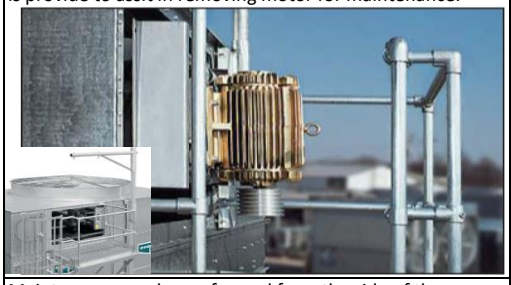
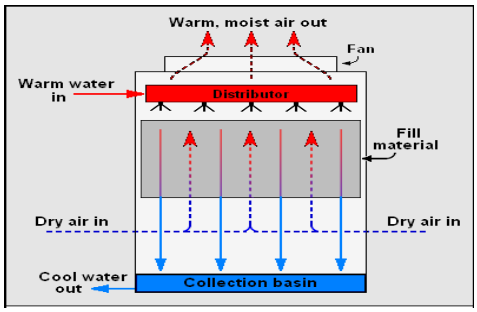
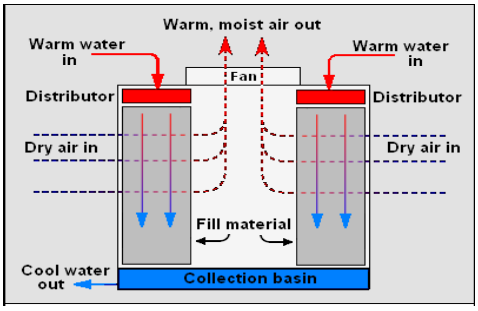
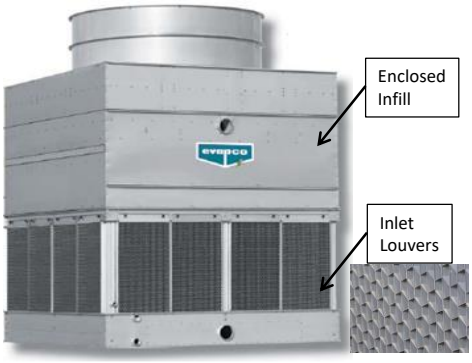
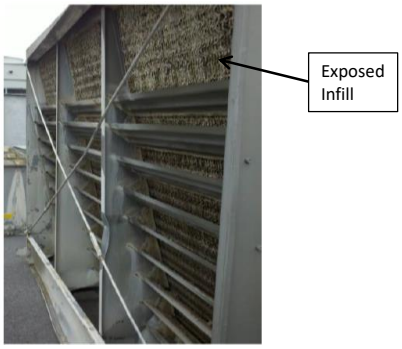
NEWARK FLUID & AIR HANDLING TECHNOLOGIES	NEWARK ENGINEERING PTE LTD		Client:	
	Submission Description:	COUNTERFLOW COOLING TOWER VS. CROSSFLOW COOLING TOWER	Project:	
			Ref. No.:	-

	Counterflow Cooling Tower	Crossflow Cooling Tower
	Water Saving	
1.	Drift loss at **maximum 0.001%** which is 5 times lower than the crossflow cooling tower. Low drift loss promote **water saving and reduce chemical usage**.	Typical drift loss is about 0.005% which is five time more than counterflow which will resulted in excessive water usage, expensive chemical loss, potential property damage and costly maintenance
	Motor Access And Maintenance	
2.	Motor can be **accessed without entering the cooling tower**. Unlike the crossflow design, counterflow motor is placed above the infills, which has sufficient space for the unique swing-out feature to move the motor to outside of the cooling tower. Motor, belts, and bearings can be maintain wihtout entering the units. Motor davit is provide to assit in removing motor for maintenance. 	Requires ladder & platform to reach the motor as it is 10-15ft above ground. Removing motor is dangerous, difficult, and **high risk of damaging** the internal parts of cooling tower. **Working inside** the cooling tower is hazard as it is **confined space**. If the motor is removed externally, then fan guard and fan has to be removed first and it is time-consuming. 
3.	Maintenance can be performed from the side of the cooling tower by using the external side platform. It is **safe, ergonomics, time-saving, and reduce labor**. 	Maintenance has to be done on top of the cooling tower. Although the handrail is installed, but it is **dangerous** for people to **moving on top** of the unit as there are pipings. Fan guard need to be removed for maintenance and inspection, it is time consuming and require more labors. 
	Risk of Recirculation	
4.	Dry air intake is at the **bottom/lower part of the tower**, the **risk of recirculation is much lower** compared to crossflow cooling tower. 	Dry air intake extend **from bottom to the deck level**, the flume discharge is very close to the air intake area at the top, the **risk of recirculation is much higher** compared to counterflow cooling tower. Recirculation of moist air into the cooling tower will reduce the performance greatly. 

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	Counterflow Cooling Tower	Crossflow Cooling Tower
	Hot Water Distribution System	
5.	EVAPCO patented design of nozzles which is anti-clogging and distribute water effectively. Unique design of nozzles allow sweeping oscillation of water to ensure complete infills pack coverage. **Balancing valve is not required** for hot water supply as it is single inlet to water distribution piping.	Gravity flow hot water basin installed above two sides of infills. **Balancing valve** is required as there are two hot water inlet. **Balancing work** has to be cautious during installation.
	High Reliability of Infills	
6.	EVAPCO infills has high stiffness making it is able to be **used as working platform**. Constructed with inert PVC which will not decay, and able to withstand 55°C water. Regular cleaning is not required as the **infill is completely enclosed** in the unit casing, and as such has a maximum protection from sunlight, rain, and wind. 	Crossflow infills is soft and rollable, so it is not designed for handling load. **Breaking of infills or permanently deform** of infills will cause water splash-out and affect performance greatly. As infills is exposed to environment, regular cleaning is required and it is **less durable** due to frequent water jet cleaning. 
	Air Intake Louvers	
7.	Evapco's inlet louvers keep debris and direct sunlight out of cold water basin with its patented design thus reduce the possibility of water treatment by reducing water splash-out 	Crossflow cooling tower require **minimum gap opening** at louvers (about 70%) so that air intake is sufficient and tower performance not to be affected. The opening is vulnerable to sunlight & air debris which can cause **algae formation**, and **higher water splash-out**. 
	Basin Access During Maintenance	
8.	Inspect in two ways: 1. A small door at louver side for water level inspection. 2. Easy dismantle louver access door from **all directions** of the unit which allows entry of people from all directions into the unit. (Tooling is not required) 	Access into the unit from **1 to 2 directions only**. **Narrow internal walkway** is provided for standing but has to be cautious when walking on it. Crossflow units fall within the **confined space** definition due to it's limited or restricted space for entry and it is not designed for long working hours. **Moving across multiple cells** is difficult as door is provided at first or last cell of the units only. 