

ENHANCING SAFETY THROUGH MONITORING SOLUTIONS

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MONITORING SOLUTION PROVIDERS PTE LTD



**PRECISION AND TIMELINESS
ARE THE BASIS OF MSP
COMPETENCE**



**DELIVERING QUALITY
MONITORING SERVICES
THROUGHOUT THE
PROJECT LIFE CYCLE**

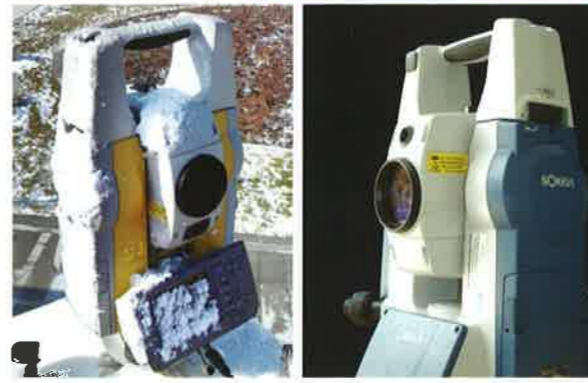


**ACHIEVING A HIGHER LEVEL OF SERVICE
THROUGH CEASELESS IMPROVEMENT
OF OUR LEVEL OF RESEARCH AND
DEVELOPMENT.**

Monitoring Solution Providers Pte Ltd (MSP) is a specialist in providing Automated Deformation Monitoring System service. We are able to provide a comprehensive and high quality service to our clients as our monitoring service covers the complete project cycle starting from design, installation, system debugging, data transfer, calculation, to the instant monitoring results being made available online to clients through our website.



MSP has in place a professional in-house team of Engineers, Surveyors, Electronics and Information Technology specialists, who are always striving to move a step ahead of technology development. MSP also works closely with manufacturers of sophisticated measuring instruments, to research and develop reliable automated deformation monitoring systems, with continuous improvements constantly being carried out.



The range of automated deformation monitoring systems we offer is vast, including applications in Settlement Monitoring, Slope Displacement Monitoring and Monitoring of Building Tilt. These are over and above our core competency in real-time deformation monitoring of bridges, tunnels and other underground facilities.

MSP is dedicated to achieving a higher level of service through ceaseless improvement of our level of research and development, as well as strengthening our close cooperation with industry partners to realise our target of being the best that we can be.

COMPLETE SUITE OF MONITORING SERVICES



- **Automatic Deformation Monitoring System**

- Tunnel Monitoring System
- Building & Tilt Settlement Monitoring
- Bridge & Slope Monitoring
- Viaduct Monitoring
- Dam Monitoring
- Landslide Monitoring
- Mining Monitoring

- **Ground Instrumentation**

- **Curved and Straight Pipe Jacking Guidance System**

- **MSP WebPro**

- **Information Technology Services**

- Software Development & Customisation
- Database Storage
- IT Support & Professional Services
- Industrial Network & Wireless Solution

We also provide customised solutions for other automated structural monitoring, settlement, displacement, vibration and user software application that are cost effective and inexpensive to use.



BUILDING MONITORING

The total station's reflectorless capability is used in this system to capture points on buildings to formulate tilt and settlement, making it the fastest and most commercially viable system.



TUNNEL MONITORING

In a thickly crowded living environment where construction activities are carried out nearby an existing tunnel, it is critical to know the structural effects arising from these activities. The system aims to address this need.



PIPE JACKING

A pilot project was carried out in Singapore in collaboration with our business partners from Japan to provide Automated Guidance System for curved pipe jacking. The entire curve pipe line is 480 meters.



MINING MONITORING

Mining monitoring is being equipped with sophisticated industrial instruments such as the total station. Its capability of measuring long distance prism targets with accuracy is suitable for all mining sites.



SOFTWARE DEVELOPMENT AND CUSTOMISATION

MSP developed an array of software applications for accurate and reliable Automated Monitoring System which have since been subjected to years of continuous trials in various challenging projects. MSP has also provided customised software to companies for use with their monitoring scheme; transmission via Email, GSM and GPRS was developed for clients requiring automated data transfer.

To excel in an ever changing world, MSP has collaborated with business partners to provide consultancy services and carry out Research and Development on a global marketable product with companies such as Sokkia Singapore Positioning Sales.

KEY PROJECTS

The past decade has witnessed the successful implementation of MSP's automated monitoring system technology on several key infrastructure development projects in Singapore, such as the construction of Kallang-Paya Lebar Expressway (KPE), VivoCity; the largest shopping mall in Singapore, the Singapore Management University (SMU), and the Marina Bay Financial Centre (MBFC), as well as the monitoring of Benjamin Sheares Bridge (during tunneling works for Downtown Line).

