

TRUWATER[®]

TC-M SERIES COOLING TOWER

SINGLE-CELL 60-1000 HRT COOLING CAPACITY

Modular Design Counterflow Type



LOW DRIFT LOSS EFFICIENT PERFORMANCE EASY MAINTENANCE



INTRODUCTION

TC-M Series is an induced draft, counterflow, film filled, FRP square cooling tower designed for air conditioning and industrial process cooling applications.

The TC-M Series is specifically designed to meet the 21st century challenges where the cost of energy, space and labour are ever increasing. It also incorporates a safety maintenance platform complete with safety railings for ease of maintenance.

This highly efficient engineered design M Class is a result of Truwater's commitment in the continuous R&D in cooling tower technology.

M Class utilizes only components that are manufactured from the finest raw material and have been proven in the field. All components are designed to operate collectively to give the optimum overall cooling efficiency. This translates to lower operating cost and long term savings to the operator.

ADVANTAGES

- **Efficient Drift Eliminator**
up to 0.001% drift loss, solves water carry over problems.
- **Reduced Plan Area**
a saving in costly space.
- **High Performance Fill**
reduces energy consumption.
- **Simplified Piping layout**
streamlined layout and lower piping cost.
- **Reliable Mechanical Driver System**
trouble free operation.

TRUWATER®



:: HSBC Bank Kuala Lumpur, 1125 HRT.



:: Central Sugar Refinery Selangor, FRP Pultruded Structure, 600 HRT.



:: HP Tuas Singapore, 1500 HRT.



:: SG Buloh Hospital, 3000 HRT.

...providing solution to your cooling needs



:: Western Digital Selangor, 1000 HRT.



:: ST Micro Johor, total 9600 HRT.

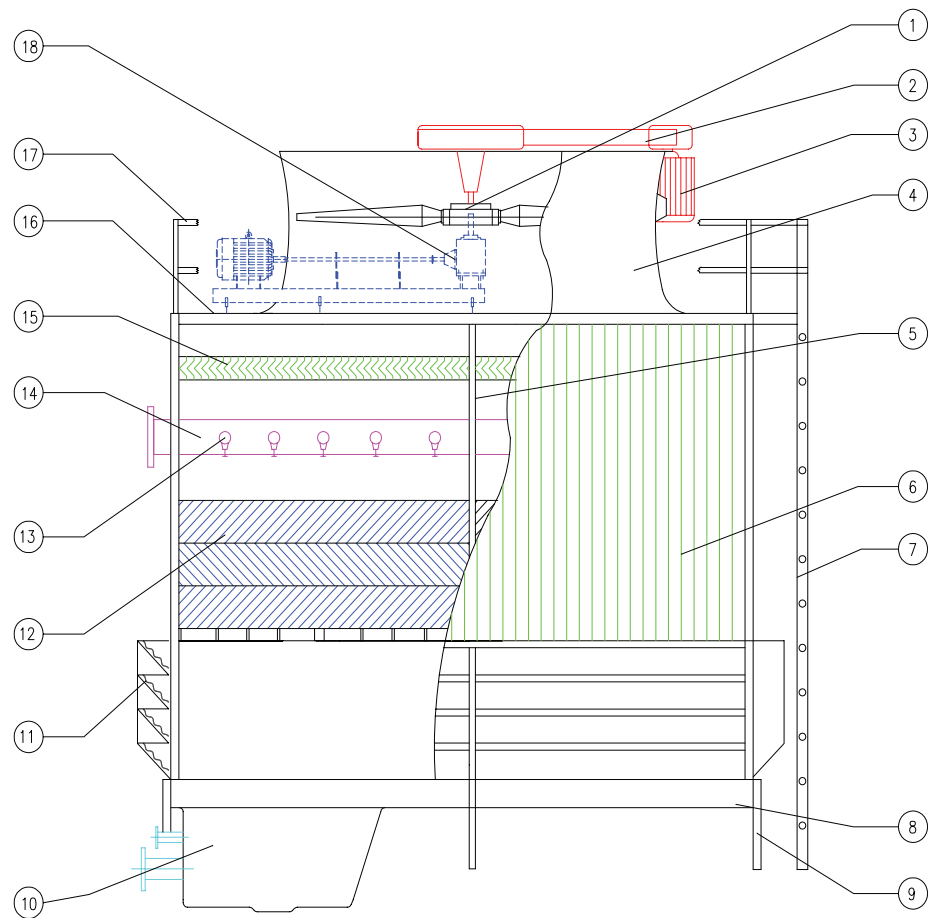


:: ORNA Steel Malacca, stainless steel frame, 600 HRT.



