

**MPS System Installation
at CLP Fan Room No. 4
Harbour City, No. 25 Canton Road
Tsim Sha Tsui, HK**



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March 2011

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1.0 Introduction

Great Top Engineering Limited has been appointed by Harbour City Management to undertake water leakage treatment using MPS System at CLP Fan Room No. 4 located No. 25 Canton Road, Tsim Sha Tsui at the basement carpark zone E.

2.0 General Description of Harbour City & CLP Fan Room No. 4

Harbour City is a large shopping mall in Tsim Sha Tsui. It is part of a series of office blocks and hotels. It comprises four parts: Marco Polo Hong Kong Hotel, Ocean Terminal, Ocean Centre and the Gateway. The complex is located along the west side of Canton Road, stretching from the Star Ferry terminal in the south to China Hong Kong City in the north.

The structural plan was approved by the Buildings Authority in April 1960 and construction was completed in 1966.

The CLP Fan Room No. 4 with the Harbour City is constructed using conventional reinforced concrete column to beam type of framing system with lift shear walls. The total floor area of the CLP Fan Room no. 4 is approximately 34 sqm. The total MPS treatment area is 228 sqm. The structure is in generally good condition.

3.0 Problem Statement

The CLP Fan Room is adjacent to Victoria Harbour and suffers from severe water ingress on walls and floor slab through the body of the concrete lining.

Visible water ingress was noticed on the existing 600mm thick diaphragm wall. Efflorescence was evident on walls.

Visible cracks appeared on the surface of the internal walls, peeling of paints was also noticed in some locations.



Conditions of external diaphragm wall



Conditions of internal wall and existing equipment



Efflorescence of walls



Conditions of existing floor slab

4.0 Scope of Works

- Provide a comprehensive MPS System design to cater for the existing site condition.
- Supply all materials for the MPS System including control units, junction box, titanium wire, cathodes, feeder wires and connectors necessary to complete the installation.
- Provide all the necessary tools for the installation.
- Supervise the installation of the MPS System.
- Test and commission the MPS System.

5.0 MPS System Design for CLP Fan Room no. 4

Based on the site condition survey, it was concluded that MPS system will be install on the tiled floor slab by saw cutting a deeper groove to allow the anode to be placed onto a sound screeding layer.

Titanium anode wires are strategically installed into all external diaphragm walls and selected internal walls where peeling of paint was observed.

There are a total of 4 anode circuits installed on floor; 8 anode circuits on walls and 2 cathodes installed on walls.

6.0 MPS System Performance Monitoring

MPS System performance monitoring are based on electrical current readings. Current readings on each circuit are taken in the junction box using a multi-meter or ammeter. Maximum absolute values are recorded. For the values of current readings and procedures, refer to Appendices.

The MPS System at CLP Fan Room no. 4 was tested and commissioned on the 18th of February 2011.

7.0 Performance Monitoring Schedule

An initial current reading was taken on the 18th of February 2011 and the succeeding readings will be on the following dates.

4 March 2011, 18 March 2011, 1 April 2011, 15 April 2011, 29 April 2011, 27 May 2011, 24 June 2011, 29 July 2011, 26 August 2011, 30 September 2011, 28 October 2011, 25 November 2011, 30 December 2011 and 27 January 2012.

Acceptable ranges:

LCD Range: greater than 0 but less than 80%.

Current Range: greater than 0 but less than 10 amps.

