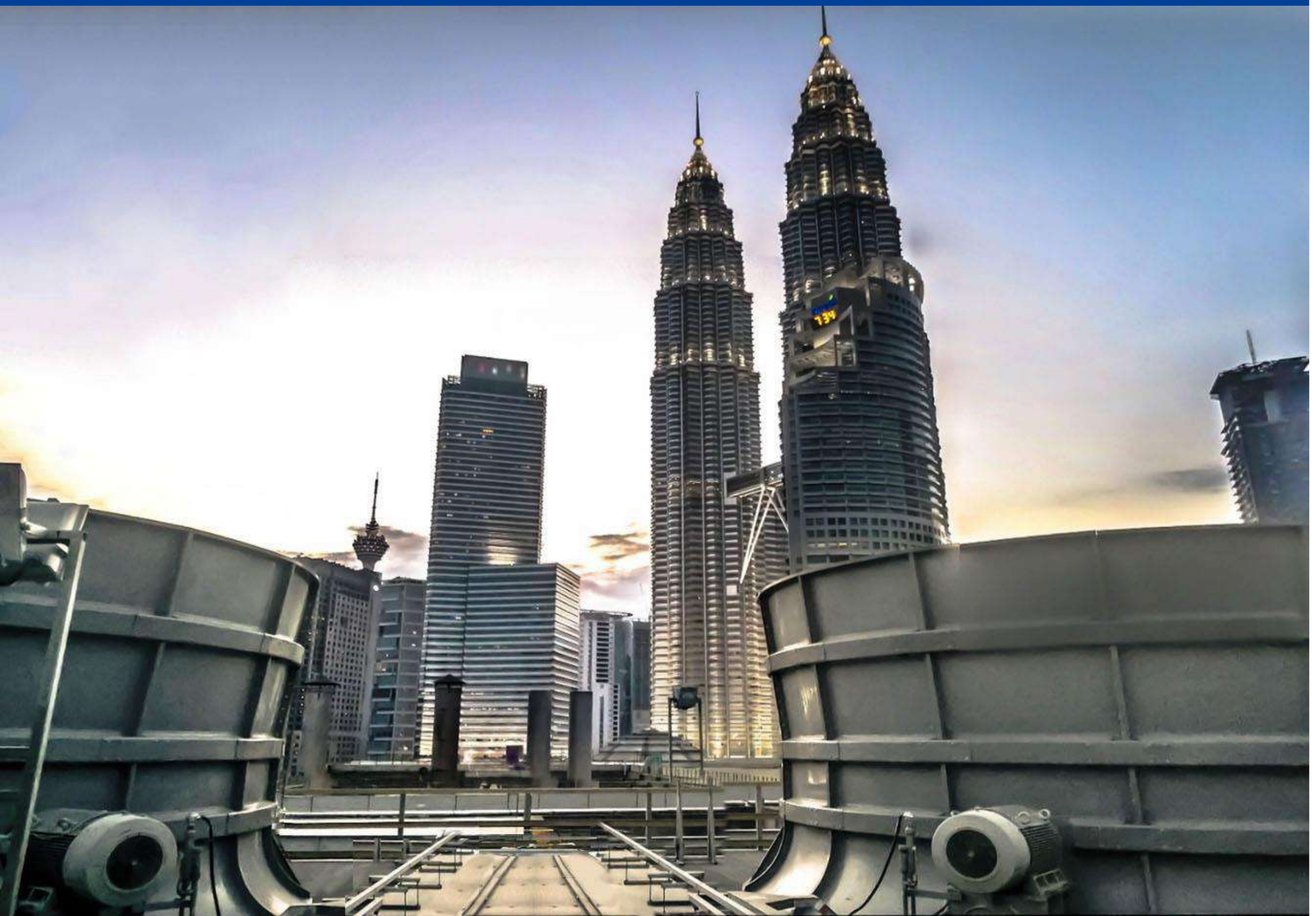
KLIA II District Cooling Plant

6 Cells FRP District Cooling Plant (DCP)	
EPC Contractor	Shinryo Corporation (Malaysia Branch)
End User	Gas District Cooling Sdn Bhd
Total Water Flow	8,100 m^3/h
Flow rate each cell	1,350 m^3/h
Scope	Design, supply & install 6 cells of cooling tower

DISTRICT COOLING SYSTEM



KLCC District Cooling Centre

8 Cells District Cooling Plant (DCP)	
EPC Contractor	IAQ Solutions Sdn Bhd
End User	Gas District Cooling Sdn Bhd
Total Water Flow	22,727 m^3/h
Flow rate each cell	2,841 m^3/h
Scope	Design, supply & install 8 cells of cooling tower

DISTRICT COOLING SYSTEM

Seagull | TRUWATER®

Palm Jumeirah Trunk Crown T3 & T4, Dubai

7 Cells District Cooling Plant	
EPC Contractor	Shinryo Corporation
End User	Palm District Cooling LLC
Total Water Flow	14,315 m^3/h
Flow rate each cell	2,045 m^3/h
Scope	Supply of 12 cells of Concrete Structural cooling tower

DISTRICT COOLING SYSTEM

Marina Bay Sands District Cooling Plant 2

7 Cells District Cooling Plant (DCP)	
EPC Contractor	Asia Project Engineering Ptd. Ltd.
End User	Singapore Power Group
Total Water Flow	21,848 m^3/h
Flow rate each cell	3,121 m^3/h
Scope	Design, supply & install 7 cells of cooling tower

DISTRICT COOLING SYSTEM

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Jewel Changi Airport - Singapore

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We **Understand** your needs
&
Tailor the best fit solutions.

TALK TO US TODAY!