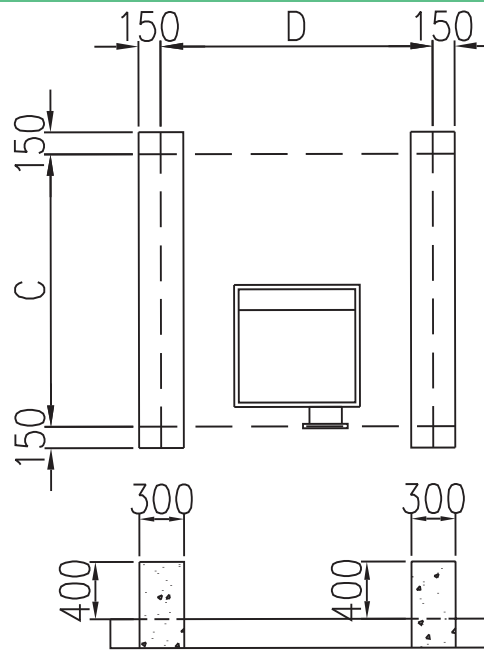
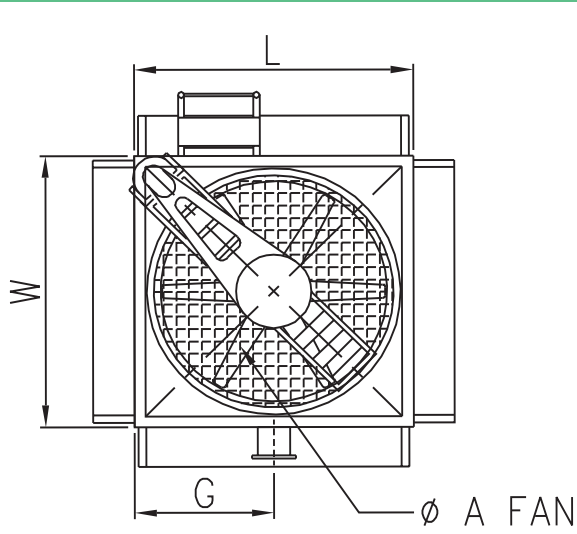
:: Locsin Makati Philippines, 750 HRT.

FEATURES

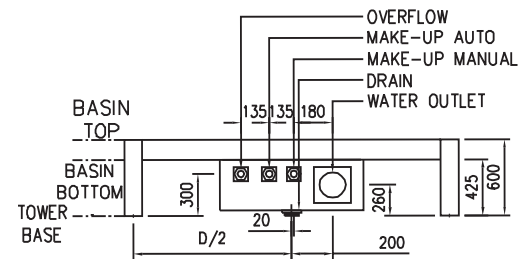


No	Description	Material / Specification
1	Fan Assembly	Aluminium Alloy
2	V-Belt and Pulley System	FRP Pulley Cover
3	Motor	Weather Proof TEFC type
4	Fan Stack	FRP
5	Main Frame Structure	HDG Steel
6	Casing	FRP
7	Ladder	HDG Steel
8	Cold Water Basin Floor	FRP
9	Cold Water Basin Frame	HDG Steel
10	Cold Water Basin Sump	FRP
11	Louver	FRP
12	High Performance Film Fill Pack	PVC
13	Non-Clog Spray Nozzle	Polypropylene
14	Water Distribution System	PVC
15	Drift Eliminator	PVC
16	Safety Maintenance Platform	HDG Steel
17	Safety Handrail	HDG Steel
18	Gear Box System	Optional