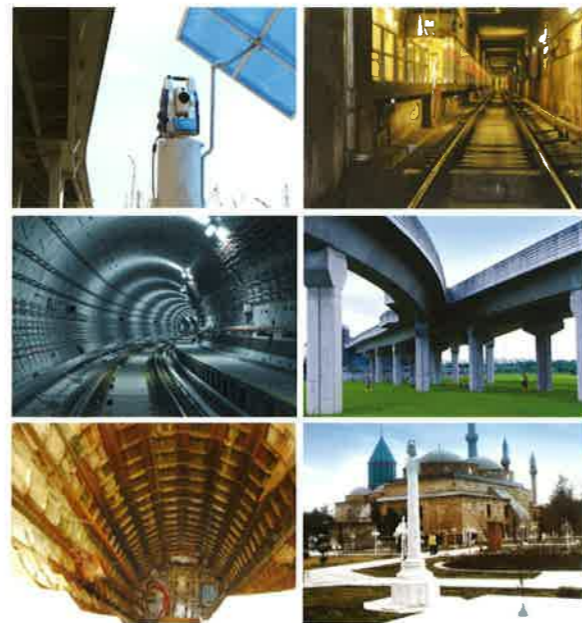
BRIDGE MONITORING BENJAMIN SHEARES BRIDGE

Land Transport Authority Contract C905 is one of the seven Downtown Line 1 contracts for the construction of tunnels between Promenade Station and Bayfront Station. MSP is engaged for the monitoring of Benjamin Sheares Bridge and Marina Bay Bridge.

TUNNEL MONITORING MARINA BAY FINANCIAL CENTRE (MBFC)

The Marina Bay Financial Centre (MBFC) is a strategic development by the Singapore Government to ensure that Singapore remains a major player in the global banking and financial arena. It is a purpose-built financial district of the new downtown with three office towers.

The development is above existing MRT tunnels as well as the Common Service Tunnel (CST). MSP participated actively in the monitoring of the tunnels and CST through various sub-projects for the development.



VIADUCT MONITORING BUONA VISTA MRT STATION

Automatic Monitoring System was adopted in the vicinity of the MRT Station at Buona Vista. 2 total stations were deployed to monitor the viaducts. Monitoring prisms were installed on viaducts. Electrolytic Sensor Beams (ELBeams) were installed at the soffit.

PIPE JACKING DTSS KIM CHUAN

The Kim Chuan Link Sewer Tunnel is part of the Singapore Deep Tunnel Sewerage System conceived as a long-term solution for water collection, treatment and disposal for the next century. MSP is involved in providing an automated guidance system for the Tunnel Boring Machine.

BUILDING MONITORING MEVLANA MUSEUM (KONYA, TURKEY)

The Mevlana Museum in the city of Konya, Turkey, is a historical structure more than 737 years old. The appearance of movement cracks in the structure prompted the commission of MSP to install an Automatic Deformation Monitoring System (ADMS) to detect further movements in the structure using two MS1AX instruments controlled by MSP RAPID ADMS Suite.

PROJECT REFERENCES

1. **Mass Rapid Transport (MRT) Train Tunnel**
 - a. Circle Line
 - b. Downtown Line
 - c. North East Line
 - d. East West Line
2. **MRT Depot**
3. **LTA Road Project**
 - a. KPE Road Tunnel
4. **Housing Development Board**
5. **PUB Deep Tunnel and Sewer Diversion**
6. **Building Monitoring**
 - a. Local
 - i. Marina Bay Financial Centre
 - ii. VivoCity
 - iii. Watertown @ Punggol
 - iv. NEX Shopping Center
 - v. D'leedon
 - b. Overseas
 - i. Mevlana Museum (Konya, Turkey)
7. **Ministry of Education**
 - a. Singapore Management University (SMU)
 - b. National Continuing and Training Centre (CET)

MSP RAPID™



The MSP RAPID™ Software – Automated Deformation Monitoring System (ADMS) is a simple to use application that is suited even for special projects requiring significant customisation, such as for the mining industry. With the MSP RAPID™ ADMS Suite, Manual Surveyors will no longer be burdened with an overload of information.

MSP RAPID™ ADMS Suite is a comprehensive system for monitoring the structural health of major infrastructure such as bridges, buildings, tunnels, viaducts, and dams on a periodic basis. It can be customised to meet the exclusive needs of individual projects. MSP RAPID™ ADMS Suite provides automated real-time and continuous monitoring 24/7. Data collected, processed, and interpreted, can be remotely accessed via a web-based system. An alert system will be triggered as soon as an anomaly is detected. Early detection of deformation can minimise the impact of disastrous events by reacting immediately.