



# Final Monitoring Report

Bahrain City Center- Enova

ScaleWatcher (SW) Water Treatment Report for  
the Indoor Fountain

September 06, 2016



# Overview

- Installation of SW IE8 SW Model in the main inlet 6" pipe of City Center Indoor Fountain was on July 24, 2016. (2 sets of loops- 20 and 40 loops in the main inlet pipe)
- Initial status for the said application was noted:
  - \* Hard white scales in the left corner water sliding area of the fountain was noted with initial pictures taken as reference point of comparison.
  - \* Initial status with picture were also noted in the stainless cover in the flooring area of the fountain.
  - \* External scaling of the pipe and fittings of the main inlet pump in the treatment tank area were noted with pictures as reference point to monitor the effect of SW water treatment system.
  - \* Hard cement scale has been noted on the flooring area of the indoor fountain when totally dried.
- OperaKool recommended a 100% non-usage of chemical water treatment upon full installation in order to prove that SW is a perfect alternative for the current water treatment implemented by City Center Maintenance Team .
- Initial water status was noted: pH is 7.8 and TDS(ppm) is 260.



# Bahrain City Center- Indoor Fountain with SW Electronic Water Treatment



# Indoor Fountain Status Before SW Installation

**Hard scaled corner of the indoor fountain of City Center.**

**Other angle of the hard scaling noted in the fountain that has developed through time.**



# Indoor Fountain Status Before SW Installation

Floor area of the fountain where there has been some scaling also.

Stainless drain cover where there is some stained area due to the chemical treatment in the circulating water.



# Indoor Fountain Status After SW Installation

Scales has started to significantly disappear after 2 weeks of installation- as of Aug. 7, 2016.

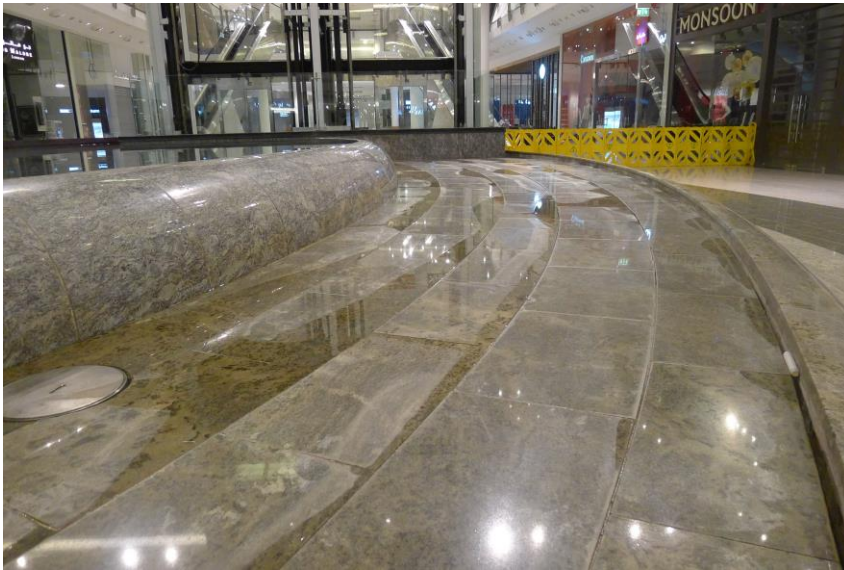
Floor area that has improved in appearance- less scales has been noted when the flooring is completely dried.



# Indoor Fountain Status After SW Installation

**Dried flooring with smoother texture and less scaling.**

**Stainless drain cover which has less stained area due to no chemical treatment in the circulating water.**



# Side by Side Comparison

**BEFORE: July 24, 2016- SW date of installation**

**AFTER: August 7, 2016- after SW was fully installed (14 days only) without any chemical treatment.**





# Side by Side Comparison

July 24, 2016- before SW Electronic Water Treatment System.

Actual picture while the fountain is active with mall guests enjoying the chemical-free water in the area(August 14, 2016 8PM- 21 days only)



# Side by Side Comparison

**BEFORE: July 24, 2016- SW date of installation**

**AFTER: September 01, 2016- appearance of the area when completely dried after SW was fully installed (38 days) without any chemical treatment.**



# Side by Side Comparison

**July 24, 2016- SW was fully installed.  
Stainless surface has some staining due to its  
metallic reaction with the chemical water  
treatment.**

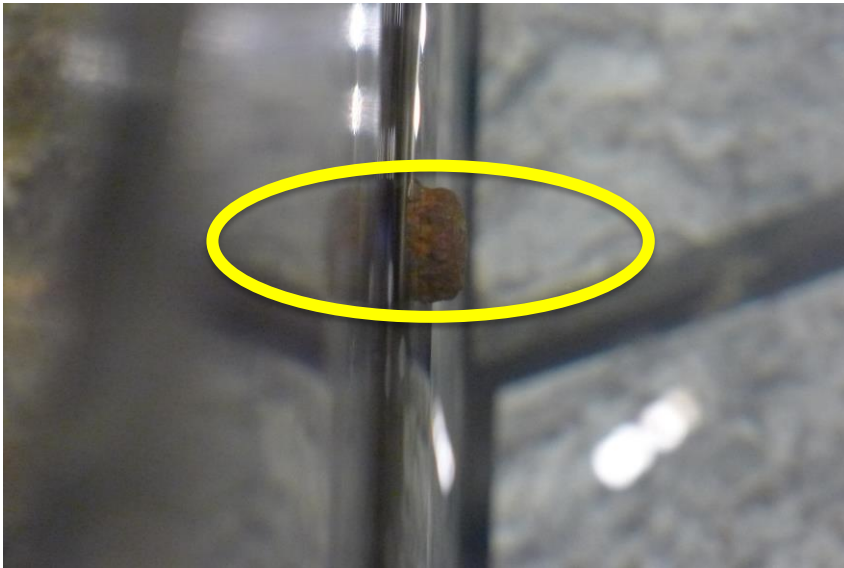
**September 01, 2016- after SW was fully  
installed (38 days only); staining in the  
stainless surface slowly disappeared.**