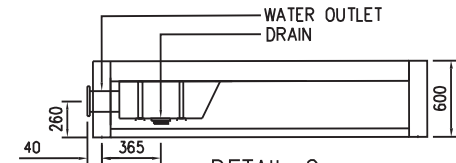
TCS 60X-1B TO TCS 200B-1B



FOR TCS 60X-1B TO 125Z-1B

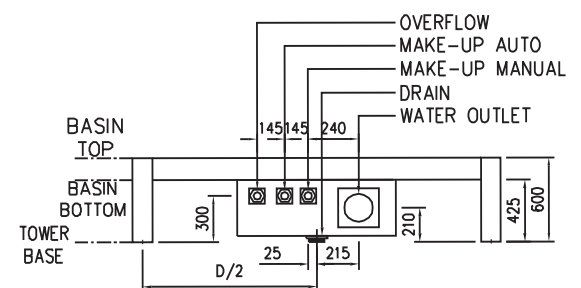


DETAIL 1

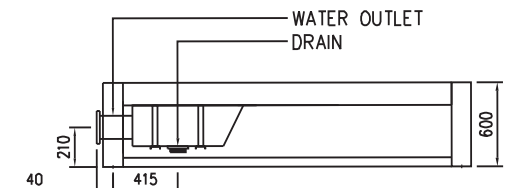


DETAIL 2

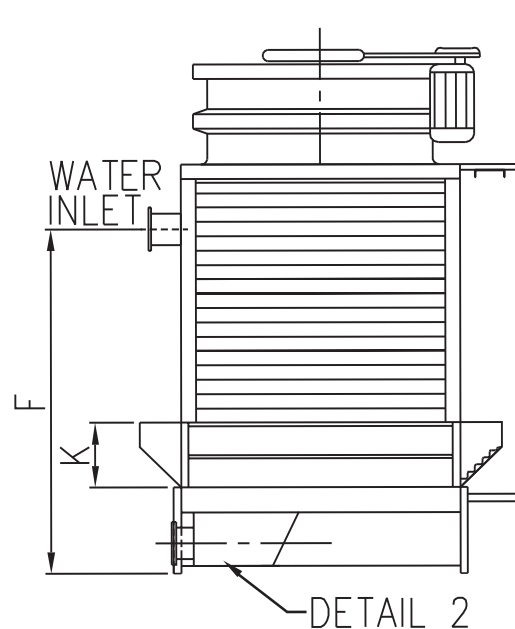
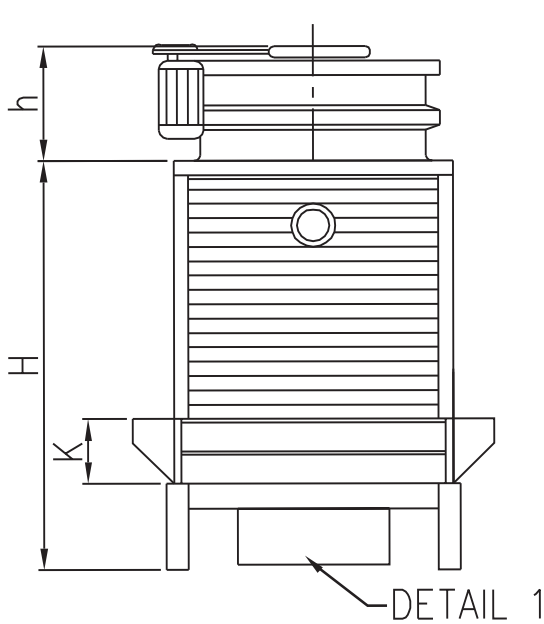
FOR TCS 150A-1B TO 200B-1B



DETAIL 1



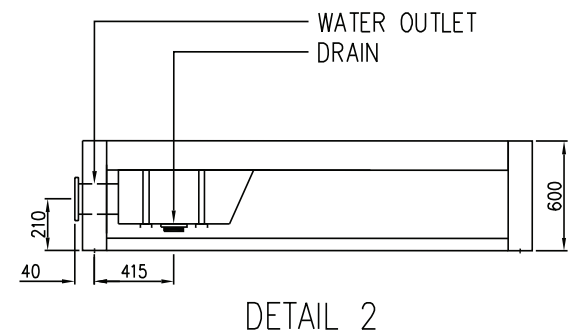
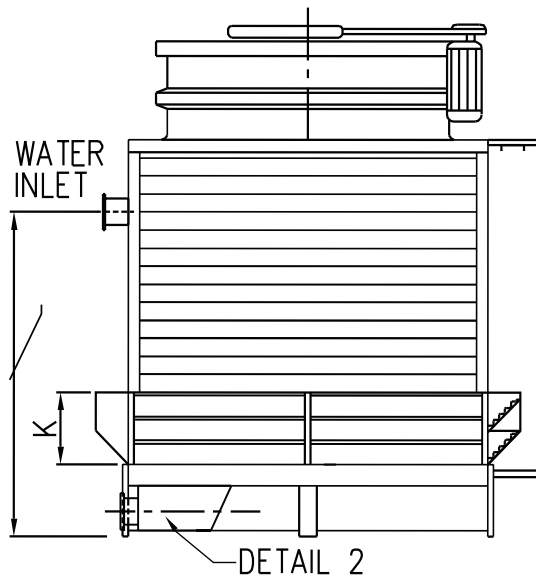
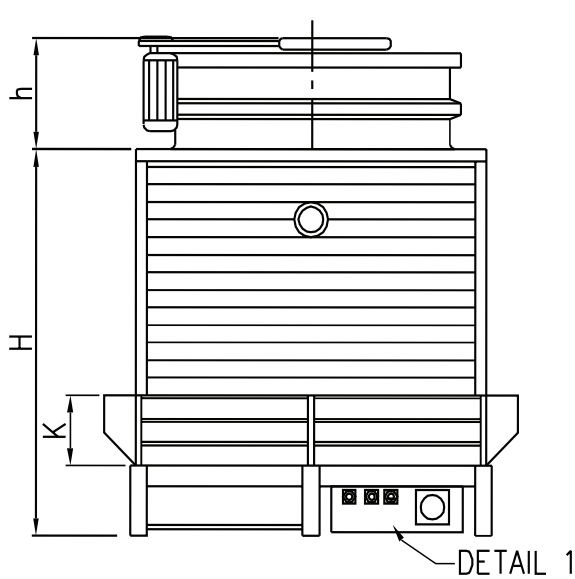
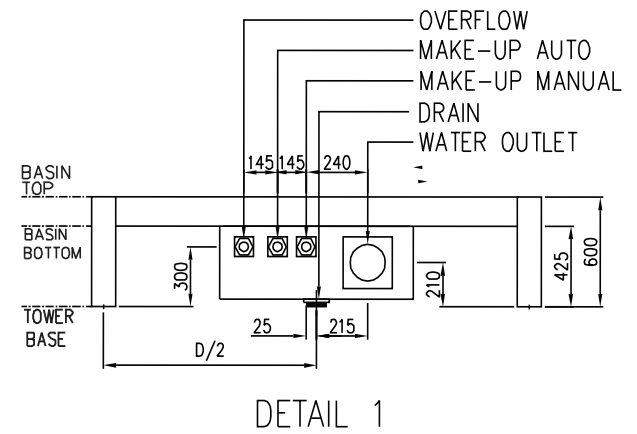
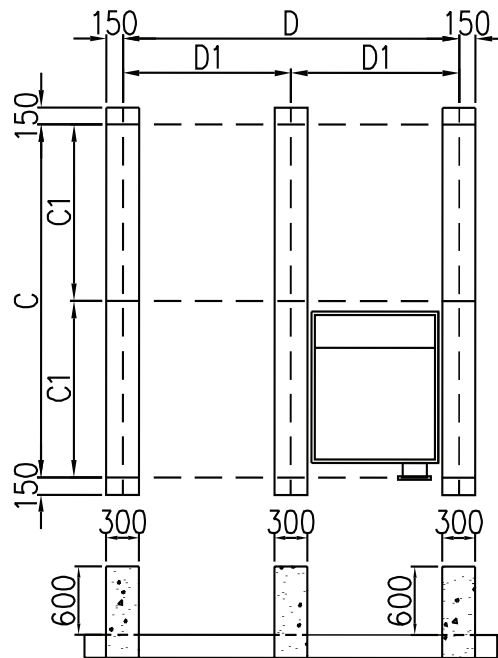
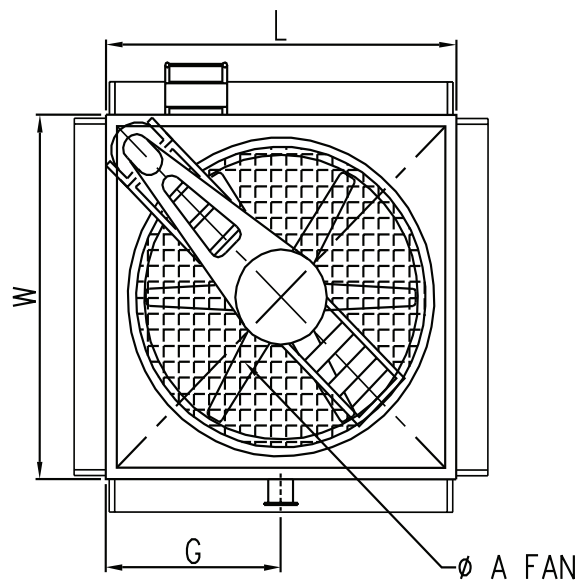
DETAIL 2