8.0 Conclusion

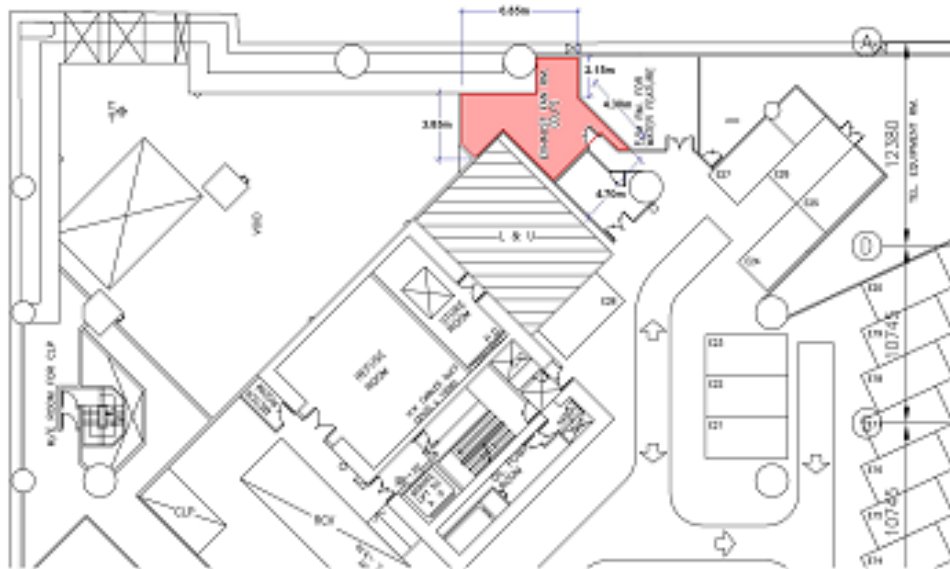
It is recommended that current readings should be taken at the suggested dates and should be plotted in a line graph form after data has been gathered.

The graphs trend will be provide more precise information with regard to the drying out process of the walls and floors of the CLP Fan Room.

Installation of relative humidity probes inside the CLP room may be recommended in the future. At the present condition, Humidity probes are not convenient due to access problem within the room.