# Side by Side Comparison

August 07, 2016- Initial picture of corroded screw submerged in the fountain area.

September 01, 2016- Corroded screw has started to soften and slowly converted into "Black Magnetite".



# Side by Side Comparison

August 07, 2016- Initial status of submerged lightings effects in the fountain area.

September 01, 2016- The submerged lighting effects has become more crystal clear reflections in the water.



# Side by Side Comparison

July 21, 2016-Water test results before SW installation with chemical treatment(pH- 7.8; TDS- 260ppm; Conductivity- 399)

August 23, 2016- Water test results 32 days without chemical treatment(pH- 7.7; TDS- 258ppm; Conductivity- 396) showing stable water parameters

## B. Fountain - Water

PRESENT PROGRAMME	CONTROL VALUES	TEST VALUES
		Production Line water
pH	6.5 - 8	7.8
CONDUCTIVITY, 1 micro s/cm	<1500	399
TDS, ppm	<500	260
TOTAL HARDNESS, ppm as CaCO <sub>3</sub>	< 100	100
Free Chlorine residual as Cl ppm		0.9

*"Certified that the water Analysis Result has been tested in accordance with 'HACH' Standard methods."*

C.R. Number: 82395-1, Flat No: 4, Building No: 98, Road No: 405, Block No: 104, Hidd, Kingdom of Bahrain  
Tel. No: +973-13625550, Fax. No: +973-13625551, E-mail ID: aamirk.water@gmail.com



Industrial Water Management

SERVICE REPORT

Date: August 23, 2016

Customer : MAF Dalkia (ENOVA)

Site : BCC

Attention : Mr. Edwin

## A. Fountain - Water

PRESENT PROGRAMME	CONTROL VALUES	TEST VALUES
pH	6.5 - 8	7.7
CONDUCTIVITY, 1 micro s/cm	<1500	396
TDS, ppm	<500	258
TOTAL HARDNESS, ppm as CaCO <sub>3</sub>	< 100	46
Free Chlorine residual as Cl ppm		0.8

*"Certified that the water Analysis Result has been tested in accordance with 'HACH' Standard methods."*

### Comment/s:

1. Appearance of water is Clear
2. TDS & Conductivity is in normal range



### Comment/s:

3. Appearance of water is Clear
4. TDS & Conductivity is in normal range

Thanks & regards

Thanks & regards

*Aamir*  
Aamir



# Side by Side Comparison

**August 07, 2016- Fountain floor area initial status.**

**September 01, 2016- 38 days of SW water treatment.**



# Side by Side Comparison

July 21, 2016-Initial flooring status when partially dried with chemical treatment(approximately 45minutes after turning off the water circulation).



September 01, 2016- After 38 days of SW treatment approximately 1hr after turning off the water circulation.





# Significant Observation- 38 Days Treatment

The dried surface of the flooring indicates that scales has started to soften.

The scales can now be easily be removed by scrubbing even with bare hands.





**As of Sept. 01, 2016- 38 days of SW water treatment.**

The hard cement scales before SW installation can now be easily removed. If completely cleaned, this will enhance the natural appearance of the granite stones.



# Observations:

- Hard scaling that has developed through time has significantly disappeared as noted in the area. The sharp texture of the scaling is now smooth if manually checked as supported by the pictures.
- The moderately hard scale in the pipe and fittings- pump and treatment tank area has softened already.
- The chemical smell in the fountain area has totally gone which was attested by the guard on duty assigned in said location. This means a less environmental respiratory hazard for the people around the area.
- SW electronic water treatment was accidentally OFF for almost 5 days due to failure in electrical connection (since Aug. 10-14, 2016) but immediately restored Aug. 14, 2016- 4PM. NO fouling of odor has been noted despite on the failure of the system.
- Water in the fountain has better reflection and more crystal clear because of no chemical treatment in the water.



# Recommendations:

- Secure a 24/7 electrical power connection for the SW Electronic Water Treatment System.
- Regularly check (DAILY) the SW head unit reading and make adjustment with the (+) or (-) sign. Reading should be within the range of 100-103.
- Implement 10-20% ONLY (which means 80-90% reduction) of the original dosage of chemical water treatment and conduct a weekly monitoring based on the desired water parameters.
- Implement a manual cleaning of the floor area when completely dried to enhance the natural and smooth surface of the granite stones.
- Increase the water level (if possible) to enhance scale softening and removal.



# OperaKool

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