TC SERIES RANGE

Tower Model TCM	FLOWRATE m ³ /hr	OVERALL DIMENSION					MOTOR				AXIAL FLOW FAN			
	37/32/27 °C	L	W	H	h	K	Output (kW)	Rated Current at 50 Hz (380V/415V)	Type	Power Source	A	Fan Speed (RPM)	No of Blades	Drive System
60X-1B	47	1585	1585	2550	800	450	1.5	3.60 / 3.30	TEFC, Outdoor, 3 Phase, Outdoor Motor, 4 Poles	3Ph/380V/50Hz or 3Ph/415V/50Hz	1220	610	Four (4) to Six (6)	V-Belt & Pulley
70Y-1B	55	1585	1585	2550	800	450	2.2	5.10 / 4.70			1220	610		
80Z-1B	63	1585	1585	2550	800	450	3.0	6.60 / 6.10			1220	610		
100Z-1B	78	1890	1890	2550	800	450	3.0	6.60 / 6.10			1525	580		
125Z-1B	98	1890	1890	2850	800	450	3.0	6.60 / 6.10			1525	580		
150A-1B	118	2500	2500	3000	800	600	4.0	8.80 / 8.10			1525	580		
175B-1B	137	2500	2500	3000	800	600	5.5	12.0 / 11.0			1525	580		
200B-1B	157	2500	2500	3300	800	600	5.5	12.0 / 11.0			1830	485		
200A-1BR	157	2195	3410	3300	950	600	4.0	8.80 / 8.10			1525	580		
225B-1BR	176	2195	3410	3300	950	600	5.5	12.0 / 11.0			1525	580		
225B-1B	176	2805	2805	3300	950	600	5.5	12.0 / 11.0			1830	485		
250C-1B	196	2805	2805	3300	950	600	7.5	14.9 / 13.6			1830	485		
275C-1BR	215	2500	3410	3300	950	600	7.5	14.9 / 13.6			1830	485		
300C-1B	235	3110	3110	3300	950	600	7.5	14.9 / 13.6			2440	400		
300C-1BR	235	2805	3410	3300	950	600	7.5	14.9 / 13.6			2135	425		
350D-1B	274	3110	3110	3300	950	600	11.0	22.0 / 20.1			2440	400		
350C-1B	274	3410	3410	4200	950	900	7.5	14.9 / 13.6			2440	400		
350D-1BR	274	2805	3410	3300	950	600	11.0	22.0 / 20.1			2135	425		
400D-1B	313	3410	3410	4200	950	900	11.0	22.0 / 20.1			2440	400		

