

sea water can be used for cooling. As a result, chilled panel with cool sea water running through is installed. The selected chilled ceiling is CT 135/135-D2428-PB15-l-BG, which is the code for chilled ceiling tile 1.35m x1.35m with diagonal

pitch perforation holes (2.2mm diameter) representing 30% open area with 15 plain border around each tile. All chilled tiles are insulated and suitable for fitment with a beam grid. The detailed structure is shown in figure 1.3.



Figure 1.3: Chilled Ceiling Structure

1.4. Rain Water Harvesting

Rain water harvesting is an effective and eco-friendly method of reducing water usage, which will lead to reduced water bills. The rain water harvesting system used for the house is Monsoon Facorit 20F 1500 which is provided by Stormsaver. There are two main benefits of Stormsaver's Rainwater Harvesting. Harvested rainwater will collect and automatically be used for toilet flushing, laundry, garden watering, etc. The result will be up to 50% lsee usage and cheaper bills. Besides, as no heavy equipment is required, it is simple and quick for setting up. The Monsoon Facorit 20F 1500 liters home rainwater harvesting system is made up of four main parts which are 1500 liters shallow dig underground storage tank, control panel, floating suction filter kit and 20m suction hose. The technical details are listed in table 1.4.

Table 1.4: Technical details of rain water harvesting system

Monsoon Facorit 20F 1500	
Size	595*550*265mm
Power consumption	0.8kW
Working pressure	2.5 - 4.5 bar
Maximum flow	80 L/min
Noise level	60dB

1.5. Dew Water Collection

Dew water collection can be applied due to two reasons. Firstly, relative humidity is quite high and the temperature of spring, autumn and summer is usually over 10 degree. Secondly, deep sea water has very low temperature which is below 5 degree. Deep cold sea water is pumped to circulate through the condenser which has large conductivity. Warm air contact with the cooling coil is condensed when the temperature drop lower than its dew point. The condensed water is as clean as tap water. Take air temperature to be 15⁰, deep water temperature to be 5⁰. The condensation rate is 0.2587 which is calculated by EES. The results are shown in figure 1.5. And details of EES program is pasted in appendix. Hence, dew water collection system is feasible and can provide sufficient clean water for daily usage.

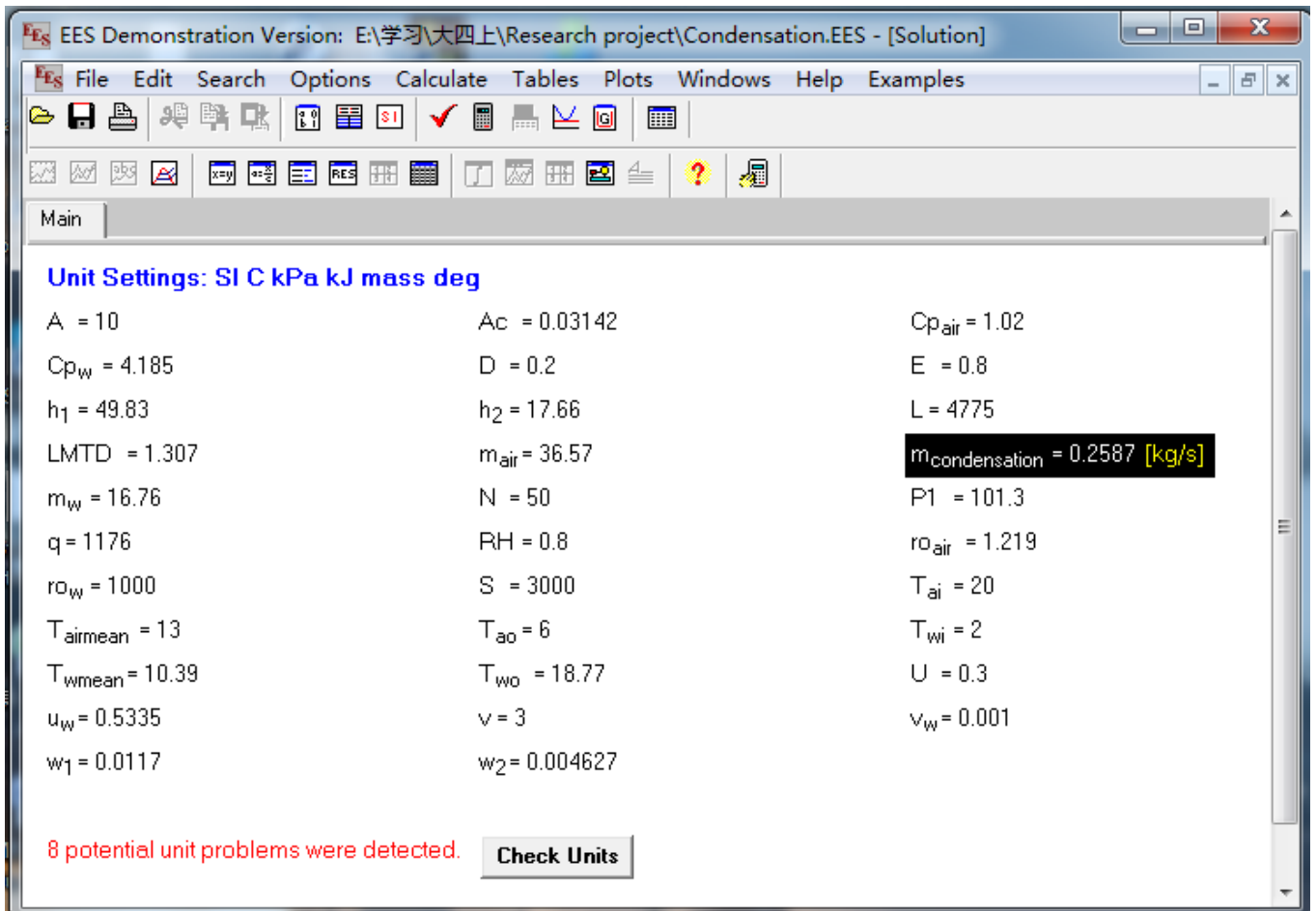


Figure 1.5: EES test result

References

- [1] http://www.vaillant.co.uk/homeowners/index.en_gb.htm
- [2] <http://www.stormsaver.com/domestic>
- [3] <http://www.frenger.co.uk/products/chilled-ceilings/principles-and-benefits-of-chilled-ceilings.html>