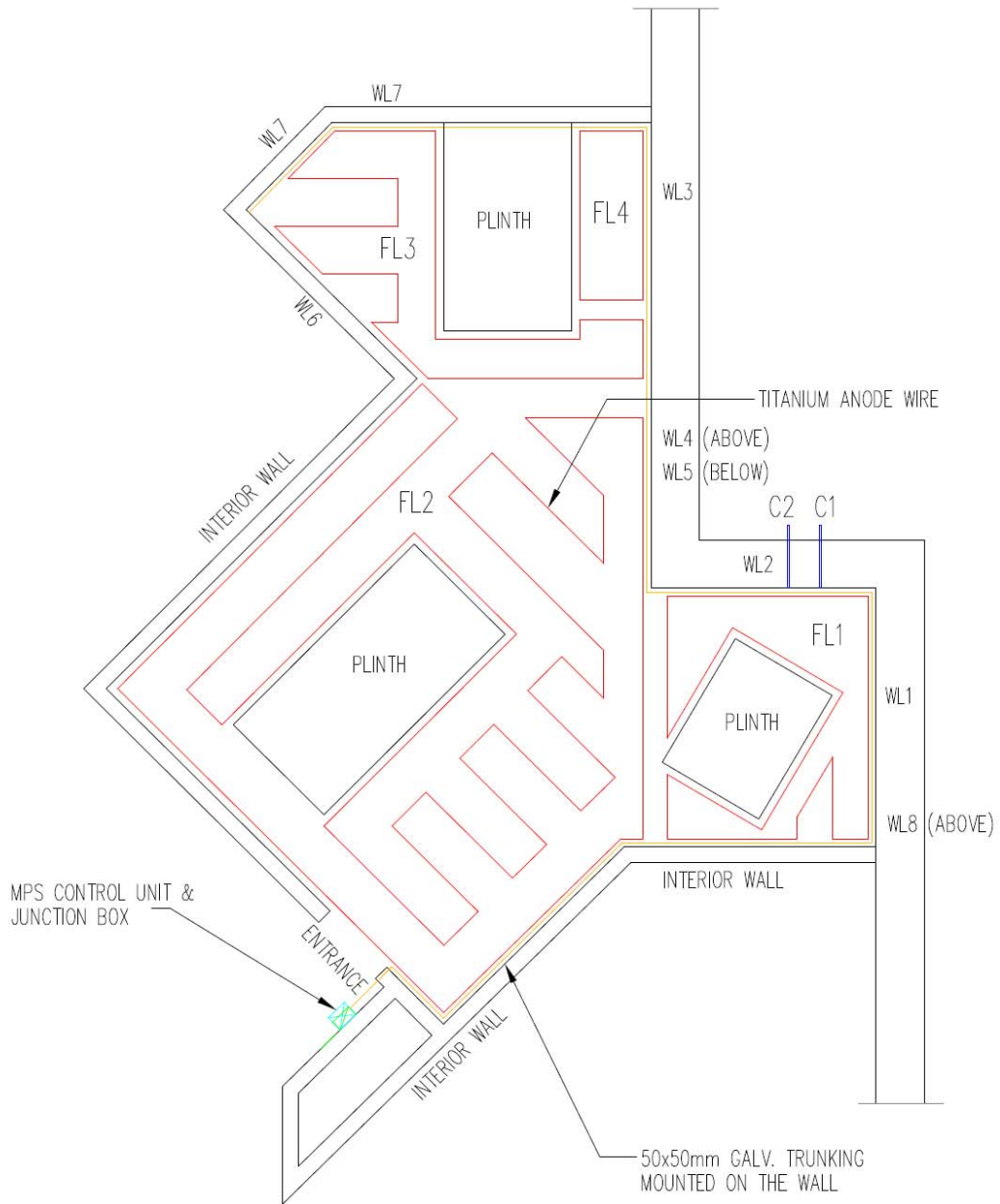
9.0 Appendices

9.1 Location Map of Harbour City, 25 Canton Road



Zone E, B/F GW Car Park

9.2 MPS Design Drawings



MPS SYSTEM - ANODE & CATHODE LAYOUT AT CLP FAN ROOM 4

WL – INDICATES ANODE ON WALL
 FL – INDICATES ANODE ON FLOOR

9.3 Electrical Current Readings

Performance Monitoring of MPS System at CLP Fan Room no. 4, Harbour City, TST

Date of site visit:	18-Feb-11	07-Mar-11	18-Mar-11
Weather:	Cool with Rain patches	Sunny	Cloudy
HK General Weather Temperature:	15 deg	21 deg	20 deg
MPS Control Unit LCD Reading:	23% (2.3Amps)	20% (2.0Amps)	18% (1.8Amps)
Anode - located on Floors & Walls	Amps	Amps	Amps
ALL A	1.21	1.07	0.95
FL1	0.27	0.45	0.37
FL2	0.57	0.35	0.33
FL3	0.12	0.09	0.13
FL4	0.07	0.04	0.05
WL1	0.02	0.01	0.01
WL2	0.01	0.01	0.01
WL3	0.01	0.01	0.01
WL4	0.05	0.01	0.01
WL5	0.03	0.01	0.01
WL6	0.01	0.01	0.01
WL7	0.01	0.01	0.01
WL8	0.01	0.01	0.01
Cathode			
ALL C	1.16	1.08	0.96
C1	1.12	1.05	0.95
C2	open (4.68)	open (3.56)	open (2.48)
Reading taken by/Remark:	EC / System Commissioning	EC	EC
Multi-Meter model no.	Victor VC830L	Victor VC830L	Victor VC830L

Note: During the commissioning, Cathode, C1 are adequate to provide electrical current for the entire anode circuits. Cathode, C2 switch are left open (switch-off) to prevent over loading of the MPS Control unit.

Based on the results of current readings above, cathode C2 switch will be close (switch-on) in the next site visit. It is expected that system will draw more electrical current (i.e. higher value) than the last readings. This is mainly due to the activation of C2 and not an increase in water pressure at the back of the walls.

9.4 Site Photos



Setting out and cover meter survey



Saw cutting works on floor slab



Saw cutting works on walls



Installation of titanium anode wires and grouting works



Installation of titanium anode wires and grouting works



Installation of feeder wires and junction box



Installation of MPS Control Units



Completed Installation