TCS 200A-1BR TO TCS 350D-1BR, TCS400D-1B

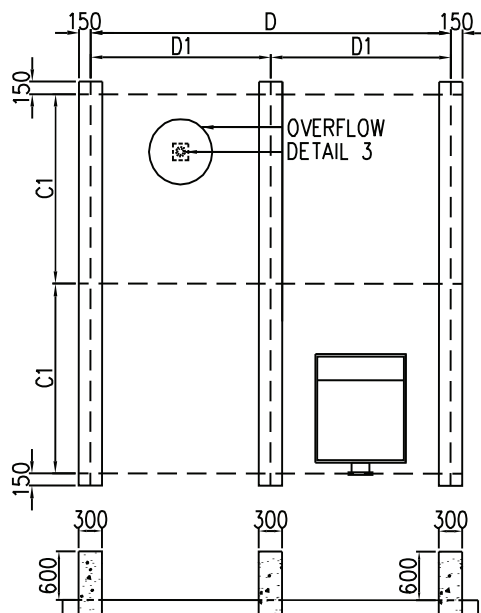
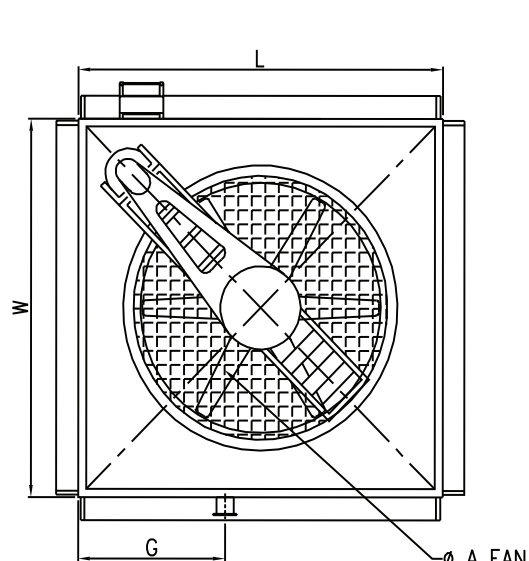


TC SERIES RANGE

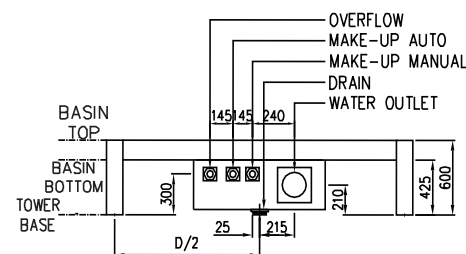
Tower Model TCM	ANCHOR BOLTS DATA					PIPING DATA		PIPING SIZE					WEIGHT	
	C	D	C1	C2	D1	F	G	Water Inlet	Water Outlet	Overflow	Drain	Make Up Auto & Manual	Dry Weight (KG)	Operating Weight (KG)
60X-1B	1595	1535	-	-	-	2100	793	80	80	50	50	25	670	1620
70Y-1B	1595	1535	-	-	-	2100	793	80	80	50	50	25	690	1660
80Z-1B	1595	1535	-	-	-	2100	793	80	80	50	50	25	700	1700
100Z-1B	1900	1840	-	-	-	2100	945	100	100	50	50	25	850	1990
125Z-1B	1900	1840	-	-	-	2400	945	100	100	50	50	25	960	2550
150A-1B	2510	2450	-	-	-	2400	1250	150	150	50	50	50	1140	2800
175B-1B	2510	2450	-	-	-	2400	1250	150	150	50	50	50	1240	3010
200B-1B	2510	2450	-	-	-	2700	1250	150	150	50	50	50	1420	3420
200A-1BR	3420	2145	1710	-	-	2700	1098	150	150	50	50	50	1430	3200
225B-1BR	3420	2145	1710	-	-	2700	1098	150	150	50	50	50	1400	3060
225B-1B	2815	2755	-	-	1378	2700	1403	150	150	50	50	50	1530	3650
250C-1B	2815	2755	-	-	1378	2700	1403	150	150	50	50	50	1630	3750
275C-1BR	3420	2450	1710	-	-	2700	1250	150	150	50	50	50	1560	3690
300C-1B	3120	3060	-	-	1530	2700	1555	200	200	50	50	50	1930	4480
300C-1BR	3420	2755	1710	-	1378	2700	1403	200	200	50	50	50	1600	4140
350D-1B	3120	3060	-	-	1530	2700	1555	200	200	50	50	50	1990	4560
350C-1B	3420	3360	1710	-	1680	3300	1105	200	200	50	50	50	2350	5470
350D-1BR	3420	2755	1710	-	1378	2700	1403	200	200	50	50	50	1600	4140
400D-1B	3420	3360	1710	-	1680	3300	953	200	200	50	50	50	2370	5490

• All dimension in MM. • Plinth & Anchor Bolts done by others. • Plinth high tolerance 5MM. • Balancing pipe connection is available upon request.
• Overflow, Drain, Makeup Auto & Manual to BSP Female Thread.

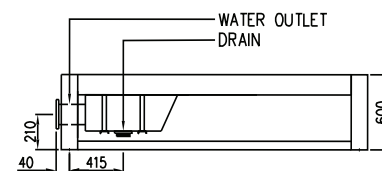
TCS 400E-1BR TO TCS 550E-1B



FOR TCS 350C-1B TO 450E-1BR

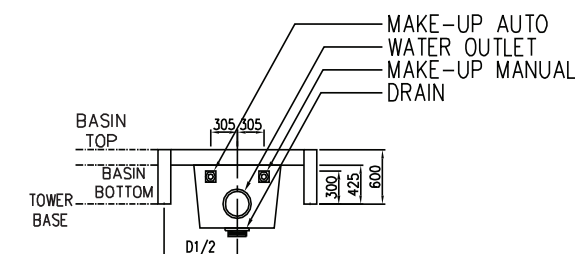


DETAIL 1

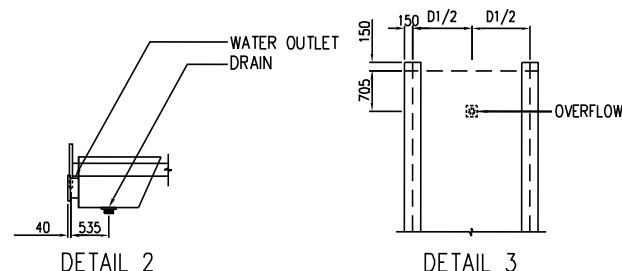


DETAIL 2

FOR TCS 500E-1B TO 700F-1B

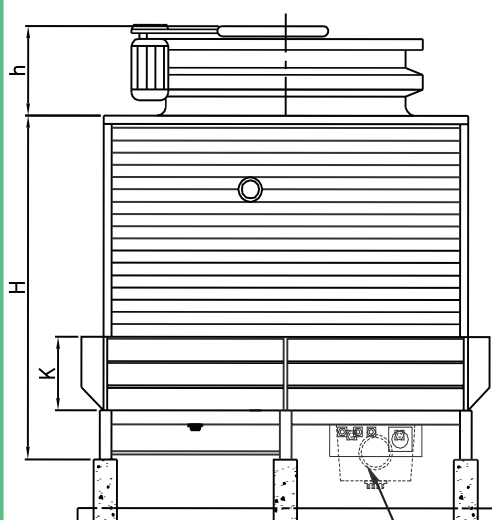


DETAIL 1 (TCS 350C-1B TO 450E-1BR)

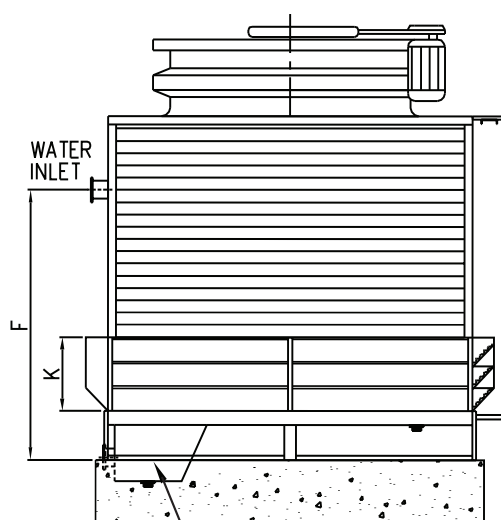


DETAIL 2

DETAIL 3



DETAIL 1

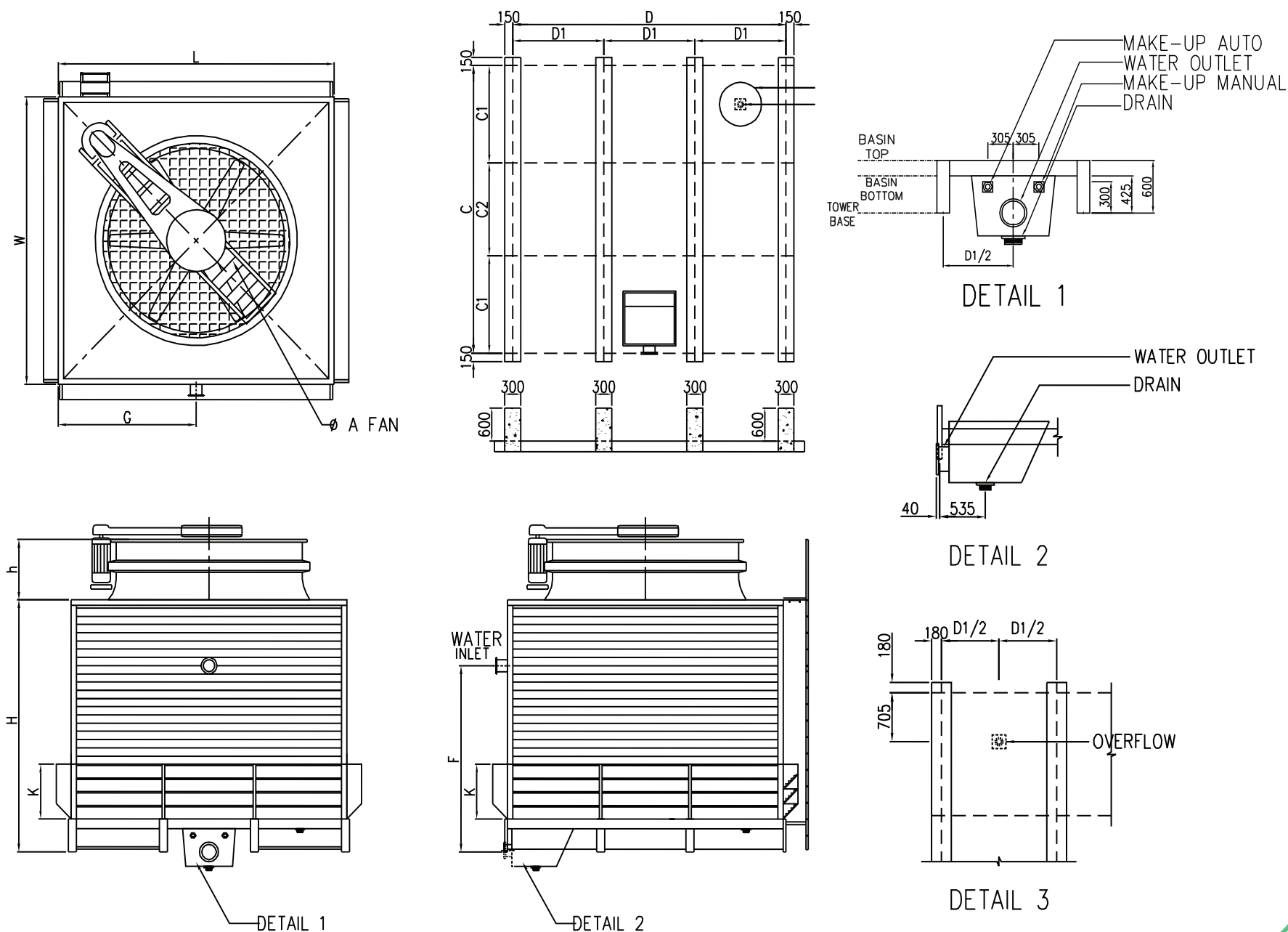


DETAIL 2

TC SERIES RANGE

Tower Model TCM	FLOWRATE m3/hr	OVERALL DIMENSION					MOTOR				AXIAL FLOW FAN			
	37/32/27 °C	L	W	H	h	K	Output (kW)	Rated Current at 50 Hz (380V/415V)	Type	Power Source	Fan dia (mm)	Fan Speed (RPM)	No of Blades	Drive System
400E-1BR	313	2805	3410	3300	950	600	15.0	29.2 / 26.7	TEFC, Outdoor, 3 Phase, Outdoor Motor, 4 Poles	3 Ph / 380 V / 50 Hz or 3 Ph / 415 V / 50 Hz	2135	425	Four (4) to Six (6)	V-Belt & Pulley / Gear Drive
450D-1B	353	3720	3720	4200	950	900	11.0	22.0 / 20.1			2440	400		
450E-1BR	353	3110	3720	4200	950	900	15.0	29.2 / 26.7			2440	400		
500E-1B	392	4020	4020	4200	950	900	15.0	29.2 / 26.7			2440	400		
500D-1B	392	4330	4330	4200	950	900	11.0	22.0 / 20.1			2440	400		
550F-1B	431	4020	4020	4200	950	900	18.5	36.3 / 33.2			2440	400		
550E-1B	431	4330	4330	4200	950	900	15.0	29.2 / 26.7			2440	400		
600F-1B	470	4330	4330	4200	950	900	18.5	36.3 / 33.2			2440	400		
600D-1B	470	4630	4630	4200	1100	900	11.0	22.0 / 20.1			3050	360		
650E-1B	509	4630	4630	4200	1100	900	15.0	29.2 / 26.7			3050	360		
700F-1B	548	4630	4630	4200	1100	900	18.5	36.3 / 33.2			3050	360		
700E-1B	548	4940	4940	4200	1100	900	15.0	29.2 / 26.7			3050	360		
750F-1B	588	4940	4940	4200	1100	900	18.5	36.3 / 33.2			3050	360		
800G-1B	627	4940	4940	4200	1100	900	22.0	42.9 / 39.3			3050	360		
850F-1B	666	5240	5240	4500	1100	1200	18.5	36.3 / 33.2			3660	310		
900G-1B	705	5240	5240	4500	1100	1200	22.0	42.9 / 39.3			3660	310		
950G-1B	744	5550	5550	4500	1100	1200	22.0	42.9 / 39.3			3660	310		
1000H-1B	783	5550	5550	4500	1100	1200	30.0	56.7 / 51.9			3660	310		

TCS 600F-1BR TO TCS 1000H-1B



TC SERIES RANGE

Tower Model TCM	ANCHOR BOLTS DATA					PIPING DATA		PIPING SIZE					WEIGHT	
	C	D	C1	C2	D1	F	G	Water Inlet	Water Outlet	Overflow	Drain	Make Up Auto & Manual	Dry Weight (KG)	Operating Weight (KG)
400E-1BR	3420	2755	1710	-	1378	2700	1403	200	200	50	50	50	1700	4240
450D-1B	3730	3670	1865	-	1835	3300	953	200	200	50	50	50	2690	6240
450E-1BR	3730	3060	1865	-	1530	3300	1555	200	200	50	50	50	1950	5070
500E-1B	4030	3970	2015	-	1985	3300	1105	250	250	80	80	50	2980	6630
500D-1B	4340	4280	2170	-	2140	3300	1560	250	250	80	80	50	3770	8000
550F-1B	4030	3970	2015	-	1985	3300	1715	250	250	80	80	50	3070	6720
550E-1B	4340	4280	2170	-	2140	3300	1560	250	250	80	80	50	3770	8000
600F-1B	4340	4280	2170	-	2140	3300	1715	250	250	80	80	50	3870	8100
600D-1B	4640	4580	2320	-	2290	3300	1715	250	250	80	80	50	4240	9140
650E-1B	4640	4580	2320	-	2290	3300	1865	250	250	80	80	50	4250	9150
700F-1B	4640	4580	2320	-	2290	3300	1865	250	250	80	80	50	4250	9150
700E-1B	4950	4890	1678	1594	1630	3300	2470	250	250	80	80	50	5180	11190
750F-1B	4950	4890	1678	1594	1630	3300	2470	250	250	80	80	50	5190	11200
800G-1B	4950	4890	1678	1594	1630	3300	2470	250	250	80	80	50	5290	11300
850F-1B	5250	5190	1778	1694	1730	3600	2620	300	300	80	80	50	6070	12910
900G-1B	5250	5190	1778	1694	1730	3600	2620	300	300	80	80	50	6160	13010
950G-1B	5560	5500	1882	1796	1833	3600	2775	300	300	80	80	50	6890	14570
1000H-1B	5560	5500	1882	1796	1833	3600	2775	300	300	80	80	50	6990	14670

• All dimension in MM. • Plinth & Anchor Bolts done by others. • Plinth high tolerance 5MM. • Balancing pipe connection is available upon request.
• Overflow, Drain, Makeup Auto & Manual to BSP Female Thread.

TC-M SERIES COUNTERFLOW COOLING TOWER SPECIFICATION

1.0 GENERAL

The cooling tower shall be induced draft, counterflow square, film filled, FRP cooling tower. For multiple cell units, watertight partition and balancing line equal, separate cells. The cooling tower shall be provided to create completely equal, separate cells. Cooling Tower shall be Truwater TC Series M Class or approved equivalent.

2.0 CAPACITY

Cooling tower shall be capable of providing thermal performance scheduled.

3.0 PERFORMANCE WARRANTY

The cooling tower manufacturer shall guarantee that the tower supplied will meet the specified performance conditions when the tower is installed according to plans.

4.0 CONSTRUCTION

The cooling tower main frame structure shall be hot dip galvanized steel (HDG). The casing shall be made of fiberglass reinforced polyester (FRP).

5.0 MECHANICAL EQUIPMENT

5.1 Fan(s) shall be propeller type, incorporating heavy duty blades of cast aluminium alloy. Blades should be individually adjustable.

5.2 V belts shall be of rubber and pulleys shall be cast aluminium alloy with the grooves of standard dimensions. FRP Belt cover must be provided to protect V belts from moist discharge air.

5.3 Motor(s) shall be TEFC, weather proof, squirrel cage, for 3 ph/50Hz/415V power supply and installed outside air stream.

5.4 The complete mechanical equipment assembly for each cell shall be supported by a rigid, welded, hot dipped galvanised steel structural support. Vibration limit switches must be installed to shut off the motor if excessive vibration occurs.

The switch is located on the motor end of the mechanical equipment support outside the fan cylinder, so as not to be exposed directly to the discharge air stream and for ease of maintenance and access to reset.



6.0 FILL AND DRIFT ELIMINATORS

6.1 Fill shall be film type, rigid, corrugated PVC sheets that are conducive to cooling water with UV protected and self extinguishing properties. Fill shall be cross-corrugated and the surface of the sheet shall have a suitable micro-structure to improve turbulence and water distribution. Fill sheets shall be bonded at all contact points. Fill shall be of alternate tip configuration to improve water drainage and minimize air pressure drop.

6.2 Drift eliminators shall be assembled in easily removable modules. Drift Eliminator shall be 3 pass sinusoidal-shaped blade type. Guarantee drift losses must not exceed 0.005% of the design water flow rate.

7.0 HOT WATER DISTRIBUTION SYSTEM

Each cell of the tower shall be equipped with hot water distribution system. Header and lateral pipes shall be PVC. Nozzles shall be non-clogging, capable of passing objects up to 25mm in diameter. The spray must be designed such that the nozzle outlet is the lowest point in the system. The water inlet connection shall be located outside the tower casing. No rotating mechanical sprinkler system is allowed.

8.0 COLD WATER BASIN

The cold water basin shall be of FRP and supported on HDG Steel framework. The basin shall be designed with sufficient water capacity to avoid air entrainment in the outlet during operating conditions. FRP sump(s) shall be provided and equipped with suction strainer, make-up ball valve, overflow and drain. For multiple tower arrangement, equillising pipes between basins shall be provided to maintain the same level of water in each basin.

9.0 ACCESS AND SAFETY

Inspection door and ladder shall be provided for inspection & maintenance purposes. Louver panel shall be removable for access to the sump, make-up, overflow and suction strainer. HDG steel fan guard shall be provided over each fan cylinder.

...providing solution to your cooling needs



Truwater Cooling Towers Sdn Bhd (188113-A)

Executive Suite 702, Block B, Kelana Business Centre, No. 97, Jalan SS7/2, Kelana Jaya, 47301 Petaling Jaya, Selangor, Malaysia

Tel. : +603 7880 8800 Fax : +603 7804 5519

E-mail : Tw.Cooling@truwater.com.my Website : www.truwater.com.my